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# Milpitas Metro Specific Plan

## Draft Subsequent Environmental Impact Report

State Clearinghouse #2006032091

**April 2022**

# DRAFT

# MILPITAS METRO SPECIFIC PLAN SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

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# Acronyms and Abbreviations

| | |
|---|---|
| 2020 UWMP | 2020 Urban Water Management Plan |
| AB | Assembly Bill |
| AB 1826 | Assembly Bill 1826 |
| AB 939 | California Integrated Waste Management Act of 1989 |
| ABAG | Association of Bay Area Governments |
| ACC | Advanced Clean Cars |
| ACE | Altamont Commuter Express |
| ACM | asbestos-containing materials |
| ACWD | Alameda County Water District |
| ADT | average daily trips |
| AFY | acre-feet per year |
| AIA | airport influence area |
| ALUC | Airport Land Use Commission |
| AQAP | Air quality attainment plans |
| AQMP | Air Quality Management Plan |
| BAAQMD | Bay Area Air Quality Management District |
| BART | Bay Area Rapid Transit |
| Bay Delta Plan | San Francisco Bay/Sacramento-San Joaquin Delta Estuary |
| BMPs | Best Management Practices |
| BPRD-L | Business Park Research & Development, Lower Density |
| BPRD-R | Business Park Research & Development, Residential |
| BVMU | Boulevard Very High Density Mixed Use |
| C&D | Construction and Demolition |
| CAAQS | California Ambient Air Quality Standards |
| CAFÉ | Corporate Average Fuel Economy Standards |
| CalEEMod | California Emissions Estimator Model |
| CALGreen | California Green Building Standards |
| Caltrans | California Department of Transportation |
| CAPCOA | California Air Pollution Control Officers Association |
| CARB | California Air Resources Board |
| CCAA | California Clean Air Act |
| CCBCs | Cross-County Bicycle Corridors |
| CCR | California Code of Regulations |
| CEC | California Energy Commission |
| CEQA | California Environmental Quality Act |
| Certified EIR | Final Environmental Impact Report |
| $CH_4$ | methane |

| | |
|---|---|
| City | City of Milpitas |
| CIWMB | California Integrated Waste Management Board |
| CMP | Congestion Management Program |
| CNEL | Community Noise Equivalent Level |
| $CO_2$ | carbon dioxide |
| CPUC | California Public Utilities Commission |
| dB | decibels |
| DPH | Department of Health Services |
| DPM | diesel particulate matter |
| EMFAC 2021 | CARB's 2021 EMission FACtor |
| EO | Executive Order |
| EPA | United States Environmental Protection Agency |
| EV | electric vehicle |
| FAR | floor area ration |
| FHWA | Federal Highway Administration's |
| First Update | First Update to the Scoping Plan |
| FTA | Federal Transit Administration |
| g/L | grams/liter |
| GHG | greenhouse gas |
| GVB | groundborne vibration |
| GWP | global warming potential |
| HCD | Housing and Community Development |
| HFCs | Hydroflourocarbons |
| hp | horsepower |
| HRA | Health Risk Assessment |
| HVAC | heating, ventilation, and air-conditioning |
| I- | Interstate |
| in/sec | inch/second |
| IPCC | Intergovernmental Panel on Climate Change |
| ITS | intelligent transportation systems |
| IWMP | Integrated Waste Management Plan |
| LCFS | low-carbon fuel standard |
| Ldn | day-night average sound level |
| LEED | Leadership in Energy and Environmental Design |
| LID | Low Impact Development measures |
| LOS | Level of Service |
| LTS | Level of Traffic Stress |
| Metro Plan Area | Metro Plan Planning Area |
| Metro Plan or Project | Milpitas Metro Specific Plan |
| MFD | Milpitas Fire Department |

| | |
|---|---|
| MFH | Multi-Family Residential High Density |
| mgd | million gallons per day |
| MGY | million gallons per year |
| $MMTCO_2e$ | million metric tons of carbon dioxide equivalent |
| MPD | Milpitas Police Department |
| mph | miles per hour |
| MRF | Materials Recovery Facility |
| MSI | Milpitas Sanitation, Inc. |
| MTC | Metropolitan Transportation Commission |
| $MTCO_2e$ | metric tons of CO2e |
| MTWS | Mission Trails Waste Systems |
| MUSD | Milpitas Unified School District |
| $N_2O$ | nitrous oxide |
| NAAQS | National Ambient Air Quality Standards |
| NESHAP | National Emissions Standards for Hazardous Air Pollutants |
| NHTSA | National Highway Traffic Safety Administrative |
| NISL | Newby Island Sanitary Landfill |
| NOP | Notice of Preparation |
| $NO_X$ | nitrogen oxides |
| NPDES | National Pollutant Discharge Elimination System |
| $O_3$ | ozone |
| OPR | Office of Planning and Research |
| PF | Public Facilities |
| PFCs | perfluorocarbons |
| PG&E | Pacific Gas & Electric Company |
| $PM_{10}$ | particulate matter |
| $PM_{2.5}$ | fine particulate matter |
| POS | Parks and Open Space |
| ppm | parts per million |
| PPV | peak particle velocity |
| R&D | Research and Development |
| RHNA | Regional Housing Needs Allocation |
| ROGs | reactive organic gases |
| RPS | Renewables Portfolio Standard |
| RRMU | Residential Retail High Density Mixed Use |
| RTP | Regional Transportation Plan |
| RTPs/SCSs | regional transportation plans/sustainable community strategies |
| RWQCB | Regional Water Quality Control Board |
| SAFE | Safer Affordable Fuel-Efficient |
| SB | Senate Bill |

| | |
|---|---|
| SCAQMD | South Coast Air Quality Management District |
| SCS | Sustainable Communities Strategy |
| SCVWD | Santa Clara Valley Water District |
| SDWA | Safe Drinking Water Act |
| SEIR | Subsequent Environmental Impact Report |
| sf | square feet |
| $SF_6$ | sulfur hexafluoride |
| SFBAAB | San Francisco Bay Area Air Basin |
| SFPUC | San Francisco Public Utilities Commission |
| SIP | State Implementation Plan |
| SJVAPCD | San Joaquin Valley Air Pollution Control District |
| SJWC | San Jose Water Company |
| SLCP | Short-Lived Climate Pollutant |
| SLM | sound level meters |
| SOS | Sustainable Organic Solutions |
| $SO_X$ | sulfur oxides |
| SRR | Source Reduction and Recycling |
| TACs | toxic air contaminants |
| TASP | Transit Area Specific Plan |
| TASP Area | TASP Planning Area |
| TCMs | Transportation Control Measures |
| TDM | travel demand management |
| TMA | Transportation Management Association |
| TOD | Transit-Oriented Development |
| TPA | Transit Priority Area |
| TSM | transportation systems management |
| URR | Urban Residential |
| USGBC | United States Green Building Council |
| VHD | Very High Density |
| VMT | vehicle miles traveled |
| VTA | Valley Transportation Authority |
| VTP 2040 | Valley Transportation Plan 2040 |
| WPCP | Water Pollution Control Plant |
| WSA | Water Supply Assessment |
| WSCP | Water Shortage Contingency Plan |
| WWTP | wastewater treatment plants |

# Executive Summary

This Draft Subsequent Environmental Impact Report (SEIR), State Clearinghouse #2006032091, has been prepared in accordance with the provisions of the California Environmental Quality Act (CEQA) to evaluate the proposed changes to the *Milpitas Transit Area Specific Plan Final Environmental Impact Report* (Certified EIR), certified in 2008. This SEIR analyzes the Milpitas Metro Specific Plan (Metro Plan), an update to the original Transit Area Specific Plan (TASP) vision to transform the area into a transit-oriented neighborhood and complete the emerging neighborhood by expanding access to neighborhood services and retail, creating new opportunities for jobs near transit, providing additional affordable and market-rate housing, enhancing multimodal connections and non-vehicle mobility throughout the area, providing a greater variety of shared public spaces, and strengthening the identity sense of place within the Metro Plan Area. As required by Section 15123 of the CEQA Guidelines, this Executive Summary contains the following.

- Project Under Review
- Project Objectives
- Project Impacts and Mitigation Measures
- Project Alternatives
- Potential Areas of Controversy/Issues to be Resolved

## Project under Review

The Project analyzed in the SEIR, in compliance with CEQA, is the proposed Milpitas Metro Specific Plan (Metro Plan or Project). The Metro Plan is an update to the TASP. The City of Milpitas (City) adopted the TASP and certified a Final Environmental Impact Report (Certified EIR) for the TASP in 2008. The TASP is a regulatory plan that guides development in the approximately 437-acre TASP Planning Area (TASP Area) surrounding the Milpitas Transit Center, which includes regional bus and light rail service as well as a new connection to the Bay Area Rapid Transit (BART) system. The Metro Plan aims to update the original TASP vision to transform the area into a transit-oriented neighborhood and complete the emerging neighborhood by expanding access to neighborhood services and retail, creating new opportunities for jobs near transit, providing additional affordable and market-rate housing, enhancing multimodal connections and non-vehicle mobility throughout the area, providing a greater variety of shared public spaces, and strengthening the identity sense of place within the Metro Plan Area.

The Metro Plan Planning Area (Metro Plan Area) covers a significant portion of the southern area of the City. The Metro Plan provides policies to guide development in this district in terms of land use, circulation, community design, and utilities and services. Policy 7.5 of the original TASP requires the creation of a coordinated development plan for the parcels at and around the Milpitas Transit Center, and the Metro Plan will continue to fulfill that requirement. The Metro Plan expands the original 437-acre TASP Area by approximately 60 acres, annexing an industrial area on the east side near Interstate (I-) 680 (I-680) and approximately 13 acres on the west side along a portion of South Main Street, resulting in a Metro Plan Area of 510 acres. Figure ES-1 shows the location of the Metro Plan.

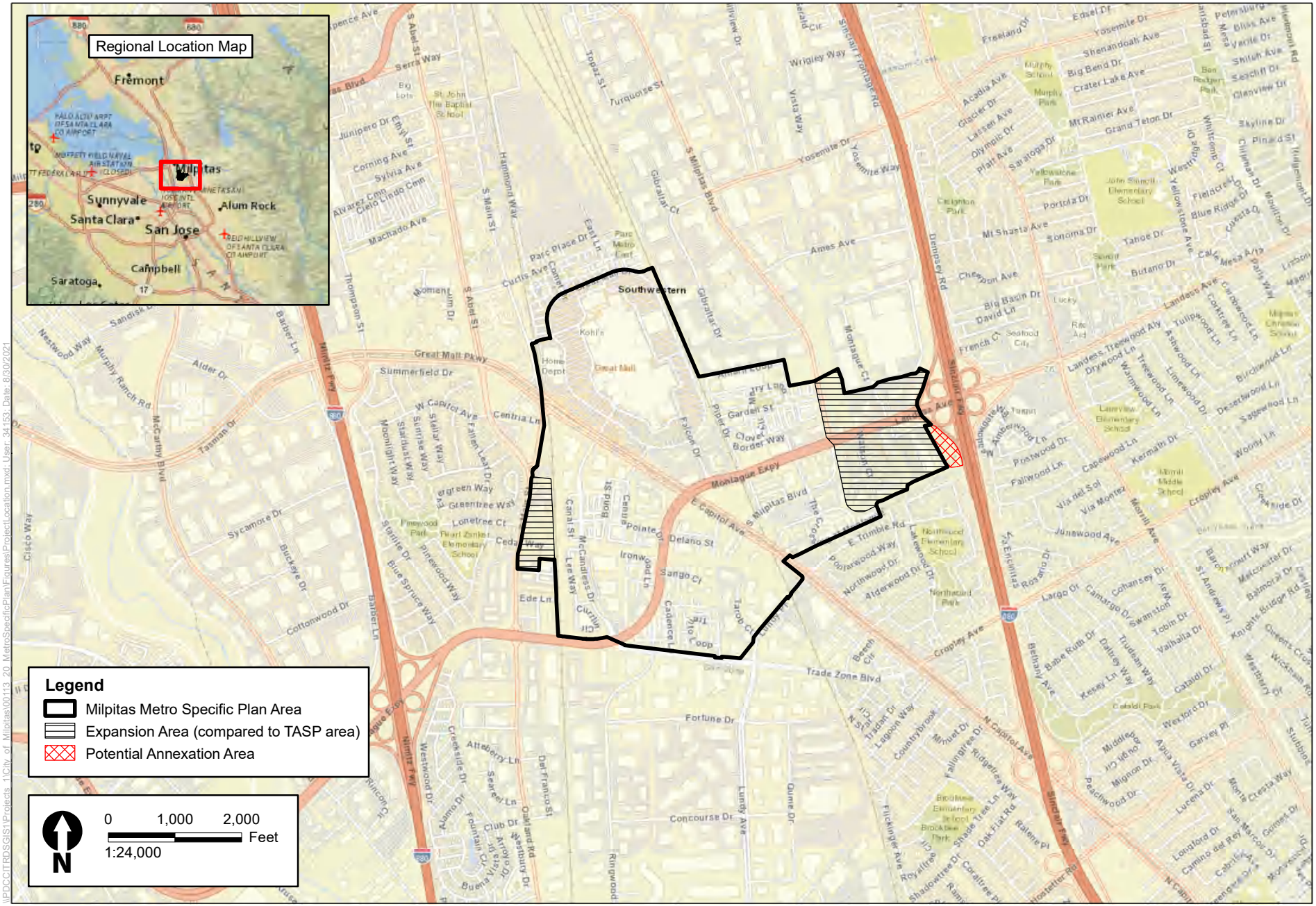


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**Figure ES-1**
**Project Location Map**

The Project Change would entail four main changes, when compared to the TASP. These changes include the following:

1. Expansion of the original 437-acre TASP Plan Area by approximately 73 additional acres, for a total of 510 acres, in order to facilitate the development of an Innovation District east of the Milpitas Transit Center and to promote opportunities for housing development along South Main Street. In addition, the Metro Plan redefines the five Districts, such that they are bounded by major streets and are located on a mix of land uses, development densities, park placements, street grids, pedestrian connections, and proximities to the Milpitas Transit Center.
2. Changes to the land use classifications (increased allowable densities, new land use classifications, and change in location of land use classifications) and policies, compared to the TASP.
3. Additional residential and non-residential density and related population and employment growth, compared to the TASP.
4. Extension of the Metro Plan horizon year by 10 years (from 2030 to 2040), compared to the TASP.

The buildout associated with the Metro Plan would be in addition to the buildout already planned for in the TASP. The buildout planned for in the TASP is summarized in Table ES-1, which also summarizes the development that has been built or entitled since 2008. In summary, the Metro Plan at buildout, as compared to the TASP, would result in approximately 7,000 additional dwelling units, 3,000,000 additional square feet of office (including industrial), 300,000 additional square feet of retail, and 700 added hotel rooms.

**Table ES-1. Comparison of Existing Growth Under the TASP and Additional Growth Under the Metro Plan**

| Land Use | 2008 Existing Development | TASP Planned New Development | Total TASP Planned Development | Entitled by 2019[1] | Additional Projected Development for Metro Plan by 2040 | Total Planned Development (TASP plus Metro Plan) |
|---|---|---|---|---|---|---|
| Dwelling Units | 468 | 7,109 | 7,577 | 6,955 | 7,000 | 14,577 |
| Office (sf) | 52,780 | 993,843 | 1,050,000 | 10,630 | 3,000,000[2] | 4,050,000 |
| Retail (sf) | 1,970,000 | 287,075 | 2,240,000 | 186,500 | 300,000 | 2,540,000 |
| Hotel (rooms) | 292 | 350 | 642 | 0[3] | 700 | 1,342 |

[1] Entitled, under construction, or constructed/occupied.

[2] Includes 500,000 sf of industrial uses

[3] Currently there are concept plans for a high-rise hotel.

Note: The Metro Plan would also allow for a police station to be developed in the Innovation District, with a potential location shown on Figure 2-4. The potential police station use is discussed in this Draft SEIR where relevant to the impact analysis.

sf = square feet

# Project Change Objectives

The City is proposing the Project Change in order to achieve the following objectives:

1. **To enhance the sense of place and identity of the Metro Plan Area with visually memorable structures and buildings.**
    - This is achieved through:
        - Providing high to very high-density housing and/or high intensity office and employment uses along arterials, the light rail, and close to the BART station to support transit ridership and complementary activities by responding to strong market interest in high-density development in an appropriate setting.
        - Accommodating a vibrant mix of pedestrian-accessible retail and amenities, high density housing and high-intensity office and other employment uses within the Metro Plan Area and particularly within the Great Mall District, along Great Mall Parkway and Montague Expressway; and promoting public art and wayfinding strategies.
2. **To provide safer and more attractive multimodal connections for walking and biking.**
    - This is achieved through:
        - Creating a multi-modal network that includes pedestrian pathways and bikeways to reinforce a pedestrian scale and grid where appropriate.
        - Creating a streetscape that encourages multimodal connections with an attractive and richly detailed urban environment with good connectivity between desired destinations.
        - Improving the City transportation network and contributing to the Countywide transportation network and transportation demand management over the next 20 years by improving the multimodal network and implementing the Active Transportation Plan. Key enhancements include creating safer and more accessible connections for pedestrians and bicyclists and establishing a plan-wide transportation demand management (TDM) program.
3. **To provide a greater variety of shared public spaces.**
    - The Metro Plan will establish urban design policies to ensure adequate public open space to serve residential development. In compliance with the General Plan, the goal for open space development is 3.5 acres per 1,000 residents or the equivalent in terms of recreational value. Some recreational opportunities may be provided outside the Metro Plan Area, and a Recreational Value metric may be used to evaluate intensively-programmed and high quality spaces as equivalent to larger spaces in meeting open space goals.
    - Develop parks, trails, and public open spaces that provide active and passive recreation opportunities, pedestrian connectivity, and places for community interaction in each District, as per the Parks and Recreation Master Plan. Encourage the development of creative, usable private and public outdoor space, such as on building rooftops and balconies and on other accessible public areas.
4. **To expand neighborhood services and the variety of retail.**

- Create additional neighborhood-serving retail to serve demand from Metro Plan Area residents, community members, and the local workforce, including up to 300,000 additional square feet of retail and restaurant space.
- Require local-serving retail on particular sites where it is feasible and appropriate, and permit it in otherwise residential and commercial-only structures.
- Promote the development of hotels where appropriate to meet demand, and support commercial activity to provide an important revenue source for the City.

5. **To create and expand available space for jobs near transit.**
   - Attract business investments and generate employment opportunities through commercial development near transit, with up to 3,000,000 square feet of new office/Research and Development (R&D)/light manufacturing space.
   - To support the development of an Innovation District in the industrial area east of the Milpitas Transit Center and west of I-680, and particularly east of Berryessa Creek and on the four corners at the intersection of South Milpitas Boulevard and Montague Expressway, as a hub of employment and R&D, integrating Milpitas into Silicon Valley with high-density office, research, light manufacturing uses, and services primarily to the east of Berryessa Creek.
6. **To provide both affordable and market-rate housing.**
   - Accommodate up to 7,000 additional housing units to help the City meet its regional housing needs requirements and support transit ridership.
   - As part of the vision, several key elements of the Metro Plan support this objective:
     - Support the evolution of the Great Mall site from a purely retail-based mall site into a mixed-use, retail and amenity-rich area that is well integrated into the Metro Plan Area.
     - Support mixed-use housing in both vertical and horizontal configurations to provide living nears jobs and services, as well as transit.
   - Enhance Great Mall Parkway as a landmark street with a new linear park, streetscape improvements, and public art.
   - Improve connectivity with the Tango District to and from the VTA Transit Station and McCandless District with a pedestrian/bicycle bridge connection and improvements that complete the multi-use trail system.

# Project Impacts and Mitigation Measures

## Summary of Project Impacts, including the Project Change

The City prepared an Initial Study, which is includes as Appendix B to this SEIR. The Initial Study idenfited that the Metro Plan would have no impact or less than significant impacts on the following environmental resource topics would be less than significant: aesthetics, agricultural and forestry resources, biological resources, cultural resources, energy, geology and soils, hazards and hazardous materials, hydrology and water quality, mineral resources, tribal cultural resources, and wildfire. Table ES-2 (presented at the end of this Executive Summary) summarizes the impacts from the

Project Change analyzed in this SEIR. Table ES-2 includes the significance of impacts before mitigation, and for significant impacts, the feasible mitigation measures (if available) and the level of significance after mitigation. Refer to Chapter 3, *Setting, Impacts, and Mitigation Measures*, for a detailed discussion of Project Change impacts and detailed description of the mitigation measures. Table ES-3 (presented at the end of this Executive Summary) summarizes the cumulative impacts from the Project Change. Refer to Chapter 4, *Other CEQA Discussions*, for a detailed discussion of cumulative impacts.

# Significant and Unavoidable Project Impacts

Significant and unavoidable impacts are those that cannot be reduced to a less-than-significant level with mitigation or for which no feasible mitigation is available. The Project Change would have the following significant and unavoidable impacts:

- Impact AQ-2a: Construction of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.
- Impact AQ-2b: Operation of the Metro Plan would result in a substantially more severe significant air quality impact than that identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.
- Impact AQ-3: Implementation of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to exposing sensitive receptors to substantial pollutant concentrations.
- Impact GHG-1: Implementation of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to the generation of GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.
- Impact NOI-1: Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.
- Impact NOI-3: Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to exposing persons to or generating excessive ground-borne vibration or ground-borne noise levels.
- Impact C-AQ-1: Implementation of the Metro Plan would result in new and substantially more severe cumulative air quality impacts that were not identified in the Certified EIR.
- Impact C-GHG-1: Implementation of the Metro Plan would result in new cumulative greenhouse gas emissions impacts that were not identified in the Certified EIR.
- Impact C-NOI-1: Implementation of the Metro Plan would result in new cumulative noise impacts that were not identified in the Certified EIR.

# Project Alternatives to the Proposed Project Change

The following three alternatives to the Proposed Project Change are analyzed in this Draft SEIR.

- **No Project Alternative.** The No Project Alternative is required by CEQA and assumes full buildout of the TASP, as disclosed in the Certified EIR.
- **Reduced Height Alternative.** The Reduced Height Alternative places a height restriction across the Metro Plan Area that limits building heights to 75 feet, which would reduce the additional projected dwelling units by 1,000 units and the additional office space by approximately 500,000 square feet compared to the proposed Metro Plan.
- **Removal of Western Expansion Area Alternative.** The Removal of Western Expansion Area would remove the western expansion area from the Metro Plan Area and reduce the additional projected dwelling units by 500 units, compared to the proposed Metro Plan.

# Potential Areas of Controversy and Issues to Be Resolved

Through the issuance of a Notice of Preparation (NOP) distributed to the State Clearinghouse, and circulated by the City on September 16, 2021, responsible agencies, interested organizations, and the public have had the opportunity to provide comments concerning the Project Change, the alternatives to be considered, and issues of concern and controversy. The following areas of concern and potential controversy have been identified through the scoping process.

- Potential impacts to transportation, including preparing a vehicle miles traveled (VMT) analysis.
- Mitigation for transportation impacts, including fair share contributions toward multimodal and regional transit improvements.
- Potential impacts to traffic and bicycle, pedestrian, and transit facilities.
- Potential impacts to biological resource, including impacts on wetlands, waters, nesting birds, and potential bird strikes due to height of new buildings.
- Potential impacts on cultural resources, including coordinating with Native American Tribes, in accordance with Assembly Bill 52 and Senate Bill 18.

The following issues need to be resolved:

- Consultation with the Native America Tribe, the Indian Canyon Mutsun Band of Costanoan, per their request.
- Consideration of comments on the Draft EIR, responses to substantive environmental issues raised in comments, and revisions to the Draft EIR as necessary based on information in comments or new information or clarifications developed in responses.
- Certification of the Final EIR after consideration of comments and responses and any public testimony.
- Approval of the Project Change or one of the alternatives.

**Table ES-2. Summary of Project Change Impacts and Mitigation Measures**

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| **Air Quality** | | | |
| Impact AQ-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to conflicting with or obstructing implementation of an applicable air quality plan. | Less than significant | None required | -- |
| Impact AQ-2a: Construction of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard. | Potentially significant | AQ-1: Require at Least Tier 4 Final Engines on Construction Equipment<br>AQ-2: Require Use of Diesel Trucks with 2010-Compliant Model Year Engines<br>AQ-3: Require Construction Fleet to Use Renewable Diesel<br>AQ-4: Require Low-VOC Coatings During Construction<br>AQ-5: Require Fugitive Dust Best Management Practices<br>AQ-6: Purchase Mitigation Credits for Construction Emissions Exceeding BAAQMD's Daily Pollutant Thresholds | Significant and Unavoidable |
| Impact AQ-2b: Operation of the Metro Plan would result in a substantially more severe significant air quality impact than that identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard. | Potentially significant | AQ-7: Restrict Use of Natural Gas in New Development<br>AQ-8: Purchase Mitigation Credits for Operational Emissions Exceeding BAAQMD's Daily Pollutant Thresholds | Significant and Unavoidable |
| Impact AQ-3: Implementation of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to exposing sensitive receptors to substantial pollutant concentrations. | Potentially significant | AQ-9: Prepare a Health Risk Assessment | Significant and Unavoidable |
| Impact AQ-4: Implementation of the Metro Plan would not result in new or substantially more severe impacts than those identified in the Certified EIR related to creating objectionable odors affecting a substantial number of people. | Less than significant | None required | -- |

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| **Greenhouse Gas Emissions** | | | |
| Impact GHG-1: Implementation of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to the generation of GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. | Potentially significant | GHG-1: Require Implementation of BAAQMD-Recommended Construction Best Management Practices<br>GHG-2: Implement Operational GHG Reduction Measures or Their Equivalent<br>GHG-3: Purchase GHG Mitigation Credits | Significant and Unavoidable |
| **Land Use and Planning** | | | |
| Impact LU-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to physically dividing an established community. | No impact | None required | -- |
| Impact LU-2: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to causing a significant environmental impact due to a conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. | Less than significant | None required | -- |
| **Noise** | | | |
| Impact NOI-1: Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies. | Potentially significant | The Project Change does not include additional mitigation measures beyond what would be required through implementation of the 2040 General Plan policies and actions. | Significant and Unavoidable |
| Impact NOI-2: Operation of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies. | Potentially significant | NOI-1: Mechanical Equipment Noise Reduction Plan | Less than significant |

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| Impact NOI-3: Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to exposing persons to or generating excessive ground-borne vibration or ground-borne noise levels. Operation of the Metro Plan would not result in a new or substantially more severe impact than what was identified in the Certified EIR related to exposing persons to or generating excessive ground-borne vibration or ground-borne noise levels. | Potentially significant | NOI-2: Protect Potentially Susceptible Structures from Construction-Generated Vibration<br>NOI-3: Implement Nighttime Construction Vibration Control Plan to Reduce Vibration-Related Annoyance Impacts on Adjacent Land Uses | Significant and Unavoidable |
| Impact NOI-4: The Metro Plan would not result in a new or substantially more severe impact than what was identified in the Certified EIR related to being located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, and exposing people residing or working in the project area to excessive noise levels. | No impact | None required | -- |
| **Population and Housing** | | | |
| Impact POP-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to inducing substantial unplanned population growth in an area, either directly or indirectly. | Less than significant | None required | -- |
| Impact POP-2: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to displacing substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. | No impact | None required | -- |
| **Public Services and Recreation** | | | |
| Impact PS-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantial adverse physical impacts associated with the provision of new or physically altered schools or the need for new schools. | Less than significant | None required | -- |

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| Impact PS-2: Implementation of the Metro Plan could result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities or the need for new fire protection facilities. | CEQA conclusion cannot be made at this time. Future fire facilities may be subject to further review under CEQA. | -- | -- |
| Impact PS-3: Implementation of the Metro Plan could result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities or the need for new police protection facilities. | CEQA conclusion cannot be made at this time. Future police facilities may be subject to further review under CEQA. | -- | -- |
| Impact PS-4: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantial adverse physical impacts associated with the provision of new or physically altered parks or the need for new parks; related to the increased use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or including recreational facilities or requiring the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. | Less than significant | None required | -- |
| **Transportation** | | | |
| Impact TR-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to conflicting with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. | Less than significant | None required | -- |

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| Impact TR-2: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to conflicting or being inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b). | Less than significant | None required | -- |
| Impact TR-3: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantially increasing hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). | Less than significant | None required | -- |
| Impact TR-4 Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to resulting in inadequate emergency access. | Less than significant | None required | -- |
| **Utilities and Service Systems** | | | |
| Impact UTIL-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to requiring or resulting in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which would cause significant environmental effects. | Less than significant (for all facilities except the future reservoir and pump stations, see below); CEQA conclusion cannot be made at this time. Future reservoir and pump station may be subject to further review under CEQA. | None required | -- |
| Impact UTIL-2: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to having sufficient water | Less than significant | None required | -- |

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years. | | | |
| Impact UTIL-3: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to resulting in a determination by the wastewater treatment provider which serves or may serve the project it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. | Less than significant | None required | -- |
| Impact UTIL-4: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to generating solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. | Less than significant | None required | -- |
| Impact UTIL-5: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to complying with federal, state, and local management and reduction statutes and regulations related to solid waste. | Less than significant | None required | -- |

**Table ES-3. Summary of Cumulative Project Change Impacts and Mitigation Measures**

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| Impact C-AES-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative aesthetics impacts. | Less than cumulatively considerable contribution | None required | -- |
| Impact C-AQ-1: Implementation of the Metro Plan would result in new and substantially more severe cumulative air quality impacts that were not identified in the Certified EIR. | Potentially significant cumulative impact | AQ-1: Require at Least Tier 4 Final Engines on Construction Equipment<br>AQ-2: Require Use of Diesel Trucks with 2010-Compliant Model Year Engines<br>AQ-3: Require Construction Fleet to Use Renewable Diesel<br>AQ-4: Require Low-VOC Coatings During Construction<br>AQ-5: Require Fugitive Dust Best Management Practices<br>AQ-6: Purchase Mitigation Credits for Construction Emissions Exceeding BAAQMD's Daily Pollutant Thresholds<br>AQ-7: Restrict Use of Natural Gas in New Development<br>AQ-8: Purchase Mitigation Credits for Operational Emissions Exceeding BAAQMD's Daily Pollutant Thresholds<br>AQ-9: Prepare a Health Risk Assessment | Significant and Unavoidable |
| Impact C-BIO-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative biological resources impacts. | Less than cumulatively considerable contribution | None required | -- |
| Impact C-CUL-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative cultural resources impacts. | Less than significant cumulative impact | None required | -- |

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| Impact C-EN-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to energy impacts. | Less than significant cumulative impact | None required | -- |
| Impact C-GEO-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative geology and soils impacts. | Less than significant cumulative impact | None required | -- |
| Impact C-GHG-1: Implementation of the Metro Plan would result in new cumulative greenhouse gas emissions impacts that were not identified in the Certified EIR. | Potentially significant cumulative impact | GHG-1: Require Implementation of BAAQMD-Recommended Construction Best Management Practices<br>GHG-2: Implement Operational GHG Reduction Measures or Their Equivalent<br>GHG-3: Purchase GHG Mitigation Credits | Significant and Unavoidable |
| Impact C-HAZ-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative hazards and hazardous materials impacts. | Less than significant cumulative impact | None required | -- |
| Impact C-LU-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative land use impacts. | Less than significant cumulative impact | None required | -- |
| Impact C-NOI-1: Implementation of the Metro Plan would result in new cumulative noise impacts that were not identified in the Certified EIR. | Potentially significant cumulative impact | NOI-1: Mechanical Equipment Noise Reduction Plan<br>NOI-2: Protect Potentially Susceptible Structures from Construction-Generated Vibration<br>NOI-3: Implement Nighttime Construction Vibration Control Plan to Reduce Vibration-Related Annoyance Impacts on Adjacent Land Uses | Significant and Unavoidable |
| Impact C-POP-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative population and housing impacts. | Less than cumulatively considerable contribution | None required | -- |

| Impact | Significance before Mitigation | Mitigation | Significance after Mitigation |
|---|---|---|---|
| Impact C-TR-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative transportation impacts. | Less than cumulatively considerable contribution | None required | -- |
| Impact C-UTIL-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to utilities and service systems impacts. | Less than significant cumulative impact | None required | -- |

# Chapter 1
# Introduction

## 1.1 Background

In 2008, the City of Milpitas (City) certified a Final Environmental Impact Report (Certified EIR) for the Transit Area Specific Plan (TASP), which consists of policies and proposals to guide growth, including transit-oriented residential and commercial redevelopment on industrial land in a 437-acre area around the Milpitas Bay Area Rapid Transit (BART) and light rail station. The Certified EIR analyzed the potential impacts from implementation of the TASP, including the potential impacts associated with redevelopment within the 437-acre TASP Planning Area (TASP Area) and the potential impacts associated with population growth (17,915) due to additional residential units (7,109), and new jobs (4,228) resulting from added office uses (993,843 square feet), retail uses (287,075 square feet), and hotels (175,500 square feet). These improvements were analyzed at a program level in the Certified EIR. While development associated with the TASP has occurred, full buildout of the TASP has not yet been achieved.

Based on current needs and policy directives, the City is proposing changes to the TASP that was analyzed in the Certified EIR. The Milpitas Metro Specific Plan (Metro Plan or Project) would update the TASP by adding substantially more opportunity for development in this transit-oriented and integrated mixed use area of the City, including the potential for more housing, jobs, services and amenities in the slightly enlarged Metro Plan Area. The changes to the TASP in the Metro Plan are referred to as the "Project Change." This Subsequent Environmental Impact Report (SEIR) evaluates the potential environmental impacts associated only with the Project Change to determine whether the Project Change would alter the impact significance determinations for the Project in the Certified EIR. As an SEIR, this document is not required to reevaluate development already addressed by the previously certified EIR, even if it has not yet been constructed but may still go forward. The Project Change involves environmental analysis of new development that would result in the following: (1) the addition of up to 14,000 new residents and 9,500 new jobs, (2) the expansion of the geographic area of the Metro Plan, and (3) changes in the policies identified in the Metro Plan (refer to Chapter 2, *Project Description*).

Section 15367 of the California Environmental Quality Act (CEQA) Guidelines defines a *lead agency* as "the public agency which has the principal responsibility for carrying out or approving a project." The City of Milpitas has the authority to approve the Metro Plan and is therefore the lead agency for activities associated with the Project.

## 1.2 Purpose of the SEIR

Per State CEQA Guidelines Section 15162, , when an EIR has been certified, a subsequent EIR should be prepared if a lead agency determines on the basis of substantial evidence that one or more of the following circumstances has arisen:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:
    a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
    b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
    c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
    d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The Project Change could potentially involve new significant environmental effects or a substantial increase in the severity of effects identified in the Certified EIR. Additionally, given the time that has passed since preparation of the Certified EIR, which was certified in 2008, new circumstances and/or information relevant to the environmental analysis may exist. Therefore, the Project Change constitutes a substantial change to the Project previously reviewed under CEQA, which requires preparation of an SEIR.

## 1.3 Environmental Baseline

Project development characteristics are typically compared to the existing physical environment to isolate impacts caused by the project on its surroundings. In other words, the existing condition (also referred to as the environmental setting) is normally the baseline against which the project's impacts are measured to determine whether impacts are significant. However, because SEIRs focus on changes relative to a certified EIR, the baseline used for an SEIR is the conditions associated with buildout of the project in the certified EIR. In other words, the environmental baseline for this SEIR

is the full buildout of the TASP as identified in the Certified EIR.[1] Furthermore, the City of Milpitas General Plan, which was adopted on March 9, 2021, (referred to as the 2040 General Plan herein) assumes the full buildout of the TASP.

## 1.4 Specific Plan Process and Public Involvement

The Milpitas Metro Specific Plan was developed through public engagement in multiple ways. The process began with the Existing Conditions Phase in the spring of 2020, during which community concerns and priorities were identified and used to guide the approach for the Metro Plan. This process included a map-based online survey, which asked members of the public to identify destination and service needs in the Metro Plan Area. A total of 316 responses were collected, which informed conceptual ideas for the Metro Plan and were presented to the City Council. In addition, interviews were held with 24 different stakeholders, including the Chamber of Commerce, Milpitas Unified School District (MUSD), Santa Clara Valley Transportation Authority (VTA), private commercial and housing developers, and City departments, to identify priorities and concerns for development in the Metro Plan Area.

The process continued with the Plan Framework Phase in the summer and winter of 2020. During this phase, members of the community were able to provide feedback on conceptual land use and transportation connection ideas. The community was engaged through an interactive community meeting held on September 30, 2020. In addition, an asynchronous Open House was available online for 3.5 weeks in October 2020, during which members of the public could provide their input.

The process then continued with Draft Plan Phase in the spring and summer of 2021. During this phase, members of the public were able to review and provide comments on the Draft Metro Plan. A virtual Community Open House was held on October 25, 2021, during which an overview of the Draft Metro Plan was provided, and members of the community were able to ask questions about the Draft Metro Plan.

The Final Metro Plan will be developed in tandem with the preparation of the Final SEIR and will be considered for approval at that time. The Draft Metro Plan is included as Appendix C to this SEIR. This CEQA process will allow for revisions to be made to the Draft Metro Plan. The Draft Metro Plan will be revised, as needed, in response to comments made by agencies and the public on this Draft SEIR.

## 1.5 Program EIR Approach

This Subsequent EIR, like the EIR for the TASP is a Program EIR. A program EIR is defined in State CEQA Guidelines Section 15168 as: "…an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either: (1) geographically; (2) as logical parts in the chain of contemplated actions; (3) in connection with the issuance of rules, regulations, plans,

[1] See *Benton v Board of Supervisors* (1991) 226 CA3d 1467, 1484, 277 CR 481 (holding that when evaluating whether changes to a project would result in new significant environmental impacts, the agency must consider the incremental difference between the original project and the project as modified), and *Temecula Band of Luiseño Mission Indians v Rancho Cal. Water Dist.* (1996) 43 CA4th 425, 437, 50 CR2d 769 (holding that the agency's review is limited to new effects not previously considered).

or other general criteria to govern the conduct of a continuing program; or (4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental impacts which can be mitigated in similar ways."

Program EIRs can be used as the basic, general environmental assessment for an overall program of projects developed over the 20-year planning horizon. A program EIR has several advantages. First, it provides a basic reference document to avoid unnecessary repetition of facts or analysis in subsequent project-specific assessments. Second, it allows the lead agency to look at the broad, regional impacts of a program of actions before its adoption and eliminates redundant or contradictory approaches to the consideration of regional and cumulative impacts.

As a program EIR, this document focuses on the overall effects of the proposed changes to the TASP under the Metro Plan; the analysis does not examine the effects of potential site-specific projects that may occur under the overall umbrella of this program in the future. When specific development proposals for the Metro Plan Area are submitted to the City, the City will follow the CEQA process as identified in Section 1.6, *Intended Uses of the SEIR*.

In order to place many of the proposed Metro Plan policies into effect, the City will adopt or approve specific actions—zoning regulations, zoning map amendments, development impact fees, capital improvement programs, development projects, etc.—that are consistent with the policies and implementation measures of the Metro Plan.

CEQA mandates that lead agencies adopt mitigation monitoring and reporting programs for projects identified as having significant impacts where mitigation measures have been identified. Mitigation monitoring and reporting programs are intended to ensure compliance during project implementation. These programs provide the additional advantages of providing staff and decision-makers with feedback as to the effectiveness of mitigation measures, as well as the experience and information to shape future mitigation measures. The Certified EIR did not identify any required mitigation measures and concluded that the policies in the TASP would mitigate potential environmental impacts; however, air quality impacts were still found to be significant and unavoidable in the Certified EIR. The Metro Plan also includes some policies that would minimize environmental impacts; however, this SEIR identifies significant impacts that would require the implementation of mitigation measures. As such, a mitigation monitoring and reporting program would be required for the Metro Plan.

This SEIR represents the best effort to evaluate the potential environmental effects of the proposed Metro Plan given its long-term planning horizon. It can be anticipated that conditions will change; however, the assumptions used are the best available at the time of preparation and reflect existing knowledge of patterns of development and travel patterns. The SEIR is based on the following key assumptions:

- *Full Implementation*. This SEIR assumes that all policies in the proposed Metro Plan will be fully implemented, and all development will be consistent with the proposed Land Use Diagram.
- *Buildout in 2040*. This SEIR assumes that the majority of development and redevelopment under the proposed Metro Plan will occur within 20 years. This is the timeline or planning horizon for this analysis. It is understood that development under the proposed Metro Plan will be incremental and timed in response to market conditions and property owners' initiatives.

# 1.6 Intended Uses of the SEIR

This section provides a brief overview of the purpose and intended uses of this SEIR.

## 1.6.1 Program-Level Analysis

Buildout for the Metro Plan is evaluated at a program level in this SEIR. State CEQA Guidelines Section 15168 establishes the use of program EIRs for review of later activities. As defined therein, a program EIR is one prepared on a series of related actions that can be characterized as one large project. Feasible mitigation measures and alternatives developed in the program EIR must be incorporated into later activities in the program to the extent applicable to the individual later activity. Later activities must be evaluated to determine whether additional environmental review is needed. If a later activity is determined to be "within the scope" of the project covered by the program EIR, the lead agency can make a finding of consistency and approve the activity without having to prepare a new environmental document. The lead agency may use a written checklist or similar device to determine whether the environmental effects of the later action are within the scope of the program EIR. The City anticipates utilizing such a written checklist or similar device when evaluating future development projects processed under the Metro Plan and/or for implementation of related infrastructure improvements.

### 1.6.1.1 Subsequent Activities Not Previously Examined

If the lead agency determines that the later activity would have effects that were not examined in the previously certified program EIR, subsequent environmental review would be required in accordance with State CEQA Guidelines Sections 15162–15163 (Public Resources Code Section 21166), as outlined in detail in Section 1.2 above.

A program EIR can be used to simplify the task of preparing environmental documents on later parts of the program by serving as a "tiering" document that focuses future analyses on impacts that may not have been known or had not previously been studied under the program EIR. This subsequent or supplemental CEQA document would not re-open the analyses in the program EIR that are not related to the new or more severe impact implicated in the action. As needed, a subsequent or supplemental CEQA document related to this EIR would focus on the newly proposed action that might call for more analysis. It would update the prior EIR, as needed, to disclose the new or more severe impacts that could result from the later action. Depending on circumstances, the new CEQA document may be in the form of a new subsequent EIR, a less extensive supplemental EIR, or a subsequent mitigated negative declaration. Alternatively, an addendum under State CEQA Guidelines Section 15164 may be prepared if some changes or additions are necessary but none of the conditions described in State CEQA Guidelines Section 15162 calling for subsequent environmental review have occurred.

### 1.6.1.2 Additional Streamlining Opportunities

#### State CEQA Guidelines Sections 15182 and 15183

Pursuant to Public Resources Code Section 21155.4 and State CEQA Guidelines Section 15182, future projects that meet the following criteria qualify for a statutory exemption from CEQA:

1. The project is a qualifying residential, employment center, or mixed-use project;

2. The project is located within a Transit Priority Area (TPA);
3. The project is consistent with a specific plan for which an environmental impact report was certified; and
4. The project is consistent with an adopted sustainable communities strategy or alternative planning strategy.

A TPA is defined as an area within 0.5 mile of an existing or planned major transit stop, such as a rail transit station, a ferry terminal served by transit, or the intersection of two or more major bus routes (Public Resources Code Section 21099(a)(7)). As shown on Figure 2-3 in Chapter 2**,** the majority of the Metro Plan Area—but not the entire Metro Plan Area—would be within a designated TPA. Future projects under the Metro Plan may qualify for this exemption.

In addition, State CEQA Guidelines Section 15183 allows for a streamlined environmental review process for projects that are consistent with the densities established by existing zoning, community plan, or general plan policies for which an EIR was certified. To be eligible for streamlined review under State CEQA Guidelines Section 15183, the following findings must be made based on an initial study or other analysis:

1. The project is consistent with the development density established by existing zoning, community plan, or general plan policies for which an EIR was certified.
2. There are no project-specific effects that are peculiar to the project or its site.
3. There are no project-specific impacts that the prior EIR failed to analyze as significant effects.
4. There are no potentially significant offsite and/or cumulative impacts that the prior EIR failed to evaluate.
5. There is no substantial new information that results in more severe impacts than anticipated by the prior EIR.

As discussed in Section 2.5.2.1, *Land Use Classifications*, the proposed project would establish new development densities and intensities in the Metro Plan Area, the impacts of which are evaluated in this SEIR. Therefore, future projects under the Metro Plan may qualify for streamlined environmental review under State CEQA Guidelines Section 15183.

The City, or responsible agencies, as applicable, will review future projects for their conformance with the criteria discussed above and determine whether later activities may be cleared under or may tier from this SEIR analysis; that is, whether the project is within the scope of the program EIR pursuant to State CEQA Guidelines Section 15168, whether an addendum under State CEQA Guidelines Section 15164 may be prepared, whether subsequent or supplemental review is required pursuant to State CEQA Guidelines Sections 15162–15163, whether the project qualifies for a statutory exemption pursuant to State CEQA Guidelines Section 15182 (Public Resources Code Section 21155.4), or whether the project qualifies for streamlined environmental review pursuant to State CEQA Guidelines Section 15183.

# 1.7 Scope and Content of this Subsequent Environmental Impact Report

*Scoping* refers to the process used to assist the lead agency in determining the focus and content of an EIR. Scoping solicits input on the potential topics to be addressed in an EIR, the range of project alternatives, and possible mitigation measures. Scoping is also helpful in establishing methods of assessment and in selecting the environmental effect to be considered. A Notice of Preparation (NOP) for the SEIR was published, distributed to the State Clearinghouse, and circulated by the City on September 16, 2021. The NOP notified agencies, interested parties, and the public about the Project Change and provided an opportunity to transmit comments and concerns on the scope and content of the SEIR. The 30-day NOP review period began on September 16, 2021, and ended on October 18, 2021. A scoping meeting was held on September 30, 2021. The NOP and comments on the NOP received by the City are provided in Appendix A of this SEIR.

As discussed above, this SEIR analyzes the potential environmental impacts that could result from the Project Change. Because the potential activities associated with the Project Change were not evaluated in the Certified EIR, they present the possibility of potential new impacts, which need to be analyzed according to CEQA. Using the Certified EIR as the baseline, this SEIR assesses whether modifications proposed by the Project Change or changes in circumstances would result in new or greater significant impacts as compared to the impact levels disclosed in the Certified EIR, and whether new mitigation measures would be required to mitigate Project impacts.

The City prepared an Initial Study to identify the environmental resources for which the Project Change would not result in new significant impacts nor substantially more severe impacts than disclosed in the Certified EIR. The Initial Study, which is included as Appendix B of this SEIR, found that the Project Change would not result in new significant impacts nor substantially more severe impacts than disclosed in the Certified EIR, for the following environmental resources. The potential impacts on these environmental resources have been sufficiently analyzed in the Initial Study and are not discussed further in this SEIR. The reasons for this conclusion are briefly summarized below.

- *Aesthetics.* The Certified EIR identified that the TASP could result in buildings that could block views, light and glare from buildings, and removal of mature trees. Nonetheless, the Certified EIR concluded that after implementation of policies in the TASP, impacts on aesthetics would be less than significant. As described in the Initial Study, most of the future development associated with the Metro Plan would comply with Public Resources Code Section 21099, which identifies that visual resource impacts of residential, mixed-use residential, or employment center[2] projects on an infill site[3] within a Transit Priority Area[4] shall not be considered significant impacts on the environment. Overall, because there are no scenic vistas or scenic resources located within the Metro Plan Area and because the Metro Plan would include similar policies as the TASP to protect scenic quality, the Metro Plan would have a less-than-significant impact on

[2] An "employment center project" is a project located on property zoned for commercial uses with a floor area ratio of no less than 0.75 and that is located within a TPA (Public Resources Code Section (a)(1)).

[3] An "infill site" is a lot located within an urban area that has been previously developed, or on a vacant site where at least 75 percent of the perimeter of the site adjoins, or is separated only by an improved public right-of-way from, parcels that are developed with qualified urban uses. (Public Resources Code Section 20199(a)(4)).

[4] A Transit Priority Area is an area within 0.5 mile of a major transit stop that is existing or planned. (Public Resources Code Section (a)(7)).

aesthetics. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to aesthetics.

- *Agricultural and Forestry Resources*. Because there are no agricultural or forestry resources in the Metro Plan Area or areas zoned for agricultural or forestry resources, the Metro Plan would result in no impact on agricultural or forestry resources.

- *Biological Resources*. The Certified EIR identified that the TASP could impact biological resources, including burrowing owls; non-listed special-status raptor and other bird species; significant trees; wetland, creeks, and drainages, including Penitencia Creek, Berryessa Creek, and their tributaries; and patches of riparian habitat associated with creeks. Nonetheless, the Certified EIR concluded that after implementation of policies in the 1994 General Plan and TASP, impacts on biological resources would be less than significant. Because the environmental setting for biological resources has not changed substantially within the TASP Area, because the environmental setting for the geographic expansion is the same as the TASP, and because the Metro Plan and 2040 General Plan have updated policies (similar to those in the TASP) that would protect biological resources, the potential impacts from the Project Change are the same as described in the Certified EIR. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to biological resources.

- *Cultural Resources*. The Certified EIR concluded that federal, state, and local laws would adequately protect significant built-environment resources from demolition or insensitive alteration, as well as significant archaeological resources, thus ensuring the TASP would have a less-than-significant impact on built-environment historical resources and archaeological resources. One known archaeological resource would be located within the Metro Plan due to the expansion of the Metro Plan. Nonetheless, the Metro Plan would be required to adhere to similar federal, state, and local laws as identified in the TASP. Adherence to these laws would ensure protection of cultural resource. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to cultural resources.

- *Energy*. Implementation of policies in the Metro Plan, as well as implementation of existing regulations would ensure that impacts related to the wasteful, inefficient, or unnecessary consumption of energy resources and conflicting with plans for renewable energy or energy efficiency would be less than significant. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

- *Geology and Soils*. The Certified EIR identified that the TASP could be susceptible to ground shaking generated during an earthquake and secondary seismic hazards, such as liquefaction; could be subject to soil expansion, settlement, and erosion during construction; would place serious demands on the emergency services provided by the City; and could result in the destruction of paleontological resources. Nonetheless, the Certified EIR concluded that after implementation of existing regulations and policies in the TASP, impacts on geology and soils, including paleontological resources, would be less than significant. Because the setting for the Metro Plan is the same as the setting in the TASP, the Metro Plan would include similar kinds of development and infrastructure as the TASP, and the Metro Plan would be subject to the same

or comparable regulatory requirements as the TASP, the impacts identified in the Certified EIR for geology, soils, and paleontological resources would be the same for the Metro Plan. Overall, through adherence to existing regulations and policies in the 2040 General Plan and the Metro Plan, the Project Changes are expected to result in a less-than-significant impact on geology, soils, and paleontological resources. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to geology, soils, and paleontological resources.

- *Hazards and Hazardous Materials*. The Certified EIR identified that the TASP could be located in an area with a known hazardous materials release site; could demolish structures potentially containing hazardous building materials such as asbestos, PCBs, or lead-based paint; could result in future use, transport, and disposal of hazardous substances including paints, polishes, petroleum-based products, household cleaning agents, solvents, gardening chemicals, pool chemicals, and ammonia; could require construction near a future school; and would not impair the implementation of or interfere with the City's Multi-Hazard Emergency Plan. Nonetheless, the Certified EIR concluded that after implementation of existing regulations and policies in the TASP, impacts due to hazards and hazardous materials would be less than significant. Because the Metro Plan would result in the use, transport, and disposal of hazardous substances in a similar way to the TASP, and because the Metro Plan would be required to adhere to similar regulations and policies as the TASP, the impacts identified in the Certified EIR for hazards and hazardous materials would be the same for the Metro Plan. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to hazards and hazardous materials.

- *Hydrology and Water Quality*. The Certified EIR identified that the TASP is not expected to substantially affect groundwater levels or interfere substantially with groundwater recharge; would not substantially alter the course of a stream or river in a manner that would result in substantial erosion or siltation on- or offsite; and would not be subject to inundation by seiche, tsunami, or mudflow. The Certified EIR also identified that the TASP could result in erosion, entrainment of sediment in runoff, sedimentation, localized ponding, flooding, and potential release of chemicals during construction; could include increased discharge of pollutants in stormwater due to the new residents and additional vehicular traffic, which would result in pollutants in runoff; and could result in impacts from constructing development within a Federal Emergency Management Agency–designated 100-year floodplain. Nonetheless, the Certified EIR concluded that after compliance with existing regulations and policies in the 1994 General Plan and TASP, impacts on hydrology and water quality would be less than significant. Because construction for the Project would be similar to what was described in the Certified EIR (i.e., grading, excavation, soil stockpiling, use of chemicals) and because the Metro Plan would adhere to similar regulations and policies as the TASP, the impacts identified in the Certified EIR for hydrology and water quality would be the same for the Metro Plan. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to hydrology and water quality.

- *Mineral Resources*. Because there are no mineral resources in the Metro Plan Area, the Metro Plan would result in no impact on mineral resources.

- *Tribal Cultural Resources*. To date, the City has not received any requests from tribes to be notified of projects under Assembly Bill (AB) 52. Accordingly, no tribal cultural resources have

been identified within the Metro Plan Area. Therefore, there would be no impact on tribal cultural resources.

- *Wildfire*. The area surrounding the Metro Plan is generally developed and lacking features that normally elevate wildland fire risks (i.e., dry vegetation, steeply sloped hills). Because the Project site is not within or near a State Responsibility Area or Very High Fire Hazard Severity Zone, there would be no impact.

This SEIR addresses topics where the Project Change would have the potential to change the impact level conclusions in the Certified EIR, or where new mitigation could be required, as determined by the City. Topic areas addressed in Chapter 3, *Setting, Impacts, and Mitigation Measures*, include:

- Air Quality
- Greenhouse Gas Emissions
- Land Use and Planning
- Noise
- Population and Housing
- Public Services and Recreation
- Transportation [5]
- Utilities and Service Systems

## 1.8 Information Incorporated by Reference

This SEIR incorporates by reference information from the *Final Environmental Impact Report for the Milpitas Transit Area Specific Plan* (Certified EIR) (State Clearinghouse No. 2006032091) pursuant to State CEQA Guidelines Section 15150. Specifically, the environmental setting and regulatory setting discussions in Chapter 3, *Setting, Impacts, & Mitigation Measures*, of the Certified EIR are incorporated by reference. The environmental setting discussion provides a description of the baseline conditions relevant to the Certified EIR analysis. The regulatory setting discussion provides a description of the policies and regulations that govern the resources analyzed in the Certified EIR analysis. Both discussions provide general background for the analysis in the Certified EIR and this SEIR. A copy of the Certified EIR with comments and responses and the record of project approvals is available to the general public at the City of Milpitas Planning Department, 455 East Calaveras

[5] Senate Bill (SB) 743 resulted in changes to the assessment of transportation impacts under CEQA. In accordance with significance thresholds in effect at the time the Certified EIR was prepared, the Certified EIR included an operational analysis of key intersections and roadway segments in and around the TASP Area, and identified impacts using the metric of level of service (LOS). Because vehicle delay is no longer an environmental impact under CEQA, pursuant to SB 743, VMT was used to assess transportation impacts in this SEIR and traffic operations impacts (i.e., LOS impacts) were not evaluated. While changes to traffic operations as a result of the Project Change were not considered in assessing environmental impacts under CEQA, per City of Milpitas policy and for purposes of Congestion Management Program (CMP) compliance, LOS was assessed as part of the planning effort for the Metro Plan and compiled in the Draft Milpitas Metro Specific Plan Traffic Operations Report (W-Trans 2022).

Boulevard, Milpitas, CA 95035. In addition, the Certified EIR can be accessed on the following website: https://www.ci.milpitas.ca.gov/metro/.

# 1.9 Draft Subsequent Environmental Impact Report Organization

This Draft SEIR is organized into the following main chapters and sections:

- *Executive Summary* – Provides a summary of the TASP analyzed in the Certified EIR, a summary of the Project Change, and a brief description of areas of controversy and issues arising from the Project Change. It includes a table summarizing impacts, mitigation measures, and the level of significance after mitigation of the Metro Plan due to the Project Change.
- Chapter 1, *Introduction* – Provides an overview of the Draft SEIR. The chapter explains the purpose of the SEIR as it relates to the Project and the Project Change, and provides the scope and content of the SEIR and organization of the document.
- Chapter 2, *Project Description* – Provides a summary of the previously analyzed TASP and detailed information regarding the Project Change, including a summary of the additional population and employment growth due to the Metro Plan and an overview of the expanded geographic areas of the Metro Plan.
- Chapter 3, *Setting, Impacts, and Mitigation Measures* – Analyzes the potential impacts of the Project Change and makes a determination as to whether the Project Change would change the impact significance determinations for the Project in the Certified EIR, and whether new mitigation measures would be required. Impacts are described according to topic areas, and include descriptions of the environmental setting, methodology, significance criteria, impacts, applicable mitigation measures, and the significance of the impact following mitigation. The topics addressed in this chapter include:
    - 3.1, *Air Quality*
    - 3.2, *Greenhouse Gas Emissions*
    - 3.3, *Land Use and Planning*
    - 3.4, *Noise*
    - 3.5, *Population and Housing*
    - 3.6, *Public Services and Recreation*
    - 3.7, *Transportation*
    - 3.8, *Utilities and Service Systems*
- Chapter 4, *Other CEQA Considerations* – Addresses cumulative impacts and other CEQA requirements as they relate to the Project Change.
- Chapter 5, *Alternatives* – Compares the potential impacts resulting from the Project Change with three alternatives: the No Project Alternative, Reduced Height Alternative, and Removal of

Western Expansion Area Alternative. The chapter also identifies the environmentally superior alternative.

- Chapter 6, *List of Preparers* – Provides the names of chapter/report authors as well as persons and organizations that were consulted during the preparation of this Draft SEIR.
- Chapter 7, *References* – Lists the references that were cited throughout this Draft SEIR.
- Appendices – Include technical reports the support the analyses contained in this Draft SEIR as well as procedural documents.
    - Appendix A, *Notice of Preparation and Scoping Comments Received*
    - Appendix B, *Initial Study*
    - Appendix C, *Draft Milpitas Metro Specific Plan*
    - Appendix D, *Air Quality and Greenhouse Gas Emissions Data*
    - Appendix E, *Noise Data*
    - Appendix F, *Utilities and Service Systems Information*

# Chapter 2
# Project Description

## 2.1 Overview

The Project analyzed in this Subsequent Environmental Impact Report (SEIR) is the proposed Milpitas Metro Specific Plan (Metro Plan or Project). The Metro Plan is an update to the Transit Area Specific Plan (TASP). The City of Milpitas (City) adopted the TASP and certified a Final Environmental Impact Report (Certified EIR) for the TASP in 2008. The TASP is a regulatory plan that guides development in the approximately 437-acre TASP Planning Area (TASP Area) surrounding the Milpitas Transit Center, which includes regional bus and light rail service as well as a new connection to the Bay Area Rapid Transit (BART) system. The Metro Plan aims to update the original TASP vision to transform the area into a transit-oriented neighborhood and complete the emerging neighborhood by expanding access to neighborhood services and retail, creating new opportunities for jobs near transit, providing additional affordable and market-rate housing, enhancing multimodal connections and non-vehicle mobility throughout the area, providing a greater variety of shared public spaces, and strengthening the identity sense of place within the Metro Plan Area.

The Metro Plan Planning Area (Metro Plan Area) covers a significant portion of the southern area of the City. The Metro Plan provides policies to guide development in this district in terms of land use, circulation, community design, and utilities and services. Policy 7.5 of the original TASP requires the creation of a coordinated development plan for the parcels at and around the Milpitas Transit Center, and the Metro Plan will continue to fulfill that requirement. The Metro Plan expands the original 437-acre TASP Area by approximately 60 acres, annexing an industrial area on the east side near Interstate (I-) 680 and approximately 13 acres on the west side along a portion of South Main Street, resulting in a Metro Plan Area of 510 acres.

The Project involves an update of the original TASP land use plan, renaming it as the Milpitas Metro Specific Plan, and includes all necessary actions needed to implement the Metro Plan and make it consistent with the City's adopted 2040 General Plan and other relevant master plans and land development regulations. The Metro Plan is recognized by the General Plan as the land use document governing the Metro Plan Area. Preparation and adoption of the Metro Plan will be undertaken in concert with the following actions by the City:

- Updates and amendment to the boundaries of the Milpitas Gateway-Main Street Specific Plan (formerly Midtown Milpitas Specific Plan)
- Milpitas Zoning Code and Zoning Map amendments
- Updates to the Parks and Recreation Master Plan updates
- Updates to the Bicycle, Pedestrian, and Trails Master Plan
- Updates to the Water, Sewer, and Storm Drain Master Plans
- Updates to the Climate Action Plan

The California Environmental Quality Act (CEQA) lead agency for the Project is the City of Milpitas. The lead agency contact person is:

- Kevin Riley, Metro Plan Project Manager
  City of Milpitas
  East Calaveras Boulevard
  Milpitas, CA 95035
  Email: kriley@ci.milpitas.ca.gov

## 2.2 Description of the Previously Approved Project (TASP)

The Transit Area Specific Plan or TASP, adopted in 2008, anticipated a transit center that included Santa Clara Valley Transportation Authority (VTA) light rail and the Milpitas BART. The TASP envisioned the transformation of the light industrial area into a mixed-use, transit-oriented, attractive and livable neighborhood with housing, offices, and shopping. The City identified the following overall vision statement for the TASP.

> *Create attractive high density urban neighborhoods with a mix of land uses around the light rail stations and future BART station in Milpitas. Create pedestrian connections so that residents, visitors, and workers will walk, bike, and take transit. Design streets and public spaces to create a lively and attractive street character, and a distinctive identity for each subdistrict*.

The TASP included a set of goals and policies meant to promote the vision of the TASP. These included goals to provide a mix of land uses, including housing, office, retail, restaurants, personal services, hotels, parks, and community facilities; build quality neighborhoods and commercial districts; create a new network of streets though the area that is appropriate for the mix of land uses and encourages walking, biking, and transit use rather than auto trips; provide adequate developed park space; and plan for areawide infrastructure.

Full development (also known as buildout) of the TASP was estimated to take place by 2030. Buildout for the TASP was estimated to result in the following: 7,109 new dwelling units and 17,915 new residents, 350 new hotel rooms and 287,705 square feet of new retail uses, and 993,843 square feet of new office uses, resulting in approximately 4,228 new jobs. As of 2019, the following was entitled in the TASP Area: 6,995 residential units, 10,630 square feet of office space, and 186,500 square feet of retail space. Some of this development is under construction or already occupied.

## 2.3 Metro Plan Purpose and Objectives

The vision of the Metro Plan is to expand the Metro Plan Area and promote higher density and intensity development opportunities in the Metro Plan Area, and in doing so create a more complete neighborhood that includes a variety of services to further enable a walkable and transit-oriented community that is reflective of the progressive social conditions and growing economy. The Metro Plan represents a unique opportunity in the City and seeks to achieve the following objectives:

1. **To enhance the sense of place and identity of the Metro Plan Area with visually memorable structures and buildings.**
    - This is achieved through:
        - Providing high to very high-density housing and/or high intensity office and employment uses along arterials, the light rail, and close to the BART station to support transit ridership and complementary activities by responding to strong market interest in high-density development in an appropriate setting.
        - Accommodating a vibrant mix of pedestrian-accessible retail and amenities, high density housing and high intensity offices and other employment uses within the Metro Plan Area and particularly within the Great Mall District, along Great Mall Parkway and Montague Expressway; and promoting public art and wayfinding strategies.
2. **To provide safer and more attractive multimodal connections for walking and biking.**
    - This is achieved through:
        - Creating a multi-modal network that includes pedestrian pathways and bikeways to reinforce a pedestrian scale and grid where appropriate.
        - Creating a streetscape that encourages multimodal connections with an attractive and richly detailed urban environment with good connectivity between desired destinations.
        - Improving the City transportation network and contributing to the Countywide transportation network and transportation demand management over the next 20 years by improving the multimodal network and implementing the Active Transportation Plan. Key enhancements include creating safer and more accessible connections for pedestrians and bicyclists and establishing a plan-wide transportation demand management (TDM) program.
3. **To provide a greater variety of shared public spaces.**
    - The Metro Plan will establish urban design policies to ensure adequate public open space to serve residential development. In compliance with the General Plan, the goal for open space development is 3.5 acres per 1,000 residents or the equivalent in terms of recreational value. Some recreational opportunities may be provided outside the Metro Plan Area, and a Recreational Value metric may be used to evaluate intensively-programmed and high quality spaces as equivalent to larger spaces in meeting open space goals.
    - Develop parks, trails, and public open spaces that provide active and passive recreation opportunities, pedestrian connectivity, and places for community interaction in each District, as per the Parks and Recreation Master Plan. Encourage the development of creative, usable private and public outdoor space, such as on building rooftops and balconies and on other accessible public areas.
4. **To expand neighborhood services and the variety of retail.**
    - Create additional neighborhood-serving retail to serve demand from Metro Plan Area residents, community members, and the local workforce, including up to 300,000 additional square feet of retail and restaurant space.
    - Require local-serving retail on particular sites where it is feasible and appropriate, and permit it in otherwise residential and commercial-only structures.

- Promote the development of hotels where appropriate to meet demand, and support commercial activity to provide an important revenue source for the City.

5. **To create and expand available space for jobs near transit.**
    - Attract business investments and generate employment opportunities through commercial development near transit, with up to 3,000,000 square feet of new office/Research and Development (R&D)/light manufacturing space.
    - To support the development of an Innovation District in the industrial area east of the Milpitas Transit Center and west of I-680, and particularly east of Berryessa Creek and on the four corners at the intersection of South Milpitas Boulevard and Montague Expressway, as a hub of employment and R&D, integrating Milpitas into Silicon Valley with high-density office, research, light manufacturing uses, and services primarily to the east of Berryessa Creek.
6. **To provide both affordable and market-rate housing.**
    - Accommodate up to 7,000 additional housing units to help the City meet its regional housing needs requirements and support transit ridership.
    - As part of the vision, several key elements of the Metro Plan support this objective:
        - Support the evolution of the Great Mall site from a purely retail-based mall site into a mixed-use, retail and amenity-rich area that is well integrated into the Metro Plan Area.
        - Support mixed-use housing in both vertical and horizontal configurations to provide living nears jobs and services, as well as transit.
        - Enhance Great Mall Parkway as a landmark street with a new linear park, streetscape improvements, and public art.
        - Improve connectivity with the Tango District to and from the VTA Transit Station and McCandless District with a pedestrian/bicycle bridge connection and improvements that complete the multi-use trail system.

## 2.4 Description of the Metro Plan

The Metro Plan, which is included in Appendix C of this SEIR,[1] is organized per the following chapters:

- **Chapter 1: Introduction** – Provides background information on the Metro Plan, explains the Metro Plan's relationship with other municipal regulatory documents, establishes the Metro Plan Vision, and projects the expected plan buildout.
- **Chapter 2: Land Use and Public Space** – Establishes the land use and open space strategy and policies for the Metro Plan Area.
- **Chapter 3: Site and Building Design Standards and Guidelines** –Details the Metro Plan's strategy for activating the public realm, including sidewalks and pathways, and provides

[1] Appendix C includes the Draft Milpitas Metro Specific Plan. Revisions to this Draft Milpitas Metro Specific Plan may be made in response to any comments received on the Draft SEIR and Draft Milpitas Metro Specific Plan. The Final Milpitas Metro Specific Plan will be prepared in conjunction with the Final SEIR.

guidance on building design in the Metro Plan Area. The site and building design standards replace the TASP guidelines and are written in coordination with citywide objective design standards for mixed-use and residential buildings.

- **Chapter 4: Mobility and Circulation –** Describes strategies to create a multimodal network, reduce vehicle miles traveled through transportation demand management policies, and decrease automobile dependency.
- **Chapter 5: Infrastructure –** Describes the public infrastructure and services needed to accommodate development in the Metro Plan Area.
- **Chapter 6: Implementation** – Details the implementation of the Metro Plan by the City of Milpitas, including funding sources and timeframes for public infrastructure projects.

An overview of the location of the Metro Plan is included in Section 2.5.1; an overview of the land use program and policies in the Metro Plan is included in Section 2.5.2; an overview of the projected population growth and employment growth associated with the buildout of Metro Plan is included in Section 2.5.3; and an overview of the horizon year is included in Section 2.5.4.

# 2.5 Description of the Project Change

Implementation of the Metro Plan would result in four main changes, when compared to the TASP. These changes, which are collectively referred to as the *Project Change*, are described in detail below. Overall, the Project Change consists of the following:

1. Expansion of the original 437-acre TASP Plan Area by approximately 73 additional acres, for a total of 510 acres, in order to facilitate the development of an Innovation District east of the Milpitas Transit Center and to promote opportunities for housing development along South Main Street. In addition, the Metro Plan redefines the five Districts, such that they are bounded by major streets and are located on a mix of land uses, development densities, park placements, street grids, pedestrian connections, and proximities to the Milpitas Transit Center.
2. Changes to the land use classifications (increased allowable densities, new land use classifications, and change in location of land use classifications) and policies, compared to the TASP.
3. Additional residential and non-residential density and related population and employment growth, compared to the TASP.
4. Extension of the Metro Plan horizon year by 10 years (from 2030 to 2040), compared to the TASP.

As described in Chapter 1, *Introduction*, this SEIR evaluates the potential environmental effects that could result from the Project Change.

## 2.5.1 Geographic Expansion

The City of Milpitas is a largely residential community occupying a unique location in the southeastern Bay Area. It is located at the northern edge of Santa Clara County and is bounded by San Jose to the south and west, Fremont to the north, and unincorporated hillside lands to the east. The City is at the crossroads of I-880 and I-680, Highway 237, and the Montague Expressway. The

Metro Plan Area, which includes the TASP Area, lies between these major regional vehicular routes near the southern edge of the City.

The Certified EIR identifies that the TASP Area is centered on a roughly 0.5-mile radius around the Milpitas BART station. The TASP Area consists of much of the southern portion of the Midtown Plan plus the Great Mall and an area northeast of Piper Drive and Montague Expressway. Figure 2-1 shows the location of the TASP Area.

The Metro Plan Area would be located in the same overall location as the TASP with two additional areas. First, the Metro Plan Area would include an additional approximately 60 acres of land located on the east side of Penitencia Creek near I-680. Second, the Metro Plan would include an additional approximately 13 acres of land located on the west side along a portion of South Main Street. The boundaries of the Metro Plan Area are roughly the northern extent of the Great Mall, South Main Street on the west, Trade Zone Boulevard and the City limits on the south, I-680 and the San Jose border on the east, and the existing industrial area along South Milpitas Boulevard in the northeast. Figure 2-1 shows the location of the Metro Plan Area and identifies the two areas where the Metro Plan Area has been expanded.

In addition, the City of Milpitas supports a request from the property owner to annex a 3.7-acre site from the City of San Jose that would be incorporated into the Metro Plan Area. This site is located on the east side of the I-680, south of the Montague Expressway, and is adjacent to the proposed Innovation District, as shown on Figure 2-1. This annexation is under consideration by the City of San Jose at this time; therefore, this SEIR does not consider this annexation site in its environmental analysis. If the site is annexed by the City of Milpitas, then the annexation action would be reviewed by the City to determine whether additional environmental review is required. This annexation site is not discussed further in this SEIR.

In addition to geographic expansion, the Metro Plan redefines the District boundaries from the TASP. The TASP included seven subdistricts that were organized around Montague Expressway, as shown on Figure 2-2. The Metro Plan establishes new boundaries for five Districts that are separated by major roadways as shown on Figure 2-3.

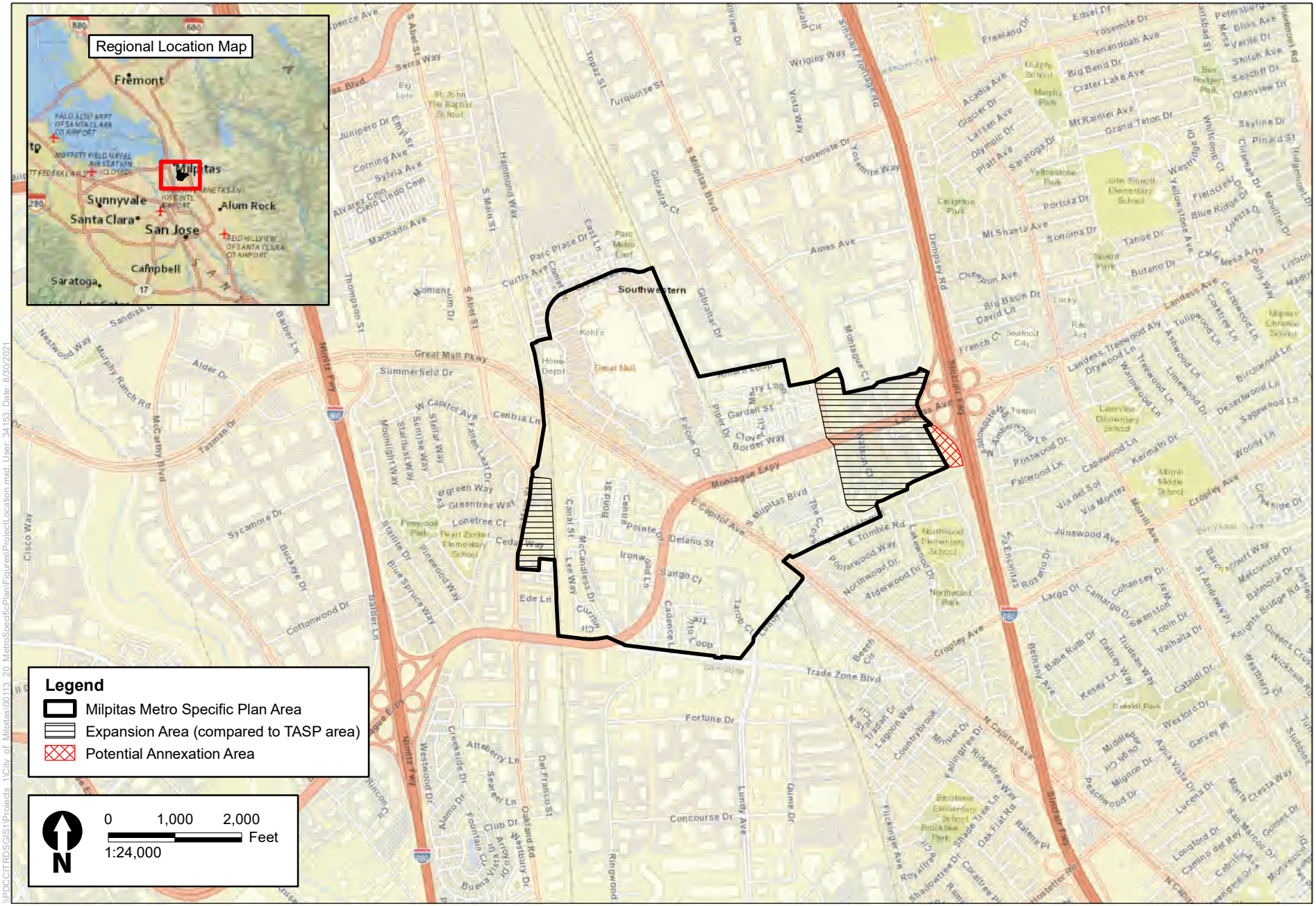


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**Figure 2-1**
**Project Location Map**

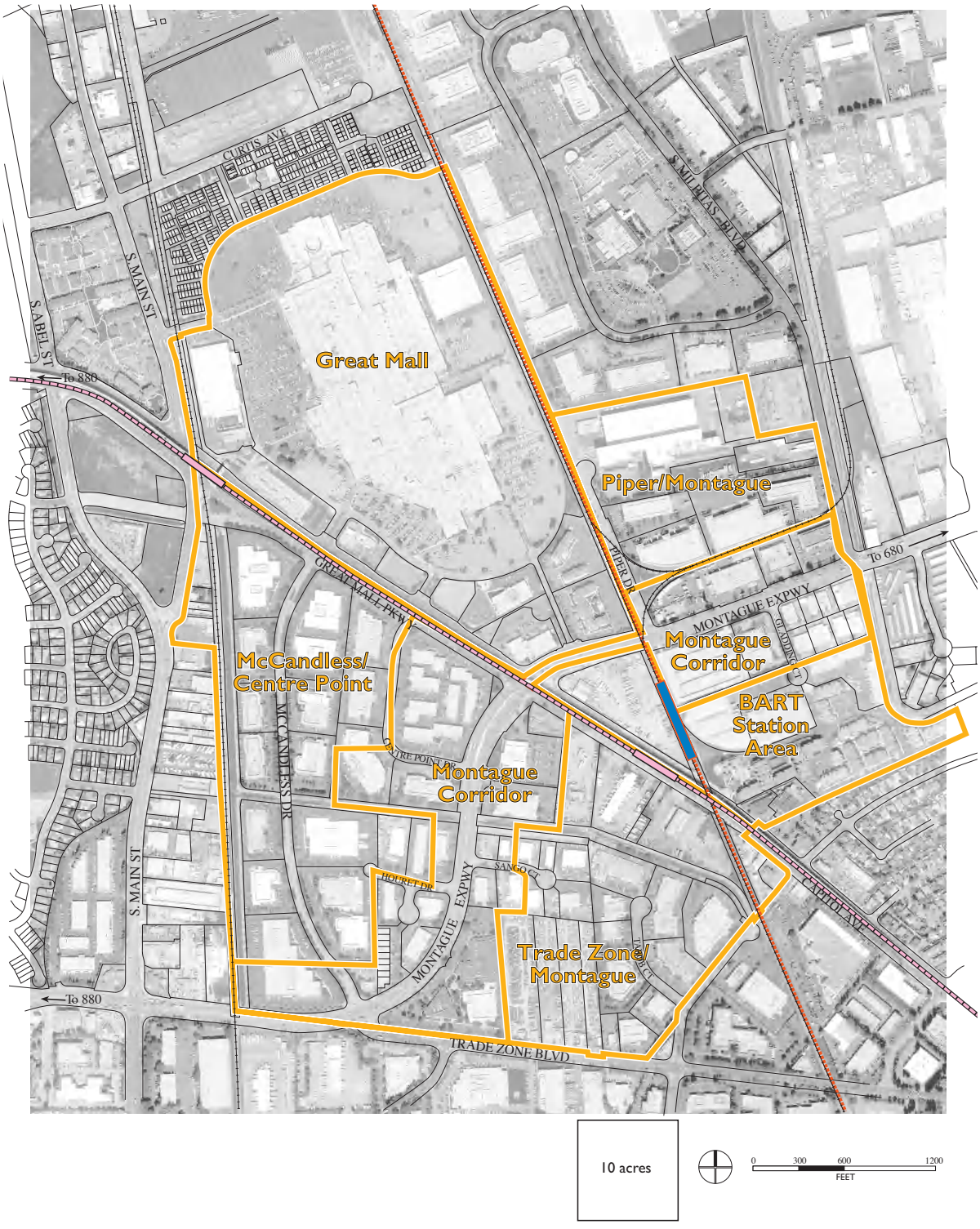


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**Figure 2-2**
**TASP Subdistricts**

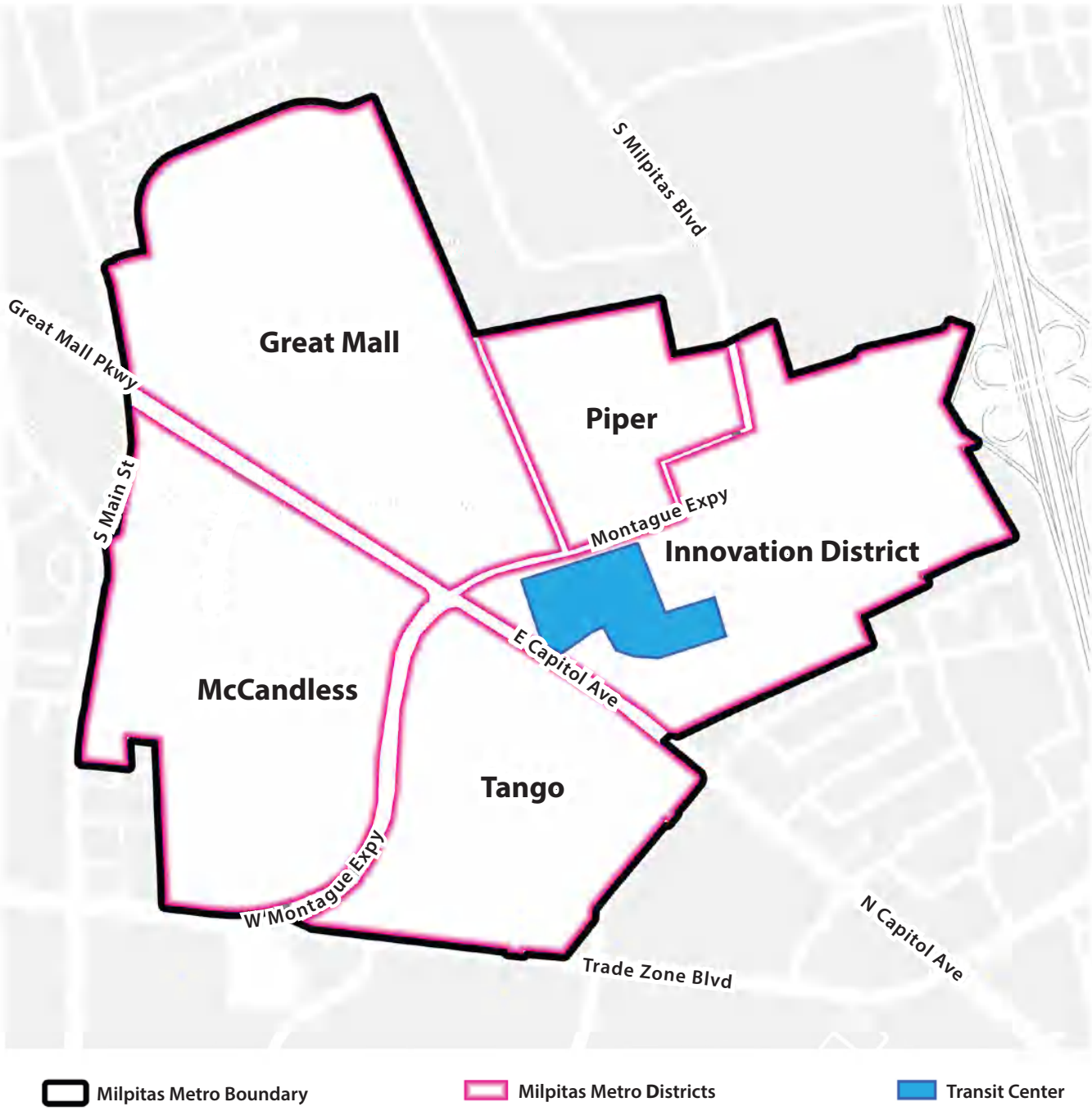


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**Figure 2-3**
**Metro Plan Districts**

## 2.5.2 Changes in Land Use Classifications and Policies

### 2.5.2.1 Land Use Classifications

Both the TASP and the Metro Plan identified different land use categories not used elsewhere in the City that would allow for higher densities. For the Metro Plan, the land use categories also allow for decreased parking ratios. The Metro Plan updates the land use classification in three different ways. First, the Metro Plan updates the allowable densities for some of the land use classifications in the TASP. Second, the Metro Plan adds additional land use classifications that were not included in the TASP. Third, the Metro Plan updates the locations of where the land use classifications would apply.

The TASP included the following land use classifications:

- Residential – Retail High Density Mixed Use
- Boulevard Very High Density Mixed Use
- Very High Density Transit Oriented Residential
    - A Density Bonus allowing for up to a 25 percent increase in maximum allowable density was identified for certain parcels with the three land use classifications above that were located near BART and light rail.
- High Density Transit Oriented Residential
- General Commercial/Shopping Center Retail[2]
- Retail Mixed-Use
- Transit Facilities
- Industrial Park/Light Industrial/R&D[3]
- Parks/Plazas/Community Facilities
- Linear Park and Trails
- Landscaped Front Yards and Buffers

A description of these land use classifications can be found on pages 2-6 through 2-10 of the Certified EIR. As discussed in Chapter 1 of this SEIR, this information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1 of this SEIR for the locations available for the public to review the Certified EIR.

The Metro Plan includes the following land use classifications:

- *Residential Retail High Density Mixed Use (RRMU).* This district is intended to be a mixed-use area with retail, restaurants, and services on the ground floor, and residential or office uses on floors above. The residential density is a minimum average density of 40 units per acre and a maximum of 85 units per acre. Ground floor retail and active commercial development are only

[2] The TASP identified the term "General Commercial" and the TASP EIR identified the term "Shopping Center Retail." Because both terms are used in the TASP and TASP EIR, for the purpose of clarity, both terms are used in this SEIR.

[3] The TASP identified the term "Industrial Park" and the TASP EIR identified the term "Light Industrial/R&D." Because both terms are used in the TASP and TASP EIR, for the purpose of clarity, both terms are used in this SEIR.

required in designated areas. With the exception of sites identified as Housing Element opportunity sites, RRMU parcels may be developed for office and hotel uses without residential development, although ground floor retail or restaurant square footage will still be required. For non-residential projects, the maximum floor area ratio (FAR) is 2.5. However, there is no FAR limit for hotels.

- *Boulevard Very High Density Mixed Use (BVMU).* This classification is intended to provide high-density housing, retail, and employment. Sites developed with a mix of uses, or non-residential uses, must adhere to the FAR limits: a minimum intensity of 2.5 FAR is required, with a maximum FAR of 5.0 allowed. Retail uses are required on 80 percent of building street frontages that are along Activity Streets. Residential projects shall have a minimum average density of 85 units per acre and can be built up to 250 units per acre.
- *Multi-Family Residential High Density (MFH)*. This classification supports medium-density residential neighborhoods farther from the Milpitas Transit Center. A minimum density of 30 units per acre is required, up to a maximum of 40 units per acre. Residential and related uses are allowed, but not commercial uses.
- *Multi-Family Residential Very High Density (VHD)*. This classification allows high-density residential development, such as multi-story apartments and condos. This designation requires housing to be built at an average density of at least 40 units per acre, up to a maximum of 85 units per acre. Small local-serving commercial uses are permitted with a conditional use permit at the ground floor level, including retail, restaurants, and personal services uses.
- *Urban Residential (URR).* This classification allows for very high-density residential development along Main Street and Capitol Avenue. This designation requires multi-family housing to be built at a minimum density of 70 units per acre and up to a maximum density of 120 units per acre. Small local-serving commercial uses are permitted with a conditional use permit at the ground floor level, including retail, restaurants, and personal services uses.
- *Business Park Research & Development (BPRD)*. This non-residential designation provides for office, R&D, and hotels in the Innovation District and the Great Mall District. Limited retail uses that are business-supportive, such as fitness centers, restaurants, and daycare, are also allowed in this classification. Development shall have a minimum FAR of 1.0 and is capped at a maximum FAR of 2.5.
- *Business Park Research & Development, Limited Residential (BPRD-R)*. This classification supports office, R&D, office-supportive commercial retail, hotels, and supplemental residential uses. Development shall have a minimum FAR of 1.0 and is capped at a maximum FAR of 5.0. A minimum 1.0 FAR of office or R&D is required.
- *Public Facilities (PF).* The Public Facilities designation applies to parcels owned by public agencies and that are intended to be accessed by the public, including schools, community facilities and transit centers.
- *Parks and Open Space (POS).* This designation is applied to areas that are intended for parks, plazas, waterways, creek corridors, and trails.

Table 2-1 summarizes the allowed residential and non-residential densities for the land use classifications in the TASP and the Metro Plan. As shown in Table 2-1, the Metro Plan would allow for increased residential and non-residential densities, compared to the TASP.

In addition, the Metro Plan identifies four new land use classifications that were not previously included in the TASP. The two Business Park Research & Development land use classifications allow for light industrial, research and development, and office uses and would be applied to parts of the Innovation District and Great Mall District. The Urban Residential land use classification would allow for high-density residential development and would be applied to an area along Capitol Avenue.

**Table 2-1. Land Use Development Standards for the TASP and Metro Plan**

| Land Use | Density Type | TASP | Metro Plan |
|---|---|---|---|
| **Land Uses with Residentials Components** | | | |
| Residential Retail High Density Mixed Use (RRMU) | Allowed Base Residential Density (units/acre) | 31–40 (up to 50 with Density Bonus) | 40–85 |
| | Allowed Base Non-Residential Density | 1.0–1.5 FAR | 1.0–2.5 FAR |
| Boulevard Very High Density Mixed Use (BVMU) | Allowed Base Residential Density (units/acre) | 41–60 (up to 75 with Density Bonus) | 85–250 |
| | Allowed Base Non-Residential Density | 1.5 FAR | 2.5–5.0 FAR |
| Metro Plan: Multi-Family Residential High Density (MFH) | Allowed Base Residential Density (units/acre) | 21–40 | 30–40 |
| TASP: High Density Transit Oriented Residential | | | |
| Metro Plan: Multi-Family Residential Very High Density (VHD) | Allowed Base Residential Density (units/acre) | 41–60 (up to 75 with Density Bonus) | 40–85 |
| TASP: Very High Density Transit Oriented Residential | | | |
| Urban Residential (URR) | Allowed Base Residential Density (units/acre) | N/A | 70–120 |
| **Land Uses with Non-Residential Components** | | | |
| Business Park Research & Development (BPRD) | Allowed Base Non-Residential Density | N/A | 1.0–2.5 FAR |
| Business Park Research & Development, Limited Residential (BPRD-R) | Allowed Base Non-Residential and Mixed-Use Density | N/A | 1.0–5.0 FAR (minimum of 1.0 FAR of office or R&D required) |

Figure 2-4 maps the new land uses associated with the Metro Plan. The Metro Plan updates the following land use classifications in the Metro Plan Area, compared to the TASP.

- *Great Mall District.* The Metro Plan updates this District by applying the Residential Retail High Density Mixed Use; Boulevard Very High Density Mixed Use; Business Park Research & Development; and Business Park Research & Development, Limited Residential land use classifications instead of the General Commercial/Shopping Center Retail and Retail Mixed Use land use classifications from the TASP.
- *Piper District.* The boundaries of this District are slightly different in the Metro Plan. The two parcels east of Border Way have been taken out of the Piper District and are part of the Innovation District under the Metro Plan. In addition, there are some changes to the locations of the Parks and Open Space land use classification to reflect existing park locations.
- *Innovation District.* The Metro Plan updates this District by applying the Boulevard Very High Density Mixed Use land use classification on a portion of land that was classified as Transit Facilities in the TASP. An area that was designated as General Commercial/ Shopping Center Retail is replaced with Residential Retail High Density Mixed Use. The Metro Plan also expands this area by approximately 60 acres and introduces the two new Business Park Research & Development land classifications in the area east of Berryessa Creek and on the parcels south of Milpitas Boulevard Extension, which were previously Very High Density Transit-Oriented Residential, High Density Transit-Oriented Residential, and Parks and Open Space.
- *Tango District.* The Metro Plan applies the Multi-Family Residential, Very High Density and Multi-Family Residential, High Density land use classification in an area previously classified for Industrial Park/Light Industrial/R&D in the TASP. The Metro Plan also applies the Urban Residential land use classification in an area that was classified for Very High Density Transit Oriented Residential and Boulevard Very High Density Mixed Use land use classifications in the TASP. Areas that were designated as General Commercial/Shopping Center Retail are replaced with Residential Retail High Density Mixed Use. There are also changes to the location of Parks and Open Space.
- *McCandless District.* The Metro Plan expands this area by approximately 13 acres along South Main Street. Existing parcels on South Main Street are changed from High Density Transit Oriented Residential to Multi-Family Residential, Very High Density, and new properties added are also classified as Multi-Family Residential, Very High Density. The Metro Plan also updates this District by applying the Boulevard Very High Density Mixed Use land use classification on properties east of Centre Point Drive. Furthermore, the Metro Plan also expands the Multi-Family Residential High Density classification for properties along Penitencia Creek in this District. Finally, there are changes to the location of Parks and Open Space, and the Public Facilities land use is added to reflect existing conditions.

As a result of these changes, the projected buildout and resulting population growth and employment from the Metro Plan are expected to be more than what was identified in the TASP. This is discussed in Section 2.5.3, *Metro Plan Buildout: Population Growth and Employment*.

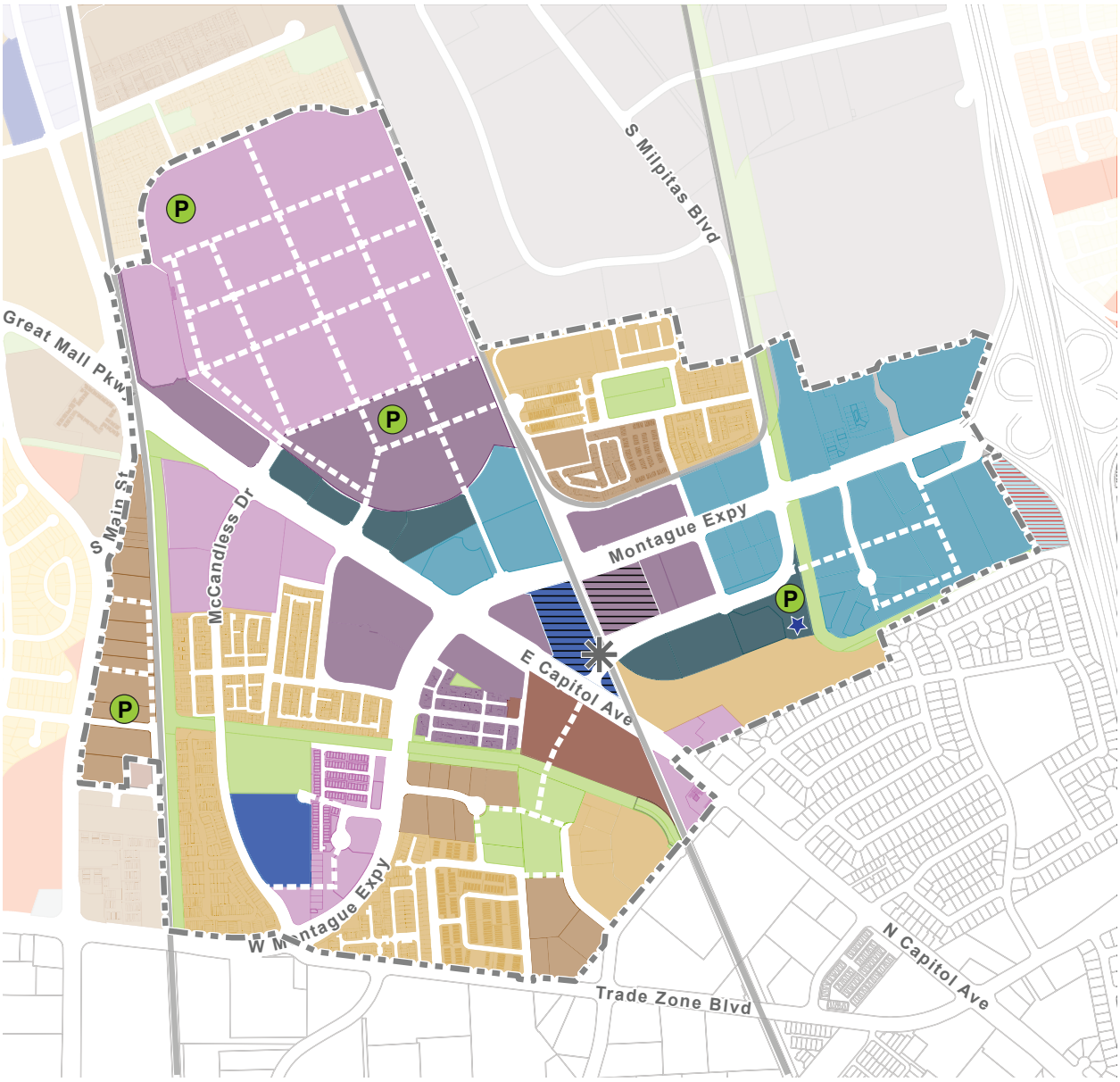


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**Figure 2-4**
**Land Uses**

In addition to updates to the allowed density, there have also been updates to the heights allowed for buildings within these land uses. Land uses that are unchanged from the TASP or do not have maximum height limits are not included below. The following height limit updates have been made.

- *Residential Retail High Density Mixed Use (RRMU)*. The Metro Plan identifies a maximum height of 85 feet for this land use, which is 10 feet higher than the height allowed by right under the TASP. The Metro Plan requires additional height step downs if the development is near existing residentially zoned parcels.
- *Boulevard Very High Density Mixed Use (BVMU).* The Metro Plan identifies a maximum height of 275 feet for this land use. The TASP identified a maximum height of 150 feet, with an additional 20 stories allowed with a conditional use permit. The Metro Plan increases the maximum height for this land use by 105 feet.
- *Multi-Family Very High Density Residential (VHD)*. The Metro Plan allows a maximum height of 85 feet for this land use, which is 10 feet higher than the maximum height of 75 feet allowed by right under the TASP.
- *Urban Residential (URR).* This is a new land use designation under the Metro Plan that allows a maximum height of 110 feet.
- *Business Park Research & Development, Limited Residential (BPRD-R)*. This is a new land use designation under the Metro Plan that allows a maximum height of 275 feet.

#### 2.5.2.2 Policies

Both the TASP and Metro Plan include policies that guide the implementation of the Specific Plans, as well as reduce potential environmental impacts. The Metro Plan has updated the policies in the TASP. Table 2-2 provides a summary of the TASP policies that were identified in the Certified EIR to minimize environmental impacts, as well as the Metro Plan policies that would replace those policies.

**Table 2-2. Summary of TASP and Metro Plan Policies**

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| ***Aesthetics*** | | |
| Development Standard: Utilities shall be underground or in subsurface conduits and accessible. | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan requires similar polices.<br>Policy CD 1-10. Minimize the visual impacts of public and private communication, service, and utility facilities by requiring the provider to incorporate sensitive site design techniques, including, but not limited to the placement of facilities in less conspicuous locations, the undergrounding of facilities wherever possible, and the screening of facilities.<br>Policy UCS 6-3. Require that all new power and gas lines and transformers are installed underground where feasible and promote the undergrounding of existing overhead facilities.<br>Policy UCS 7-7. Require that all new telecommunication lines are installed underground where feasible and promote the undergrounding of existing overhead facilities. |
| Policy 6.41: Construct a continuous trail network as delineated in the Transit Area Plan through land dedication and improvements by property owners in coordination with the Santa Clara Valley Water District and the City of Milpitas. | Policy M 5. Trails. Develop trails that link into the citywide trail system in order to aid connectivity and provide recreational and leisure spaces.<br>Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | No substantial change. The Metro Plan envisions a network of trails, similar to the TASP. |

[4] The numbering of the policies in the TASP changed between (1) the numbers cited in the Certified EIR and (2) the numbers cited in the Final Approved TASP. Where there is a discrepancy, both numbers are identified in footnotes to this table. This SEIR, including this Table uses the numbers in the Final Approved TASP.

[5] The numbering of the polices from the Metro Plan are from the Draft Metro Plan. These numbers will be updated if there are any changes between the Draft SEIR and the Final SEIR.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | Policy M 5.2. Create a network of trails along Penitencia Creek, Berryessa Creek, and railroad right of ways.<br>Policy M 5.3. Require all properties that the proposed trail network runs through or adjacent to set aside land for the trails. This land will count towards the required public park land dedication requirement. If trail easements already exist or are acquired within the rail line or flood control right of ways, these easements may be used in lieu of land on development sites. | |
| Policy 4.4: A 40 foot wide, landscaped setback is required from the future right of way line of Montague Expressway. | Policy M 2.4: Montague Expressway. Work with County Roads to complete improvements on Montague Expressway as described in Figure 4-10 [of the Metro Plan] and with the following features:<br>Deciduous trees shall be planted in the median and in planting strips on both sides of Montague Expressway.<br>Pedestrian-scale street lights, avenue-scaled street lights, benches, and trash receptacles shall be located on the sidewalk. | The Metro Plan updates the setbacks required on Montague Expressway. Within the Metro Plan, there would be a 20-foot setback, 6-foot sidewalk, and 9-foot planting strip. |
| Policy 4.6: Buildings will be designed with facades facing Montague Expressway. | Policy CB 3.2. Framing Open Space. The base of towers must be designed to form and enhance open spaces and sidewalks at the ground level.<br>Policy CB 4.2. Ground Floor Treatment. The base of buildings shall place active ground floor uses and primary building entrances along their primary facades oriented to adjacent streets, parks, and open space.<br>Policy CB 4.3.2. Entries Activating Streets. The main entrance may not face a parking lot and must be placed to support activity on streets | The Metro Plan includes a policy for facades oriented to adjacent streets, parks, and open space. Overall, the updated Metro Plan policies would require that building facades face Montague Expressway. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Policy 4.7: Planting strips and street trees shall be placed along all streets, between the curb and the sidewalk, to provide an attractive landscaped appearance for this high density neighborhood. | Policy SD 1.4.12. Amenity Zone. Amenity zones shall be located between the street and the Pedestrian Zone and provide amenities contributing to pedestrian comfort, convenience, safety and interest, and support positive social interaction.<br>Policy PA 3.7.2. Street Trees. Street trees shall be planted in the Amenity Zone at a maximum of 30 feet apart. Street trees shall be selected from Milpitas's Approved Street Trees list. No more than one species shall be planted per block in planters between the street and the sidewalk. Specimens may be more varied adjacent to buildings. | No substantial change. |
| Policy 4.13: Provide landscape buffers at least 30 feet deep along the BART track, the northern property line of the subdistrict, the railroad spur, the PG&E substation, and Milpitas Boulevard. | Policy SC 2.1. Features. Central Corridors should include the following features:<br>Bike lanes and sidewalks on both sides of the road<br>Street furnishings, including ample seating, bike racks, waste and recycling bins, bollards, and human scale street lights.<br>Ground-level activity that invites Central Corridor users on to Activity Streets.<br>Landscaped setbacks along Great Mall Parkway, Capitol Avenue, South Main Street, and South Milpitas Boulevard to buffer uses from heavy traffic.<br>Pedestrian crossing enhancements for traffic awareness and speed reduction.<br>Policy SC 4. Separation from Rail Lines. Any development projects, parks, or pedestrian trails built directly adjacent to a rail line (i.e. sharing a property boundary, not separated from the rail line by a roadway) shall build continuous fencing or solid walls between the development and the rail line to ensure that there will be no pedestrian access to | No substantial change, except that some of these buffers (i.e., the buffer around the PG&E Substation) has already been implemented. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | the line. Fencing shall be designed to deter graffiti and trespassing. | |
| Policy 4.36: Provide 30 foot landscape setbacks with a double row of trees between the BART track and residential buildings.[6] | Policy SC 4. Separation from Rail Lines. Any development projects, parks, or pedestrian trails built directly adjacent to a rail line (i.e. sharing a property boundary, not separated from the rail line by a roadway) shall build continuous fencing or solid walls between the development and the rail line to ensure that there will be no pedestrian access to the line. Fencing shall be designed to deter graffiti and trespassing. | No substantial change. |
| Policy 4.37: Provide a minimum 20 foot landscaped buffer between Capitol Avenue and any BART garage and other BART facilities located along Capitol Avenue.[7] | None. | This landscaped buffer has been completed. As such, the TASP policy has been fulfilled and no longer applies. |
| Policy 4.46: Create a deep landscape setback along Capitol Avenue to separate residences from noise and heavy traffic on Capitol Avenue. See Figure 5-11, Chapter 5 [of the TASP].[8] | Policy SC 2.1. Features. Central Corridors should include the following features:<br>Bike lanes and sidewalks on both sides of the road<br>Street furnishings, including ample seating, bike racks, waste and recycling bins, bollards, and human scale street lights.<br>Ground-level activity that invites Central Corridor users on to Activity Streets.<br>Landscaped setbacks along Great Mall Parkway, Capitol Avenue, South Main Street, and South Milpitas Boulevard to buffer uses from heavy traffic.<br>Pedestrian crossing enhancements for traffic awareness and speed reduction. | The Metro Plan updates the policy related to Capitol Avenue. However, the Metro Plan policy would overall be similar in its requirements as the TASP policy. |

[6] The Final Approved TASP identified this as Policy 4.36. The Certified Draft EIR identified this as Policy 4.34.

[7] The Final Approved TASP identified this as Policy 4.37. The Certified Draft EIR identified this as Policy 4.35.

[8] The Final Approved TASP identified this as Policy 4.46. The Certified Draft EIR identified this as Policy 4.44.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | Policy M 2.1. Great Mall Parkway. Transform Great Mall Parkway/Capitol Avenue into multimodal complete streets that provides for the mobility needs and safety of transit users, bicyclists, pedestrians, and drivers as indicated in Figure 4-7 and by providing bike lanes and sidewalks on both sides of the road. | |
| Policy 4.51: Create a deep landscape setback along Trade Zone Boulevard to buffer residential uses from the office/R&D/industrial uses across the street in San Jose, and to provide an overall attractive street appearance. See Figure 5-12, Chapter 5 [of the TASP].[9] | Policy M 2.5. Trade Zone Boulevard. Complete multimodal street improvements on Trade Zone Boulevard as described in Figure 4-10 [of the Metro Plan] and with the following features:<br>Provide a staggered row of deciduous trees, avenue-scaled street lights, and pedestrian-scaled street lights in the planting strip.<br>Provide a bicycle lane on both sides of the road.<br>Provide or require new development to provide ornamental trees at the back of the sidewalk along private frontages. | The Metro Plan updates the policy related to Trade Zone Boulevard. However, the Metro Plan policy would overall be similar in its requirements as the TASP policy. |
| Policy 4.53: Provide 30 foot landscape setbacks with a double row of trees between the BART track and residential buildings.[10] | Policy SC 4. Separation from Rail Lines. Any development projects, parks, or pedestrian trails built directly adjacent to a rail line (i.e. sharing a property boundary, not separated from the rail line by a roadway) shall build continuous fencing or solid walls between the development and the rail line to ensure that there will be no pedestrian access to the line. Fencing shall be designed to deter graffiti and trespassing. | No substantial change. |

[9] The Final Approved TASP identified this as Policy 4.51. The Certified Draft EIR identified this as Policy 4.49.

[10] The Final Approved TASP identified this as Policy 4.53. The Certified Draft EIR identified this as Policy 4.51.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Policy 4.59: To the maximum extent feasible (and with exceptions such as removal for emergency, health, or fire hazard purposes), retain the corridor of trees along McCandless Drive and in the vicinity both as an important visual resource and a potential resource for habitat. Also maintain the existing double row of trees on Great Mall Parkway north of McCandless Drive.[11] | None. | The trees mentioned in the TASP policy have been removed. As such, this policy would no longer apply. |
| Policy 4.67: Do not create new curb cuts along McCandless Drive or Centre Point Drive, in order to preserve the existing trees and to create a pedestrian environment along the street.[12] | None. | The trees mentioned in the TASP policy have been removed. As such, this policy would no longer apply. |
| Development Standard: Lighting shall be designed and placed to direct lighting to appropriate surfaces and minimize glare onto adjacent areas. All external signs and lighting should be lit from the top and shine downward except where up-lighting is required for safety or security purposes. The lighting should be shielded to prevent direct glare and/or light trespass and directed to the focus area. | None. | The Metro Plan does not have a similar policy; however Citywide Objective Design Standards would be applied in the Metro Plan Area with similar requirements. Pertinent text from the Citywide Objective Design Standards is included below.<br>Nuisance Prevention. All outdoor lighting shall be designed, located, installed, directed downward or toward structures, fully shielded, and maintained to prevent glare, light trespass, and light pollution and away from adjoining properties and public rights-of-way, so that no light fixture directly illuminates an area outside of the project site intended to be illuminated.<br>All lights shall be directed, oriented, and shielded to prevent light trespass or glare onto adjacent properties. The light level at property lines shall not exceed 0.3 foot-candles. |
| Development Standard: The light source used in outdoor lighting should provide a white light for | None. | The Metro Plan does not have a similar policy; however Citywide Objective Design Standards would be applied in the Metro Plan Area with |

[11] The Final Approved TASP identified this as Policy 4.59. The Certified Draft EIR identified this as Policy 4.57.

[12] The Final Approved TASP identified this as Policy 4.67. The Certified Draft EIR identified this as Policy 4.65.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| better color representation and to create a more pedestrian-friendly environment. | | similar requirements. Pertinent text from the Citywide Objective Design Standards is included below.<br>Intent. To create safe, welcoming, well-lighted areas, including building entries, pedestrian pathways and plazas, parking lots and vehicle maneuvering areas; and to minimize excessive illumination on adjoining properties. |
| Development Standard: Low pressure sodium lamps are prohibited. | None. | The Metro Plan does not have a similar policy; however Citywide Objective Design Standards would be applied in the Metro Plan Area with similar requirements. Pertinent text from the Citywide Objective Design Standards is included below.<br>Minimum Lighting Requirements.<br>(a) Parking Areas. Lighting in parking, garage, and carport areas shall be maintained with a minimum of one foot-candle of illumination at the ground-level during hours of darkness, with a maximum of four footcandles. All lighting shall be on a timeclock or photo-sensor system. Lighting used to illuminate parking areas shall be designed and located to prevent light trespass or glare, in accordance with this Section. Illumination shall not include low pressure sodium or similar lighting techniques.<br>(b) Multi-Unit Residential Developments. Aisles, passageways, and entryways/recesses related to and within the building complex shall be illuminated with an intensity of at least one-quarter foot-candles at the ground level during the hours of darkness.<br>(c) Non-Residential Developments (or portions of a development). All exterior doors, during the hours of darkness, shall be illuminated with a minimum of one-quarter foot-candles of light. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Development Standard: To reinforce the pedestrian character of the area, light standards along sidewalks should be approximately 12 to 16 feet in height. | None. | The Metro Plan does not have a similar policy; however Citywide Objective Design Standards would be applied in the Metro Plan Area with similar requirements. Pertinent text from the Citywide Objective Design Standards is included below.<br>Maximum Height. Freestanding outdoor light fixtures shall not exceed 16 feet in height. |
| Development Standard: The use of uplighting to accent interesting architectural features or landscaping is encouraged. | None. | The Metro Plan does not have a similar policy; however Citywide Objective Design Standards would be applied in the Metro Plan Area with similar requirements. Pertinent text from the Citywide Objective Design Standards is included below.<br>Design of Fixtures<br>(a) Fixtures on buildings shall be attached only to walls or eaves, and the top of the fixture shall not exceed the height of the parapet, roof, or eave of the roof.<br>(b) Accent Lighting. Architectural features may be illuminated by up-lighting, provided that the lamps are low intensity, and fully shielded such that no glare or light trespass is produced. |
| ***Air Quality*** | | |
| Policy 3.16: Establish and implement a travel demand management (TDM) program. Establish a funding mechanism to pay for the costs of the program, including the cost of a transportation coordinator to administer the program. The program would include a ride-matching program, coordination with regional ride-sharing organizations, and provision of transit information; and could also include sale of discounted transit passes and provision of shuttle service to major destinations. | Policy M 8. Parking and Transportation Demand Management. Establish and implement a travel demand management (TDM) program with the non-compulsory goal of reducing VMT by 15 percent or more below the regional baseline per employee or resident and efficiently provides parking that meet the needs of residents, employees, and visitors. TDM measures should be incorporated into all new development and may be implemented by individual uses or through TMA oversight. | No substantial change. Both the TASP and the Metro Plan require implementation of a TDM Program. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Policy 3.19: In future decisions regarding street layout, street design, and allocation of public right-of-way, balance the needs of cars with those of pedestrians, bicyclists, and transit. | The Metro Plan identifies in Chapter 4 of the Metro Plan that, the Metro Plan "sets standards for street and roadway design to create a balanced multimodal transportation environment." | The policies identified in the Mobility and Circulation Chapter of the Metro Plan balance the needs of cars with those of pedestrians, bicyclists, and transit. Overall, the policies in the Metro Plan would be similar to the policy in the TASP to slow local streets. |
| Policy 3.21: Provide continuous pedestrian sidewalks and safe bike travel routes throughout the entire Transit Area and within development projects. | Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | No substantial change. |
| Policy 3.22: Private development shall be encouraged to provide direct walking and biking routes to schools and major destinations, such as parks and shopping, through their property. | Policy PA 1.1.5. Direct Routes. Private development is encouraged to provide direct walking and biking routes to schools and major destinations, such as parks and shopping, through their property. | No substantial change. |
| Policy 3.23: Encourage children to walk or bike to school by expanding existing safe walking and bicycling routes to schools into the Transit Area. | Policy M 6.2. Work with Safe Routes to School programs to encourage children to walk or bike to school. | No substantial change. |
| Policy 3.24: Design local streets for slow speeds (25 – 35 miles per hour) to improve pedestrian safety and comfort. | Policy M 4. Neighborhood Streets. Create local streets within residential neighborhoods with a slower, pedestrian character.<br>Policy M4.1. Provide on-street parking in coordination with the Engineering Department on at least one side of all neighborhood streets to provide parking for guests and residents, slow traffic, and buffer pedestrians on the sidewalk. Where parking only occurs on one side of the street, parking locations should be provided on alternating sides of the street for different blocks and shall utilize permeable pavers and/or decorative pavers in parking aisles. | Overall, the policies in the Metro Plan would be similar to the policy in the TASP to slow local streets. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| Policy 3.25: Improve pedestrian crossings at major intersections on Great Mall Parkway, as shown in Figure 3-3 and Figure 3-4 [of the TASP]. | Policy M 2.1. Great Mall Parkway. Transform Great Mall Parkway/Capitol Avenue into multimodal complete streets that provides for the mobility needs and safety of transit users, bicyclists, pedestrians, and drivers as indicated in Figure 4-7 [of the Metro Plan] and by providing bike lanes and sidewalks on both sides of the road.<br>Policy M 2.1.1. Maintain the number of vehicle lanes and reduce lanes widths on Great Mall Parkway to calm traffic, create a more comfortable environment for non-vehicular modes.<br>Policy M 2.1.2. Provide protected bike lanes in both directions on Great Mall Parkway.<br>Policy M 2.1.4. Provide a linear park and pedestrian path along Great Mall Parkway from Montague to Main Street.<br>Policy M 2.1.5. Provide enhancements to pedestrian crossings along Great Mall Parkway and other major roadways through measures including curb extensions, traffic signal modifications, and/or other amenities.<br>Policy M 2.2. Great Mall Parkway and Main Street Intersection. Accommodate bicycle and pedestrian improvements and improve the connection between the Great Mall VTA Light Rail Station to the Great Mall (Figure 4-8 [of the Metro Plan]).<br>Policy M 2.2.1. Remove fencing and redesign the bus drive to become a multi-use path that directly connects the VTA Light Rail Station with the Great Mall.<br>Policy M 2.2.2. Redesign the plaza by the Light Rail Station Elevator on the north side | The Metro Plan has updated policies related to improving pedestrian crossings on Great Mall Parkway. Overall, the policies in the Metro Plan would achieve the same goal of improving the safety of pedestrians on Great Mall Parkway. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | of Great Mall Parkway to be more landscaped, more usable as a public plaza, with commercial uses oriented to it and features that activate the plaza. Coordinate with VTA and developers to improve the pedestrian and transit user experience at the LRT Station.<br>Policy M 2.2.3. Use colored paving to define bike lanes, particularly in areas with potential conflict with vehicular traffic.<br>Policy M 2.2.4. Remove the existing separated right turn lane at Great Mall Parkway and Main Street to expand the plaza on the south side of Great Mall Parkway at the train tracks. Replace the through lane with an optional right turn lane. Redesign the plaza to include hardscape and softscape treatment to make the plaza as activated and usable as possible<br>Policy M 2.2.5. Build a new pedestrian overcrossing from the elevated level at the Great Mall Light Rail Station to the corner plaza at Main and Great Mall Parkway. | |
| Policy 3.26: Construct pedestrian/bicycle bridges over Montague Expressway to allow safe crossings of this regional roadway with heavy traffic volumes: (1) near Piper Drive, to connect the Light Rail station, BART station, and development sites on the south side with the Great Mall and the neighborhoods north of Montague Expressway; and (2) near the Penitencia Creek East channel to connect schools and neighborhoods north and south of Montague Expressway | None. | The bridge over Montague Expressway near Piper Drive has been constructed. The bridge over Montague Expressway near the Penitencia Creek East channel is undergoing environmental review and will be constructed in the future. |
| Policy 3.27: Every resident of the Transit Area shall be able to safely walk and bike to the BART and VTA light rail stations. As projects are constructed, make sure that all the routes described below are | Policy M 9. Pedestrian Circulation. Promote pedestrian circulation for daily trips under a half mile and to transit by implementing the proposed street improvements and safety | Overall, the policies in the Metro Plan would allow for residents within the Metro Plan to safely walk and bike to the Milpitas Transit Center. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| continuous and designed to be attractive and safe for pedestrians. | features, including pedestrian infrastructure enhancements on Great Mall Parkway (M 2.1) and intersection improvements (M 2.2). For a full list of street and circulation improvements to increase pedestrian safety, refer to Chapter 6: Implementation [of the Metro Plan].<br>Policy M 10. Bicycle and Micromobility Circulation. Promote bicycle and micromobility modes (e.g. e-bikes, motorized scooters, and skateboards) for trips to local destinations (e.g. Milpitas Transit Center, neighborhood retail, parks). Determine if the Metro Area is a suitable place for implementing the one-year shared micromobility pilot program detailed in the City's Bicycle/Pedestrian and Trails Plan.<br>Policy M 10.1. Provide direct and convenient bicycle circulation through the project site and to adjacent areas by closing existing gaps in bicycle lanes and bicycle routes, per Milpitas' Bicycle/ Pedestrian and Trails Plan and as shown on the Circulation Network Map (Figure 4-6 [of the Metro Plan]) as well as routes suggested above for individual roadways such as Great Mall Parkway.<br>Policy M 10.2. Signage alerting pedestrians of potentially fast-moving traffic should be considered where this connectivity network intersects or runs alongside pedestrian-focused routes, particularly at intersections with the trail network described in M 5.<br>Policy M 11. Transit. Connect the Milpitas Metro Plan Area to local and regional transit. | |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | Policy M 11.1. Encourage the development of local circulators (by the City or property owners) as shown on the Circulation Network Map (Figure 4-6 [of the Metro Plan]).<br>Policy M 11.3. Encourage multimodal infrastructure improvements near transit to improve local connectivity to transit stops, with particular focus on the Milpitas Transit Center, as per Milpitas' Bicycle/Pedestrian and Trails Plan (2021). | |
| Policy 3.28: Provide continuous bicycle circulation through the project site and to adjacent areas by closing existing gaps in bicycle lanes and bicycle routes, per Figure 3-5 [of the TASP]. | Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | Overall, the Metro Plan includes policies to promote a bicycle network in the Metro Plan Area. In addition, the City would implement the bicycle facilities in the Active Transportation Plan. |
| Policy 3.29: A Class III bicycle route shall be created on the internal roadways (from the Milpitas Boulevard Extension/Capitol Avenue intersection to Tarob Court) to provide a continuous bicycle connection between Milpitas Boulevard and the existing bicycle lanes on Lundy Street, as indicated on Figure 3-5 [of the TASP]. | Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | Overall, the Metro Plan includes policies to promote a bicycle network in the Metro Plan Area. In addition, the City would implement the bicycle facilities in the Active Transportation Plan. |
| Policy 3.30: Maintain pedestrian and biking facilities. | Policy M 1.5. Maintain pedestrian and biking facilities | No substantial change. |
| Policy 3.31: Require provision of bicycle and pedestrian facilities such as weather protected bicycle parking, direct and safe access for pedestrians and bicyclists to adjacent bicycle routes and transit stations, showers and lockers for employees at the worksite, secure short-term parking for bicycles, etc. | Policy M 8.4. Require provision of bicycle and pedestrian facilities at workplaces, commercial centers, and residential complexes.<br>Policy M 8.4.1. This includes long-term bicycle parking that is weather-protected (either indoor or in an enclosed outdoor locker) at residential complexes and workplaces and short-term parking for bicycles that is visible from the entrance of the building at commercial developments. | Overall, the policies in the TASP and the Metro Plan are similar and would require provisions for bicycle and pedestrian facilities. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | Required bicycle parking ratios are listed in Table 4-2 [of the Metro Plan].<br>Policy M 8.3. Development projects are encouraged to implement additional optional TDM measures to achieve VMT and trip reduction goals. Section 7.6 [of the Metro Plan] details some potential strategies. The Santa Clara Countywide VMT Evaluation Tool is another resource for selecting TDM measures. | |
| Policy 3.32: Coordinate with VTA to provide sufficient amenities (such as transit shelters) at all transit stops within the Transit Area. | Action IM 27. Coordinate with VTA to provide sufficient amenities (such as transit shelters) at all transit stops within the Metro Area. | No substantial change. |
| Policy 3.33: Require new development within the Transit Area to facilitate the use of alternative modes of transportation through programs such as carpool parking, the VTA's EcoPass Program, shuttles to transit stations and lunchtime destinations, assistance to regional and local ridesharing organizations, alternative work schedules, telecommuting, etc. Establish a Transportation Demand Management (TDM) program for this purpose, as described in Policy 3.16. | Policy M 7. Reduce Climate Impacts. Manage automobile demand and promote low-carbon transportation to minimize emissions in the planning area.<br>Policy M 7.1. Zero and Low Emission Vehicles. Promote use of zero and low-emission vehicles through the following measures:<br>Require all new multifamily residential and all new nonresidential buildings to provide at least 45 percent of parking spaces as EV capable (including the raceway and panel capacity) to support future installation of Level 2 chargers on a dedicated 40-amp, 208/240-volt branch circuit.<br>Require all new multifamily residential and new nonresidential buildings to install at least 33 percent of EV capable parking spaces with EVSE Level 2. Where six Level 2 EVSE are installed, one DC Fast Charger can be installed to substitute for five Level 2 EVSEs. The DCFC shall be rated at 80 kW minimum. | Overall, both the policies in the TASP and the Metro Plan would promote alternative modes of transportation and TDM for new development. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | Require all new warehouses, grocery stores, and retail stores with planned loading docks to install at least one EV capable loading dock with a raceway(s) and service panel(s) or subpanel(s) for each 25,000 square feet of floor space planned.<br>Provide preferentially-located charging stations for electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs).<br>Policy M 8. Parking and Transportation Demand Management. Establish and implement a travel demand management (TDM) program with the non-compulsory goal of reducing VMT by 15 percent or more below the regional baseline per employee or resident and efficiently provides parking that meet the needs of residents, employees, and visitors. TDM measures should be incorporated into all new development and may be implemented by individual uses or through TMA oversight.<br>Policy M 8.2. All projects should provide the following TDM measures at a minimum individually or as participants of the TMA:<br>Annual monitoring reports<br>Annual employee commuter survey<br>Participation within the Milpitas Metro Specific Plan TMA<br>Provision of bicycle parking spaces<br>Fully subsidized transit passes (e.g. VTA, BART, Caltrain, etc.). At a minimum the transit subsidy should be equivalent to the cost of a monthly VTA pass<br>Commute shuttle funding<br>Unbundled parking<br>511.org participation | |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | Production of marketing and education materials<br>Policy M 8.3. Development projects are encouraged to implement additional optional TDM measures to achieve VMT and trip reduction goals. Section 7.6 [of the Metro Plan] details some potential strategies. The Santa Clara Countywide VMT Evaluation Tool is another resource for selecting TDM measures. | |
| Policy 3.34: Encourage preferential parking measures for carpool and vanpool vehicles, guaranteed ride home services and other incentives to employees choosing transportation modes other than driving. Provide preferential parking for low-emission vehicles. | See Policies M 7, M 7.1, M 8, M 8.2, and M 8.3 above. | Overall, both the policies in the TASP and the Metro Plan would promote alternative forms of transportation other than driving and would provide parking for low-emissions vehicles. |
| Policy 4.21: A small amount of neighborhood-serving retail shall be located in the Piper/Montague subdistrict as indicated in the Transit Plan Map Figure 3-1 [of the TASP] to serve its residents as well as other users of the area.[13] | None. | The neighborhood-serving retail has been constructed. As such, this TASP policy would no longer apply. |
| Policy 4.39: Provide a small amount of neighborhood commercial use that also serves BART patrons, located adjacent or across the street from the BART station.[14] | The Land Use Map in the Metro Plan identifies the Transit Center on areas designated for Public Facilities. Adjacent to the Transit Center are areas designated for Boulevard Very High Density Mixed Use, which allows for commercial uses. | Overall, the Metro Plan's land use designations would allow for commercial uses that would serve BART patrons. |
| Policy 5.16: During review of specific development proposals made to the City, sponsors of individual development projects under the Specific Plan shall implement the BAAQMD's approach to dust abatement. | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan requires a similar action.<br>Action CON-7e: Require dust control measures, including those included in the Santa Clara Valley Non-point Source Pollution Control |

[13] The Final Approved TASP identified this as Policy 4.21. The Certified Draft EIR identified this as Policy 4.20.

[14] The Final Approved TASP identified this as Policy 4.39. The Certified Draft EIR identified this as Policy 4.37.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | | Program, and BAAQMD's Best Management Practices for fugitive dust control during construction. |
| Policy 5.18: Day care facilities, schools, nursing homes, and other similar sensitive receptors shall be located away from sites which store or use hazardous materials, in accordance with State and City standards. Adequate buffers to protect occupants of these sensitive uses shall be provided, including but not limited to walls, fences, landscaping, large building setbacks, and additional exit routes over and above minimum code requirements. | Policy LU 1.6. Ensure day care facilities, schools, nursing homes, and other similar sensitive receptors are located away from sites that store or use hazardous materials, in accordance with State and City standards. Adequate buffers to protect occupants of these sensitive uses shall be provided, including but not limited to walls, fences, landscaping, large building setbacks, and additional exit routes over and above minimum code requirements. | No substantial change. |
| Policy 5.19: Require the installation of temporary buffers—fences, walls, or vegetation— when residential uses are developed adjacent to existing industrial uses. The type of buffer must be reviewed and approved by the City Planning Department. The temporary buffers may be removed if and when an adjacent site is redeveloped as a non-industrial use. | Policy SC 9. Temporary Buffers. Require the installation of temporary buffers—fences, walls, or vegetation— when residential uses are developed adjacent to existing industrial uses. The type of buffer must be reviewed and approved by the City Planning Department. The temporary buffers may be removed if and when an adjacent site is redeveloped as a non-industrial use. | No substantial change. |
| Policy 5.23: Require project sponsors to inform future and/or existing sensitive receptors (such as hospitals, schools, residential uses, and nursing homes) of any potential health impacts resulting from nearby sources of dust, odors, or toxic air contaminants, and where mitigation cannot reduce these impacts. | Policy SC 8.2. Communication with Sensitive Receptors. Require project sponsors to inform future and/or existing sensitive receptors (such as hospitals, schools, residential uses, and nursing homes) of any potential health impacts resulting from nearby sources of dust, odors, or toxic air contaminants, and where mitigation cannot reduce these impacts. | No substantial change. |
| Policy 5.24: Allow only natural gas fireplaces, pellet stoves or EPA-Certified wood-burning fireplaces or stoves. Conventional open-hearth fireplaces shall not be permitted. | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan requires a similar action.<br>Action CON-7g: Continue implementation of the City's Municipal Code Chapter 15, |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | | Fireplace/Woodsmoke Pollution, in order to improve and maintain air quality conditions in the City<br>Chapter 15 of the City's Municipal Code includes the following text:<br>15-1.01. It shall be unlawful to install a wood burning device that is not a pellet-fueled device or EPA certified.<br>15-1.02. Only gas fireplaces, pellet-fueled devices or E.P.A. certified wood-burning devices may be installed in any new construction. |
| Policy 5.25: For new residential development that is proposed within 500 feet of active rail lines where vehicles emit diesel exhaust, or roadways where total daily traffic volumes from all roadways within 500 feet of such location exceed 100,000 vehicles per day, will, as part of its CEQA review, include an analysis of toxic air contaminants (which includes primarily diesel particulate matter (DPM)). If the results show that the carcinogenic human health risk exceeds the 10 people in a million standard for carcinogenic human health impacts established by the BAAQMD, the City may require upgraded ventilation systems with high efficiency filters, or other equivalent mechanisms, to minimize exposure of future residents.<br>The above standard shall also apply to other sensitive uses such as schools, daycare facilities, and medical facilities with inpatient services. | Policy SC 8.1. CEQA. For new residential development that is proposed within 500 feet of active rail lines where vehicles emit diesel exhaust, or roadways where total daily traffic volumes from all roadways within 500 feet of such location exceed 100,000 vehicles per day, will, as part of its CEQA review, include an analysis of toxic air contaminants (which includes primarily diesel particulate matter (DPM)). If the results show that the carcinogenic human health risk exceeds the 10 people in a million standard for carcinogenic human health impacts established by the BAAQMD, the City may require upgraded ventilation systems with high efficiency filters, or other equivalent mechanisms, to minimize exposure of future residents. This standard shall also apply to other sensitive uses such as schools, daycare facilities, and medical facilities with inpatient services. | No substantial change. |
| ***Biological Resources*** | | |
| Policy 5.26: For any project sites that are either undeveloped or vacant and support vegetation, or project sites which are adjacent to such land, a pre- | None. | The Metro Plan does not have a similar policy related to burrowing owl; however, the 2040 |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| construction survey shall be conducted by a qualified biologist within 30 days of the onset of construction. This survey shall include two early morning surveys and two evening surveys to ensure that all owl pairs have been located. If preconstruction surveys undertaken during the breeding season (February 1st through July 31st) locate active nest burrows, an appropriate buffer around them (as determined by the project biologist) shall remain excluded from construction activities until the breeding season is over. During the non-breeding season (August 15th through January 31st), resident owls may be relocated to alternative habitat. The relocation of resident owls shall be according to a relocation plan prepared by a qualified biologist in consultation with the California Department of Fish and Game (CDFG). This plan shall provide for the owl's relocation to nearby lands possessing available nesting habitat. Suitable development-free buffers shall be maintained between replacement nest burrows and the nearest building, pathway, parking lot, or landscaping. The relocation of resident owls shall be in conformance with all necessary state and federal permits.[15] | | General Plan includes an action that requires mitigation for biological resources.<br>Action CON-3b: Where sensitive biological habitats have been identified on or immediately adjacent to a project site, the project shall include appropriate mitigation measures identified by a qualified biologist, which may include, but are not limited to the following:<br>Pre-construction surveys for species listed under the State or Federal Endangered Species Acts, or species identified as special-status by the resource agencies, shall be conducted by a qualified biologist;<br>Construction barrier fencing shall be installed around sensitive resources and areas identified for avoidance or protection, and to reduce potential soil compaction in sensitive areas; and<br>Pre-Construction training of contractors and sub-contractors shall be conducted by a qualified biologist to identify and avoid protected species and habitat. |
| Policy 5.27: To mitigate impacts on non-listed special-status nesting raptors and other nesting birds, a qualified biologist will survey the site for nesting raptors and other nesting birds within 14 days prior to any ground disturbing activity or vegetation removal. Results of the surveys will be forwarded to the U.S. Fish and Wildlife Service (USFWS) and CDFG (as appropriate) and, on a case-by-case basis, avoidance procedures adopted. These can include construction buffer areas | Policy SC 9.1. Bird Habitat. To the extent feasible, future developers in the Metro Plan Area will conduct initial construction activities outside the nesting season between September 16 and January 14 including, but not limited to, tree trimming or tree removal, ground disturbance, demolition, site grading, and other activities that may compromise breeding birds or the | Overall, both the policies in the TASP and the Metro Plan would include measures to protect nesting birds. |

[15] The Final Approved TASP identified this as Policy 5.26. The Certified Draft EIR identified this as Policy 5.25.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| (several hundred feet in the case of raptors) or seasonal avoidance. However, if construction activities occur only during the non-breeding season between August 31 and February 1, no surveys will be required.[16] | success of their nests occurring within or outside the development site.<br>If construction must occur during the migratory bird nesting season between February 1 to August 31 for small bird species, January 15 to September 15 for owls, and February 15 to September 15 for other raptors, a qualified wildlife biologist will conduct two preconstruction nesting surveys within 14 days and 48 hours prior to the start of construction or demolition. Additional surveys will be conducted 48 hours prior to the start of construction or demolition in areas that have not been previously disturbed by construction activities or after any construction breaks of 10 days or more. Typical experience requirements for a "qualified biologist" include a minimum of 4 years of academic training and professional experience in biological sciences and related resource management activities, and a minimum of 2 years of experience in biological monitoring or surveying for nesting birds. Surveys of suitable habitat will be performed in publicly accessible areas within 250 feet, 500 feet, and 1,000 feet of the construction site to locate any active passerine, small raptor (e.g., accipiters), and large raptor (e.g, buteos) nests, respectively. Surveys will be conducted at the appropriate times of day and during appropriate nesting times.<br>If active nests are located during the preconstruction nesting bird surveys, a | |

[16] The Final Approved TASP identified this as Policy 5.27. The Certified Draft EIR identified this as Policy 5.26.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | qualified biologist will evaluate the construction schedule and location to determine if construction activities could affect an active nest. If so, the following measures will apply, as determined by the qualified biologist:<br>If construction would not affect an active nest, construction may proceed without restriction; however, a qualified biologist will regularly monitor the nest at a frequency determined appropriate for the surrounding construction activity, to confirm that there would be no adverse effect. The frequency of spot check monitoring would be determined on a case-by-case basis, considering the scope of the particular construction activity, duration, proximity to the nest, and any physical barriers that may screen the nest. The qualified biologist may revise the determination at any time during the nesting season.<br>If it is determined that construction could affect an active nest, the qualified biologist will establish a no disturbance buffer around the nest. All construction will halt within the buffer until the qualified biologist determines that the nest is no longer active. Buffer distances will be equal to the survey distances (i.e., 50 feet for passerines and 250 feet for raptors); however, the buffer may be adjusted if an obstruction, such as a building, is within the line of sight between the nest and construction.<br>Modifying nest buffer distances, allowing certain construction activities within the buffer, and/or modifying construction methods in proximity to active nests will be | |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | done at the discretion of the qualified biologist.<br>Any construction that must occur within established no disturbance buffers will be monitored by a qualified biologist. If adverse effects in response to construction within the buffer are observed that could compromise the nest, construction within the no disturbance buffer will halt until the nest occupants have fledged.<br>Any birds that begin nesting within the construction area and survey buffers amid construction activities are assumed to be habituated to construction related or similar noise and disturbance levels. Therefore, exclusion zones around nests may be reduced or eliminated in these cases, as determined by the qualified biologist. Construction may proceed around active nests as long as the nests and their occupants would not be directly affected.<br>If inactive nests are observed within or adjacent to the construction site, removal or relocation of the inactive nests will be at the discretion of the qualified biologist. Construction may proceed around inactive nests. | |
| Policy 5.28: Development under the Specific Plan shall, to the maximum extent feasible (and with exceptions such as removal for emergency, health, or fire hazard purposes), retain the corridor of trees along McCandless Drive and corridors of trees in the vicinity both as a potential resource for habitat and as an important visual resource.[17] | None. | The trees mentioned in the TASP policy have been removed. As such, this policy would no longer apply. In addition, significant trees would continue to be protected by following the City's Tree and Planting Ordinance. |

[17] The Final Approved TASP identified this as Policy 5.28. The Certified Draft EIR identified this as Policy 5.27.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| Policy 5.30: Prior to new development in areas that border creeks and with potential riparian habitat, applicants will be required to coordinate with the CDFG, as required by law. Coordination will include evaluation of existing riparian habitat and development of avoidance, minimization, and/or compensatory measures sufficient to procure a Streambed Alteration Agreement with the CDFG.[18] | None. | The Metro Plan does not include a comparable TASP policy. However, the coordination identified in this policy would be required, per state law. In addition, the 2040 General Plan includes an action that requires compliance with guidelines for land uses near streams.<br>Action CON-3c: Cooperate with State, federal and local agencies to ensure that development does not cause significant adverse impacts to existing riparian corridors; this includes continued compliance with the "Guidelines and Standards for Land Use Near Streams" from the Santa Clara Valley Water District and Title XI, Chapter 15 (Floodplain Management Regulations) of the Milpitas Municipal Code. |
| Policy 5.31: For properties adjacent to any waterway in the study area, the following requirements shall apply:<br>Any plans for construction over the Santa Clara Valley Water District (SCVWD) fee or easement lands require review and issuance of a permit.<br>The SCVWD's Milpitas Pipeline, located at the north end of the study area [of the TASP] and adjacent and parallel to the rail line continuing south onto Capital Avenue at the southern end of the study area, shall be shown on all future plans.<br>Projects should generally be consistent with the recommendations developed by the Water Resources Protection Collaborative in the "Guidelines and Standards for Land Use Near Streams." | Policy SC 8.1. Santa Clara Valley Water District. For properties adjacent to any waterway in the study area, the following requirements shall apply:<br>Any plans for construction over the Santa Clara Valley Water District (SCVWD) fee or easement lands require review and issuance of a permit.<br>The SCVWD's Milpitas Pipeline, located at the north end of the study area [of the TASP] and adjacent and parallel to the rail line continuing south onto Capital Avenue at the southern end of the study area, shall be shown on all future plans.<br>Projects should generally be consistent with the recommendations developed by the Water Resources Protection Collaborative in the "Guidelines and Standards for Land Use Near Streams." | No substantial change. |

[18] The Final Approved TASP identified this as Policy 5.30. The Certified Draft EIR identified this as Policy 5.29.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Policy 5.32: Consistent with current City practice, all new development located on or adjacent to Penitencia and Berryessa Creek will be required to comply with the standards and guidelines for land uses near streams, as adopted by the City of Milpitas. Any development or construction activity to be conducted on or adjacent to SCVWD property or easements, such as creek crossings, shall be required to obtain applicable permits from the SCVWD prior to such construction activity | Policy SC 8.2. Penitencia and Berryessa Creek. Consistent with current City practice, all new development located on or adjacent to Penitencia and Berryessa Creek will be required to comply with the standards and guidelines for land uses near streams, as adopted by the City of Milpitas. Any development or construction activity to be conducted on or adjacent to SCVWD property or easements, such as creek crossings, shall be required to obtain applicable permits from the SCVWD prior to such construction activity. | No substantial change. |
| Development Standard<br>Setbacks Adjacent to Creeks and Drainage Channels. Minimum 25 feet from top of bank, or from a maintenance road if one exists (in addition to required rear or side yard setbacks). See Figure 5-23 [of the TASP]. | Policy SC 8.3. Setbacks Adjacent to Creeks and Drainage Channels. A minimum setback of 25 feet from top of bank, or from a maintenance road if one exists (in addition to required rear or side yard setbacks) shall be maintained. | No substantial change. |
| ***Cultural Resources*** | | |
| Policy 5.33: Consider any potential impacts to historic and cultural resources during the review of any proposed alteration or demolition projects on the Great Mall property.[19] | Policy SC 1 Historic Resource. For any future development project occurring within the Metro Plan area that proposes to alter or demolish a building that is more than 50 years old, the City will require the project sponsor to engage a professionally qualified historian or architectural historian to prepare a historical evaluation of the building unless a previously prepared historical evaluation is available. This requirement can be met through the preparation of California Department of Parks and Recreation 523 Forms. The historical evaluation will analyze whether | The Metro Plan has a similar policy to consider potential impacts to historic resources, as the TASP. However, the Metro Plan policy applies to all historic-aged built-environment resources within the entire Metro Plan Area rather than being limited to the Great Mall of the Bay Area property. |

[19] The Final Approved TASP identified this as Policy 5.33. The Certified Draft EIR identified this as Policy 5.30.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | the building meets the eligibility requirements of the California Register of Historical Resources. If the building is determined to be eligible, the project sponsor's professionally qualified historian or architectural historian must also assess the project's compliance with the Secretary of the Interior's Standards for Rehabilitation. If the building is determined not to be eligible, or if the project is found to adhere to the Secretary's Standards relative to eligible resources, no further action is required. | |
| Policy 5.34: Any future ground disturbing activities, including grading, in the Transit Area shall be monitored by a qualified archaeologist to ensure that the accidental discovery of significant archaeological materials and/or human remains is handled according to CEQA Guidelines § 15064.5 regarding discovery of archeological sites and burial sites, and Guidelines §15126.4(b) identifying mitigation measures for impacts on historic and cultural resources. (Reference CEQA §§ 21083.2, 21084.1.) In the event that buried cultural remains are encountered, construction will be temporarily halted until a mitigation plan can be developed. In the event that human remains are encountered, the developer shall halt work in the immediate area and contact the Santa Clara County coroner and the City of Milpitas. The coroner will then contact the Native American Heritage Commission (NAHC) which will in turn contact the appropriate Most Likely Descendent (MLD). The MLD will then have the opportunity to make a recommendation for the | Policy SC 7. Archaeological Resource. Any future ground-disturbing activities, including grading, in the Metro Plan Area shall be monitored by a qualified archaeologist to ensure that the accidental discovery of significant archaeological materials and/or human remains is handled according to State CEQA Guidelines Section 15064.5 regarding discovery of archaeological sites and burial sites, and State CEQA Guidelines Section 15126.4(b) identifying mitigation measures for impacts on historic and cultural resources (reference CEQA Sections 21083.2 and 21084.1). A Native American monitor will also be present during future ground-disturbing activities due to the high potential for inadvertent discoveries of archaeological materials and/or human remains. Prior to commencement of ground-disturbing activities, the City shall ensure that the general contractor and those conducting ground-disturbing activities are given cultural sensitivity training. Cultural sensitivity training will | No substantial change. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| respectful treatment of the Native American remains and related burial goods.[20] | ensure that any cultural material encountered during ground-disturbing activities is protected and treated with culturally appropriate dignity. This training will be administered by a Native American monitor and a qualified archaeologist. In the event that buried cultural materials are encountered, construction will be temporarily halted until a mitigation plan can be developed. In the event that human remains are encountered, the developer shall halt work in the immediate area and contact the Santa Clara County coroner and the City of Milpitas. The coroner will then contact the Native American Heritage Commission (NAHC), which will in turn contact the appropriate Most Likely Descendant (MLD). The MLD will then have the opportunity to make a recommendation for the respectful treatment of the Native American remains and related burial goods. | |
| Policy 5.35: All grading plans for development projects involving ground displacement shall include a requirement for monitoring by a qualified paleontologist to review underground materials recovered. In the event fossils are encountered, construction shall be temporarily halted. The City's Planning Department shall be notified immediately, a qualified paleontologist shall evaluate the fossils, and steps needed to photo-document or to recover the fossils shall be taken. If fossils are found during construction activities, grading in the vicinity shall be temporarily suspended while the fossils are | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan includes an action to protect paleontological resources.<br>Action CON 4b: Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:<br>If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning |

[20] The Final Approved TASP identified this as Policy 5.34. The Certified Draft EIR identified this as Policy 5.31.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| evaluated for scientific significance and fossil recovery, if warranted.[21] | | Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.<br>If human remains are discovered during any ground disturbing activity, work shall stop until the Planning Department and the County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Planning Department. |
| ***Geology and Soils*** | | |
| Policy 6.50: The Fire Department shall conduct a "standards of cover" analysis to determine the Transit Plan's precise impact on the department's staffing and equipment, and any required facility needs. Identify and evaluate potential sites for an expanded or new fire station near the Transit Area if the standards of cover analysis determines it is warranted.[22] | Policy CS 8.1. Conduct a "standards of cover" analysis to determine the Metro Plan's precise impact on the Fire Department's staffing and equipment, and any required facility needs. Identify and evaluate potential sites for an expanded or new fire station near the Plan Area if the standards of cover analysis determines it is warranted. | No substantial change. |
| Policy 6.51: Additional fire department staff will be hired, equipment purchased, and facilities built to provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Transit Area. New | Policy ICS 8.2. Provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Plan Area by hiring additional fire department staff, purchasing equipment, | No substantial change. |

[21] The Final Approved TASP identified this as Policy 5.35. The Certified Draft EIR identified this as Policy 5.32.

[22] The Final Approved TASP identified this as Policy 6.50. The Certified Draft EIR identified this as Policy 6.49.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| equipment and facilities shall be funded by the Community Facilities District fee and new staff paid from the City's General Fund.[23] | and building facilities. New equipment and facilities shall be funded by the Community Facilities District fee and new staff paid from the City's General Fund.<br>Policy ICS 8.3. These facilities are not expected to be sited within the Plan Area.<br>Policy ICS 8.4. If a new fire station is built to meet the service needs of the Plan Area, it must be sited and developed in such a way to not create substantial adverse physical impacts or significant environmental impacts.<br>Policy ICS 8.5. Any new facilities should minimize noise and traffic impacts on existing land uses. | |
| Policy 6.52: If a new fire station is built to meet the service needs of the Transit Area, it must be sited and developed in such a way to not create substantial adverse physical impacts or significant environmental impacts.[24] | Policy ICS 8.4. If a new fire station is built to meet the service needs of the Plan Area, it must be sited and developed in such a way to not create substantial adverse physical impacts or significant environmental impacts. | No substantial change. |
| Policy 6.53: The Fire Department shall update the City's emergency and disaster response plans to take the location and type of new development, and future traffic levels, into account.[25] | Policy ICS 8.6. Update the City's emergency and disaster response plans to take the location and type of new development, and future traffic levels, into account. | No substantial change. |
| Policy 6.54: Additional police staff will be hired and equipment purchased to provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Transit Area. New equipment shall be funded by the Community | Policy ICS 9.1. Hire additional police staff and purchase equipment provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Metro Area as well as surrounding areas. New equipment shall be funded by the Community Facilities District | No substantial change. |

[23] The Final Approved TASP identified this as Policy 6.51. The Certified Draft EIR identified this as Policy 6.50.

[24] The Final Approved TASP identified this as Policy 6.52. The Certified Draft EIR identified this as Policy 6.51.

[25] The Final Approved TASP identified this as Policy 6.53. The Certified Draft EIR identified this as Policy 6.52.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| Facilities District fee and new staff paid from the City's General Fund.[26] | fee and new staff paid from the City's General Fund. | |
| Policy 5.35: All grading plans for development projects involving ground displacement shall include a requirement for monitoring by a qualified paleontologist to review underground materials recovered. In the event fossils are encountered, construction shall be temporarily halted. The City's Planning Department shall be notified immediately, a qualified paleontologist shall evaluate the fossils, and steps needed to photo-document or to recover the fossils shall be taken. If fossils are found during construction activities, grading in the vicinity shall be temporarily suspended while the fossils are evaluated for scientific significance and fossil recovery, if warranted.[27] | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan includes an action to protect paleontological resources.<br>Action CON 4b: Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:<br>If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.<br>If human remains are discovered during any ground disturbing activity, work shall stop until the Planning Department and the County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Planning Department. |

[26] The Final Approved TASP identified this as Policy 6.54. The Certified Draft EIR identified this as Policy 6.53.

[27] The Final Approved TASP identified this as Policy 5.35. The Certified Draft EIR identified this as Policy 5.32.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| ***Greenhouse Gas Emissions*** | | |
| Policy 3.16: Establish and implement a travel demand management (TDM) program. Establish a funding mechanism to pay for the costs of the program, including the cost of a transportation coordinator to administer the program. The program would include a ride-matching program, coordination with regional ride-sharing organizations, and provision of transit information; and could also include sale of discounted transit passes and provision of shuttle service to major destinations. | Policy M 8. Parking and Transportation Demand Management. Establish and implement a travel demand management (TDM) program with the non-compulsory goal of reducing VMT by 15 percent or more below the regional baseline per employee or resident and efficiently provides parking that meet the needs of residents, employees, and visitors. TDM measures should be incorporated into all new development and may be implemented by individual uses or through TMA oversight. | No substantial change. Both the TASP and the Metro Plan require implementation of a TDM Program. |
| Policy 3.21: Provide continuous pedestrian sidewalks and safe bike travel routes throughout the entire Transit Area and within development projects. | Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | No substantial change. |
| Policy 3.22: Private development shall be encouraged to provide direct walking and biking routes to schools and major destinations, such as parks and shopping, through their property. | Policy PA 1.1.5. Direct Routes. Private development is encouraged to provide direct walking and biking routes to schools and major destinations, such as parks and shopping, through their property. | No substantial change. |
| Policy 3.23: Encourage children to walk or bike to school by expanding existing safe walking and bicycling routes to schools into the Transit Area. | Policy M 6.2. Work with Safe Routes to School programs to encourage children to walk or bike to school. | No substantial change. |
| Policy 3.28: Provide continuous bicycle circulation through the project site and to adjacent areas by closing existing gaps in bicycle lanes and bicycle routes, per Figure 3-5 [of the TASP]. | Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | Overall, the Metro Plan includes policies to promote a bicycle network in the Metro Plan Area. In addition, the City would implement the bicycle facilities in the Active Transportation Plan. |
| Policy 3.31: Require provision of bicycle and pedestrian facilities such as weather protected bicycle parking, direct and safe access for pedestrians and bicyclists to adjacent bicycle routes and transit stations, showers and lockers for | Policy M 8.4. Require provision of bicycle and pedestrian facilities at workplaces, commercial centers, and residential complexes. | Overall, the policies in the TASP and the Metro Plan are similar and would require provisions for bicycle and pedestrian facilities. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| employees at the worksite, secure short-term parking for bicycles, etc. | Policy M 8.4.1. This includes long-term bicycle parking that is weather-protected (either indoor or in an enclosed outdoor locker) at residential complexes and workplaces and short-term parking for bicycles that is visible from the entrance of the building at commercial developments. Required bicycle parking ratios are listed in Table 4-2 [of the Metro Plan].<br>Policy M 8.3. Development projects are encouraged to implement additional optional TDM measures to achieve VMT and trip reduction goals. Section 7.6 [of the Metro Plan] details some potential strategies. The Santa Clara Countywide VMT Evaluation Tool is another resource for selecting TDM measures. | |
| Policy 3.33: Require new development within the Transit Area to facilitate the use of alternative modes of transportation through programs such as carpool parking, the VTA's EcoPass Program, shuttles to transit stations and lunchtime destinations, assistance to regional and local ridesharing organizations, alternative work schedules, telecommuting, etc. Establish a Transportation Demand Management (TDM) program for this purpose, as described in Policy 3.16. | Policy M 7. Reduce Climate Impacts. Manage automobile demand and promote low-carbon transportation to minimize emissions in the planning area.<br>Policy M 7.1. Zero and Low Emission Vehicles. Promote use of zero and low-emission vehicles through the following measures:<br>Require all new multifamily residential and all new nonresidential buildings to provide at least 45 percent of parking spaces as EV capable (including the raceway and panel capacity) to support future installation of Level 2 chargers on a dedicated 40-amp, 208/240-volt branch circuit.<br>Require all new multifamily residential and new nonresidential buildings to install at least 33 percent of EV capable parking spaces with EVSE Level 2. Where six Level 2 EVSE are installed, one DC Fast Charger can | Overall, both the policies in the TASP and the Metro Plan would promote alternative modes of transportation and TDM for new development. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | be installed to substitute for five Level 2 EVSEs. The DCFC shall be rated at 80 kW minimum.<br>Require all new warehouses, grocery stores, and retail stores with planned loading docks to install at least one EV capable loading dock with a raceway(s) and service panel(s) or subpanel(s) for each 25,000 square feet of floor space planned.<br>Provide preferentially-located charging stations for electric vehicles (Evs) and plug-in hybrid electric vehicles (PHEVs).<br>Policy M 8. Parking and Transportation Demand Management. Establish and implement a travel demand management (TDM) program with the non-compulsory goal of reducing VMT by 15 percent or more below the regional baseline per employee or resident and efficiently provides parking that meet the needs of residents, employees, and visitors. TDM measures should be incorporated into all new development and may be implemented by individual uses or through TMA oversight.<br>Policy M 8.2. All projects should provide the following TDM measures at a minimum individually or as participants of the TMA:<br>Annual monitoring reports<br>Annual employee commuter survey<br>Participation within the Milpitas Metro Specific Plan TMA<br>Provision of bicycle parking spaces<br>Fully subsidized transit passes (e.g. VTA, BART, Caltrain, etc.). At a minimum the transit subsidy should be equivalent to the cost of a monthly VTA pass<br>Commute shuttle funding | |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | Unbundled parking<br>511.org participation<br>Production of marketing and education materials<br>Policy M 8.3. Development projects are encouraged to implement additional optional TDM measures to achieve VMT and trip reduction goals. Section 7.6 [of the Metro Plan] details some potential strategies. The Santa Clara Countywide VMT Evaluation Tool is another resource for selecting TDM measures. | |
| Policy 3.34: Encourage preferential parking measures for carpool and vanpool vehicles, guaranteed ride home services and other incentives to employees choosing transportation modes other than driving. Provide preferential parking for low-emission vehicles. | See Policies M 7, M 7.1, M 8, M 8.2, and M 8.3 above. | Overall, both the policies in the TASP and the Metro Plan would promote alternative forms of transportation other than driving and would provide parking for low-emissions vehicles. |
| Policy 5.4: New commercial or institutional buildings, or tenant improvements to commercial, industrial or institutional buildings shall follow the provisions of the City's future Green Building Ordinance. In the absence of any ordinance, all new projects should be encouraged to incorporate green building measures. | None. | The Metro Plan does not have a similar policy as the TASP; however, the 2040 General Plan includes similar policies.<br>Policy CON 1-2: Ensure all development projects comply with the mandatory energy efficiency requirements of the California Green Building Standards Code (CALGreen).<br>Policy CON 1-3: Support innovative green building best management practices including, but not limited to, LEED certification, and encourage project applicants to exceed the most current "green" development standards in the California Code of Regulations (CCR), Title 24, as feasible. |
| Policy 5.5: Coordinate with Santa Clara County and other regional agencies to establish and implement new local regulations and standards related to | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan includes a similar policy. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| greenhouse gas emissions simultaneously across the region. | | Policy CON 7-9: Coordinate with Santa Clara County and nearby cities to implement regional GHG reduction plans and to consolidate efforts to reduce GHGs throughout the county as appropriate. |
| Policy 5.6: Require the use of Energy Star appliances and equipment in new residential and commercial development, and new City facilities. | Policy CB 7.2. Energy. New buildings shall include features that include the most impactful methods for reducing energy uses and greenhouse gas emissions. | The Metro Plan includes policies to increase energy efficiency in the Metro Plan Area. |
| Policy 5.7: Require at least 50 percent of all new residential development to be pre-wired for optional photovoltaic roof energy systems and/or solar water heating. | None. | The Metro Plan does not have a similar policy; however, the 2013 Climate Action Plan includes a similar Action.<br>Measure 3.1, Action B. Require all new single-family and multi-family residential development to comply with the Homebuyer Solar Option, either to provide prewiring for photovoltaic roof systems or to provide an in-lieu fee for off-site solar facilities, building on current standards of the Transit Area Specific Plan. |
| Policy 5.8: Incorporate cost-effective energy conservation measures into all buildings being constructed by the City in the Transit Area, including construction, operations and maintenance. These measures can include but are not limited to:<br>Energy efficient light fixtures, including solar powered systems, for streetscapes, parks, and public buildings which have limited glare and spillover;<br>Automatic lighting systems in public buildings and offices; and<br>Life-cycle costing of capital projects so that the environmental, societal, and economic costs are evaluated over the project's long-term operation. | Policy CB 7.1. Citywide Sustainability Policies. The Milpitas Metro Plan Area is a center of development and change in Milpitas, and will serve as an example for the implementation of sustainable building practices in the city. Additional sustainability policies are located in the City of Milpitas Climate Action Plan.<br>Policy CB 7.2. Energy. New buildings shall include features that include the most impactful methods for reducing energy uses and greenhouse gas emissions.<br>Policy CB 7.2.1. Solar Design Management Plan. All new developments shall develop a management plan for solar exposure, including optimizing natural lighting and managing passive heating and cooling. | The Metro Plan policies identify different polices than the TASP related to cost-effective energy conservation measures. Nonetheless, both the policies in the TASP and the Metro Plan identify measures for energy conservation. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | Policy CB 7.2.2. Residential Electrification. All new residential buildings shall be all-electric.<br>Policy CB 7.2.3. Nonresidential Electrification. All new nonresidential buildings shall be all-electric, as feasible. Where full electrification of nonresidential buildings is infeasible, all new nonresidential buildings shall install electric water and space heaters.<br>Policy CB 7.3. On-Site Energy Generation. Encourage on-site renewable energy generation, including the use of solar panels on rooftops and over parking lots.<br>Policy CB 7.3.1. Solar Energy. All new nonresidential buildings shall install solar photovoltaic systems or purchase electricity from a community energy provider (e.g. Silicon Valley Clean Energy).<br>Policy CB 7.3.2. Generators. All new residential and nonresidential buildings shall use zero-emission generator engines for generators with a supply of 25 kW or less.<br>Policy CB 7.4. Construction Equipment. All off-road heavy-duty construction equipment shall use high-performance renewable diesel.<br>Policy CB 7.8. Electric Outlets. All new development shall install sufficient exterior electrical outlets to power electric-powered landscaping equipment. | |
| Policy 5.9: Establish a program to support energy efficiency in new private development and facilitate environmentally sensitive construction practices by: | None. | The Metro Plan does not have a similar policy as the TASP; however, the 2040 General Plan and 2013 Climate Action Plan includes similar polices and actions.<br>2040 General Plan |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| Establishing an incentive program for projects with energy-efficient design, such as expedited permit processing;<br>Promoting use of products that are durable and allow efficient end-of-life disposal (recyclable);<br>Requiring demolition permits for structures and/or pavement exceeding 7,500 square feet to submit a report on recycled materials;<br>Promoting the purchase of locally or regionally available materials; and<br>Promoting the use of cost-effective design. | | Policy CON 1-11: Consider incentive programs such as reduced fees, and permit expedition for projects that exceed mandatory energy requirements, incorporate alternative energy technologies, or support the City's energy objectives.<br>Policy CON 1-13: Support projects and programs such as appliance upgrades and the use of electric appliances, and energy storage options that reduce the use of and reliance on natural gas.<br>Action CD-11b: Expand the City's Green Building Program to include addition incentives, above and beyond expedited building permit processing, for projects that incorporate sustainable design approaches and/or elements that exceed local, regional, and state requirements. The incentives may include, but are not limited to, additional maximum development density/intensity, lot coverage, building height; and parking reductions.<br>Action CD-11c: Provide incentives, including, but not limited to, additional maximum development density/intensity, lot coverage, building height; and parking reductions in community benefits programs of specific plans for projects that implement sustainability measures beyond minimum requirements.<br><u>2013 Climate Action Plan</u><br>Action 12.2A. The City will encourage new development to comply with applicable BAAQMD best management practices that reduce GHGs, including use of alternative-fueled vehicles and equipment, use of local recycled materials, and recycling of construction or demolition materials. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| ***Hazards and Hazardous Materials*** | | |
| Policy 5.20: Property owners shall work with the City of Milpitas Fire Department, the Santa Clara County Department of Environmental Health (SCCDEH), the California Department of Toxic Substances Control (DTSC), and/or the State Water Resources Control Board (SWRCB), whichever has jurisdiction, to resolve issues related to contamination that could potentially impact future land uses in the project area. The lateral and vertical extent of contamination shall be determined, remediation activities completed, and land use restrictions implemented, as necessary, prior to the issuance of development permits on parcels with known contamination. For parcels with known contamination, appropriate human health risk assessments (HHRAs) shall be conducted based on proposed land uses by a qualified environmental professional. The HHRAs shall compare maximum soil, soil gas, and groundwater concentrations to relevant environmental screening levels (ESLs9) and evaluate all potential exposure pathways from contaminated groundwater and soil. Based on the findings of the HHRAs, if appropriate, engineering controls and design measures shall be implemented to mitigate the potential risk of post-development vapor intrusion into buildings. For parcels with no identified contamination, a Phase I study shall be completed to review potential for ground water, soil, or other contamination related to previous land uses. If any potential for contamination is determined to exist that could adversely affect human health for residential uses, a Phase II level analysis shall be conducted per City, State, and Federal requirements. If contamination is found to | None. | The Metro Plan does not have a similar policy as the TASP; however, the 2040 General Plan includes a similar action.<br>Action SA-5a Require that applications for discretionary development projects provide detailed information regarding the potential for the historical use of hazardous materials on the site, including information regarding the potential for past soil and/or groundwater contaminations. If warranted, identify and require mitigation measures to ensure the exposure to hazardous materials from historical uses has been mitigated to acceptable levels consistent with EPA and/or DTSC standards. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| exist, procedures for contaminated sites as described in the paragraph above shall be followed. | | |
| Policy 5.21: Project applicants shall submit information to the City regarding the presence of asbestos-containing building materials, PCBs, and lead-based paint in existing buildings proposed for demolition, additions, or alterations. The information shall be verified prior to the issuance of demolition permits by the City of Milpitas Building Inspection Division for any existing structures or buildings in the project area. If it is found that painted surfaces contain lead-based paint and/or the structures contain asbestos-containing building materials, measures to ensure the safe demolition of site structures shall be incorporated into the project Demolition Plan. The Demolition Plan shall address both onsite and offsite chemical and physical hazards. Prior to demolition, hazardous building materials associated with lead-based paint and asbestos-containing building materials shall be removed and appropriately disposed of in accordance with all applicable guidelines, laws, and ordinances. The demolition of buildings containing asbestos would require retaining contractors who are licensed to conduct asbestos abatement work and notifying the Bay Area Air Quality Management District (BAAQMD) ten days prior to initiating construction and demolition activities. Regarding lead-based paint, Cal-OSHA regulates all worker exposure during construction activities associated with lead-based paint. The Cal-OSHA-specified method of compliance includes respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, and training. | None. | The Metro Plan does not have a similar policy as the TASP; however, the 2040 General Plan includes a similar policy. In addition, Section 19827.5 of the California Health and Safety Code and Titles 8 and 17 of the California Code of Regulations include similar requirements.<br>Policy SA 5-1. Require hazardous waste generated within Milpitas to be disposed of in a safe manner, consistent with all applicable local, state, and federal laws. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| Policy 5.22: At sites with known contamination issues, a Risk Management Plan (RMP) shall be prepared to protect the health and safety of construction workers and site users adjacent to construction activities. The RMP shall include engineering controls, monitoring, and security measures to prevent unauthorized entry to the construction site and to reduce hazards outside of the construction site. The RMP shall address the possibility of encountering subsurface hazards and include procedures to protect workers and the public. The RMP shall also include procedures for managing soils and groundwater removed from the site to ensure that any excavated soils and/or dewatered groundwater with contaminants are stored, managed, and disposed of in accordance with applicable regulations and permits. Protocols for the handling, transport, and disposal of both known and previously unidentified hazardous materials that may be encountered during project development shall be specified. If prescribed exposure levels are exceeded, personal protective equipment shall be required for workers in accordance with OSHA regulations. Finally, the RMP shall also include procedures for the use, storage, disposal, of hazardous materials used during construction activities to prevent the accidental release of these materials into the environment during construction. | None. | The Metro Plan does not have a similar policy as the TASP; however, the 2040 General Plan includes similar policies.<br>Policy SA 5-1 Require hazardous waste generated within Milpitas to be disposed of in a safe manner, consistent with all applicable local, state, and federal laws.<br>Action SA-5a Require that applications for discretionary development projects provide detailed information regarding the potential for the historical use of hazardous materials on the site, including information regarding the potential for past soil and/or groundwater contaminations. If warranted, identify and require mitigation measures to ensure the exposure to hazardous materials from historical uses has been mitigated to acceptable levels consistent with EPA and/or DTSC standards. |
| ***Hydrology and Water Quality*** | | |
| Policy 5.36: Require construction projects that disturb one or more acres to prepare a Stormwater Pollution Prevention Plan (SWPPP) that, when properly implemented, would reduce or eliminate | None. | The Metro Plan does not include a comparable TASP policy. However, a SWPPP would still be required for future development per the Construction General Permit. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| impacts on surface water quality during construction.[28] | | |
| Policy 5.37: Require construction projects to comply with the Santa Clara County National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges.[29] | None. | The Metro Plan does not include a comparable TASP policy. However, a Stormwater Plan would still be required for future development per the NPDES permit. |
| Policy 6.1: Minimize damage associated with flooding events and comply with regulations stipulated by FEMA and the National Flood Insurance Program. | Policy ICS 2.1. Minimize damage associated with flooding events and comply with regulations stipulated by FEMA and the National Flood Insurance Program. | No substantial change. |
| Policy 6.2: New development within a FEMA-designated flood hazard zone must follow the City's construction standards for such areas, as currently laid out in Section XI-15 'Floodplain Management Regulations' of the Milpitas Municipal Code. | Policy ICS 2.2. New development within a FEMA-designated flood hazard zone must follow the City's construction standards for such areas, as currently laid out in Section XI-15 'Floodplain Management Regulations' of the Milpitas Municipal Code. | No substantial change. |
| Policy 6.3: New development must maintain the Transit Area's urban design standards. In particular, first floor commercial space must be within two feet of the elevation of the public sidewalk. | Section 5.2 of the Metro Plan identifies the following: All new residential construction must have the lowest floor built to at least one foot above the Base Flood Elevation, or in the case of areas within Zone AO, at least one foot above the depth number listed on the Flood Insurance Rate Map (FIRM), or three feet above the highest adjacent grade if no depth number is shown. For non-residential construction, the lowest floor elevation can be at Base Flood Elevation. The FEMA-Designated Special Flood Hazard Areas are shown in Figure 5-2 [of the Metro Plan]. | The Metro Plan includes some updates to the requirements regarding the elevation of future development. Overall, the Metro Plan policies would address potential flooding. |

[28] The Final Approved TASP identified this as Policy 5.36. The Certified Draft EIR identified this as Policy 5.33.

[29] The Final Approved TASP identified this as Policy 5.37. The Certified Draft EIR identified this as Policy 5.34. Note: the Certified EIR identified the followinglanguage for this policy: *Require construction projects that disturb one or more acres to prepare a Stormwater Control Plan, as stipulated in Provision C.3 of the Santa Clara County National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges.*

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | Policy CB 4.5.8. Flood Elevation for Non-Residential Buildings. The lowest floor of non-residential construction in the floodplain can be built at the Base Flood Elevation. | |
| Policy 6.4: Provide storm drain infrastructure to adequately serve new development and meet City standards. | Policy ICS 1.1. Provide storm drain infrastructure to adequately serve new development and meet City standards. | No substantial change. |
| Policy 6.5: Ensure that runoff in storm drains does not lower water quality within or outside of the Transit Area by implementing Best Management Practices (BMPs) in new developments within the Transit Area. | Policy ICS 1.2. Ensure that runoff in storm drains does not lower water quality within or outside of the Plan Area by implementing Best Management Practices (BMPs) in new developments within the Transit Area. | No substantial change. |
| Policy 6.6: Construct the improvements within the Transit Area that were identified in the 2001 Storm Drainage Master Plan, and any other improvements identified in updates to the Master Plan.<br>The Master Plan improvements within the Transit Area are:<br>Constructing a new parallel 48-inch culvert beneath Montague Expressway at Piper Drive.<br>Replacing an existing 30-inch pipe with a 36-inch pipe to drain the low end of Tarob Court.<br>Improving Wrigley Creek (560') along Piper Drive, downstream of Montague Expressway to carry the 100-year flood.<br>Constructing a parallel 24-inch pipe (390') where Wrigley Creek is crossing Railroad Spurs.<br>Constructing a 54-inch (500') parallel pipe downstream of the railroad crossing Wrigley Creek.<br>Constructing a 36-inch pipe (140') to drain the Piper Drive cul-de-sac. | Policy ICS 1.3. Construct the improvements within the Metro Area that were identified in the 2013 Storm Drainage Master Plan, and any other improvements identified in updates to the Master Plan including:<br>South Main St. SD Improvements at Cedar Way (P2)<br>Montague Expressway SD Improvements (P1)<br>Montague Expressway SD Improvements at Lower Penitencia Creek (P1)<br>Tarob Ct Outfall Relocation (P1)<br>Lundy Place Relief Line (P1)<br>Watson Ct. Relief Drain (PDB1) | The Metro Plan has updated the TASP policy based on updates that have been made to the Strom Drainage Master Plan. |
| Policy 6.7: Prepare Master Grading and Storm Drainage Plans for each subdistrict of the Transit Area prior to approval of Zoning Permits for new buildings in that subdistrict. | None. | The Metro Plan does not include a comparable TASP policy. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| Actions from Table 7-1, Implementation Plan, of the TASP:<br>Prepare Master Grading and Storm Drainage Plans for each subdistrict of the Transit Area prior to approval of Zoning Permits for new buildings in that subdistrict.<br>Establish a funding mechanism to recoup the cost of preparation of the Storm Drainage and Flooding Master Plans for each subarea. | None. | The Metro Plan does not include a comparable TASP policy. |
| ***Land Use and Planning*** | | |
| Chapter 7: Implementation of the Transit Area Specific Plan lists the steps required to implement the Plan. This includes:<br>• Amend Milpitas Midtown Specific Plan sections related to the Transit Area.<br>• Amend Milpitas General Plan sections related to the Transit Area.<br>• Amend Zoning Ordinance and Map to add new base districts MXD2 and MXD3 and amend R4 and MP districts and TOD Overlay. Amend other zoning code sections including parking and landscaping | Chapter 6: Implementation of the Milpitas Metro Specific Plan lists the steps required to implement the Plan. | No substantial change. The Metro Plan would require a similar process as the TASP. |
| Policy 3.35: Any development projects, parks, or pedestrian trails built adjacent to a rail line shall build continuous fencing or solid walls to ensure that there will be no pedestrian access to the line. Fencing shall be designed to be vandal-resistant in order to deter trespassing | Policy SC 4. Separation from Rail Lines. Any development projects, parks, or pedestrian trails built directly adjacent to a rail line (i.e. sharing a property boundary, not separated from the rail line by a roadway) shall build continuous fencing or solid walls between the development and the rail line to ensure that there will be no pedestrian access to the line. Fencing shall be designed to deter graffiti and trespassing. | No substantial change. |
| Policy 3.36: The City will maintain and enhance public safety by requiring uniform safety standards for all at-grade rail crossings. | Policy M 6.5. Maintain and enhance public safety by requiring uniform safety standards for all at-grade rail crossings. | No substantial change. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Policy 4.15: Safety fencing or solid walls shall be installed along all Union Pacific rail lines along Piper Drive. Consultation with UPRR and CPUC will be required prior to any project related activities within UPRR right-of-ways. Improvements may be required, including but not limited to: pedestrian gates, pavement markings, and "no trespassing" signs. | None. | The requirements in in this TASP policy have been completed. As such, the TASP policy has been fulfilled and no longer applies. |
| Policy 4.23 (BART): If the Milpitas Boulevard extension is constructed prior to the termination of Union Pacific rail line at Montague, an interim at-grade crossing will need to be constructed. The crossing shall be designed with adequate controls to restrict vehicular and pedestrian access during train crossings. | None. | The Milpitas Boulevard extension has already been constructed and the rail line identified in this policy is no longer active. As such, the TASP policy has been fulfilled and no longer applies. |
| Policy 5.10: New development in the Transit Area shall adhere to the standards and guidelines in the Milpitas General Plan that govern noise levels. | None. | The Metro Plan does not have a similar policy; however, the Metro Plan would be required to adhere to the General Plan, including policies related to noise levels, as shown further below. |
| Policy 5.13: Apply the FTA groundborne vibration criteria (presented in Table 5-5 [of the TASP]) as review criteria for development projects in the vicinity of vibration sources such as BART trains and heavy rail trains | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan requires a similar measure.<br>Action N-2b: Review new developments within 100 feet of the rail line to ensure that vibration experienced by residents and sensitive uses would not exceed the Federal Transit Administration guidelines. |
| Policy 5.14: Project applicants shall conduct a vibration impact analysis for any sites adjacent to or within 300 feet of active UPRR and BART alignments to demonstrate that interior vibration levels within all new residential development (single family and multifamily) and lodging facilities would be at acceptable levels. If needed, require mitigation measures to reduce vibration to acceptable levels. | None. | The Metro Plan does not include a comparable TASP policy. However, a vibration impact analysis would still be required, per the following policy and action in the 2040 General Plan.<br>Policy N 2-3: Consider ground borne vibration and noise nuisance associated with rail operations prior to approving the development of sensitive uses. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | | Action N-2b: Review new developments within 100 feet of the rail line to ensure that vibration experienced by residents and sensitive uses would not exceed the Federal Transit Administration guidelines. |
| Policy 5.15: Prior to issuance of building permits, applicants shall demonstrate that noise exposure to sensitive receptors from construction activities has been mitigated to the extent feasible pursuant to the City's Noise Abatement Ordinance. | None. | The Metro Plan does not include a comparable TASP policy. However, mitigation for construction noise would still be required by the following policy and action in the 2040 General Plan.<br>Policy N 1-8: Require construction activities to comply with standard best practices to reduce noise exposure to adjacent sensitive receptors (see Action N 1d).<br>Action N 1c: Require developers to prepare a construction management/noise mitigation plan that defines best management practices to reduce construction noise, and includes proposed truck routes (that comply with Section 12 V-100-12.05 - Truck Routes of the Milpitas Municipal Code) as part of the entitlement process.<br>Action N 1d: During the environmental review process, determine if proposed construction will constitute a significant impact on nearby sensitive receptors and, if necessary, require mitigation measures in addition to the standard best practice controls. Suggested best practices for control of construction noise include:<br>Noise-generating construction activities, including truck traffic coming to and from the construction site for any purpose, shall be limited to between the hours of 7:00 am and 7:00 pm. No construction shall occur on National holidays.<br>All equipment driven by internal combustion engines shall be equipped with mufflers, which |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | | are in good condition and appropriate for the equipment.<br>The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.<br>At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.<br>Unnecessary idling of internal combustion engines shall be prohibited for a duration of longer than five minutes.<br>Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible.<br>Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.<br>The construction contractor shall designate a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible for determining the cause of the noise complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site. |
| Policy 5.17: In all rental and sale agreements, provide disclosures to future residents about all surrounding industrial uses, including UPRR train | Policy LU 1.7. In all rental and sale agreements, provide disclosures to future residents about all surrounding industrial | No substantial change. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| tracks and operations, and the permanent rights of such industrial uses to remain. Describe potential impacts including but not limited to: noise, groundborne and airborne vibration, odors, and use of hazardous materials. | uses, including UPRR train tracks and operations, and the permanent rights of such industrial uses to remain. Describe potential impacts including but not limited to: noise, groundborne and airborne vibration, odors, and use of hazardous materials | |
| Policy 5.18: Day care facilities, schools, nursing homes, and other similar sensitive receptors shall be located away from sites which store or use hazardous materials, in accordance with State and City standards. Adequate buffers to protect occupants of these sensitive uses shall be provided, including but not limited to walls, fences, landscaping, large building setbacks, and additional exit routes over and above minimum code requirements. | Policy LU 1.6. Ensure day care facilities, schools, nursing homes, and other similar sensitive receptors are located away from sites that store or use hazardous materials, in accordance with State and City standards. Adequate buffers to protect occupants of these sensitive uses shall be provided, including but not limited to walls, fences, landscaping, large building setbacks, and additional exit routes over and above minimum code requirements | No substantial change. |
| Policy 5.19: Require the installation of temporary buffers—fences, walls, or vegetation— when residential uses are developed adjacent to existing industrial uses. The type of buffer must be reviewed and approved by the City Planning Department. The temporary buffers may be removed if and when an adjacent site is redeveloped as a non-industrial use. | Policy SC 9. Temporary Buffers. Require the installation of temporary buffers—fences, walls, or vegetation— when residential uses are developed adjacent to existing industrial uses. The type of buffer must be reviewed and approved by the City Planning Department. The temporary buffers may be removed if and when an adjacent site is redeveloped as a non-industrial use. | No substantial change. |
| Development Standards from Table 5-1 of the TASP, including setbacks to limit the potential incompatible uses adjacent to one another. | The Metro Plan includes setback requirements in Table 2-2, Zoning District Setbacks.<br>See also Policies M 2.1, M 2.4, M 2.5, SC 2.1, and SC 4 in the Aesthetics section above, which includes requirements for landscape buffers. | The Metro Plan makes some updates to the setback requirements and adds setback requirements for new land use categories. Nonetheless, the changes in the Metro Plan would still have the overall same effect of limiting the potential incompatible uses adjacent to one another. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| ***Noise*** | | |
| Policy 5.10: New development in the Transit Area shall adhere to the standards and guidelines in the Milpitas General Plan that govern noise levels. (The particular policies of note are Policies 6-I-1 through 6-I-16.) | None. | The Metro Plan does not have a similar policy; however, any new development in the Metro Plan Area would be required to adhere to the 2040 General Plan, including the guidelines governing noise. |
| Policy 5.11: Construct masonry walls to buffer residential uses from BART and UPRR train tracks. | Policy SC 4.1. Residential Uses next to Rail Lines. Housing units next to rail lines must be constructed to mitigate negative impacts of train noise.<br>Policy SC 4.2. Acoustics for Bedrooms Adjacent to Railways. The acoustical exterior of bedrooms in areas within 200 feet of rail right of ways shall be enhanced to address the sound of the trains. | The Metro Plan includes policies to address noise from railways. |
| Policy 5.12: The City shall offer to pay for sound walls, sound absorptive material, and additional sound insulation for residential uses located along Great Mall Parkway, between South Main and Abel streets, if interior noise levels rise above permitted levels by the year 2030. | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan requires a similar measure.<br>General Plan Policy N 1-3: Use sound walls for sound attenuation only when other measures are not practical, or when recommended by an acoustical expert as part of a mitigation measure. Sound walls shall be designed to be aesthetically pleasing, and should incorporate features such as vegetation, variations in color and texture, artwork, and other features deemed appropriate by the City. |
| Policy 5.13: Apply the FTA groundborne vibration criteria (presented in Table 5-5 [of the TASP]) as review criteria for development projects in the vicinity of vibration sources such as BART trains and heavy rail trains. | None. | The Metro Plan does not have a similar policy; however, the 2040 General Plan requires a similar measure.<br>Action N-2b: Review new developments within 100 feet of the rail line to ensure that vibration experienced by residents and sensitive uses would not exceed the Federal Transit Administration guidelines. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| Policy 5.14: Project applicants shall conduct a vibration impact analysis for any sites adjacent to or within 300 feet of active UPRR and BART alignments to demonstrate that interior vibration levels within all new residential development (single family and multifamily) and lodging facilities would be at acceptable levels. If needed, require mitigation measures to reduce vibration to acceptable levels. | None. | The Metro Plan does not include a comparable TASP policy. However, a vibration impact analysis would still be required, per the following policy and action in the 2040 General Plan.<br>Policy N 2-3: Consider ground borne vibration and noise nuisance associated with rail operations prior to approving the development of sensitive uses.<br>Action N-2b: Review new developments within 100 feet of the rail line to ensure that vibration experienced by residents and sensitive uses would not exceed the Federal Transit Administration guidelines. |
| Policy 5.15: Prior to issuance of building permits, applicants shall demonstrate that noise exposure to sensitive receptors from construction activities has been mitigated to the extent feasible pursuant to the City's Noise Abatement Ordinance. | None. | The Metro Plan does not include a comparable TASP policy. However, mitigation for construction noise would still be required by the following policy and action in the 2040 General Plan.<br>Policy N 1-8: Require construction activities to comply with standard best practices to reduce noise exposure to adjacent sensitive receptors (see Action N 1d).<br>Action N 1c: Require developers to prepare a construction management/noise mitigation plan that defines best management practices to reduce construction noise, and includes proposed truck routes (that comply with Section 12 V-100-12.05 - Truck Routes of the Milpitas Municipal Code) as part of the entitlement process.<br>Action N 1d: During the environmental review process, determine if proposed construction will constitute a significant impact on nearby sensitive receptors and, if necessary, require mitigation measures in addition to the standard |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | | best practice controls. Suggested best practices for control of construction noise include:<br>Noise-generating construction activities, including truck traffic coming to and from the construction site for any purpose, shall be limited to between the hours of 7:00 am and 7:00 pm. No construction shall occur on National holidays.<br>All equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.<br>The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.<br>At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.<br>Unnecessary idling of internal combustion engines shall be prohibited for a duration of longer than five minutes.<br>Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible.<br>Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.<br>The construction contractor shall designate a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | | for determining the cause of the noise complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site. |
| Policy 5.17: In all rental and sale agreements, provide disclosures to future residents about all surrounding industrial uses, including UPRR train tracks and operations, and the permanent rights of such industrial uses to remain. Describe potential impacts including but not limited to: noise, groundborne and airborne vibration, odors, and use of hazardous materials. | Policy LU 1.7. In all rental and sale agreements, provide disclosures to future residents about all surrounding industrial uses, including UPRR train tracks and operations, and the permanent rights of such industrial uses to remain. Describe potential impacts including but not limited to: noise, groundborne and airborne vibration, odors, and use of hazardous materials | No substantial change. |
| Policy 5.18: Day care facilities, schools, nursing homes, and other similar sensitive receptors shall be located away from sites which store or use hazardous materials, in accordance with State and City standards. Adequate buffers to protect occupants of these sensitive uses shall be provided, including but not limited to walls, fences, landscaping, large building setbacks, and additional exit routes over and above minimum code requirements. | Policy LU 1.6. Ensure day care facilities, schools, nursing homes, and other similar sensitive receptors are located away from sites that store or use hazardous materials, in accordance with State and City standards. Adequate buffers to protect occupants of these sensitive uses shall be provided, including but not limited to walls, fences, landscaping, large building setbacks, and additional exit routes over and above minimum code requirements | No substantial change. |
| Policy 5.19: Require the installation of temporary buffers—fences, walls, or vegetation—when residential uses are developed adjacent to existing industrial uses. The type of buffer must be reviewed and approved by the City Planning Department. The temporary buffers may be removed if and when an adjacent site is redeveloped as a non-industrial use. | Policy SC 9. Temporary Buffers. Require the installation of temporary buffers—fences, walls, or vegetation— when residential uses are developed adjacent to existing industrial uses. The type of buffer must be reviewed and approved by the City Planning Department. The temporary buffers may be removed if and when an adjacent site is redeveloped as a non-industrial use. | No substantial change. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| ***Public Services and Recreation*** | | |
| Policy 6.43: Coordinate with the affected school districts on facilities needed to accommodate new students and define actions the City can take to assist or support them in their efforts.[30] | Policy ICS 10.1. Coordinate with the affected school districts on facilities needed to accommodate new students and define actions the City can take to assist or support them in their efforts. | No substantial change. |
| Policy 6.44: The City will ensure that all school impacts fees are paid from individual projects prior to the issuance of any building permits. | Policy ICS 10.2. Ensure that all school impact fees are paid from individual projects prior to the issuance of any building permits. | No substantial change. |
| Policy 6.45: Cooperate with the Milpitas Unified School District to identify and evaluate potential sites for the construction of a K-8 public school, within or in reasonable proximity to the Transit Area, taking the State's school siting guidelines into consideration.[31] | None. | Mabel Mattos Elementary School has been constructed and is located within the Metro Plan Area. As such, the TASP policy has been fulfilled and no longer applies. |
| Policy 6.46: The City and the school districts located in the Transit Area should consider entering into a joint use agreement, allowing public use of a new school's playfields when not in use by students, and public use of rooms in the school building for community meetings and events. Any new school site should include outdoor active recreation facilities, which would be counted toward the Transit Area's public parks requirement. The school building should include facilities that can be accessed and used for community events.[32] | None. | A joint use agreement is in place between the City and the Milpitas Unified School District for joint use of facilities in the McCandless property, including facilities associated with the Mabel Mattos Elementary School. Because the joint use agreement is in place at the new school identified in this policy, the TASP policy no longer applies. |
| Policy 6.47: If a new Milpitas Unified school is not located within the Transit Area, it should be sited and developed in such a way as to be accessible to students in the Transit Area by safe continuous | None. | Mabel Mattos Elementary School has been constructed and is located within the Metro Plan Area. As such, the TASP policy no longer applies. |

[30] The Final Approved TASP identified this as Policy 6.43. The Certified Draft EIR identified this as Policy 6.46.

[31] The Final Approved TASP identified this as Policy 6.45. The Certified Draft EIR identified this as Policy 6.43.

[32] The Final Approved TASP identified this as Policy 6.46. The Certified Draft EIR identified this as Policy 6.44.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| walking and biking routes. The City and the Milpitas Unified School District should work together to create the necessary pedestrian and bicycle connections.[33] | | |
| Policy 4.74: If a school is located in the Transit Area, place it in the McCandless/Centre Point subdistrict.[34] | None. | Mabel Mattos Elementary School has been constructed and is located within the McCandless District. As such, the TASP policy has been fulfilled and no longer applies. |
| Policy 6.50: The Fire Department shall conduct a "standards of cover" analysis to determine the Transit Plan's precise impact on the department's staffing and equipment, and any required facility needs. Identify and evaluate potential sites for an expanded or new fire station near the Transit Area if the standards of cover analysis determines it is warranted.[35] | Policy ICS 8.1. Conduct a "standards of cover" analysis to determine the Metro Plan's precise impact on the Fire Department's staffing and equipment, and any required facility needs. Identify and evaluate potential sites for an expanded or new fire station near the Plan Area if the standards of cover analysis determines it is warranted. | No substantial change. |
| Policy 6.51: Additional fire department staff will be hired, equipment purchased, and facilities built to provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Transit Area. New equipment and facilities shall be funded by the Community Facilities District fee and new staff paid from the City's General Fund.[36] | Policy ICS 8.2. Provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Plan Area by hiring additional fire department staff, purchasing equipment, and building facilities. New equipment and facilities shall be funded by the Community Facilities District fee and new staff paid from the City's General Fund.<br>Policy ICS 8.3. These facilities are not expected to be sited within the Plan Area.<br>Policy ICS 8.4. If a new fire station is built to meet the service needs of the Plan Area, it must be sited and developed in such a way | No substantial change. |

[33] The Final Approved TASP identified this as Policy 6.47. The Certified Draft EIR identified this as Policy 6.45.

[34] The Final Approved TASP identified this as Policy 4.76. The Certified Draft EIR identified this as Policy 4.74.

[35] The Final Approved TASP identified this as Policy 6.50. The Certified Draft EIR identified this as Policy 6.49.

[36] The Final Approved TASP identified this as Policy 6.51. The Certified Draft EIR identified this as Policy 6.50.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | to not create substantial adverse physical impacts or significant environmental impacts.<br>Policy ICS 8.5. Any new facilities should minimize noise and traffic impacts on existing land uses. | |
| Policy 6.52: If a new fire station is built to meet the service needs of the Transit Area, it must be sited and developed in such a way to not create substantial adverse physical impacts or significant environmental impacts.[37] | Policy ICS 8.4. If a new fire station is built to meet the service needs of the Plan Area, it must be sited and developed in such a way to not create substantial adverse physical impacts or significant environmental impacts. | No substantial change. |
| Policy 6.53: The Fire Department shall update the City's emergency and disaster response plans to take the location and type of new development, and future traffic levels, into account.[38] | Policy ICS 8.6. Update the City's emergency and disaster response plans to take the location and type of new development, and future traffic levels, into account. | No substantial change. |
| Policy 4.9: Create a street grid with small size blocks of 2-3 acres that provides easy and direct access for pedestrians to walk from the Piper/Montague subdistrict to BART, light rail, and the Great Mall. | None. | The Metro Plan does not have a similar policy; however Citywide Objective Design Standards would be applied in the Metro Plan Area with similar requirements. Pertinent text from the Citywide Objective Design Standards is included below.<br>Block Structure<br>Intent<br>Integrate new large-scale development projects into the fabric of the existing community (LU 5-1)<br>Reduced block size in new developments to develop a grid or modified grid network to enhance walkability (CIR 1-5)<br>Provide pedestrian and vehicular connections with cross-access easements within and |

[37] The Final Approved TASP identified this as Policy 6.52. The Certified Draft EIR identified this as Policy 6.51.

[38] The Final Approved TASP identified this as Policy 6.53. The Certified Draft EIR identified this as Policy 6.52.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
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| | | between the existing developments to encourage walking. (CD 10-11) |
| Policy 5.3: All streets (public & private) shall be consistent with the street sections in Chapter 5 [of the proposed Plan] and shall meet any additional Milpitas Fire Department fire apparatus design requirements for access and firefighting operations. | Policy M 1.2. Provide an intuitive hierarchy of streets that includes a continuum from bustling on boulevards and retail concentrated streets to contemplative and neighborhood-oriented in character. These streets shall meet all Milpitas Fire Department fire apparatus design requirements for access and firefighting operations, and should follow the hierarchy and actions provided in M 2 – M 5:<br>• Central Corridors<br>• Shopping Streets<br>• Neighborhood Streets<br>• Trails | No substantial change. |
| Policy 6.54: Additional police staff will be hired and equipment purchased to provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Transit Area. New equipment shall be funded by the Community Facilities District fee and new staff paid from the City's General Fund.[39] | Policy ICS 9.1. Hire additional police staff and purchase equipment provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Metro Area as well as surrounding areas. New equipment shall be funded by the Community Facilities District fee and new staff paid from the City's General Fund. | No substantial change. |
| Policy 3.35: The open space requirements of the Midtown Milpitas Specific Plan (Policy 3.24) shall apply to the entire area of the Transit Area Specific Plan.[40]<br>Midtown Milpitas Specific Plan Policy 3.24: Require new residential development to provide public parks at a ratio of 3.5 acres per 1,000 persons, of | Section 2.8.2: Determining Park Demand: Acres Ratio vs Recreation Value System<br>The General Plan establishes an overall goal of 2 acres of open space per 1,000 residents in the Milpitas Metro Area. The Milpitas Metro Specific Plan maintains this ratio as a standard, but provides additional nuance by | The Metro Plan would include the same requirement of 3.5 acres per 1,000 residents as the Plan. However, the Metro Plan also provides an update by identifying a hybrid approach of using both an acre ratio and a Recreational Value System to assess public space facilities and identify opportunities for growth. |

[39] The Final Approved TASP identified this as Policy 6.54. The Certified Draft EIR identified this as Policy 6.53.

[40] The Final Approved TASP identified this as Policy 3.38. The Certified Draft EIR identified this as Policy 3.35.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| which up to 1.5 acres per 1,000 persons can be developed as private or common open space. | using the Recreational Value System to quantify a public space's level of service.<br>Policy PPS 3.1. Use the Recreational Value System to guide existing and future park improvements to ensure all parks provide a diversity of active, contemplative, and social gathering experiences. | |
| Policy 3.39: Develop between 32 and 47 acres of public park space in the Transit Area, with a goal of around 36 acres.[41] | Policy PPS 3.1. Use the Recreational Value System to guide existing and future park improvements to ensure all parks provide a diversity of active, contemplative, and social gathering experiences. | The Metro Plan provides an update by identifying a hybrid approach of using both an acre ratio and a Recreational Value System to assess public space facilities and identify opportunities for growth. As described in Section 2.8.2 of the Milpitas Metro Specific Plan, the Recreational Value System provides a quantitative system for evaluating existing and proposed public parks on their capacity to provide social gathering, contemplative, and active recreational opportunities; ensures that parks are meeting their maximum potential in providing residents and workers with flexible and usable space; and prioritizes the variety of experiences, access and proximity to experiences, and a comprehensive range of spaces. |
| Policy 3.40: Locate and size parks as shown on Figure 3-6, Parks, Public Spaces, and Trails [of the TASP].[42] | Figure 2-6, Existing and Proposed Parks identifies existing parks, proposed parks, and potential locations for new parks. | The Metro Plan has updated the location of parks. |
| Policy 3.41: Park land dedication and in-lieu fees required of new development.[43] | Policy COS 1. Private development must provide on-site open space at a rate of 100 square feet of private or common space per unit. If developments are unable to provide the required private open space, they may | Both the TASP and the Metro Plan identify requirement for developers to dedicate land parks/open space or payment of in-lieu fees for parks/open space. |

[41] The Final Approved TASP identified this as Policy 3.39. The Certified Draft EIR identified this as Policy 3.36.

[42] The Final Approved TASP identified this as Policy 3.40. The Certified Draft EIR identified this as Policy 3.37.

[43] The Final Approved TASP identified this as Policy 3.41. The Certified Draft EIR identified this as Policy 3.38.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | pay an in-lieu fee as described in Chapter 1 Section 9 of the Municipal Zoning Code on a project-by-project basis, as determined at the time of project entitlements.<br>Policy COS 3. At least 5 percent of the total open space provided should be publicly accessible. Developers may provide at least one of the following types of public open spaces as part of their development project:<br>• i. Park<br>• ii. Plaza<br>• iii. Garden<br>• iv. Public sitting area<br>Policy PPS 4. Public/Private Partnership and Requirements for New Development. Work with property owners to develop public parks and open spaces as a part of the entitlement and/or Development Agreement process for development projects. | |
| Policy 3.42: If a public utility easement (such as the one existing between Capitol Avenue and Penitencia Creek East Channel) is developed as a publicly-accessible pathway or linear park that connects two public streets, it can be counted toward a development's park dedication requirement.[44] | Policy PPS 2.3. If a public utility easement (such as the one existing between Capitol Avenue and Penitencia Creek East Channel) is developed as a publicly-accessible pathway or linear park that connects two public streets, it can be counted toward a development's park dedication requirement. | No substantial change. |
| Policy 3.43: New development must pay for the construction of public parks and streets surrounding the parks (or half-streets if bordering an adjacent development site).[45] | Policy COS 1. Private development must provide on-site open space at a rate of 100 square feet of private or common space per unit. If developments are unable to provide the required private open space, they may | Overall, both the policies in the TASP and the Metro Plan include a policy for new developments providing open space or in-lieu fees for open space. |

[44] The Final Approved TASP identified this as Policy 3.42. The Certified Draft EIR identified this as Policy 3.39.

[45] The Final Approved TASP identified this as Policy 3.43. The Certified Draft EIR identified this as Policy 3.40.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | pay an in-lieu fee as described in Chapter 1 Section 9 of the Municipal Zoning Code on a project-by-project basis, as determined at the time of project entitlements. | |
| Policy 3.44: The design and programming of new parks must be approved by the City's Parks and Recreation Department.[46] | Policy PPS 5.5. The design and programming of new parks must be approved by the City's Parks and Recreation Department. | No substantial change. |
| Policy 3.42: Private development within the Transit Area must meet the private open space requirements on a project-by-project basis.[47] | Private Open Space Requirements<br>Requirements. The design of private open spaces must comply with the following standards.<br>POS 1. Private open space must be at least 4 feet by 6 feet to ensure that the space is large enough to be usable.<br>POS 2. Examples of private open space that can be built include, but are not limited to balconies, private yards, terraces, decks, and porches.<br>POS 3. Private open space construction, irrigation and planting must be completed before the occupation of a building. | Overall, both the policies in the TASP and the Metro Plan include requirements for private open space. |
| Policy 3.43: Parks in the Piper Montague subdistrict shall be small urban neighborhood parks with passive recreation facilities that include tot lots, barbeques, and opportunities for dog-walking.[48] | None. | Bob McGuire Park has been constructed in the Piper District. As such, the TASP policy has been fulfilled and no longer applies. |
| Policy 3.44: The park along Berryessa Creek shall provide a staging area for access to the citywide trail system.[49] | Policy PPS 1.3. Design the parks adjacent to Penitencia Creek and Berryessa Creek to provide trailheads for accessing the citywide creek trail system. | No substantial change. The Metro Plan identifies a proposal park along Berryessa Creek. |

[46] The Final Approved TASP identified this as Policy 3.44. The Certified Draft EIR identified this as Policy 3.41.

[47] The Final Approved TASP identified this as Policy 3.45. The Certified Draft EIR identified this as Policy 3.42.

[48] The Final Approved TASP identified this as Policy 3.46. The Certified Draft EIR identified this as Policy 3.43.

[49] The Final Approved TASP identified this as Policy 3.47. The Certified Draft EIR identified this as Policy 3.44.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | Figure 2-6, Existing and Proposed Parks identifies a proposed park along Berryessa Creek. | |
| Policy 3.48: The park along the Penitencia Creek East Channel shall provide a pedestrian path along the creek; BBQ's; a tot lot; open space areas for frisbee and similar informal recreation, and other passive recreation facilities.[50] | Policy PPS 1.3. Design the parks adjacent to Penitencia Creek and Berryessa Creek to provide trailheads for accessing the citywide creek trail system.<br>Figure 2-6, Existing and Proposed Parks identifies a proposed park along the Penitencia Creek East Channel. | No substantial change. The Metro Plan identifies a proposal park along the Penitencia Creek East Channel. |
| Policy 3.49: The park site in the McCandless/Centre Point subdistrict shall include a school and/or community center along with play fields and areas for passive recreation.[51] | None. | McCandless Park is currently under construction in the McCandless District, next to the Mabel Mattos Elementary School, which has been constructed. The McCandless Park is expected to be completed in 2021. Because this TASP policy is in the process of being fulfilled, there is no comparable policy in the Metro Plan. |
| Policy 3.50: The park in the center of the Trade Zone/Montague subdistrict shall provide sports fields for soccer, baseball, basketball, and/or other sports that have a high demand in Milpitas.[52] | None. | August Rathbone Park has been constructed in the Tango District. As such, the TASP policy has been fulfilled and no longer applies. |
| Policy 3.51: Parks will have public streets abutting at least three sides.[53] | Policy PPS 1.2. Ensure that at least three sides of a park shall be accessible by pedestrians and bicyclists via a sidewalk, pathway, or trail. | The Metro Plan policy includes a similar policy of the TASP for parks to be accessible by three sides. Overall, there would be no substantial change. |
| Policy 3.52: Provide a plaza or other type of public space in the Mixed Use District at Great Mall Parkway/ McCandless/ Centre Point.[54] | Policy PPS 4.2. Activate the Great Mall Subdistrict with flexible urban public open spaces that support a range of purposes, | McCandless Park is currently under construction in the McCandless District and is expected to be completed in 2021. The Metro Plan identifies the locations of potential open |

[50] The Final Approved TASP identified this as Policy 3.48. The Certified Draft EIR identified this as Policy 3.45.

[51] The Final Approved TASP identified this as Policy 3.49. The Certified Draft EIR identified this as Policy 3.46.

[52] The Final Approved TASP identified this as Policy 3.50. The Certified Draft EIR identified this as Policy 3.47.

[53] The Final Approved TASP identified this as Policy 3.51. The Certified Draft EIR identified this as Policy 3.48.

[54] The Final Approved TASP identified this as Policy 3.52. The Certified Draft EIR identified this as Policy 3.49.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | including social gatherings. Minimum requirements are as follows:<br>Development of one large public park, measuring at least two acres.<br>Development of one smaller public park, measuring at least one acre.<br>Require developer to fund and construct a new public plaza at the Great Mall. Ownership and maintenance of the plaza will be negotiated between the developer and the City.<br>Prior to the granting of entitlements for the 1,000th unit, a parkland space for at least 2 acres must be secured for design and construction prior to our concurrent with those entitled units.<br>Figure 2-6, Existing and Proposed Parks identifies the location of potential parks in the Great Mall, as well as McCandless Park. | space in the Great Mall. The Metro Plan also includes policies for a new public plaza in the Great Mall. Overall, the Metro Plan envisions public space in the Great Mall Parkway/ McCandless/ Centre Point area. |
| Policy 3.53: Create an attractive and comfortable plaza at the future BART Station that provides a place for BART, light rail, and bus patrons waiting for a ride.[55] | None. | The plaza referenced in this policy has been constructed. |
| Policy 3.54: Include a network of trails along Penitencia Creek and railroad right of ways.[56] | Policy M 5.2. Create a network of trails along Penitencia Creek, Berryessa Creek, and railroad right of ways. | No substantial change. |
| Policy 3.55: Complete a Trail Loop connecting the whole Transit Area.[57] | Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | No substantial change. |

[55] The Final Approved TASP identified this as Policy 3.53. The Certified Draft EIR identified this as Policy 3.50.

[56] The Final Approved TASP identified this as Policy 3.54. The Certified Draft EIR identified this as Policy 3.51.

[57] The Final Approved TASP identified this as Policy 3.55. The Certified Draft EIR identified this as Policy 3.52.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Policy 3.56: Connections shall be created across Montague Expressway with overhead bridges or undercrossings to create a continuous trail network; allow pedestrians and bicyclists to cross safely; and connect neighborhoods, schools, and parks.[58] | None. | The bridge over Montague Expressway near Piper Drive has been constructed. |
| Policy 3.57: All properties along the trail network will need to set aside land for the trails. This land will count towards the required public park land dedication requirement. Refer to Figure 3-7 [of the TASP] for required dimensions. If trail easements already exist or are acquired within the rail line or flood control right of ways, these easements may be used in lieu of land on development sites.[59] | Policy M 5.3. Require all properties that the proposed trail network runs through or adjacent to set aside land for the trails. This land will count towards the required public park land dedication requirement. If trail easements already exist or are acquired within the rail line or flood control right of ways, these easements may be used in lieu of land on development sites. | No substantial change. |
| ***Transportation*** | | |
| Policy 3.15: Review individual development applications to ensure that adequate street right-of-way, bicycle facilities, pedestrian facilities and landscaping are provided and are consistent with the Transit Area Plan circulation policies and street design standards in Chapter 5. | Policy M 1.6. Review individual development applications to ensure that adequate street right-of-way, bicycle facilities, pedestrian facilities and landscaping are provided and are consistent with the policies and standards in Chapter 3: Site and Building Design Standards and Guidelines [of the Metro Plan]. | No substantial change. |
| Policy 3.28: Provide continuous bicycle circulation through the project site and to adjacent areas by closing existing gaps in bicycle lanes and bicycle routes, per Figure 3-5 [of the TASP]. | Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | Overall, the Metro Plan includes policies to promote a bicycle network in the Metro Plan Area. In addition, the City would implement the bicycle facilities in the Active Transportation Plan. |
| Policy 3.29: A Class III bicycle route shall be created on the internal roadways (from the Milpitas Boulevard Extension/Capitol Avenue intersection to Tarob Court) to provide a continuous bicycle | Policy M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous | Overall, the Metro Plan includes policies to promote a bicycle network in the Metro Plan Area. In addition, the City would implement the |

[58] The Final Approved TASP identified this as Policy 3.56. The Certified Draft EIR identified this as Policy 3.53.

[59] The Final Approved TASP identified this as Policy 3.57. The Certified Draft EIR identified this as Policy 3.54.

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| connection between Milpitas Boulevard and the existing bicycle lanes on Lundy Street, as indicated on Figure 3-5 [of the TASP]. | sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area. | bicycle facilities in the Active Transportation Plan. |
| Policy 3.32: Coordinate with VTA to provide sufficient amenities (such as transit shelters) at all transit stops within the Transit Area. | None. | |
| Policy 3.35: Any development projects, parks, or pedestrian trails built adjacent to a rail line shall build continuous fencing or solid walls to ensure that there will be no pedestrian access to the line. Fencing shall be designed to be vandal-resistant in order to deter trespassing | Policy SC 10. Separation from Rail Lines: Any development projects, parks, or pedestrian trails built directly adjacent to a rail line (i.e. sharing a property boundary, not separated from the rail line by a roadway) shall build continuous fencing or solid walls between the development and the rail line to ensure that there will be no pedestrian access to the line. Fencing shall be designed to be vandal-resistant in order to deter graffiti and trespassing.<br>Policy SC 4. Separation from Rail Lines. Any development projects, parks, or pedestrian trails built directly adjacent to a rail line (i.e. sharing a property boundary, not separated from the rail line by a roadway) shall build continuous fencing or solid walls between the development and the rail line to ensure that there will be no pedestrian access to the line. Fencing shall be designed to deter graffiti and trespassing. | No substantial change. |
| Policy 3.36: The City will maintain and enhance public safety by requiring uniform safety standards for all at-grade rail crossings. | Policy M 6.5. Maintain and enhance public safety by requiring uniform safety standards for all at-grade rail crossings. | No substantial change. |
| Policy 3.37: Consult with the Union Pacific Railroad and the Public Utilities Commission prior to any improvements to segments of Milpitas Boulevard, Capitol Avenue, and Montague Expressway that include at-grade rail crossings, to determine if improvements to existing at-grade highway-rail crossings are warranted. | Action IM 43. Consult with the Union Pacific Railroad and the Public Utilities Commission prior to any improvements to segments of Milpitas Boulevard, Capitol Avenue, and Montague Expressway that include at-grade rail crossings, to determine | No substantial change. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | if improvements to existing at-grade highway-rail crossings are warranted. | |
| Policy 4.15: Safety fencing or solid walls shall be installed along all Union Pacific rail lines along Piper Drive. Consultation with UPRR and CPUC will be required prior to any project related activities within UPRR right-of-ways. Improvements may be required, including but not limited to: pedestrian gates, pavement markings, and "no trespassing" signs. | None. | The requirements in in this TASP policy have been completed. As such, the TASP policy has been fulfilled and no longer applies. |
| Policy 6.32: The City shall establish and assess a transportation impact fee program to contribute toward traffic improvements to be undertaken in whole or in part by the County of Santa Clara or City of San Jose. This fee will go toward the Montague Expressway Widening project east of Trade Zone Boulevard, the Calaveras Boulevard (SR 237) Overpass Widening project, and Capitol Avenue improvements within the City of San Jose. | Action IM 47. Update the TADIF to reflect changes in expected development, public investments and improvements, and transportation projects, including the Montague Expressway and Calaveras Boulevard Widening Project. | No substantial change. |
| Policy 6.33: The City shall establish and assess a transportation impact fee program to provide improvements to mitigate future traffic operations on the roadway segments within the City of Milpitas. All projects within the Transit Area Plan will be required to pay this fee. | Action IM 47. Update the TADIF to reflect changes in expected development, public investments and improvements, and transportation projects, including the Montague Expressway and Calaveras Boulevard Widening Project. | No substantial change. |
| ***Utilities and Service Systems*** | | |
| Policy 6.8: Construct the improvements to the wastewater collection system within the Transit Area that were identified in the 2007 Sewer Master Plan Update, which include the following:<br>Upsize 990 feet of existing 18-inch pipe to 27-inch, 370 feet of 12-inch pipe to 27-inch, and 560 feet of 18-inch pipe to 21-inch along South Main Street north of Great Mall Parkway.<br>Upsize 1,460 feet of 15-inch pipe to 21-inch along South Abel Street north of Curtis Avenue. | Policy ICS 4.3. Construct improvements within the Plan Area as required to serve new projects. Participate in fair share contributions to downstream improvements that were identified as deficient in the 2021 Sewer Master Plan, and any other improvements identified in updates to the Master Plan. | The Metro Plan has a similar policy to the TASP; however, it has been updated per the 2021 Sewer Master Plan. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Upsize 450 feet of 10-inch pipe to 15-inch, 1,820 feet of 10-inch pipe to 18-inch, and 360 feet of 15-inch pipe with 18-inch along Great Mall Parkway between South Main Street and Montague Expressway.<br>Upsize 325 feet of 8-inch pipe to 12-inch, 20 feet of 8 inch pipe to 15-inch and 885 feet of 10-inch pipe to 12-inch along Montague Expressway.<br>Upsize 2,060 feet of 8-inch pipe with 12-inch along South Main Street south of Great Mall Parkway.<br>Upsize 1,415 feet of 18-inch pipe with 21-inch and 690 feet of 15-inch pie with 18-inch along East Curtis Avenue north of the Great Mall.<br>Upsize 495 feet of 10-inch pipe with 12-inch along Montague Expressway west of Gladding Avenue.<br>Upsize 500 feet of 15-inch pipe to 18-inch south of Calaveras Boulevard and north of South Abbott Avenue | | |
| Policy 6.9: The City of Milpitas will implement improvements to the Main Sewage Pump Station and the force mains which convey flows to the WPCP in general accordance with those improvements identified in the "Functionality and Operation Report" as prepared for the City by Winzler & Kelly Engineers, November 2005 | Policy ICS 4.3. Construct improvements within the Plan Area as required to serve new projects. Participate in fair share contributions to downstream improvements that were identified as deficient in the 2021 Sewer Master Plan, and any other improvements identified in updates to the Master Plan. | No substantial change. Implementation of the Sewer Master Plan would ensure the reliability of sewer infrastructure. |
| Policy 6.10: The City of Milpitas will acquire up to 1.0 mgd of wastewater treatment capacity at the WPCP if necessary. The final amount to be acquired, if any, and the timing of the acquisition will be based on studies of actual usage and the pace of development in the city. The City shall monitor the increase in actual sewage flows and the amount of new development approved on an annual basis to determine when additional capacity is required. | Policy ICS 4.2. Consider additional review of available wastewater treatment capacity if development in the Metro Area exceeds 7,000 housing units. | The Milpitas General Plan EIR from 2020 identifies that the City has purchased 1.0 mgd of capacity at the plant from West Valley Sanitation District and 0.75 mgd of capacity from Cupertino Sanitary District to bring the City's total contracted peak week flow capacity at the plant to 14.25 mgd (City of Milpitas 2020). As such, the TASP policy has been fulfilled. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Policy 6.13: Provide water supply for the Transit Area from the Santa Clara Valley Water District per the Water Supply Assessment. | Policy ICS 3.1. Provide water supply for the Milpitas Metro Area from the City's portfolio of water supplies, including potable water from Valley Water District and San Francisco Public Utilities and groundwater and recycled water from South Bay Water Recycling, per the Water Master Plan. No development is entitled to municipal water until a building permit is issued by the City.<br>Policy ICS 3.3. Update the Water Supply Assessment if development in the Plan Area exceeds water demand estimated in the Water Supply Assessment. | No substantial change. |
| Policy 6.16: Reduce water consumption through a program of water conservation measures, such as use of recycled water, water-saving features, and drought-tolerant landscaping | Policy ICS 3.4. Reduce overall water consumption and particularly potable water consumption through water conservation measures, including but not limited to the following:<br>use of recycled water<br>water-saving features<br>drought-tolerant landscaping | No substantial change. |
| Policy 6.17: The City of Milpitas will require that water saving devices, as required by the California Plumbing Code, be installed in all residential, commercial, industrial and institutional facilities within the Transit Area. Such devices are capable of reducing the amount of water used indoors, resulting in substantial wastewater flow reductions. | Policy ICS 3.5. Require installation of water saving devices, as required by the California Building Code, in all residential, commercial, industrial and institutional facilities within the Plan Area. Such devices are capable of reducing the amount of water used indoors, resulting in substantial wastewater flow reductions. | No substantial change. |
| Policy 6.18: Construct recycled water mains along Great Mall Parkway, Capitol Avenue, as Montague Expressway, Sango Court, and into the Piper/Montague subdistrict, as shown in Figure 6-3 [of the proposed Plan]. | Policy ICS 3.1. Provide water supply for the Milpitas Metro Area from the City's portfolio of water supplies, including potable water from Valley Water District and San Francisco Public Utilities and groundwater and recycled water from South Bay Water Recycling, per the Water Master Plan. No | No substantial change. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | development is entitled to municipal water until a building permit is issued by the City.<br>Policy ICS 3.10. Recycled water mains shall be installed up to and across the frontage of parcels that do not have access to recycled water. The cost of extending recycled water mains, excluding the length across the frontage, shall be funded through the TADIF. | |
| Policy 6.19: Per the Midtown Specific Plan, require new development to include recycled water lines for irrigation. | Policy CB 7.5.3. Recycled Water for Residential and Nonresidential Uses. All new residential and nonresidential development shall include a separate piping system for recycled water (i.e. purple pipes) to be used for irrigation and other outdoor water uses, as feasible.<br>Policy CB 7.5.4. On-site Recycled Water. All new development projects shall install on-site recycled water systems (i.e., greywater systems) and rainwater harvesting systems, consistent with all State and County Health Codes and standards and in compliance with regional water agency requirements. | No substantial change. Similar requirement for new development to use recycled water. |
| Policy 6.20: The City of Milpitas will require that recycled water be used to irrigate all parks, plazas, community facilities, linear parks, landscaped front yards and buffer zones. Recycled water may also be used for landscape irrigation on vegetated setbacks and private common areas. The City shall also require, where reasonable and feasible, that commercial uses, schools and non-residential mixed use developments be provided with dual plumbing to enable indoor recycled water use for non-potable uses to the extent feasible. | Policy ICS 3.6. Require that recycled water be used for all irrigation, including parks, plazas, community facilities, linear parks, landscaped front yards, buffer zones, vegetated setbacks, and private common areas.<br>Policy ICS 3.7. Require, where reasonable and feasible, that commercial uses, schools, and non-residential mixed-use developments include dual plumbing to enable indoor recycled water use for non-potable uses to the extent feasible. | No substantial change. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| Policy 6.21: Require existing irrigation users to convert to recycled water when it becomes available | Policy CB 7.5.2. Recycled Water for Industrial Uses. Incorporate the use of recycled water for industrial uses and landscape irrigation where feasible, within the parameters of State and County Health Codes and standards and in compliance with regional agency requirements.<br>Policy CB 7.5.3. Recycled Water for Residential and Nonresidential Uses. All new residential and nonresidential development shall include a separate piping system for recycled water (i.e. purple pipes) to be used for irrigation and other outdoor water uses, as feasible.<br>Policy CB 7.5.4. On-site Recycled Water. All new development projects shall install on-site recycled water systems (i.e., greywater systems) and rainwater harvesting systems, consistent with all State and County Health Codes and standards and in compliance with regional water agency requirements. | No substantial change. Similar requirement to use recycled water. |
| Policy 6.22: Upgrade and expand the water distribution system such that it will be adequate to serve new development in the Transit Area. | Policy ICS 3.8. Upgrade and expand the water distribution system in accordance with the Water Master Plan such that it will be adequate to serve new development in the Plan Area. | No substantial change. |
| Policy 6.23: All new development shall participate to the maximum extent practical in solid waste source reduction and diversion programs. | Policy CB 7.7. Solid Waste. Building construction and operations shall incorporate measures to screen waste areas from view, reduce waste generation and maximize waste diversion from landfills and reuse.<br>Policy CB 7.7.2. Waste Diversion. All construction and demolition projects shall achieve a 75 percent diversion waste rate.<br>Policy CB 7.7.3. Organic Waste Collection for Residential. All multifamily residential | No substantial change. Similar requirement to reduce solid waste generation. |

| TASP Policy [4] | Comparable Metro Plan Policy[5] | Summary of Change |
|---|---|---|
| | buildings shall provide organic waste collection services for tenants and employees.<br>Policy CB 7.7.4. Organic Waste Collection for Nonresidential. All nonresidential buildings shall provide collection containers for organic waste and recyclables in all areas where disposal containers are provided, except in restrooms. | |
| Policy 6.24: Before the expiration of its current waste disposal contract, the City shall negotiate new agreements to handle the long-term disposal of its solid waste past the closure of the Newby Island Sanitary Landfill. | None. | The Metro Plan does not include a comparable policy because the City of Milpitas no longer disposes of solid waste at the Newby Island Sanitary Landfill. Solid waste is disposed of through the Franchise Hauler Agreement that the City has with Milpitas Sanitation, Inc. (MSI). This TASP policy is no longer applicable. |

## 2.5.3 Metro Plan Buildout: Population Growth and Employment

Full development under the Metro Plan is referred to as *buildout*. Although the Metro Plan applies a 20-year planning horizon, it is not intended to specify or anticipate when buildout will actually occur; nor does the designation of a site for a certain use necessarily mean the site will be redeveloped with that use in the next 20 years. This section describes the assumptions included in the Metro Plan regarding buildout in terms of future population, housing units, and jobs.

The buildout associated with the Metro Plan would be in addition to the buildout already planned for in the TASP. The buildout planned for in the TASP is summarized in Table 2-3, which also summarizes the development that has been built or entitled since 2008.

The Metro Plan identifies that significant development has occurred as part of the TASP, including entitling approximately 92 percent of the residential uses planned for in the TASP. However, there are still several large areas where development could still occur, including the Great Mall area and the new expanded areas. Based on the capacity of the remaining undeveloped parcels, an anticipated buildout for the Metro Plan was developed. Table 2-3 summarizes the new development that is projected by 2040 under the Metro Plan.

**Table 2-3. Comparison of Existing Growth Under the TASP and Additional Growth Under the Metro Plan**

| Land Use | 2008 Existing Development | TASP Planned New Development | Total TASP Planned Development | Entitled by 2019[1] | Additional Projected Development for Metro Plan by 2040 | Total Planned Development (TASP plus Metro Plan) |
|---|---|---|---|---|---|---|
| Dwelling Units | 468 | 7,109 | 7,577 | 6,955 | 7,000 | 14,577 |
| Office (sf) | 52,780 | 993,843 | 1,050,000 | 10,630 | 3,000,000[2] | 4,050,000 |
| Retail (sf) | 1,970,000 | 287,075 | 2,240,000 | 186,500 | 300,000 | 2,540,000 |
| Hotel (rooms) | 292 | 350 | 642 | 0[3] | 700 | 1,342 |

[1] Entitled, under construction, or constructed/occupied.
[2] Includes 500,000 sf of industrial uses
[3] Currently there are concept plans for a high-rise hotel.
Note: The Metro Plan would also allow for a police station to be developed in the Innovation District, with a potential location shown on Figure 2-4. The potential police station use is discussed in this Draft SEIR where relevant to the impact analysis.
sf = square feet

## 2.5.4 Horizon Year

The Metro Plan applies until the 2040 planning horizon year, which updates the TASP, which had a buildout horizon year of 2030.

# 2.6 Additional Metro Plan Features

## 2.6.1 Sustainability

Chapter 3 of the Metro Plan identifies some sustainability strategies that would apply for new development in the Metro Plan Area. The Metro Plan identifies several requirements that would promote sustainability in the Metro Plan Area (see Policy CB 7, Sustainability). This includes the following requirements for energy use:

- Include features in new buildings to reduce energy use and greenhouse gas emissions;
- Require new residential buildings to be all-electric;
- Require non-residential buildings to be all-electric (unless uses essential to the key functions of the internal business require natural gas);
- Install solar photovoltaic systems or purchase electricity from a community energy provider (e.g., Silicon Valley Clean Energy) for all non-residential buildings;
- Encourage onsite renewable energy generation;
- Use zero-emission generator engines for all new residential and nonresidential buildings;
- Use high-performance renewable diesel for all off-road heavy-duty equipment during construction; and
- Install sufficient exterior electrical outlets to power electric-powered landscaping equipment.

In addition, new development in the Metro Plan Area would be required to comply with additional sustainability policies in the Climate Action Plan.

The Metro Plan also includes requirements for sustainable water usage, including the following requirements: design of buildings using Low Impact Development principles (Policy CB 7.6); encouraging incorporation of water collection and retention devices (Policy CB 7.6.1); encouraging incorporation of water runoff strategies (Policy CB 7.6.2); requiring ultra-low-flow fixtures in residential and non-residential development (Policy 7.5.1); and requiring the use of recycled water, where feasible (Policies CB 7.5.2, CB 7.5.3, and CB 7.5.4). The Metro Plan also includes sustainability requirements for solid waste, with the following requirements: provide waste and recycling facilities for all buildings (Policy 7.7.1); achieve a 75 percent diversion waste rate for construction and demolition projects (Policy CB 7.7.2); provide organic waste collection services for multifamily residential buildings (Policies CB 7.7.3 and CB 7.7.4); and provide collection containers for organic waste and recyclables for non-residential buildings (Policies CB 7.7.3 and CB 7.7.4).

## 2.6.2 Transportation Demand Management

TDM is typically categorized as a set of strategies aimed at encouraging transit use, walking, biking, and carpooling while reducing single occupant vehicle trips, vehicle miles traveled, and parking demand. The Metro Plan requires TDM measures for all new development projects within the Metro Plan Area and encourages TDM strategies for existing uses. The Metro Plan would ensure that TDM measures are followed through the establishment of a Transportation Management Association (TMA) for the Metro Plan Area, as required by Action IM 28. The TMA will be responsible for

monitoring trip reduction, vehicle miles traveled (VMT) targets, and services within the Metro Plan Area.

## 2.6.3 Open Space

The need for additional public outdoor spaces in the Metro Plan Area was identified as a top priority by members of the community. The Metro Plan identifies several opportunities for additional open space to be developed. This includes the following publicly accessible open space opportunities: a park north of the existing August Rathbone Park; improvements to the Penitencia Creek Trail, which is planned for in the Bicycle/Pedestrian and Trails Master Plan (City of Milpitas 2021); multiple parks and plazas in the Great Mall District; a park north of Mabel Mattos Elementary School; a park along Main Street in the McCandless District; improvements to trails along Berryessa Creek; and a park in the Innovation District. These proposed and potential parks are identified on Figure 2-5. In addition, the Metro Plan includes a policy to "generate publicly-accessible private open space to supplement public open space in meeting the outdoor and recreational needs of residents" (Policy PPS 3.2).

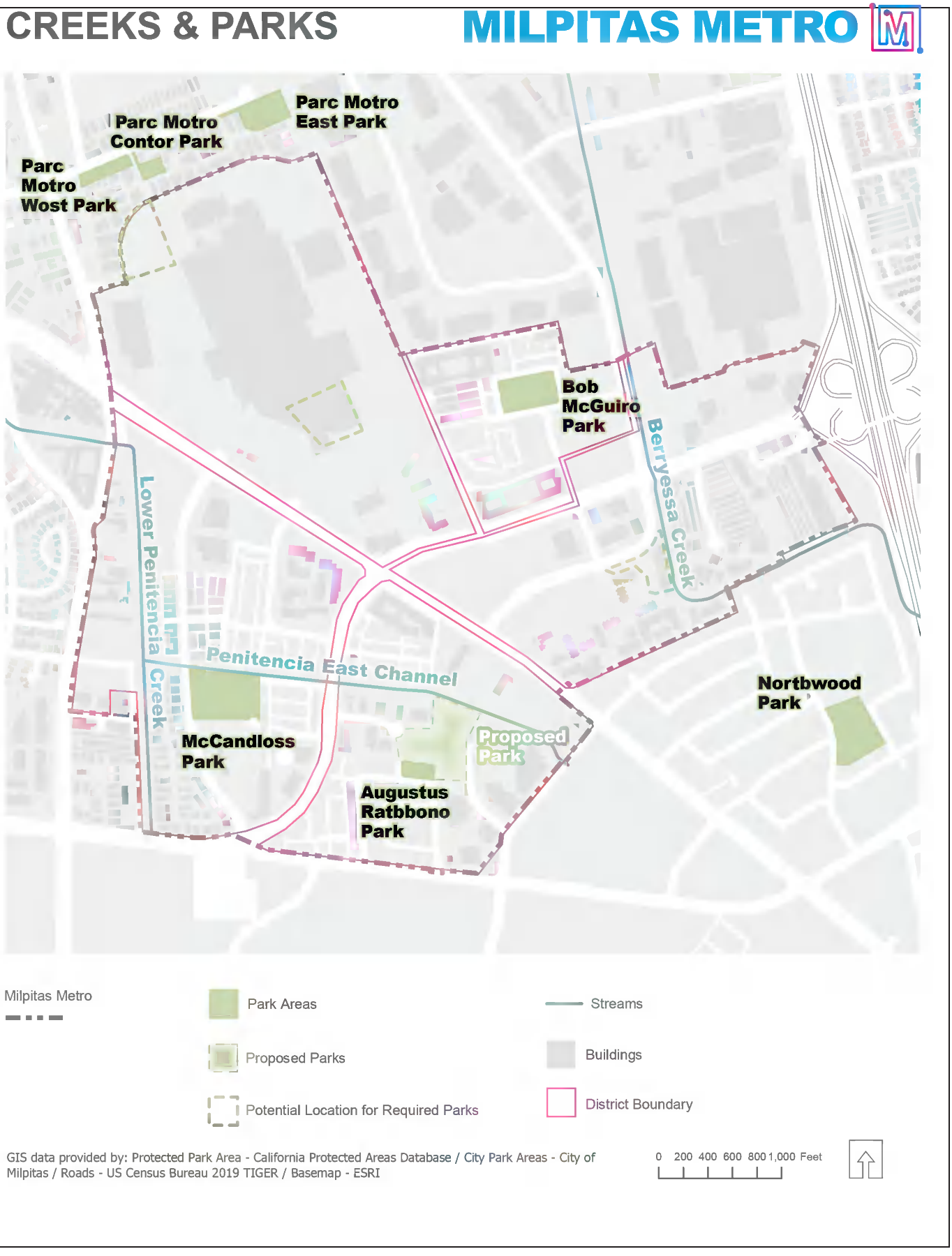



**Figure 2-5**
**Metro Plan Existing and Proposed Parks**

### 2.6.4 Construction

Although the construction characteristics of individual Metro Plan proposals within the Metro Plan Area would vary, generally, buildout of the Metro Plan would involve demolition, grading, excavation, and construction activities to build new structures, roadway improvements, infrastructure, landscaping improvements, and open space. Heavy construction equipment, including cranes, bulldozers, excavators, scrapers, and loaders, would be used. The number of construction workers on the project site would vary according to the stage of construction and whether or not construction phases are undertaken concurrently. As required by the Metro Plan, all construction and demolition projects would be required to achieve a 75 percent diversion waste rate. In addition, all development projects would be required to perform geotechnical investigations in accordance with state law.

## 2.7 Implementation

The Metro Plan provides specific policy guidance for the implementation of its initiatives and establishes a basis for coordinated action by the City, adjacent jurisdictions, Santa Clara County, VTA, and regional and state agencies. The Metro Plan's Implementation Program describes, in general terms, the responsibilities for implementation by City department. It also outlines specific implementation actions that will be initiated after adoption. The Implementation Program will be updated as often as deemed necessary to ensure that it reflects the City's implementation and strategic priorities.

### 2.7.1 Policy And Regulatory Implementation

The major implementation process for the land use proposals will be the administration of the Zoning Ordinance through the Zoning Map. The Zoning Ordinance and Zoning Map will need to be amended to be consistent with the Metro Plan's policies. Amendments to the General Plan and Milpitas Gateway-Main Street Specific Plan (formerly Midtown Milpitas Specific Plan) will also be needed to reflect the newly adopted Metro Plan's boundaries. Additionally, the use of a Development Agreement (DA) may be an effective tool for both the City and the developer of larger sites, particularly the Great Mall and the Innovation District, either or both of which may involve multiple sites aggregation or subdivision and long term or phased development.

### 2.7.2 Physical Implementation

#### 2.7.2.1 Areawide Infrastructure

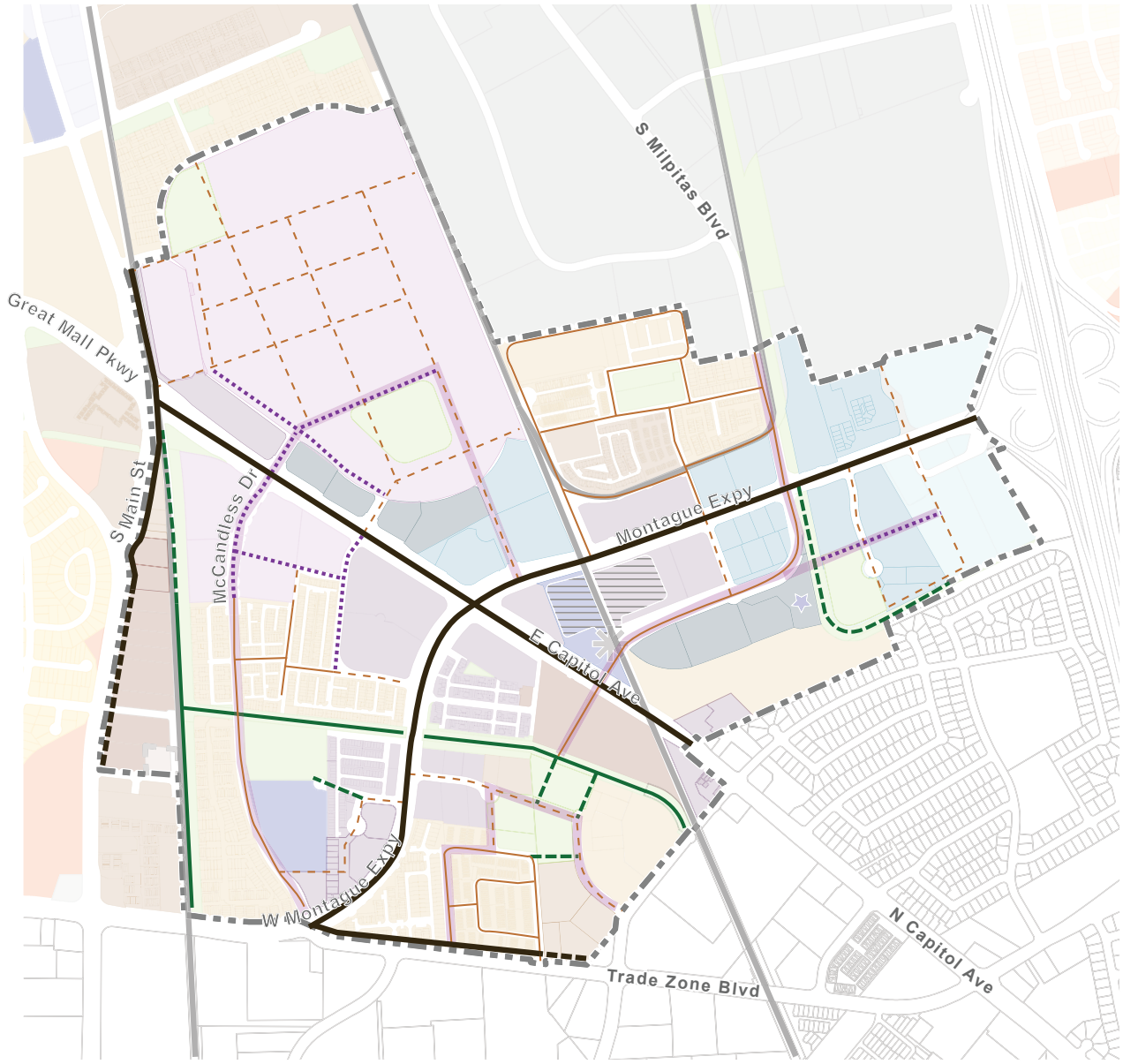
A series of area-wide infrastructure improvements will take place to accommodate and benefit residential, commercial, and mixed-use development; make it more accessible to and comfortable for pedestrians; improve vehicle navigability; provide open space amenities; and reduce obstructions to development. Streetscape improvements and a system of signature bridges and pedestrian overcrossings are particularly important to give identity to the area and make it amenable to walking and bicycles. Recommended improvements that are additive to improvements planned for in the TASP include the following specific projects:

- Develop public broadband infrastructure to allow for continuous connectivity in public areas.

- Promote new trails along Berryessa Creek.
- Construct public parkland in the Innovation District adjacent to Berryessa Creek.
- Construct public parkland in the McCandless District along South Main Street
- Pave city-owned trails with multi-weather, permeable surfacing.
- Construct new streets and pedestrian paseos (as indicated on Figure 2-6).
- Construct pedestrian connections between Districts, including the following at-grade bridges and crossings and overhead pedestrian bridges :
    - Pedestrian bridge across East Penitencia Creek to connect Mabel Mattos Elementary.
    - Pedestrian bridge across Montague Expressway at Penitencia Creek East.
    - Multimodal bridge over Berryessa Creek to connect the Innovation District to the Milpitas Transit Center.
    - Enhanced at-grade pedestrian crossings at the South Milpitas Boulevard Extension and Capitol Avenue and Great Mall Parkway and Main Street.
    - Overhead pedestrian bridge from the Great Mall light rail station and the corner of Main Street and Great Mall Parkway.
    - Enhanced connection between the Great Mall District and neighborhoods to the north.
    - Enhanced connection between the Innovation District and neighborhoods to the south.
    - Pedestrian connection across the railroad and Lower Penitencia Creek from the eastern McCandless District to Main Street.
- Construct storm drainage improvements as identified in the Storm Drainage Master Plan.
- Upgrade and expand the water distribution system in accordance with the Water Master Plan.
- Expand recycled water infrastructure into the Innovation District, along Main Street, and in the Tango District.
- Construct sewer infrastructure improvements as identified in the Sewer Master Plan.
- Construct a police substation in the Innovation District.
- Construct a community facilities building/small conference center in the Innovation District.

#### 2.7.2.2 Circulation Improvements

The Metro Plan identifies three different kinds of streets within the Metro Plan. First, there are Central Corridors, which are wide arterials that support multiple lanes of traffic and include facilities for active transportation within and beyond the Metro Plan Area. Second, there are Activity Streets, which typically are two-lane roads that are pedestrian-oriented and support high levels of retail and active uses (there are two configurations for Activity Streets: one with a parking lane and another with accommodations for bike lanes and transit). Third, there are Neighborhood Streets, which are local streets within residential neighborhoods that support slower speeds and have a pedestrian character. Neighborhood Streets have two configurations: one with parallel parking on alternating sides of the street and another that accommodates parking on both sides of the street as well as bike lanes. The Metro Plan proposes Central Corridors, Activity Streets, and Neighborhood Streets to serve the buildout associated with the Metro Plan. The proposed locations for these streets are shown on Figure 2-6; however, exact alignments would be determined by developers and City.




Milpitas Metro
BART Station
Railway

**Existing Streets**
Central Corridor
Activity Street
Neighborhood Street
Trail

**Proposed Streets**
Central Corridor
Activity Street
Neighborhood Street
Trail

Bike Path

Note that proposed street grid on the Great Mall parcel are conceptual. Underlying land uses shall be consistent with the MMSP.

GIS data provided by: General Plan - City of Milpitas / Roads - US Census Bureau 2019 TIGER / Basemap - ESRI

Graphics 103830 (3-9-2022) JC

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**Figure 2-6**
**Metro Plan Circulation Network**

### 2.7.2.3 Development Issues

A series of development issues must be resolved within certain portions of the Metro Plan Area during the implementation of the Metro Plan. These include:

- Identifying and cleaning soil or groundwater contamination.
- Providing new drainage and/or detention facilities to serve properties within the flood zone.
- Determining the alignment of the new proposed streets, including the street grid in the Great Mall District, streets in the Innovation District, connections between Houret Court and McCandless Boulevard, and connections in the Tango District.
- Determining location of new publicly accessible open spaces in the Great Mall District.
- Providing pedestrian connections across the expressway, major thoroughfares, creeks, and railroad tracks.

## 2.7.3 Financing Recommendations

There are a variety of infrastructure projects planned for future years, as described above. These will be costly, but necessary to the successful development of the Metro Plan Area according to the Metro Plan. Different agencies and interested parties will need to co-operate and participate in infrastructure funding in various ways. Some of these include: The City of Milpitas, VTA, BART, and property owners. Residential development will also contribute to City operating costs as the area develops. Some financing tools recommended to assist with operations expenses include updating the Transit Area Development Impact Fees and the private maintenance of street landscaping and public spaces, where appropriate. In addition, Chapter 6 of the Metro Plan identifies that the Community Facilities District (CFD) would require that new residential development pay an annual special tax to cover the cost of additional public service provision.

## 2.7.4 Implementation

The City will use a variety of regulatory mechanisms and administrative procedures to implement the Metro Plan. Overall responsibility for plan implementation is vested in the City Council, Planning Commission, Planning Director, and Director of Engineering.

To ensure that the Metro Plan is consistent with other citywide plans, the adoption of the Metro Plan will be coordinated with the following:

- Milpitas 2040 General Plan
- Midtown/Gateway Specific Plan
- Parks and Recreation Master Plan
- Bicycle, Pedestrian, and Trails Master Plan
- Urban Water Management Plan
- Water Master Plan
- Sewer Master Plan
- Climate Action Plan

The City's Zoning Ordinance will translate Metro Plan policies into specific land use regulations, development standards, objective design standards, and performance criteria that will govern development on individual properties. The Metro Plan calls for eight new zoning districts.

Regulations for these districts will be established as part of the zoning amendment undertaken concurrently with the adoption of the Metro Plan. Density and intensity limits consistent with the Metro Plan's land use classifications will also be established. At the time of Plan adoption, the City will bring both the Zoning Ordinance and the Zoning Map into conformance with the Metro Plan.

In addition, the City will implement the Citywide Objective Design Standards. Citywide Objective Design Standards will provide design standards and guidelines for all multifamily development in the City of Milpitas, as well as other development as relevant. Citywide Objective Design Standards will include standards for key design features, such as setbacks, height limits, and lighting standards. These design standards will ensure high-quality development that is visually compatible with the surrounding area. The City of Milpitas is currently developing Objective Design Standards for residential development, including residential-only and mixed-use development. When adopted, these standards will apply in the Metro Plan Area and elsewhere in the City. The City anticipates that the Citywide Objective Design Standards will be adopted before approval of the Metro Plan.

The Metro Plan includes an implementation program, which lists the actions, responsible parties, and timeframes needed to enact the Metro Plan. These mechanisms will require the involvement of the City government: Planning, Economic Development, Public Works, Engineering, Parks and Recreation, Building, Police, Fire, and Finance. The City will take the lead in coordinating the areawide actions and will implement many of them. In some instances, the City will establish funding mechanisms that will cover costs for capital projects ahead of time.

# Chapter 3
# Setting, Impacts, and Mitigation Measures

This chapter provides analyses of the physical impacts on the environment that could occur as a result of implementing the Project Change and identifies whether those impacts would change the impact significance determinations in the *Final Environmental Impact Report for the Milpitas Transit Area Specific Plan* (Certified EIR). There is a separate section for each resource analyzed, as listed below. Each section presents a description of the environmental and regulatory setting for that resource, focusing on any changes that have occurred since the Certified EIR, significance criteria and methodology used in the impact analysis, and potential impacts that were not in the Certified EIR.

This chapter comprises the following sections.

- 3.1, *Air Quality*
- 3.2, *Greenhouse Gas Emissions*
- 3.3, *Land Use and Planning*
- 3.4, *Noise*
- 3.5, *Population and Housing*
- 3.6, *Public Services and Recreation*
- 3.7, *Transportation*
- 3.8, *Utilities and Service Systems*

As discussed in Chapter 1, *Introduction*, the Project Change would not have the potential to change the impact significance determinations for the Milpitas Metro Specific Plan (Metro Plan or Project) in the Certified EIR for the following resources. Therefore, these topics are not discussed further.

- *Aesthetics*
- *Agricultural and Forestry Resources*
- *Biological Resources*
- *Cultural Resources*
- *Energy*
- *Geology and Soils*
- *Hazards and Hazardous Materials*
- *Hydrology and Water Quality.*
- *Mineral Resources*
- *Tribal Cultural Resources*
- *Wildfire*

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# 3.1 Air Quality

This section discloses and analyzes the potential change in Project impacts on air quality that would result from implementing the Project Change.

## 3.1.1 Regulatory Setting

The regulatory setting for air quality is described on pages 3.6-4 to 3.2-8 of the Certified EIR. These regulations include the federal Clean Air Act and California Clean Air Act (CCAA), including the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS), and the Bay Area Air Quality Management District's (BAAQMD) Clean Air Plan. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIR.

There have been no substantial new regulations related to air quality beyond those described in the Certified EIR. However, there have been updates to existing regulations and guidelines since the Certified EIR was prepared that are relevant to the Project Change. Updates to the regulatory setting are discussed in the sections that follow.

### 3.1.1.1 Federal

#### National Ambient Air Quality Standards

Since the Certified EIR was prepared, the NAAQS for ozone has been revised from 0.075 parts per million (ppm) to 0.070 ppm. The most current NAAQS and CAAQS are shown in Table 3.1-1.

**Table 3.1-1. Current National and State Ambient Air Quality Standards**

| Criteria Pollutant | Average Time | California Standards | National Standards[1] | |
|---|---|---|---|---|
| | | | Primary | Secondary |
| Ozone | 1-hour | 0.09 ppm | None | None |
| | 8–hour | 0.070 ppm | 0.070 ppm | 0.070 ppm |
| Respirable Particulate Matter (PM10) | 24-hour | 50 μg/m$^3$ | 150 μg/m$^3$ | 150 μg/m$^3$ |
| | Annual mean | 20 μg/m$^3$ | None | None |
| Fine Particulate Matter (PM2.5) | 24-hour | None | 35 μg/m$^3$ | 35 μg/m$^3$ |
| | Annual mean | 12 μg/m$^3$ | 12.0 μg/m$^3$ | 15.0 μg/m$^3$ |
| Carbon Monoxide | 8-hour | 9.0 ppm | 9 ppm | None |
| | 1-hour | 20 ppm | 35 ppm | None |
| Nitrogen Dioxide | Annual mean | 0.030 ppm | 0.053 ppm | 0.053 ppm |
| | 1-hour | 0.18 ppm | 0.100 ppm | None |
| Sulfur Dioxide | Annual mean | None | 0.030 ppm | None |
| | 24-hour | 0.04 ppm | 0.014 ppm | None |
| | 3-hour | None | None | 0.5 ppm |
| | 1-hour | 0.25 ppm | 0.075 ppm | None |

| Criteria Pollutant | Average Time | California Standards | National Standards[1] | |
|---|---|---|---|---|
| | | | Primary | Secondary |
| Lead | 30-day Average | 1.5 μg/m$^3$ | None | None |
| | Calendar quarter | None | 1.5 μg/m$^3$ | 1.5 μg/m$^3$ |
| | 3-month average | None | 0.15 μg/m$^3$ | 0.15 μg/m$^3$ |
| Sulfates | 24-hour | 25 μg/m$^3$ | None | None |
| Hydrogen Sulfide | 1-hour | 0.03 ppm | None | None |
| Vinyl Chloride | 24-hour | 0.01 ppm | None | None |

Source: California Air Resources Board 2016.
[1] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.
μg/m$^3$ = micrograms per cubic meter

### 3.1.1.2 Local

#### Bay Area Air Quality Management District/2017 Clean Air Plan

In May 2017, the BAAQMD updated their CEQA guidelines (Bay Area Air Quality Management District 2017a). While the Certified EIR used the 1999 BAAQMD's CEQA guidelines to determine significance, this SEIR uses their 2017 CEQA guidelines.

The Certified EIR discussed the BAAQMD 2005 Bay Area Ozone Strategy for its Air Quality Management Plan (AQMP) consistency. On April 19, 2017, the BAAQMD Board of Directors adopted the 2017 Clean Air Plan (Bay Area Air Quality Management District 2017b).

The 2017 Clean Air Plan guides the region's air quality planning efforts to attain the CAAQS. The current plan contains district-wide control measures to reduce ozone ($O_3$) precursor emissions (e.g., reactive organic gases [ROGs] and nitrogen oxides [$NO_X$]), particulate matter, and greenhouse gas (GHG) emissions. Specifically, the Clean Air Plan provides the following:

- Describes the BAAQMD plan for attaining all state and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities.
- Defines a vision for transitioning the region to the post-carbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050.
- Provides a regional climate protection strategy that will put the Bay Area on a pathway to achieving GHG reduction targets.
- Identifies a wide range of control measures to (1) decrease emissions of the air pollutants that are most harmful to Bay Area residents, such as particulate matter, $O_3$, and toxic air contaminants (TACs); (2) reduce emissions of methane and other GHGs with high global warming potential that are potent climate pollutants in the near term; and (3) decrease emissions of carbon monoxide (CO) by reducing fossil fuel combustion.

Both the 2005 Bay Area Ozone Strategy and the 2017 Clean Air Plans focus on protecting public health and contain control measures aimed at reducing air pollution in the region.

#### Milpitas 2040 General Plan

On March 9, 2021, the City of Milpitas adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan is an update to the 1994 General Plan and supersedes

and replaces the 1994 General Plan. Policies from the 2040 General Plan relevant to air quality include the following:

- **Goal CON-7:** Implement a proactive approach to maintain and improve air quality within Milpitas and the region.
- **Policy CON 7-1:** Ensure that land use and transportation plans support air quality goals through a logical development pattern that focuses growth in and around existing urbanized areas, locates new housing near places of employment, encourages alternative modes of transportation, supports efficient parking strategies, reduces vehicle miles traveled, and requires projects to mitigate significant air quality impacts.
- **Policy CON 7-2:** Minimize exposure of the public to toxic or harmful air emissions and odors through requiring an adequate buffer or setback distance between residential and other sensitive land uses and land uses that typically generate air pollutants, toxic air contaminants, or obnoxious fumes or odors, including but not limited to industrial, manufacturing, and processing facilities, high-volume roadways, and industrial rail lines. New sensitive receptors, such as residences (including residential care and assisted living facilities for the elderly), childcare centers, schools, playgrounds, churches, and medical facilities shall be located away from existing point sources of air pollution such that excessive levels of exposure do not result in unacceptable health risks. Compliance shall be verified through the preparation of a Health Risk Assessment when deemed necessary by the Planning Director.
- **Policy CON 7-3:** Require projects which generate high levels of air pollutants, such as heavy industrial, manufacturing facilities and hazardous waste handling operations, to incorporate air quality mitigations in their design to reduce impacts to the greatest extent feasible.
- **Policy CON 7-4:** Require projects to adhere to the requirements of the Bay Area Air Quality Management District (BAAQMD).
- **Policy CON 7-5:** Use the City's development review process and the California Environmental Quality Act (CEQA) to evaluate and mitigate the local and cumulative effects of new development on air quality.
- **Policy CON 7-6:** Coordinate with the California Air Resources Board (CARB) and the Bay Area Air Quality Management District to properly measure air quality emission sources and enforce the standards of the Clean Air Act
- **Policy CON 7-7:** Comply with regional, state, and federal standards and programs for control of all airborne pollutants and noxious odors, regardless of source.
- **Policy CON 7-8:** Consider the health risks associated with Toxic Air Contaminants (TACs) when reviewing development applications.
- **Policy CON 7-10:** Implement policies and action from the Land Use and Circulation Elements to provide mixed-use developments, locate high-density uses near transit facilities, provide neighborhood-serving retail uses convenient to residential neighborhoods, and other Transportation Demand Management (TDM) programs that would reduce vehicle trips and vehicle miles traveled, thus reducing air-pollutant emissions.
- **Policy CON 7-12:** Encourage and prioritize infrastructure investments and improvements that promote safe walking, bicycling and increased transit ridership.

- **Policy CON 7-13:** Implement energy policies and actions that have co-benefits of reduced air pollution and greenhouse gases by increasing energy efficiency, conservation, and the use of renewable resources.
- **Action CON-7c**: Require site-specific air quality Health Risk Assessments (HRAs) for developments that would place sensitive receptors closer than 500 feet from the edge of a regional roadway facility (including I-680, I-880, and SR-237), or for development projects that would place significant point sources of air pollution such as gas station and dry cleaning facilities, or other industrial facilities that emit toxic air contaminates TACs within 500 feet of a sensitive receptor.
- **Action CON-7e**: Require dust control measures, including those included in the Santa Clara Valley Non-point Source Pollution Control Program, and BAAQMD's Best Management Practices for fugitive dust control during construction.
- **Action CON-7f**: Use the BAAQMD "Air Quality Guidelines", as amended, or replaced, in identifying thresholds, evaluating the potential project and cumulative impacts, and determining appropriate mitigation measures. Review development, infrastructure, and planning projects for consistency with BAAQMD requirements during the CEQA review process. Require project applicants to prepare air quality analyses to address BAAQMD, and General Plan requirements, which includes analysis and identification of:
    - Air pollutant emissions associated with the project during construction, project operation, and cumulative conditions;
    - Potential exposure of sensitive receptors to toxic air contaminants;
    - Significant air quality impacts associated with the project for construction, project operation, and cumulative conditions; and
    - Mitigation measures to reduce significant impacts to less than significant or the maximum extent feasible where impacts cannot be mitigated to less than significant
- **Action CON-7i**: Require construction activity plans, and grading and drainage plans to include and/or provide for dust management to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard. Project applicants, or their assigned agents/contractors, shall be responsible for ensuring that all adequate dust control measures are implemented in a timely manner during all phases of project grading and construction.

## TASP Policies

Table 2-2 in Chapter 2, *Project Description,* provides a summary of the TASP policies related to air quality. Table 2-2 identifies policies that require the following:

- *Pedestrian Access*. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes through the entire Milpitas Metro Area.
- *Bicycle Lanes*. Create multimodal complete streets that provide for the mobility needs and safety of bicyclists. This includes protected bike lanes and encouraging micro-mobility circulation. Encourage children and individuals to bike to school or work, as well as provide bicycle facilities.

- *Alternative Forms of Transportation*. Encourage individuals within the Milpitas Metro Area to walk, bike, or take transit by building the necessary infrastructure to support these alternative forms of transportation. Require development projects to implement TDM measures to help achieve VMT and trip reduction goals.
- *Sensitive Receptors.* New residential development that is proposed within 500 feet of active rail lines where vehicles emit diesel exhaust, or roadways where total daily traffic volumes from all roadways within 500 feet of such location exceed 100,000 vehicles per day, will, as part of its CEQA review, include an analysis of TACs (which includes primarily diesel particulate matter [DPM]). If the results show that the carcinogenic human health risk exceeds the 10 people in a million standard for carcinogenic human health impacts established by the BAAQMD, the City may require upgraded ventilation systems with high efficiency filters, or other equivalent mechanisms, to minimize exposure of future residents.

## 3.1.2 Environmental Setting

The environmental setting for air quality at the TASP Area is described on pages 3.6-1 to 3.6-9 of the Certified EIR. This discussion describes the regional climate conditions within the San Francisco Bay Area Air Basin (SFBAAB), pollutants of greatest concern, air quality conditions, and attainment status of Santa Clara County. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1 of this SEIR for the locations available for the public to review the Certified EIR.

The setting with regard to air quality has not changed substantially since the Certified EIR was prepared. Air quality conditions were reported for the 2001–2005 period in Table 3.6-1 of the Certified EIR. Since the Certified EIR was prepared, air quality monitoring data have become available for more recent years (2018, 2019, 2020) and data for these years are shown in Table 3.1-2 to supplement the air quality monitoring data in the Certified EIR. Similar to the Certified EIR, the air quality monitoring data in Table 3.1-2 is from the San Jose – Jackson Street Station. No substantial changes in the climate conditions, pollutants of concern, or attainment status of the City have occurred since the Certified EIR was prepared.

**Table 3.1-2. Ambient Air Quality Data for the Metro Plan Area (2018–2020)**

| Pollutant Standards | 2018 | 2019 | 2020 |
|---|---|---|---|
| **Ozone ($O_3$) at San Jose – Jackson Street Station** | | | |
| Maximum 1-hour concentration (ppm) | 0.078 | 0.095 | 0.106 |
| Maximum 8-hour concentration (ppm) | 0.61 | 0.081 | 0.085 |
| Fourth highest 8-hour concentration (ppm) | 0.053 | 0.060 | 0.068 |
| Number of days standard exceeded | | | |
| CAAQS 1-hour standard (> 0.09 ppm) | 0 | 1 | 1 |
| CAAQS 8-hour standard (> 0.070 ppm) | 0 | 2 | 2 |
| NAAQS 8-hour standard (> 0.070 ppm) | 0 | 2 | 2 |
| **Carbon Monoxide (CO) at San Jose – Jackson Street Station** | | | |
| Maximum 8-hour concentration (ppm) | 2.1 | 1.3 | 1.5 |
| Maximum 1-hour concentration (ppm) | 2.5 | 1.7 | 1.8 |
| Number of days standard exceeded | | | |

| Pollutant Standards | 2018 | 2019 | 2020 |
|---|---|---|---|
| NAAQS 8-hour standard (≥ 9 ppm) | 0 | 0 | 0 |
| CAAQS 8-hour standard (≥ 9.0 ppm) | 0 | 0 | 0 |
| NAAQS 1-hour standard (> 35 ppm) | 0 | 0 | 0 |
| CAAQS 1-hour standard (≥ 20 ppm) | 0 | 0 | 0 |
| **Nitrogen Dioxide ($NO_2$) at San Jose – Jackson Street Station** | | | |
| Maximum state 1-hour concentration (ppm) | 0.861 | 0.598 | 0.519 |
| Number of days standard exceeded | | | |
| CAAQS 1-hour standard (0.18 ppm) | 0 | 0 | 0 |
| NAAQS 1-hour standard (0.100 ppm) | 0 | 0 | 0 |
| **Respirable Particulate Matter ($PM_{10}$) at San Jose – Jackson Street Station** | | | |
| Maximum state 24-hour concentration (μg/m³) | 121.8 | 77.1 | 137.1 |
| Maximum national 24-hour concentration (μg/m³) | 115.4 | 75.4 | 134.9 |
| National annual average concentration | 20.9 | 18.4 | 24.1 |
| Measured number of days standard exceeded | | | |
| CAAQS 24-hour standard (50 μg/m³) | 4 | 4 | 10 |
| NAAQS 24-hour standard (150 μg/m³) | 0 | 0 | 0 |
| **Fine Particulate Matter ($PM_{2.5}$) at San Jose – Jackson Street Station** | | | |
| Maximum state 24-hour concentration (μg/m³) | 133.9 | 34.4 | 120.5 |
| Maximum national 24-hour concentration (μg/m³) | 133.9 | 27.6 | 120.5 |
| National annual average concentration | 12.7 | 9.0 | 11.5 |
| Measured number of days standard exceeded | | | |
| NAAQS 24-hour standard (> 35 μg/m³) | 15 | 0 | 12 |

Sources: California Air Resources Board 2021, U.S. Environmental Protection Agency 2022.
**Notes:**
An exceedance is not necessarily a violation.
State statistics are based on local conditions data; state statistics are based on California-approved samplers.
National statistics are based on standard conditions data. In addition, national statistics are based on samplers, using federal reference or equivalent methods.
State criteria for ensuring data are adequate for calculating valid annual averages are more stringent than national criteria.
2020 is the last year of available air quality monitoring data.

## 3.1.3 Impacts and Mitigation

This section describes the change in Project impacts on air quality that would occur with the Project Change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. The Certified EIR found that, with implementation of the policies in the TASP, impacts on air quality would be significant and unavoidable, even with implementation of the TASP policies. No feasible mitigation measures were identified to reduce or avoid the significant impact. Because the Metro Plan policies would replace policies in the TASP, the analysis includes a comparison of the TASP policies and the Metro Plan policies to determine if any

changes in policies would result in an impact. If new mitigation measures are needed to reduce new impacts that would result from the Project Change, those measures are listed below.

This SEIR analysis evaluates the change in Project impacts with the Project Change, and, if applicable, changes in circumstances or new information that was not available at the time the Certified EIR was prepared. The analysis does not reevaluate the impacts of the Project that were already disclosed in the Certified EIR and are not altered due to the Project Change. Based on the change in the Project impact due to the Project Change, a determination is made as to whether there would be changes to the impact significance determinations for the Project in the Certified EIR.

### 3.1.3.1 Significance Criteria

The State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on air quality.

An impact would be considered significant if construction or operation of the Project would do any of the following.

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in a cumulatively considerable net increase in any criteria pollutant for which the project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.
- Expose sensitive receptors to substantial pollutant concentrations.
- Result in other emissions (such as those leading to odors) that would adversely affect a substantial number of people.

According to the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make significance determinations for potential impacts on environmental resources.

#### Regional Emissions

This analysis evaluates the impacts of regional emissions generated from the Metro Plan following the plan-level guidance recommended by BAAQMD in their CEQA guidelines (BAAQMD 2017a). Specifically, this analysis considers whether the Metro Plan would conflict with the most recent air quality plan (2017 Clean Air Plan), consistent with BAAQMD guidance for programmatic analyses (BAAQMD 2017a, 2017b). The impact analysis evaluates whether the Project supports the primary goals of the 2017 Clean Air Plan, including applicable control measures from the 2017 Clean Air Plan, and whether it would disrupt or hinder implementation of any 2017 Clean Air Plan control measure.

While BAAQMD has quantitative project-level thresholds, they were developed to analyze emissions generated by a single project and, thus, do not lend well to an evaluation of emissions from a land use plan being evaluated at a programmatic level. Large-scale land use plans that consist of numerous individual developments will, by their nature, produce more criteria pollutants than single developments, even if the plans include efficiency measures to reduce future emissions. Use of the project-level thresholds to evaluate land use plans may therefore unfairly penalize the plans, yielding a significant and unavoidable conclusion simply due to scale. Thus, this EIR uses the BAAQMD's plan-level thresholds for evaluation of potential impacts due to the Metro Plan, rather

than comparing the totality of Metro Plan buildout to BAAQMD's project-level thresholds. The use of BAAQMD's plan-level thresholds (i.e., consistency with the most recently adopted attainment plan) is a common industry practice for CEQA review, and they are the most appropriate standards to apply.

### 3.1.3.2 Methods

The Certified EIR qualitatively analyzed the construction and operational impact from the TASP. Specifically, As discussed in Chapter 2 of this SEIR, the Metro Plan would add 7,000 dwelling units, 3 million square feet of office space, 300,000 square feet of retail space, and 700 hotel rooms, in addition to the development of the TASP. For the Project Change, impacts on air quality and criteria pollutants emissions from operations were quantified using industry-standard methodology and land use emissions model, the California Emissions Estimator Model (CalEEMod). Specifically, CalEEMod version 2020.4.0 is used in this analysis. Additionally, CARB's 2021 EMission FACtor (EMFAC 2021) Model was utilized to model mobile emissions. This section describes the key methods used to quantify emissions and estimate potential impacts for the Project Change. Assumptions used in the air quality analysis can be found in Appendix D**,** *Air Quality and Greenhouse Gas Data and Calculations.*

#### Construction

Implementation of the Project Change would generate emissions of VOC, $NO_X$, CO, sulfur oxides ($SO_X$), respirable particulate matter ($PM_{10}$), and fine particulate matter ($PM_{2.5}$) during construction activities. Implementation of the Project Change would result in the construction of additional development, which could result in short-term impacts on ambient air quality within the City.

Sources of construction emissions would include mobile and stationary construction equipment exhaust, employee and haul truck vehicle exhaust, land clearing and material movement, paving, and application of architectural coatings. However, the specific size, location, and construction techniques and scheduling that would be used for each individual development project occurring in the City from implementation of the Project Change is not currently known. With a horizon year of 2040, development of the various land uses associated with the Project would occur over an extended period and would depend on factors such as local economic conditions, market demand, and other financing considerations.

As such, without specific project-level details, it is not possible to develop a refined construction inventory.[1] Consequently, the determination of construction air quality impacts for each individual development project, or a combination of these projects, would require the City to speculate regarding such potential future project-level environmental impacts. Therefore, in the absence of the necessary construction information required to provide an informative and meaningful analysis, the evaluation of potential construction-related impacts resulting from implementation of the Project is conducted qualitatively. The analysis discusses the potential for future individual developments in the City to generate construction emissions that, where necessary, would apply best management practices and/or mitigation measures to reduce those emissions.

[1] Project-level information includes details such as the size and scale of the project to be constructed, construction schedule, equipment fleet, construction worker crew estimates, and demolition and grading quantities.

## Operation

Buildout of the Metro Plan would result in a change in emissions relative to the development proposed in the TASP. Operation of the potential new dwelling units, office uses, retail uses, and hotel uses would generate criteria pollutants and precursor emissions that could result in long-term impacts on ambient air quality within the City. Emissions would result from motor vehicle travel; area sources, such as landscaping, consumer products, and architectural coatings; and natural gas consumption associated with space and water heating. Due to the adoption of BAAQMD Regulation 6: Rule 3, *Wood-Burning Devices*, in 2015, it was assumed that new development would be constructed without the installation of permanent wood-burning fireplaces, stoves, or other devices.

Given that the Metro Plan requires General Plan Amendments and rezoning of land throughout the City, the operational emissions analysis accounts for the net change in emissions due to the Metro Plan. Area and energy (natural gas) emissions for these land uses were estimated using CalEEMod, version 2020.4.0 based off the total potential buildout of the Metro Plan. Because the No Project scenario would be the modeled and approved TASP (i.e., full TASP buildout in 2030), only the Project Change was analyzed.

Air quality impacts from motor vehicles associated with the Metro Plan were evaluated using the EMFAC 2021 emissions model. The mobile source emission factors (grams per mile and grams per trip) were averaged in EMFAC 2021 based on vehicle and fuel types at aggregated speeds for the vehicle fleet operating within the SFBAAB at the horizon year of 2040. The emission factors were applied to the Project-specific daily vehicle miles traveled (VMT) estimates and average daily trips (ADT) outlined in Table 3.1-3 to generate mobile-source emission estimates. An annual factor of 260 days was used to calculate yearly VMT and emissions, per industry practice recommended from traffic engineers that conducted the Transportation analysis for the Metro Plan. Refer to Appendix D for additional information on the assumptions and model data used to estimate the Project's potential future operational emissions.

**Table 3.1-3. VMT Changes with Implementation of the Metro Plan**

| 2040 Horizon Year Scenario – Metro Plan Area | Daily VMT | Average Daily Trips (ADT) | Average Trip Length |
|---|---|---|---|
| 2040 – No Project (Metro Plan TAZs)[1] | 1,548,069 | 132,169 | 11.71 |
| 2040 – Plus Project (Metro Plan TAZs)[2] | 2,086,360 | 180,517 | 11.56 |
| *Project-Only Net Change* | *538,291* | *48,349* | *11.13* |

Source: Appendix D.
[1] The No Project scenario would be the full buildout of the approved TASP.
[2] The Plus Project Scenario would be the full buildout of the Metro Plan.
TAZs = Traffic Analysis Zones.

This analysis assumes that the updated policies in the Metro Plan would be implemented. Table 2-2 in Chapter 2 of this SEIR provides a summary of the policies in the Metro Plan related to Air Quality. In summary, Table 2-2 identifies policies that require the following:

- *Sensitive Receptors.* New residential development that is proposed within 500 feet of active rail lines where vehicles emit diesel exhaust, or roadways where total daily traffic volumes from all roadways within 500 feet of such location exceed 100,000 vehicles per day, will, as part of its CEQA review, include an analysis of toxic air contaminants (which includes primarily DPM). If the results show that the carcinogenic human health risk exceeds the 10 people in a million standard for carcinogenic human health impacts established by the BAAQMD, the City may

require upgraded ventilation systems with high efficiency filters, or other equivalent mechanisms, to minimize exposure of future residents.

- *Zero and Low Emissions Vehicles.* Promote use of zero and low-emission vehicles through the following measures. Specifically, require all new multifamily residential and all new nonresidential buildings to provide at least 45 percent of parking spaces as electric vehicle (EV) capable (including the raceway and panel capacity) to support future installation of Level 2 chargers on a dedicated 40-amp, 208/240-volt branch circuit.
- *VMT.* Establish and implement a travel demand management (TDM) program with the non-compulsory goal of reducing VMT by 15 percent or more below the regional baseline per employee or resident and efficiently provides parking that meet the needs of residents, employees, and visitors. TDM measures should be incorporated into all new development and may be implemented by individual uses or through Transportation Management Association (TMA) oversight.

## 3.1.3.3 Impacts and Mitigation Measures

This section includes a discussion of each impact as it corresponds to the significance criteria presented in Section 3.1.3.1, *Significance Criteria*.

### Impact AQ-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to conflicting with or obstructing implementation of an applicable air quality plan.

#### Summary of Certified EIR Impact Analysis

The Certified EIR concluded that the TASP would result in future individual projects within the TASP Area that would generate population growth and air quality impacts due to new development, and thus would be inconsistent with the population assumptions in the 2005 Bay Area Ozone Strategy (see Impact Discussion 3.6-1 of the Certified EIR). The Certified EIR concluded that a significant and unavoidable impact would occur even with the incorporation of the 1994 General Plan and TASP policies.

The Certified EIR concluded that while the TASP would be inconsistent with the growth projections of the 2005 Bay Area Ozone Strategy, the TASP would be consistent with the Transportation Control Measures (TCMs) found within the 2005 Bay Area Ozone Strategy (see Impact Discussion 3.6-2 of the Certified EIR). Consistency with the TCMs would reduce adverse impacts associated with motor vehicle use, such as poor air quality, and would promote use of transit and other modes of transportation. Consistency with the TCMs found in the 2005 Bay Area Ozone Strategy would reduce the TASP impacts to less than significant.

#### Impact Analysis

The CAA requires that a State Implementation Plan (SIP) or an air quality control plan be prepared for areas with air quality violating the NAAQS. The SIP sets forth the strategies and pollution control measures that states will use to attain the NAAQS. The CCAA requires attainment plans to demonstrate a 5 percent per year reduction in nonattainment air pollutants or their precursors, averaged every consecutive 3-year period, unless an approved alternative measure of progress is developed. Air quality attainment plans (AQAP) outline emissions limits and control measures to

achieve and maintain these standards by the earliest practical date. The current AQAP for the SFBAAB is the 2017 Clean Air Plan.

According to BAAQMD's CEQA guidelines, the determination of 2017 Clean Air Plan consistency should consider the following for plan-level analyses (BAAQMD 2017a):

1. Does the plan support the primary goals of the 2017 Clean Air Plan?
2. Does the plan include applicable control measures from the 2017 Clean Air Plan?
3. Does the plan disrupt or hinder implementation of any 2017 Clean Air Plan control measure?

Each of these questions are addressed below for the Metro Plan.

***Support of 2017 Clean Air Plan Goals***

The primary goals of the 2017 Clean Air Plan are to:

1. Reduce emissions and decrease concentrations of harmful pollutants.
2. Safeguard public health by reducing exposure to air pollutants that pose the greatest health risk.
3. Reduce GHG emissions and protect the climate.

The Metro Plan includes numerous policies and improvements that will support regional attainment of the CAAQS and NAAQS. For example, the Metro Plan and 2040 General Plan include recommended sustainability measures, such as green building and Leadership in Energy and Environmental Design (LEED) certification that would support sustainable building design, reduction in GHG emissions, and coordination at the local and regional levels to improve local and regional air quality. Several land use, transportation, and urban design policies in the Metro Plan promote alternative modes of transportation, such as walking, biking, and transit, as well as alternative transportation development and VMT reductions (see Policy M 2.1, Policy M 4, Policy M 5.1, Policy M 8, Policy M 9, Policy M 10, and Policy M 11).

The proposed transportation improvements identified in the Metro Plan would create stronger links for the pedestrian and bicycle network within the Metro Plan Area. For instance, the Metro Plan aims to create complete pedestrian and bicycle networks that connect trails and paths, maintain pedestrian and biking facilities, increase bicycle parking availability, construct street improvements and safety feature to promote pedestrian trips, and install pedestrian-oriented signage to alert of potentially fast-moving traffic. Additionally, the Metro Plan encourages strengthening access and connection between the Metro Plan Area and the regional transit systems, including Milpitas BART and VTA transit centers, consistent with the BAAQMD 2017 Clean Air Plan Measure TR-8. The Metro Plan also aims to effectively manage transportation demand and parking by supporting programs such as guaranteed ride home program, carshare spaces, bike share, parking cash-out, and childcare services. Several policies further support the maintenance and expansion of the transportation network to enhance connectivity, accessibility, and safety (see Policy M5, Policy M6, and Policy M7). Together, the proposed improvements and policies would lessen the severity of growth-oriented criteria pollutants by reducing VMT, encouraging transit use, fostering bicycle and pedestrian infrastructure, and supporting sustainable land use patterns, including mixed-use design and increased density and intensity. With implementation of the Metro Plan, VMT per capita would decrease compared to the TASP. Reductions in VMT per capita would further help the region attain the ambient air quality standards.

The Metro Plan also includes policies to protect public health and reduce GHG emissions. Specifically, Policy SC 8.1 requires new development near TAC sources be designed to minimize any potential health risks to adjacent existing receptors. Operational activities would be further guided by Policies CB 7.2.2 and CB 7.2.3, which supports the full electrification of new development to help reduce natural gas consumption and subsequent natural gas emissions. Strategies that reduce VMT (see Policy M 8) and energy consumption will also lower public health effects of adverse air quality as they will reduce overall emissions generated by the Metro Plan. Based on the above analysis, the Metro Plan would support the primary goals of the 2017 Clean Air Plan.

***Applicable Control Measures***

To meet the primary goals, the 2017 Clean Air Plan recommends specific control measures and actions. These control measures are grouped into various categories and include stationary source measures, mobile-source measures, and transportation control measures. The 2017 Clean Air Plan recognizes that community design dictates individual travel mode and that a key long-term control strategy to reduce emissions of criteria pollutants, air toxics, and GHGs from motor vehicles is to channel future Bay Area growth into vibrant urban communities where goods and services are close at hand and people have a range of viable transportation options. To this end, the 2017 Clean Air Plan includes control measures that are aimed at reducing air pollution in the SFBAAB.

The measures most applicable to the Metro Plan are transportation, energy, building, waste management, water, and stationary source control measures. These include the following:

- TR1: Clean Air Teleworking Initiative – Develop teleworking best practices for employers and develop additional strategies to promote telecommuting. Promote teleworking on Spare the Air Days.
- TR2: Trip Reduction Programs – Implement the regional Commuter Benefits Program (Rule 14-1) that requires employers with 50 or more Bay Area employees to provide commuter benefits. Encourage trip reduction policies and programs in local plans, e.g., general plan and specific plans while providing grants to support trip reduction efforts. Encourage local governments to require mitigation of vehicle travel as part of new development approval, to adopt transit benefits ordinances in order to reduce transit costs to employees, and to develop innovative ways to encourage rideshare, transit, cycling, and walking for work trips. Fund various employer-based trip reduction programs.
- TR8: Ridesharing, Last-Mile Connection – Promote carpooling and vanpooling by providing funding to continue regional and local ridesharing programs and support the expansion of carsharing programs. Provide incentive funding for pilot projects to evaluate the feasibility and cost-effectiveness of innovative ridesharing and other last-mile solution trip reduction strategies. Encourage employers to promote ridesharing and carsharing to their employees.
- TR9: Bicycle and Pedestrian Access and Facilities – Encourage planning for bicycle and pedestrian facilities in local plans, e.g., general and Metro Plans, fund bike lanes, routes, paths and bicycle parking facilities.
- TR13: Parking Policies – Encourage parking policies and programs in local plans, e.g., reduce minimum parking requirements; limit the supply of off-street parking in transit-oriented areas; unbundle the price of parking spaces; support implementation of demand-based pricing (such as “SF Park”) in high-traffic areas.

- TR14: Cars and Light Trucks – Commit regional clean air funds toward qualifying vehicle purchases and infrastructure development. Partner with private, local, state and federal programs to promote the purchase and lease of battery-electric and plug-in hybrid electric vehicles
- TR15: Public Outreach and Education – Implement the Spare the Air Every Day Campaign including Spare the Air alerts, employer program, and community resource teams, a PEV Outreach campaign and the Spare the Air Youth Program.
- TR19: Medium and Heavy Duty Trucks – Directly provide, and encourage other organizations to provide, incentives for the purchase of 1) new trucks with engines that exceed ARB's 2010 NOX emission standards for heavy-duty engines, 2) new hybrid trucks, and 3) new zero-emission trucks. The Air District will work with truck owners, industry, CARB, the California Energy Commission, and others to demonstrate additional battery-electric and hydrogen fuel cell zero-emission trucks.
- TR23: Lawn and Garden Equipment – Seek additional funding to expand the Commercial Lawn and Garden Equipment Replacement Program into all nine Bay Area counties. Explore options to expand Lawn and Garden Equipment Program to cover shredders, stump grinders and commercial turf equipment.
- EN2: Decrease Electricity Demand – Work with local governments to adopt additional energy efficiency policies and programs. Support local government energy efficiency program via best practices, model ordinances, and technical support. Work with partners to develop messaging to decrease electricity demand during peak times.
- BL1: Green Buildings – Collaborate with partners such as KyotoUSA to identify energy-related improvements and opportunities for onsite renewable energy systems in school districts; investigate funding strategies to implement upgrades. Identify barriers to effective local implementation of the CALGreen (Title 24) statewide building energy code; develop solutions to improve implementation/enforcement. Work with ABAG's BayREN program to make additional funding available for energy-related projects in the buildings sector. Engage with additional partners to target reducing emissions from specific types of buildings.
- BL2: Decarbonize Buildings – Explore potential Air District rulemaking options regarding the sale of fossil fuel-based space and water heating systems for both residential and commercial use. Explore incentives for property owners to replace their furnace, water heater or natural-gas powered appliances with zero-carbon alternatives. Update Air District guidance documents to recommend that commercial and multi-family developments install ground source heat pumps and solar hot water heaters.
- BL4: Urban Heat Island Mitigation – Develop and urge adoption of a model ordinance for "cool parking" that promotes the use of cool surface treatments for new parking facilities, as well as existing surface lots undergoing resurfacing. Develop and promote adoption of model building code requirements for new construction or re-roofing/roofing upgrades for commercial and residential multi-family housing. Collaborate with expert partners to perform outreach to cities and counties to make them aware of cool roofing and cool paving techniques, and of new tools available.
- NW2: Urban Tree Planting – Develop or identify an existing model municipal tree planting ordinance and encourage local governments to adopt such an ordinance. Include tree planting

recommendations, the Air District's technical guidance, best practices for local plans and CEQA review.

- WA3: Green Waste Diversion – Develop model policies to facilitate local adoption of ordinances and programs to reduce the amount of green waste going to landfills.
- WA4: Recycle and Waste Reduction – Develop or identify and promote model ordinances on community-wide zero waste goals and recycling of construction and demolition materials in commercial and public construction projects.
- WR2: Support Water Conservation – Develop a list of best practices that reduce water consumption and increase on-site water recycling in new and existing buildings; incorporate into local planning guidance.
- SS32: Emergency Backup Generators – Reduce emissions of diesel particulate matter and black carbon from backup generators through Draft Rule 11-18, resulting in reduced health risks to impacted individuals, and in climate protection benefits.

The Metro Plan includes policies that encourage mixed-used and dense development, which aims to reduce VMT. For instance, the Metro Plan aims to create complete pedestrian and bicycle networks that connect trails and paths, maintain pedestrian and biking facilities, increase bicycle parking availability, construct street improvements and safety features to promote pedestrian trips, and install pedestrian-oriented signage to alert of potentially fast-moving traffic. Additionally, the Metro Plan encourages strengthening access and connection between the Metro Plan Area and the regional transit systems, including Milpitas BART and VTA transit centers. The Metro Plan also aims to effectively manage transportation demand and parking by supporting programs such as guaranteed ride home program, carshare spaces, bike share, parking cash-out, and childcare services. Several Metro Plan policies further support the maintenance and expansion of the transportation network to enhance connectivity, accessibility, and safety (see Policy M 5, Policy M 6, and Policy M 7). These policies would encourage alternative methods of transportation and help achieve a VMT reduction of at least 15 percent. Furthermore, operational activities would be further guided by Policies CB 7.2.2 and CB 7.2.3, which supports the full electrification of new development to help reduce natural gas consumption and subsequent natural gas emissions. Therefore, the Metro Plan would support the applicable control measures identified in the 2017 Clean Air Plan to meet its primary goals.

***Disrupt or Hinder Implementation of 2017 Clean Air Plan Control Measures***

As discussed above, the Metro Plan includes numerous policies that promote mixed-use development, alternative modes of transportation, renewable energy, and sustainable land use design. The Metro Plan would not cause the disruption, delay, or otherwise hinder implementation of any applicable control measure from the 2017 Clean Air Plan. Rather, the Metro Plan would support and facilitate their implementation. For example, the Metro Plan encourages sustainability measures, such as promotion of zero and low emission vehicles, sustainable building design (e.g., sustainable building and paving materials), and supporting local and regional transit services, such as VTA and BART. The Metro Plan would allow future developments the ability to reduce parking requirements with a parking management or TDM plan and would not disrupt or hinder implementation of any applicable 2017 Clean Air Plan control measure related to parking. Rather the Metro Plan contains additional parking policies to reduce motor vehicle travel (see Policy M 8).

Based on the above analysis, the Project would support implementation of the 2017 Clean Air Plan. Accordingly, development under the Metro Plan would not fundamentally conflict with the 2017

Clean Air Plan and would have a less-than-significant impact related to conflicting with or obstructing implementation of an applicable air quality plan.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation for impacts related to conflicting with or obstructing implementation of an applicable air quality plan.

### New Mitigation Measures

The Project Change would not result in the need for any new mitigation measures to reduce Project impacts.

### Conclusions for Impact AQ-1

The Certified EIR determined that the Project would have a significant and unavoidable impact with regard to conflicts with air quality plans, except for the TCMs of the 2005 Ozone Plan. Based on the analysis above, with incorporation of the Project Change, the Project would have a less-than-significant impact with regard to conflicts with air quality plans. The Project Change would have less of an impact related to conflicts with air quality plans than the TASP. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact AQ-2a: Construction of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.

### Summary of Certified EIR Impact Analysis

The Certified EIR concluded that the TASP would be in full compliance with the BAAQMD's construction Best Management Practices (BMPs), and, thus, construction and demolition related air quality impacts would be less than significant (see Impact Discussion 3.6-3 of the Certified EIR).

### Impact Analysis

Construction of future development associated with the Metro Plan would result in temporary generation of ozone precursors (ROG, $NO_X$), CO, and particulate matter emissions, which could result in short-term impacts on ambient air quality within the Metro Plan Area. Emissions would originate from mobile and stationary construction equipment exhaust, employee and haul truck vehicle exhaust, haul trucks carrying TAC materials, land clearing, demolition, architectural coatings, and asphalt paving. Construction-related emissions would vary substantially depending on the level of activity, length of the construction period, specific construction operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content.

The Project does not propose any specific development. As discussed in Chapter 2 of this SEIR, the Metro Plan would add 7,000 dwelling units, 3 million square feet of office space, 300,000 square feet of retail space, and 700 hotel rooms, in addition to the development of the TASP. The exact types and sizes of future development for the Metro Plan would be driven by market conditions. It is

anticipated that throughout the course of the buildout period, multiple land use development projects would be constructed intermittently within the Metro Plan Area. As the timing, density, and intensity of future development projects are not known at this time, the precise effects of construction activities associated with buildout of the Metro Plan cannot be accurately quantified.

The BAAQMD's project-level thresholds were developed to analyze emissions generated by a single project. While the construction emission impacts associated with each new individual development would be short-term in nature (relative to the buildout year) and limited to the period of time when construction activity is taking place for that particular development, the concurrent construction of a multitude of individual development projects due to the Project Change would generate combined criteria pollutant emissions on a daily basis that could exceed BAAQMD's project-level thresholds. Additionally, depending on the size and scale of an individual development project, along with its construction schedule and other parameters, there may also be instances where the daily construction emissions generated by a single development project within the Metro Plan Area could exceed BAAQMD's criteria pollutant thresholds. As such, construction emissions generated by implementation of the Project Change would result in a potentially significant impact on air quality. These emissions could contribute to ozone formation and other air pollution in the SFBAAB, which at certain concentrations, can contribute to short- and long-term human health effects, if left unmitigated.

During construction of a development project, the activity that typically generates the highest $NO_X$ and PM exhaust emissions is the operation of off-road equipment, whereas the activity that typically generates the highest ROG emissions is the application of architectural coatings. Per Mitigation Measures AQ-1 through AQ-4, the use of at least Tier 4 engines and renewable diesel for off-road equipment, which is commercially available in Santa Clara County, newer trucks to reduce $NO_X$ and PM exhaust emission levels, and use of low-VOC paints to reduce ROG emission levels would be required during construction activities within the Metro Plan Area. Additionally, while the BAAQMD considers impacts from fugitive $PM_{10}$ and $PM_{2.}5$ dust emissions significant without the application of standard BMPs, Mitigation Measure AQ-5 would require construction projects within the Metro Plan Area to implement BMPs (as recommended by BAAQMD) to reduce these fugitive dust emissions. Thus, the implementation of BMPs by future development projects associated with the Metro Plan would reduce fugitive $PM_{10}$ and $PM_{2.5}$ emissions to less-than-significant levels.

However, with respect to ROG, $NO_{X,}$ and $PM_{10}$ and $PM_{2.5}$ exhaust emissions, there could be foreseeable conditions under the Metro Plan where the amount of construction activity for an individual development project, or a combination of projects, could result in the generation of pollutant emissions that exceed their respective BAAQMD significance thresholds (i.e., 54 pounds/ day for ROG and $NO_X$, 82 pounds per day for exhaust $PM_{10}$, and 54 pounds/day for exhaust $PM_{2.5}$). Moreover, even with implementation of Mitigation Measures AQ-1 through AQ-5, as well as the policies described under Impact AQ-1, emissions of ROG, $NO_X$, $PM_{10}$, and $PM_{2.5}$ exhaust may not be reduced to levels below BAAQMD's thresholds when multiple construction projects are concurrently ongoing within the Metro Plan Area.

Accordingly, additional mitigation would be required to reduce these emissions impacts. Pursuant to Mitigation Measure AQ-6, applicants would be required to assess and determine the estimated total emissions from proposed construction activities (subject to City review and approval), and coordinate with BAAQMD or a third-party or governmental entity to determine the mitigation fees for each development project's applicant to pay on a pro rata basis to BAAQMD or a third-party or

governmental entity to offset their pollutant emissions as necessary, such that BAAQMD's daily pollutant thresholds would not be exceeded.

Based on recent experience of offsets being feasibly available for other large projects in the Bay Area, it is reasonable to assume that offset programs will be available in the future and that emissions can, therefore, be reduced below threshold levels. Should offsets programs be available for future development, Mitigation Measure AQ-6 would ensure that the construction-related emissions would not contribute to a significant level of air pollution, such that regional air quality within the SFBAAB would be degraded and project impacts on air quality could be less than significant with mitigation. However, because it cannot be concluded that offset programs would always be available in the future at the time and in the amount needed for any given future development, for the purposes of this SEIR analysis, construction air quality impacts are conservatively assumed to be significant and unavoidable.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for air quality impacts related to criteria pollutants due to construction of the TASP.

### New Mitigation Measures

The following mitigation measures would be required for the Metro Plan.

#### Mitigation Measure AQ-1: Require at Least Tier 4 Final Engines on Construction Equipment

All applicants proposing development of projects within the Metro Plan Area shall require their contractors, as a condition of contract, to further reduce construction-related exhaust emissions by ensuring that all off-road equipment greater than 50 horsepower (hp) and operating for more than 20 total hours over the entire duration of construction activities, shall operate on at least an Environmental Protection Act (EPA)-approved Tier 4 Final or newer engine. Exemptions can be made for specialized equipment where Tier 4 engines are not commercially available within 200 miles of the Metro Plan Area. The construction contract must identify these pieces of equipment, document their unavailability, and ensure that they operate on no less than an EPA-approved Tier 3 engine.

#### Mitigation Measure AQ-2: Require Use of Diesel Trucks with 2010-Compliant Model Year Engines

All applicants proposing development of projects within the Metro Plan Area shall require their contractors, as a condition of contract, to use diesel trucks that have 2010 model year or newer engines, but no less than the average fleet mix for the current calendar year as set forth in the CARB's EMFAC database. In the event that 2010 model year or newer diesel trucks cannot be obtained, the contractor must provide documentation to the City showing that a good faith effort to locate such engines was conducted.

#### Mitigation Measure AQ-3: Require Construction Fleet to Use Renewable Diesel

All applicants proposing development of projects within the Metro Plan Area shall require their contractors, as a condition of contract, to reduce construction-related exhaust emissions by ensuring that all off-road equipment greater than 50 hp and operating for more than 20 total

hours over the entire duration of construction activities shall operate on renewable diesel (such as high performance renewable diesel).

**Mitigation Measure AQ-4: Require Low-VOC Coatings During Construction**

All applicants proposing development of projects within the Metro Plan Area shall require their contractors, as a condition of contract, to reduce construction-related fugitive ROG emissions by ensuring that low-VOC coatings that have a VOC content of 10 grams/liter (g/L) or less are used during construction. The project applicant will submit evidence of the use of low-VOC coatings to City prior to the start of construction.

**Mitigation Measure AQ-5: Require Fugitive Dust Best Management Practices**

All applicants proposing development of projects within the Metro Plan Area shall require their contractors, as a condition of contract, to reduce construction-related fugitive dust by implementing BAAQMD's basic control measures at all construction and staging areas. The following measures would be implemented.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite will be covered.
- All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads, driveways, or driving surfaces shall be limited to 15 miles per hour (mph).
- All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used.
- A publicly visible sign will be posted with the telephone number and the name of the person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The phone number of the BAAQMD will also be visible to ensure compliance.

**Mitigation Measure AQ-6: Purchase Mitigation Credits for Construction Emissions Exceeding BAAQMD's Daily Pollutant Thresholds**

Applicants proposing development of projects within the Metro Plan Area shall compare their project size with the BAAQMD screening sizes appropriate to their project for construction criteria pollutants found in Table 3-1 in BAAQMD's current CEQA guidelines (2017). The screening limit for general office buildings, office park, or government office building is 277,000 square feet. There are different screening limits for residential, retail, hotels, and other developments based off specific land use type (e.g., single-family housing, apartments, low-rise, hotels, strip malls). If the project is less than the screening limit for its project type, then applicants shall confirm to the City whether construction-related activities would include any of the following:

- Demolition.

- Simultaneous occurrence of more than two construction phases (e.g., paving and building construction would occur simultaneously) or construction would occur simultaneous with other Metro Plan development.
- Simultaneous construction of more than one land use type (e.g., project would develop residential and commercial uses on the same site) (not applicable to high density infill development).
- Extensive site preparation (i.e., greater than default assumptions used by the CalEEMod model for grading, cut/fill, or earth movement).
- Extensive material transport (e.g., greater than 10,000 cubic yards of soil import/export) requiring a considerable amount of haul truck activity.

If the project is less than the screening limit for the project type and construction would involve none of the five conditions above, no further action is required.

Project applicants not excluded by the conditions above shall estimate annual average emissions for each year of construction and compare the annual average emissions for each year of construction to the applicable BAAQMD thresholds at the time of analysis. The emissions estimate shall be provided as part of the project's initial application to the City. The City will review the estimate and confirm whether offsets are required for construction. Should the City-confirmed estimate indicate that the proposed development estimate would not result in construction emissions exceeding BAAQMD's daily pollutant thresholds, no further action will be required.

For proposed developments that are estimated to result in exceedances of thresholds, the applicants shall coordinate with a third-party (e.g., Bay Area Clean Air Foundation) or governmental entity to pay for criteria pollutant offsets for every year in which construction emissions are estimated to exceed the BAAQMD thresholds. If the estimate shows exceedances of multiple criteria pollutants above the BAAQMD thresholds, then offsets must be obtained to address each pollutant above the thresholds. Emission reduction projects and fee will be determined in consultation between the applicant and the third-party or governmental entity and will include offset provider administrative costs. The agreement that specifies fees and timing of payment shall be provided to the City for review and signed by the applicant and the third-party or governmental entity. The emission reductions shall be secured prior to any year in which construction activity is estimated to result in an exceedance. The payment for the emissions can either be on an annual basis or done once upfront, prior to construction.

To qualify under this mitigation measure, the specific emissions reduction project(s) must result in emission reductions in the SFBAAB that are real, surplus, quantifiable, and enforceable, and that would not otherwise be achieved through compliance with existing regulatory requirements of any other legal requirement.

**Conclusions for Impact AQ-2a**

The Certified EIR concluded that after implementation of policies included in the TASP, criteria air pollutant impacts due to construction would be less than significant. Based on the analysis above, with incorporation of the Project Change, construction of the Metro Plan would result in a significant and unavoidable impact related to a cumulatively considerable net increase in criteria pollutants, even with implementation of Mitigation Measures AQ-1 through AQ-6. While it may be possible for

Impact AQ-2a to be reduced to less than significant with mitigation (Mitigation Measure AQ-6), offsets cannot be guaranteed in the types and amounts that may be needed in the future and, thus, this analysis conservatively concludes a significant and unavoidable impact. Therefore, the Project Change would result in a change to the Certified EIR's impact determination related to criteria air pollutants from construction. The Project Change would result in a new significant and unavoidable impact that was not identified in the Certified EIR.

## Impact AQ-2b: Operation of the Metro Plan would result in a substantially more severe significant air quality impact than that identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.

### Summary of Certified EIR Impact Analysis

The Certified EIR concluded that implementation of the TASP would further contribute to an exceedance of regional air pollutant emission during operations, and this would result in a significant and unavoidable impact (see Impact Discussion 3.6-5 of the Certified EIR).

### Impact Analysis

The Metro Plan would be constructed in multiple phases, with operations occurring concurrently with construction. Therefore, operational emissions would include overlapping construction emissions. As described above, this analysis provides a quantified analysis of operational emissions based on the proposed land use mix and trip volumes and a qualitative analysis of construction emissions because specific construction details for individual developments are not known at this time.

Buildout of the Metro Plan has the potential to result in air quality impacts from area, energy, and mobile sources. Area sources would include landscaping equipment, off-gassing (release of VOCs) during the reapplication of architectural coatings, and consumer products (e.g., solvents, cleaning supplies, cosmetics, toiletries). Energy sources would include onsite natural gas combustion for space and water heating. Mobile sources would include vehicle trips generated by land uses proposed within the Metro Plan. Each of these sources was taken into account in calculating the Project Change long-term operational emissions, which were quantified using the CalEEMod model (for area and energy sources) and EMFAC2021 (for mobile sources), as described above.

Table 3.1-4 summarizes the unmitigated and mitigated operational emissions for the Project Change. To evaluate the magnitude of the change in the air quality environment due to implementation of the Project Change, the emissions under the Metro Plan buildout in 2040 are compared to the General Plan buildout in 2040, which includes full buildout of the TASP. The quantifiable mitigation included in the analysis is the restriction of natural gas infrastructure in future development, which would eliminate all the energy source criteria pollutant emissions. For specifics on the additional projected development for the Metro Plan for the buildout year 2040, please see Table 2-3 in Chapter 2 of this SEIR.

**Table 3.1-4. Unmitigated and Mitigated Project Change Criteria Pollutant Operational Emissions**

| | Pollutant Emissions (pounds per day) | | | | | |
|---|---|---|---|---|---|---|
| **Source** | **ROG** | **$NO_X$** | **CO** | **$SO_X$** | **$PM_{10}$** | **$PM_{2.5}$** |
| **Unmitigated Emissions** | | | | | | |
| Mobile Sources | 70.5 | 115.4 | 776.9 | 3.4 | 383.4 | 97.2 |
| Area Sources | 254.8 | 5.3 | 437.1 | <0.1 | 2.4 | 2.4 |
| Energy Sources | 4.5 | 40 | 27.5 | 0.2 | 3.1 | 3.1 |
| Total Unmitigated Project Emissions | **329.9** | **160.7** | **1,241.5** | **3.7** | **388.9** | **102.7** |
| **Mitigated Emissions [1]** | | | | | | |
| Mobile Sources | 70.5 | 115.4 | 776.9 | 3.4 | 383.4 | 97.2 |
| Area Sources | 254.8 | 5.3 | 437.1 | <0.1 | 2.4 | 2.4 |
| Energy Sources | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Mitigated Project Emissions | **325.4** | **120.6** | **1,213.9** | **3.44** | **385.8** | **99.6** |

Source: CalEEMod and mobile emissions modeling output provided in Appendix D.
[1] Quantifiable mitigation includes the restriction of natural gas infrastructure in future development, which would eliminate all the energy source criteria pollutant emissions. Actual energy-source emissions may be greater if it is not feasible for a development to eliminate gas-powered equipment. See Mitigation Measure AQ-7.
Note: Totals may not add up exactly due to rounding.

As shown in Table 3.1-4, buildout of the Project Change with incorporation of mitigation would result in an increase of approximately 325.4 pounds of ROG, 120.6 pounds of $NO_X$, 385.8 pounds of $PM_{10}$, and 99.6 pounds of $PM_{2.5}$. These emissions could contribute to ozone formation and other air pollution in the SFBAAB, which at certain concentrations, can contribute to short- and long-term human health effects, if left unmitigated.

As discussed above, BAAQMD's project-level thresholds were developed to analyze emissions generated by a single project, and as such offer an extremely conservative evaluation of emissions from the entire Metro Plan. Accordingly, operational air quality impacts of the Metro Plan are evaluated for consistency with the 2017 Clean Air Plan to determine whether criteria pollutant emissions attributed to population and economic growth are significant (refer to Impact AQ-1, above). The analysis demonstrates that the Metro Plan would support the goals of the 2017 Clean Air Plan, including all applicable control measures, and would not conflict with its implementation.

While the Metro Plan would reduce the severity of growth-oriented criteria pollutants by fostering bicycle, transit, and pedestrian infrastructure, and support sustainable land use patterns, including mixed-use design and increased density and intensity, individual projects developed under the Metro Plan may still generate emissions in excess of BAAQMD's project-level thresholds. Accordingly, operational criteria pollutant emissions associated with development under the Metro Plan are conservatively identified as potentially significant.

The Metro Plan includes numerous proposed improvements and policies to reduce VMT (Policy M 8), increase energy efficiency (Policy CB 7.2), and reduce energy consumption (Policy CB 7.2). For instance, the Metro Plan aims to create complete pedestrian and bicycle networks that connect trails and paths, maintain pedestrian and biking facilities, increase bicycle parking availability, construct street improvements and safety features to promote pedestrian trips, and install pedestrian-oriented signage to alert of potentially fast-moving traffic. Additionally, the Metro Plan encourages strengthening access and connection between the Metro Plan Area and the regional transit systems,

including Milpitas BART and VTA transit centers. The Metro Plan also aims to effectively manage transportation demand and parking by supporting programs such as the guaranteed ride home program, carshare spaces, bike share, parking cash-out, and childcare services. Several policies further support the maintenance and expansion of the transportation network to enhance connectivity, accessibility, and safety (see Policy M 5, Policy M 6, and Policy M 7). Together, the proposed improvements and policies would lessen the severity of growth-oriented criteria pollutants by reducing VMT, encouraging transit use, fostering bicycle and pedestrian infrastructure, and supporting sustainable land use patterns, including mixed-use design and increased density and intensity.

Despite these Metro Plan policies, it is reasonably foreseeable that projects developed under the Metro Plan would generate emissions in excess of BAAQMD's project-level thresholds. Mitigation Measure AQ-7 is required to reduce operational area source emissions to the extent feasible. Mitigation Measure AQ-8 is further required to offset operational criteria pollutant emissions through the purchase of mitigation credits. Through implementation of Mitigation Measures AQ-8, applicants would determine the estimated total emissions for operational activities, and BAAQMD would determine the mitigation fees for each development project's applicant to pay on a pro rata basis to BAAQMD to offset their pollutant emissions as necessary, such that BAAQMD's daily pollutant thresholds would not be exceeded. Offsetting emissions below BAAQMD's threshold levels would ensure future development under the Metro Plan would not contribute a significant level of air pollution such that regional air quality within the SFBAAB would be degraded. Based on recent experience of offsets being feasibly available for other large recent projects in Santa Clara County, it is reasonable to assume that offset programs will be available in the future and thus that emissions can be reduced below threshold levels. Should offset programs be available for future development, operational criteria pollutant emissions under the Metro Plan would be less than significant with mitigation. However, because it cannot be concluded that offset programs would always be available in the future at the time and in the amount needed for any given future development, for the purposes of this EIR analysis, operational air quality impacts are conservatively assumed to be significant and unavoidable.

Additionally, the Project's operational emissions would potentially exceed BAAQMD's regional significance thresholds for ROG, $NO_X$, and CO. Implementation of Mitigation Measure AQ-7 and Mitigation Measure AQ-8 would help ensure that the individual developments within the City would not contribute a significant level of air pollution such that regional air quality within the Basin would be degraded. However, because cumulative development within the City would potentially exceed the BAAQMD regional significance thresholds, the Project Change could contribute to an increase in health effects in the SFBAAB until the attainment standards are met. Accordingly, health impacts related to regional criteria pollutants would be significant and unavoidable.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for air quality impacts related to criteria pollutants due to operation of the TASP.

### New Mitigation Measures

The following mitigation measures would be required for the Metro Plan.

**Mitigation Measure AQ-7: Restrict Use of Natural Gas in New Development**

Future development within the Metro Plan Area shall utilize electric space and water heating to the maximum extent feasible or to the extent required by existing or future local building regulations. Natural gas infrastructure and appliances shall be installed to the extent feasible as determined by the availability and capacity of electrical power distribution infrastructure.

**Mitigation Measure AQ-8: Purchase Mitigation Credits for Operational Emissions Exceeding BAAQMD's Daily Pollutant Thresholds**

Applicants proposing development of projects within the Metro Plan Area shall compare their project size with the BAAQMD screening sizes appropriate to their project for operational criteria pollutants found in Table 3-1 in BAAQMD's current CEQA guidelines (2017). The screening limit for general office buildings, office park, or government office building is 346,000 square feet, 323,000 square feet, and 61,000 square feet, respectively. There are different screening limits for residential, retail, hotels, and other developments based off specific land use type (e.g., single-family housing, apartments, low-rise, hotels, strip malls)

If the project is less than the screening limit for the project type, then no further action is required.

Project applicants not excluded by the condition above shall estimate annual average operational emissions for each operational year over the life of the project (20 years) and compare the annual average emissions for each year of operations to the BAAQMD thresholds used in the EIR for criteria pollutants. The emissions estimate shall be provided as part of the project's initial application to the City for the project. The City will review the estimate and confirm whether offsets are required for operation. Should the City-confirmed estimate indicate that the proposed development estimate would not result in operational emissions exceeding BAAQMD's daily pollutant thresholds, no further action is required.

For proposed developments that are estimated to result in exceedances of thresholds during any year of the project's life, the applicants shall coordinate with a third-party (e.g., Bay Area Clean Air Foundation) or governmental entity to pay for criteria pollutant offsets for every year in which operational emissions are estimated to exceed the BAAQMD thresholds. If the estimate shows exceedances of multiple criteria pollutants above the BAAQMD thresholds, then offsets must be obtained to address each pollutant above the thresholds. Emission reduction projects and fee will be determined in consultation between the applicant and the third-party or governmental entity and will include offset provider administrative costs. The agreement that specifies fees and timing of payment shall be provided to the City for review and signed by the applicant and the third-party or governmental entity. The emission reductions shall be secured prior to any year in which operational activity is estimated to result in an exceedance. The payment for the emissions can either be on an annual basis or done once upfront prior to operation.

To qualify under this mitigation measure, the specific emissions reduction project(s) must result in emission reductions in the SFBAAB that are real, surplus, quantifiable, and enforceable, and that would not otherwise be achieved through compliance with existing regulatory requirements of any other legal requirement.

### Conclusions for Impact AQ-2b

The Certified EIR concluded that even after implementation of policies included in the 1994 General Plan, criteria air pollutant (ozone, $PM_{10}$, and $PM_{2.5}$) impacts due to operation, for which the SFBAAB is in nonattainment, would be significant and unavoidable. Based on the analysis above, with incorporation of the Project Change, operation of the Metro Plan would result in a significant and unavoidable impact related to a cumulatively considerable net increase in criteria pollutants for which the SFBAAB is in nonattainment, even with implementation of Mitigation Measure AQ-7 and Mitigation Measure AQ-8. The Project Change would not result in a change to the Certified EIR's impact related to criteria air pollutants from operation. Nonetheless, the magnitude of the impact would be greater with operation of the Metro Plan, and the Project Change would result in a substantially more severe impact than what was identified in the Certified EIR.

## Impact AQ-3: Implementation of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to exposing sensitive receptors to substantial pollutant concentrations.

### Summary of Certified EIR Impact Analysis

The Certified EIR concluded that CO emissions from the TASP would not exceed the BAAQMD thresholds and would decrease by 2030 (see Impact Discussion 3.6-4 of the Certified EIR). Thus, the Certified EIR determined that the TASP would not result in localized air quality impacts. The Certified EIR concluded that with compliance of BAAQMD's construction BMPs and TASP Policy 5.23, which requires new residential developers to inform future residents of TAC-related health effects and the potential for exposure, the TASP would not expose sensitive receptors to substantial TACs (see Impact Discussion 3.6-6 of the Certified EIR). Impacts were found to be less than significant for the TASP.

### Impact Analysis

#### *Criteria Pollutants*

The California Supreme Court's 2018 decision in *Sierra Club v. County of Fresno* (6 Cal. 5th 502) (hereafter referred to as the Friant Ranch Decision) reviewed the long-term, regional air quality analysis contained in the EIR for the proposed Community Plan Update and Friant Ranch Specific Plan (Friant Ranch Project). The Friant Ranch Project is a 942-acre master-plan development in unincorporated Fresno County within the San Joaquin Valley Air Basin, an air basin currently in nonattainment under the NAAQS and CAAQS for ozone and $PM_{2.5}$. The Court found that the EIR's air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time." The Court's decision clarifies that environmental documents must attempt to connect a project's air quality impacts to specific health effects or explain why it is not technically feasible to perform such an analysis.

Adverse health effects induced by regional criteria pollutant emissions generated by the Metro Plan (ozone precursors and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). Ozone precursors (ROG and $NO_X$) contribute to the formation of ground-borne ozone on a regional scale. Emissions of ROG and $NO_X$ generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of

particulate pollution may be transported over long distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project. Moreover, exposure to regional air pollution does not guarantee that an individual will experience an adverse health effect—as discussed above, there are large individual differences in the intensity of symptomatic responses to air pollutants. These differences are influenced, in part, by the underlying health condition of an individual, which cannot be known.

Models and tools have been developed to correlate regional criteria pollutant emissions to potential community health impacts. Appendix D summarizes many of these tools, identifies the analyzed pollutants, describes their intended application and resolution, and analyzes whether they could be used to reasonably correlate project-level emissions to specific health consequences. As described in Appendix D, while there are models capable of quantifying ozone and secondary PM formation and associated health effects, these tools were developed to support regional planning and policy analysis and have limited sensitivity to small changes in criteria pollutant concentrations induced by individual projects. Therefore, translating project-generated criteria pollutants to the locations where specific health effects could occur or the resultant number of additional days of nonattainment cannot be achieved with any degree of accuracy.

Technical limitations of existing models to correlate project-level regional emissions to specific health consequences are recognized by air quality management districts throughout the state, including the San Joaquin Valley Air Pollution Control District (SJVAPCD) and South Coast Air Quality Management District (SCAQMD), who provided amici curiae briefs[2] for the Friant Ranch legal proceedings. In its brief, SJVAPCD (2015) acknowledges that while health risk assessments for localized air toxics, such as DPM, are commonly prepared, "it is not feasible to conduct a similar analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task." SJVAPCD further notes that emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NOx and VOC in the Valley) is not likely to yield valid information," and that any such information should not be "accurate when applied at the local level." SCAQMD (2015) presents similar information in their brief, stating that "it takes a large amount of additional precursor emissions to cause a modeled increase in ambient ozone levels".[3] The Sacramento Metropolitan Air Quality Management District (2019) also acknowledges "neither the Sac Metro Air District nor any other air district currently have methodologies that would provide Lead Agencies and CEQA practitioners with a consistent, reliable, and meaningful analysis to correlate specific health impacts that may result from a proposed project's mass emissions."

As discussed above, BAAQMD's regional thresholds consider existing air quality concentrations and attainment or nonattainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe

[2] Latin for "friend(s) of the court"; a person or group who is not a party to an action, but has a strong interest in the matter, will petition the court for permission to submit a brief in the action with the intent of influencing the court's decision.

[3] For example, SCAQMD's analysis of their 2012 Air Quality Attainment Plan showed that modeled $NO_X$ and ROG reductions of 432 and 187 tons per day, respectively, only reduced ozone levels by 9 parts per billion. Analysis of SCAQMD's Rule 1315 showed that emissions of $NO_X$ and ROG of 6,620 and 89,180 pounds per day, respectively, contributed to 20 premature deaths per year and 89,947 school absences (South Coast Air Quality Management District 2015).

concentrations of criteria pollutants. While recognizing that air quality is a cumulative problem, BAAQMD considers projects that generate criteria pollutant and ozone precursor emissions below these thresholds to be minor in nature, such that they would not adversely affect air quality to the extent that the health-protective NAAQS or CAAQS would be exceeded. Regional emissions generated by a project could increase photochemical reactions and the formation of tropospheric ozone and secondary PM, which at certain concentrations, could lead to increased incidence of specific health consequences. Although these health effects are associated with ozone and particulate pollution, the effects are a result of cumulative and regional emissions. Thus, the Metro Plan's incremental contribution cannot be traced to specific health outcomes on a regional scale, and a quantitative correlation of project-generated regional criteria pollutant emissions to specific human health impacts is not included in this analysis. All feasible mitigation is being applied to reduce construction- and operational-generated emissions of ozone precursors and PM to the extent possible.

As discussed above under Impact AQ-2a, construction emissions resulting from individual projects developed under the Metro Plan could exceed BAAQMD's regional ROG, $NO_X$, and PM thresholds. Mitigation Measures AQ-1 through AQ-6 would reduce regional emissions of ROG, $NO_X$, and PM below BAAQMD's regional thresholds (assuming offset programs are available in the future). Similarly, long-term operation of development under the Metro Plan would result in an increase of approximately 325.4 pounds of ROG, 120.6 pounds of $NO_X$, 385.8 pounds of $PM_{10}$, and 99.6 pounds of $PM_{2.}5$. Mitigation Measure AQ-7 and Mitigation Measure AQ-8 would reduce regional emissions of ROG, $NO_X$, and PM of individual projects developed under the Metro Plan below BAAQMD's regional thresholds (assuming offset programs are available in the future). Based on recent experience of offsets being feasibly available for other large recent projects in the Bay Area, it is reasonable to assume that offset programs will be available in the future and thus that emissions can be reduced below threshold levels. Should offset programs be available for future development, health impacts related to criteria pollutant emissions under the Metro Plan would be less than significant with mitigation, as discussed above. Because it cannot be concluded that offset programs per Mitigation Measure AQ-6 and Mitigation Measure AQ-8 would be available in the future at the time and in the amount needed for any given future development, for the purposes of this SEIR analysis, health impacts related to regional criterial pollutants are conservatively assumed to be significant and unavoidable.

During grading and excavation activities associated with construction, localized fugitive dust would be generated. The amount of dust generated by a project is highly variable and dependent on the size of the disturbed area at any given time, the amount of activity, soil conditions, and meteorological conditions. BAAQMD's CEQA air quality guidelines consider dust impacts to be less than significant if BAAQMD's construction BMPs are employed to reduce such emissions. Because BAAQMD's Basic Construction Mitigation Measures would be implemented, per Mitigation Measure AQ-5, construction-related fugitive dust emissions would be less than significant and would not expose receptors to substantial pollutant concentrations or risks.

Continuous engine exhaust may elevate localized CO concentrations, resulting in hot spots. Receptors exposed to these CO hot spots may have a greater likelihood of developing adverse health effects. CO hot spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations. Peak-hour traffic volumes at 12 intersections in the vicinity of the Metro Plan were analyzed to determine whether CO emitted by Project-generated traffic would exceed BAAQMD screening criteria. Maximum traffic volumes at the intersections under all scenarios would be less than BAAQMD's recommended screening criterion of

44,000 vehicles per hour. Also, intersection traffic volumes under all scenarios would not exceed the screening criterion of 24,000 vehicles per hour that BAAQMD recommends for areas where vertical and/or horizontal mixing is substantially limited. For these reasons, the Proposed Project would be consistent with the requirements of the City/County Association of Government's Congestion Management Plan as discussed in Section 3.7, *Transportation*. The Project would not result in, or contribute to, a localized concentration of CO that would exceed the applicable NAAQS or CAAQS. This impact would be less than significant.

***Toxic Air Contaminants***

The California Supreme Court has held that lead agencies are not required to analyze the impacts of the environment on a project's future users or residents, unless the project exacerbates existing environmental hazards (see *California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal.41h 369*) or when the legislature has indicated the requirement by specific Public Resources Code sections (21096, 21151.8, 21155.1, 21159.21, 21159.22, 21159.23, and 21159.24). Some specifically defined environmental hazards are associated with airport noise and safety, school projects, certain kinds of infill housing, and transit priority projects and must be addressed. The Metro Plan would guide future development within the Metro Plan Area. Certain land use types proposed under the Metro Plan may introduce emission sources (e.g., generators, delivery trucks) that would exacerbate existing environmental TAC hazards. The Metro Plan could introduce new sensitive receptors to the Metro Plan Area, including residences and daycares, that may be exposed to the exacerbated existing TAC hazard. Accordingly, this analysis considers both potential effects of Metro Plan development on existing receptors, as well as effects of the environment on Metro Plan receptors.

Demolition of existing structures results in particulates that may disperse asbestos-containing materials (ACM) to adjacent sensitive receptor locations. ACM were commonly used as fireproofing and insulating agents prior to the 1970s. The U.S. Consumer Product Safety Commission banned use of most ACM in 1977 due to their link to mesothelioma. However, buildings constructed prior to 1977 that would be demolished by the development supported by the Metro Plan may have used ACM and could expose receptors to asbestos, which may become airborne with other particulates during demolition.

All demolition activities would be subject to EPA's asbestos National Emissions Standards for Hazardous Air Pollutants (NESHAP), if asbestos is present at the existing facilities. The asbestos NESHAP regulations protect the public by minimizing the release of asbestos fibers during activities involving the processing, handling, and disposal of ACM. The asbestos NESHAP regulations for demolition and renovation are outlined in BAAQMD Regulation 11, Rule 2. In addition to demolition and renovation measures, BAAQMD Regulation Rule 2 also includes measures to address ACM during haul truck transport. More specifically, it includes provisions such as treating ACM with water prior to transport and placing such materials in leak-tight containers for haul truck transport to disposal sites. Consequently, regulatory mechanisms exist that would ensure that impacts from ACM, if present during demolition activities within the Metro Plan Area, would be less than significant.

Development under the Metro Plan may result in the installation or operation of new stationary sources of TACs (e.g., generators). While it is unknown what specific sources would be installed or where they would operate, all new stationary sources would be subject to the permit authority of BAAQMD. BAAQMD will not issue a permit for a new permitted source that results in an operational

cancer risk in excess of 10.0 cases per million or a hazard index in excess of 1.0. Consequently, regulatory mechanisms exist that would ensure that cancer and health hazard impacts from stationary sources developed under the Project would be less than significant. However, BAAQMD's permit does not specifically address $PM_{2.5}$ impacts. Therefore, while BAAQMD's permitting would achieve some reductions in $PM_{2.5}$, it may not be sufficient to address $PM_{2.5}$ impacts if the source results in significant $PM_{2.5}$ concentrations.

CARB (2005) recommends avoiding new sensitive land uses within 500 feet of a freeway or urban roads with 100,000 vehicles per day. Epidemiological studies indicate that the distance from the roadway and truck traffic densities were key factors in the correlation of health effects, particularly in children. The increase in traffic from the Metro Plan would generate additional vehicle-related TACs (including DPM). As I-880 and I-680 are currently classified as freeways with high volumes (per CARB's land use handbook), the future traffic levels from the Metro Plan would exacerbate existing cumulative health risks. Consequently, both new and existing receptors near these roadways may be exposed to significant health risks from mobile source TACs.

Construction activities of future development projects under the Metro Plan would generate DPM and $PM_{2.5}$ that could expose adjacent receptors to significant health risks. Without specific details on the locations of building footprints or their construction schedules, a quantitative evaluation of potential health risk impacts is not possible. Depending on the size and scale of an individual development project, along with its construction schedule and proximity to receptors, there may also be instances where DPM emissions could result in cancer or non-cancer health risks that exceed BAAQMD's thresholds, resulting in a potentially significant impact.

The potentially significant impacts resulting from exposure of receptors to $PM_{2.5}$ exhaust from new stationary sources, TAC emissions from increased traffic volumes, and TACs generated during project construction activities would be reduced by Metro Plan policies and mitigation measures. Mitigation Measure AQ-1 would require BMPs to minimize construction emissions. In addition, Policy SC 8.1 in the Metro Plan requires the installation of high-efficiency filters should new sensitive receptors be sited within 500 feet of major roadways and highways in the Metro Plan Area. Reductions achieved by this measure cannot currently be quantified as the locations of these receptors are unknown.

Even with these Metro Plan policies and BMPs, additional emissions generated by new stationary sources, vehicle trips, and construction activity could expose receptors to cancer and non-cancer risks in excess of BAAQMD significance thresholds during construction and operational activities. Figure 2-1 shows that the proposed developments within the Metro Plan Area are within 1,000 feet of existing sensitive receptors. Mitigation Measure AQ-9 requires applicants to provide a project-level evaluation of construction- and operational-related health risks from future projects. However, because it cannot be concluded what the result of the project level evaluation will be without speculation, it is possible that mitigation for future project health risks may be inadequate to reduce impacts below BAAQMD's threshold level. This impact would be significant and unavoidable.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures related to exposing sensitive receptors to substantial toxic air contaminants. **.**

### New Mitigation Measures

The following mitigation measure would be required for the Metro Plan.

#### Mitigation Measure AQ-9: Prepare a Health Risk Assessment

All applicants proposing development of projects in the Metro Plan Area within 1,000 feet of existing sensitive receptors, as defined by BAAQMD (e.g., residential), shall prepare a site-specific construction and operational Health Risk Assessment (HRA). The HRA shall include all reasonably foreseeable sources of TAC, consistent with BAAQMD guidelines. If the HRA demonstrates, to the satisfaction of the City, that the health risk exposures or $PM_{2.5}$ concentrations for adjacent receptors would be less than BAAQMD project-level thresholds, then additional mitigation would be unnecessary. However, if the HRA demonstrates that health risks or $PM_{2.5}$ concentrations would exceed BAAQMD project-level thresholds, additional feasible on- and offsite mitigation would be analyzed by the applicant to help reduce risks to the greatest extent practicable. Mitigation may include installation of indoor air filters (MERV 13 or higher) at sensitive receptor locations and planting of vegetation and trees as pollution buffers.

### Conclusions for Impact AQ-3

The Certified EIR concluded that, after implementation of policies included in the TASP, impacts related to exposing sensitive receptors to substantial toxic air contaminants would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a significant and unavoidable impact with regard to exposing sensitive receptors to particulate matter pollution during construction and operation. Thus, the Project Change would result in a change to the Certified EIR's impact determination with regard to exposing sensitive receptors to substantial TACs. The Project Change would result in a new significant and unavoidable impact that was not identified in the Certified EIR.

## Impact AQ-4: Implementation of the Metro Plan would not result in new or substantially more severe impacts than those identified in the Certified EIR related to creating objectionable odors affecting a substantial number of people.

### Summary of Certified EIR Impact Analysis

The Certified EIR, as amended during the response to comments made by BAAQMD, concluded that future development within the TASP Area would be subject to further CEQA review to evaluate project-level impacts of odors, and that odor impacts would be less than significant.

### Impact Analysis

#### *Construction*

Construction of the Project Change would result in additional heavy-duty equipment and paved surfaces that could generate temporary odors. These odors would be of a nearly identical nature to the odors generated by the TASP. Because the odors would be temporary, localized, and similar to the TASP, the Project Change would not create objectionable odors that would affect a substantial number of people. Impacts would be less than significant.

***Operation***

During operation of the Metro Plan, diesel exhaust from landscaping equipment and occasional trash pick-up could create unpleasant exhaust odors. Such odors would be temporary and localized, and would only occur in the immediate vicinity of either the landscaping equipment or trash truck during the relatively short duration of the activity. As such, these activities would not expose a substantial number of people to objectionable odors. Impacts would be less than significant.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to creating odors. .

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact AQ-4

The Certified EIR determined that the Project would have a less-than-significant impact with regard to odors. Based on the analysis above, with incorporation of the Project Change, the Project would have a less-than-significant impact with regard to odors. The Project Change would not alter the Certified EIR's impact determination for impacts related to odors. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

# 3.2 Greenhouse Gas Emissions

This section discloses and analyzes the potential change in Project impacts on greenhouse gas (GHG) emissions that would result from implementing the Project Change.

## 3.2.1 Regulatory Setting

The regulatory setting for GHG and climate change is described on pages 3.12-4 to 3.12-6 of the Certified EIR. These regulations include federal regulations concerning fuel economy and greenhouse gases, state executive orders, the state's GHG goals, and regional plans. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIR.

The regulatory environment for the Project concerning greenhouse gases is largely the same as regulatory setting discussed in the Certified EIR. However, some noteworthy new regulations since the release of the Certified EIR in 2008 are summarized below.

### 3.2.1.1 Federal

#### Corporate Average Fuel Economy Standards

As discussed in Section 3.2, *Air Quality*, the National Highway Traffic Safety Administrative (NHTSA) sets the Corporate Average Fuel Economy Standards (CAFE) to improve the average fuel economy and reduce GHG emissions generated by cars and light duty trucks. NHTSA and United States Environmental Protection Agency (EPA) have proposed to amend the current fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). California, 22 other states, the District of Columbia, and two cities filed suit against the proposed action on September 20, 2019 (*California et al. v. United States Department of Transportation et al.*, 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting Defendants from implementing or relying on the Preemption Regulation," but does not stay its implementation during legal deliberations. Part 1 of the SAFE Vehicles Rule went into effect on November 26, 2019. Part 2 of the Rule was finalized on March 30, 2020. The SAFE Vehicles Rule will decrease the stringency of CAFÉ standards to 1.5 percent each year through model year 2026, as compared with the standards issued in 2012, which would have required about 5 percent annual increases.

### 3.2.1.2 State

#### Assembly Bill 1493—Pavley Rules (2002, amendments 2009)/Advanced Clean Cars (2011)

Known as Pavley I, AB 1493 provided the nation's first GHG standards for automobiles. AB 1493 required CARB to adopt vehicle standards that will lower GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as *Pavley II* and now referred to as the *Advanced Clean Cars* [ACC] measure)

was adopted for vehicle model years 2017–2025 in 2012. Together, the two standards are expected to increase average fuel economy to roughly 54.5 mpg in 2025.

## Senate Bills 1078/107/X 1-2—Renewables Portfolio Standard and Renewable Energy Resources Act (2002, 2006, 2011)

SBs 1078 and 107, California's Renewables Portfolio Standard (RPS), obligated investor-owned utilities, energy service providers, and Community Choice Aggregations to procure an additional one percent of retail sales per year from eligible renewable sources until 20 percent is reached by 2010. The California Public Utilities Commission and California Energy Commission (CEC) are jointly responsible for implementing the program. SB X 1-2, called the California Renewable Energy Resources Act, obligates all California electricity providers to obtain at least 33 percent of their energy from renewable resources by 2020. As noted below, SB 350 increased the RPS to 50 percent for 2030, and SB100 increased the RPS to 100 percent by 2045.

## Assembly Bill 32—California Global Warming Solutions Act (2006)

The scoping plan for AB 32 identifies specific measures to reduce GHG emissions to 1990 levels by 2020 and requires CARB and other state agencies to develop and enforce regulations and other initiatives to reduce GHG emissions. The AB 32 Scoping Plan, first adopted in 2008, comprises the state's roadmap for meeting AB 32's reduction target. Specifically, the scoping plan articulates a key role for local governments by recommending that they establish GHG emissions-reduction goals for both their municipal operations and the community that are consistent with those of the state (i.e., approximately 15 percent below 2005 levels by 2020) (CARB 2008).

CARB re-evaluated its emissions forecast in light of the economic downturn and updated the projected 2020 emissions to 545 million metric tons of carbon dioxide equivalent ($MMTCO_2e$). Two reduction measures (Pavley I and RPS [12–20 percent]) that were not previously included in the 2008 scoping plan baseline were incorporated into the updated baseline, further reducing the 2020 statewide emissions projection to 507 $MMTCO_2e$. The updated forecast of 507 $MMTCO_2e$ is referred to as the AB 32 2020 baseline. An estimated reduction of 80 $MMTCO_2e$ is necessary to lower statewide emissions to the AB 32 target of 427 $MMTCO_2e$ by 2020 (CARB 2014).

CARB approved the *First Update to the Scoping Plan* (First Update) on May 22, 2014. The First Update includes both a 2020 element and a post-2020 element. The 2020 element focuses on the state, regional, and local initiatives that are being implemented now to help the State meet the 2020 goal.

On December 14, 2017, CARB approved the *2017 Climate Change Scoping Plan Update* (referred to as 2017 Scoping Plan herein), which is the proposed strategy for achieving California's 2030 GHG emissions target. In addition to building on established programs, such as cap-and-trade regulation, and the low-carbon fuel standard (LCFS), the update addresses, for the first time, GHG emissions related to agriculture and forestry in California (CARB 2017).

## Executive Order S-01-07—Low Carbon Fuel Standard (2007)

Executive Order (EO) S-01-07, the Low-Carbon Fuel Standard (LCFS), mandates (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020, with a reduction in the carbon content of fuel by a quarter of a percent starting in 2011, and (2) that a low carbon fuel standard for transportation fuels be established in California.

This regulation was amended to increase the statewide goal to a 20-percent reduction in carbon intensity of California's transportation fuels by at least by 2030.

## Senate Bill 375 (2008)

SB 375, signed into law by Governor Schwarzenegger on September 30, 2008, became effective January 1, 2009. This law requires the state's 18 Metropolitan Planning Organizations to develop the sustainable communities strategies (SCS) as part of their Regional Transportation Plans (RTPs) through integrated land use and transportation planning, and to demonstrate an ability to attain the GHG emissions reduction targets that the CARB established for the region by 2020 and 2035. This would be accomplished through either the financially constrained SCS as part of the RTP or an unconstrained alternative planning strategy. If regions develop integrated land use, housing, and transportation plans that meet the SB 375 targets, new projects in these regions can be relieved of certain CEQA review requirements.

## Assembly Bill 341 (2011)

In 2011, AB 341 modified the California Integrated Waste Management Act and directed CalRecycle to develop and adopt regulations for mandatory commercial recycling. The resulting Mandatory Commercial Recycling Regulation (2012) requires that on and after July 1, 2012, certain businesses that generate 4 cubic yards or more of commercial solid waste per week or a multifamily residential dwelling of 5 units or more must arrange recycling services. To comply with this requirement, businesses may either separate recyclables and self-haul them or subscribe to a recycling service that includes mixed waste processing. AB 341 also established a statewide recycling goal of 75 percent by 2020.

## Cap-and-Trade (2011, 2017)

CARB adopted the cap-and-trade program in October 2011. The California Cap-and-Trade program is a market-based system with an overall emissions limit for affected emission sources. Affected sources include in-state electricity generators, hydrogen production, petroleum refining, and other large-scale manufacturers and fuel suppliers and distributors. The original Cap-and-Trade program set a compliance schedule through 2020. AB 398 extends the program through 2030 and requires CARB to make refinements, including establishing a price ceiling. Revenue generated from the Cap-and-Trade program is used to fund various programs. AB 398 established post-2020 funding priorities, to include (1) Air Toxics and Criteria Pollutants, (2) Low and Zero Carbon Transportation, (3) Sustainable Agricultural Practices, (4) Healthy Forests and Urban Greening, (5) Short-lived Climate Pollutants, (6) Climate Adaptation and Resiliency, and (7) Climate and Clean Energy Research.

## Senate Bill 1383 (2013)

SB 1383, adopted in 2013, requires CARB to develop and implement a Short-Lived Climate Pollutant (SLCP) Strategy. SB 1383 directed CARB to approve and implement the SLCP Reduction Strategy to achieve the following reductions in SLCPs.

- 40 percent reduction in methane below 2013 levels by 2030.
- 40 percent reduction in hydrofluorocarbon gases below 2013 levels by 2030.
- 50 percent reduction in anthropogenic black carbon below 2013 levels by 2030.

The bill also establishes the following targets for reducing organic waste in landfills and methane emissions from dairy and livestock operations.

- 50 percent reduction in organic waste disposal from the 2014 level by 2020.
- 75 percent reduction in organic waste disposal from the 2014 level by 2025.
- 40 percent reduction in methane emissions from livestock manure management operations and dairy manure management operations below the dairy sector's and livestock sector's 2013 levels by 2030.

CARB adopted the SLCP Reduction Strategy in March 2017 as a framework for achieving the methane, hydrofluorocarbon, and anthropogenic black carbon reduction targets set by SB 1383. The SLCP Reduction Strategy includes 10 measures to reduce SLCPs, which fit within a wide range of ongoing planning efforts throughout the State. CARB and CalRecycle are currently developing regulations to achieve these goals.

## Executive Order B-30-15 (2015)

Governor Jerry Brown signed EO B-30-15 on April 29, 2015. EO B-30-15 established a medium-term goal for 2030 of reducing GHG emissions by 40 percent below 1990 levels and requires the CARB to update its current AB 32 Scoping Plan to identify measures to meet the 2030 target. EO B-30-15 supports EO S-3-05 but is only binding on state agencies.

## Senate Bill 350 (2015)

SB 350 (De León, also known as the "Clean Energy and Pollution Reduction Act of 2015") was approved by the California legislature in September 2015 and signed by Governor Brown in October 2015. Its key provisions are to require the following by 2030: (1) an RPS of 50 percent and (2) a doubling of efficiency for existing buildings.

## Senate Bill 32, California Global Warming Solutions Act of 2006: Emissions Limit, and Assembly Bill 197, State Air Resources Board, Greenhouse Gases, Regulations (2016)

SB 32 (Pavley) bill requires CARB to ensure that statewide GHG emissions are reduced to at least 40 percent below the 1990 level by 2030, consistent with the target set forth in EO B-30-15. The bill specifies that SB 32 shall become operative only if AB 197 (Garcia) is enacted and becomes effective on or before January 1, 2017. AB 197 creates requirements to form the Joint Legislative Committee on Climate Change Policies; requires CARB to prioritize direct emission reductions from stationary sources, mobile sources, and other sources and consider social costs when adopting regulations to reduce GHG emissions beyond the 2020 statewide limit; requires CARB to prepare reports on sources of GHGs, criteria air pollutants, and toxic air contaminants; establishes 6-year terms for voting members of CARB; and adds two legislators as non-voting members of CARB. Both bills were signed by Governor Brown in September 2016.

CARB approved the 2017 Scoping Plan Update in December 2017, which builds on the programs set in place as part of the previous Scoping Plan that was drafted to meet the 2020 reduction targets per AB 32. The 2017 Scoping Plan Update proposes meeting the 2030 goal by accelerating the focus on zero and near-zero technologies for moving freight, continued investment in renewables, greater use of low-carbon fuels including electricity and hydrogen, stronger efforts to reduce emissions of

short-lived climate pollutants (methane, black carbon, and fluorinated gases), further efforts to create walkable communities with expanded mass transit and other alternatives to traveling by car, continuing the cap-and-trade program, and ensuring that natural lands become carbon sinks to provide additional emissions reductions and flexibility in meeting the target. The Scoping Plan Update also recommends that local governments aim to achieve community-wide efficiency of 6 metric tons of $CO_2e$ ($MTCO_2e$) per capita by 2030 and 2 $MTCO_2e$ per capita by 2050 to be used in local climate action planning. These efficiency targets would replace the "15 percent from 2008 levels by 2020" approach recommended in the initial Scoping Plan, which would allow for local governments to grow in a sustainable manner (CARB 2016).

## SB 743 (2013)

Under SB 743, in 2013, the Governor's Office of Planning and Research (OPR) implemented changes to the State CEQA Guidelines, including the addition of Section 15064.3, which requires CEQA transportation analyses to move away from a focus on vehicle delay and level of service (OPR 2017a). In support of these changes, OPR published its Technical Advisory on Evaluating Transportation Impacts in CEQA, which recommends that the determination of the transportation impact of a project be based on whether project-related vehicle miles traveled (VMT) per capita (or VMT per employee) would be 15 percent lower than that of existing development in the region. OPR's technical advisory explains that this criterion is consistent with Section 21099 of the California Public Resources Code, which states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions"(OPR 2017b). This metric is intended to replace the use of vehicle delay and level of service to measure transportation-related impacts.

## Senate Bill 100 (2018)

SB 100 (De León, also known as the "California Renewables Portfolio Standard Program: emissions of greenhouse gases") was approved by the California legislature and signed by Governor Brown in September 2018. The bill increases the RPS in 2030 from 50 percent to 60 percent and establishes a goal of 100 percent RPS by 2045. SB 100 is a legislative action that was signed into law after the 2017 Scoping Plan was adopted. The Scoping Plan modeling is based on the SB 350 target of 50 percent renewables by 2030. However, the new SB 100 targets of 60 percent renewables by 2030 and 100 percent renewables by 2045 supersede the goals of SB 350 and will be included in future Scoping Plan updates.

## Executive Order B-55-18 (2018)

EO B-55-18 was approved by the California legislature and signed by Governor Brown in September 2018. EO B-55-18 acknowledges the environmental, community, and public health risks posed by future climate change. It further recognizes the climate stabilization goal adopted by 194 states and the European Union under the Paris Agreement. While the United States was not party to the agreement, California is committed to meeting the Paris Agreement goals and going beyond them wherever possible. Based on the worldwide scientific agreement that carbon neutrality must be achieved by midcentury, EO B-55-18 establishes a new state goal to achieve carbon neutrality as soon as possible, and no later than 2045, and to achieve and maintain net negative emissions thereafter. The EO charges the CARB with developing a framework for implementing and tracking progress towards these goals. It extends EO S-3-05 but is only binding on state agencies. However, given this directive, it is likely that the carbon neutral goal by 2045 will make its way into future updates to the Scoping Plan, which must be updated every five years.

### Green Building Code and Title 24 Updates

The California Green Building Standards (CALGreen) Code (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (24 CCR). Part 11 established voluntary standards that became mandatory under the 2010 edition of the code. These involved sustainable site development, energy efficiency (in excess of CEC requirements), water conservation, material conservation, and internal air contaminants. The current energy efficiency standards were adopted in 2018 and took effect on January 1, 2020. The CEC is responsible for adopting, implementing, and updating the standards every 3 years.

## 3.2.1.3 Local

### Bay Area Air Quality Management District/2017 Clean Air Plan

As discussed in Section 3.1, *Air Quality*, the BAAQMD is responsible for air quality planning within the SFBAAB, including projects in the City of Milpitas. On April 19, 2017, the BAAQMD Board of Directors adopted an update to the 2010 Clean Air Plan, the *2017 Clean Air Plan* (Bay Area Air Quality Management District 2017b). The 2017 Clean Air Plan focuses on protecting public health and protecting the climate and contains control measures aimed at reducing air pollution in the region. BAAQMD has adopted advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's GHG emissions, including long range plans (e.g., general plans, specific plans), which are outlined in its *California Environmental Quality Act: Air Quality Guidelines* (BAAQMD 2017a). The State CEQA Guidelines also outline methods for quantifying GHG emissions, as well as potential mitigation measures.

In December 2021, BAAQMD hosted a Public Workshop to discuss its proposed updates to the CEQA GHG thresholds of significance from the 2017 CEQA Guidelines. These proposed GHG thresholds of significance were updated to consider newer state reduction targets (e.g., SB 32) and eventual carbon neutrality by 2045, as well as evolving case law. Of particular note with these updated thresholds is BAAQMD's emphasis on (1) avoiding developing fossil fuel infrastructure in new buildings that will be in place for decades and thus conflict with carbon neutrality by 2045, and (2) consistency with a qualified greenhouse reduction strategy (also known as a Climate Action Plan).

### Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) is the Metropolitan Planning Organization for the nine counties that comprise the San Francisco Bay Area and the SFBAAB, which includes the City of Milpitas. As described above, SB 375 requires the metropolitan planning organizations to prepare regional transportation plans/sustainable community strategies (RTPs/SCSs) that present integrated regional land use and transportation approaches to reduce VMT and their associated GHG emissions. CARB identified the initial goal for the SFBAAB as a reduction in VMT per capita by 7 percent for 2020 and by 15 percent by 2035 compared to 2005 levels. MTC adopted an RTP/SCS in 2013 known as *Plan Bay Area* which was updated in 2021 as *Plan Bay Area 2050* (Plan Bay Area 2050). The Plan Bay Area 2050 includes 35 different strategies across the elements of housing, economy, transportation, and the environment to help make the Bay Area more equitable for all residents. In total, the Plan Bay Area 2050 has 80 specific actions for the MTC, Association of Bay Area governments (ABAG), and other partners to help achieve the goals of the Plan Bay Area 2050.

In 2018, CARB updated the per-capital GHG emissions reduction targets to be a 10 percent per capita GHG reduction by 2020 and 19 percent per capita reduction by 2035 from 2005 levels

(California Air Resources Board 2018a). Plan Bay Area 2050 is relevant to the Project because CEQA guidelines require assessment of a project's consistency with plans to reduce GHG emissions. Future CEQA review of new development applications under the Metro Plan should be based on the most current Plan Bay Area and RTP/SCS.

## City of Milpitas Climate Action Plan

On May 7, 2013, the City adopted a qualified Climate Action Plan (2013 CAP) with the goal of creating a more sustainable community by reducing GHG emissions. The 2013 CAP looked at five key sectors: energy use, vehicle miles, waste production, water usage, and off-road activities. The 2013 CAP incorporated best practices to produce a blueprint for achieving GHG emissions reductions in the City, consistent with the state-reduction goals in AB 32 and SB 375. Specifically, the 2013 CAP identified reduction measures and implementation strategies to help the City achieve the AB 32 reduction goal of GHG emissions 15 percent below 2005 emissions by 2020. Furthermore, the 2013 CAP was designed to streamline environmental review of future development projects within the City (City of Milpitas 2013).

The City is currently working on updating the 2013 CAP with a planned draft release in spring of 2022. This CAP update will focus on the City's goal to achieve carbon neutrality by 2040 and will discuss the different pathways of doing so. However, this CAP update has not been publicly adopted as of the writing of this Draft SEIR.

## 2040 Milpitas General Plan

On March 9, 2021, the City of Milpitas adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan is an update to the 1994 General Plan and supersedes and replaces the 1994 General Plan. Policies from the 2040 General Plan relevant to the Project's physical impacts on the environment include the following:

- **Policy CD 11-2:** Encourage passive solar design and energy-efficient concepts, including, but not limited to natural heating and/or cooling, sun and wind exposure and orientation, and other solar energy opportunities.
- **Policy CD 11-5**: Encourage the use of building materials that conserve energy and material resources.
- **Policy CON 1-2**: Ensure all development projects comply with the mandatory energy efficiency requirements of the California Green Building Standards Code (CALGreen).
- **Policy CON 1-3**: Support innovative green building best management practices including, but not limited to, LEED certification, and encourage project applicants to exceed the most current "green" development standards in the California Code of Regulations (CCR), Title 24, as feasible
- **Policy CON 1-9**: Encourage site planning and building techniques that promote energy conservation. Where feasible, encourage projects to take advantage of shade, prevailing winds, landscaping, sunscreens, building orientations, and material choices that reduce energy use.
- **Policy LU-3.1**: Support regional efforts that promote higher densities near major transit and travel facilities, and reduce regional vehicle miles traveled by supporting active modes of transportation including walking, biking, and public transit. Support local and regional land use decisions that promote safe access to and the use of alternatives to auto transit.

- **Policy LU-3.2**: Continue to utilize planning tools (including specific plans and overlay districts) that promote transit-oriented and mixed-use development objectives near the Milpitas Transit Center.
- **Policy LU-4.3:** Support conveniently located neighborhood-serving commercial centers that provide desired services to local neighborhoods workers and visitors, reduce automobile dependency, and contribute positively to the surrounding neighborhoods.
- **Policy LU-6.6**: Encourage redevelopment and intensification of mixed-use areas by allowing stand-alone vertical mixed-use, or integrated horizontal mixed-use projects in mixed use areas, consistent with the Land Use Map and policies and actions included in this element.
- **Policy LU-4.2:** Emphasize efforts to reduce regional vehicle miles traveled by supporting land use patterns and site designs that promote active modes of transportation, including walking, biking, and public transit.
- **Policy CIR-2.1:** Promote multimodal transportation options by developing an interconnected system of streets, roads, bridges, and highways that provides continuous, efficient, safe and convenient travel for all users regardless of mode, age or ability and encourage users to walk, ride a bicycle, or use transit for shorter, local trips.
- **Policy CIR-3-1:** Coordinate with VTA and BART to design and implement capital improvements that support safety and access to rail stations and bus stops.
- **Policy CIR-3-2:** Coordinate transit planning and provision of transit-supportive infrastructure with Caltrans, VTA, BART, and other service providers to provide seamless service for users across transit modes and to facilitate transfers dedicated staff to work closely with communities throughout the City on ongoing education and encouragement efforts.

#### 3.2.1.4 TASP Policies

Table 2-2 in Chapter 2, *Project Description,* of this SEIR provides a summary of the policies in the TASP related to Public Services. Table 2-2 identifies policies that require the following:

- *Reduced VMT*. Establish and implement a travel demand management (TDM) program with the non-compulsory goal of reducing VMT by 15 percent or more below the regional baseline per employee or resident and efficiently provides parking that meet the needs of residents, employees, and visitors
- *Alternative forms of Transportation*. Encourage individuals within the Metro Plan Area to walk, bike, or take transit by building the necessary infrastructure to support these alternative forms of transportation. Require development projects to implement TDM measures to help achieve VMT and trip reduction goals.
- *Electric Vehicles*. Reduce VMT and Climate Impacts by managing automobile demand and promoting low-carbon transportation to minimize emissions in the planning area
- *Sustainability*. New buildings shall include features that include the most impactful methods for reducing energy uses and greenhouse gas emissions. Specifically, all new residential and non-residential shall be all electric, as feasible.

# 3.2.2 Environmental Setting

The environmental setting for GHG is described on pages 3.12-1 to 3.12-3 of the Certified EIR. This discussion describes the background of climate change, including the principal greenhouse gases, regional and local GHG inventories, and the impacts of climate change. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1 of this SEIR for the locations available for the public to review the Certified EIR.

The setting with regard to GHG has not changed substantially since the Certified Plan was prepared. However, some setting details require updating based on new analyses and data that have become available since the Certified EIR. Primarily, the GHG warming potentials, shown in Table 3.2-1, and the inventories developed for some jurisdictions have been updated with more recent analysis years. The jurisdictions with updated GHG emissions are shown in Table 3.2-1.

## Greenhouse Gases

The principle anthropogenic (human-made) GHGs contributing to global warming are $CO_2$, methane ($CH_4$), nitrous oxide ($N_2O$), and fluorinated compounds, including sulfur hexafluoride ($SF_6$), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic sources. The primary GHGs of concern associated with the Metro Plan are $CO_2$, $CH_4$, and $N_2O$. Principal characteristics of these pollutants are discussed below.

- Carbon dioxide enters the atmosphere through fossil fuels (oil, natural gas, and coal) combustion, solid waste decomposition, plant and animal respiration, and chemical reactions (e.g., manufacture of cement). $CO_2$ is also removed from the atmosphere (or *sequestered*) when it is absorbed by plants as part of the biological carbon cycle.
- Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal solid waste landfills.
- Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Methods have been set forth to describe emissions of GHGs in terms of a single gas to simplify reporting and analysis. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in Intergovernmental Panel on Climate Change (IPCC) reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of $CO_2e$, which compares the gas in question to that of the same mass of $CO_2$ ($CO_2$ has a global warming potential of 1 by definition). Table 3.2-1 lists the global warming potential of $CO_2$, $CH_4$, and $N_2O$ and their lifetimes in the atmosphere.

**Table 3.22-1. Lifetimes and Global Warming Potentials of Key Greenhouse Gases**

| Greenhouse Gas | Global Warming Potential (100 years) | Lifetime (years) |
|---|---|---|
| $CO_2$ | 1 | 50–200 |
| $CH_4$ | 25 | 9-15 |
| $N_2O$ | 298 | 114 |

Source: California Air Resources Board 2021.

All GWPs used for CARB's GHG inventory and to assess attainment of the state's 2020 and 2030 reduction targets are considered over a 100-year timeframe (as shown in Table 3.4-1). However, CARB recognizes the importance of short-lived climate pollutants and reducing these emissions to achieve the state's overall climate change goals. Short-lived climate pollutants have atmospheric lifetimes on the order of a few days to a few decades, and their relative climate forcing impacts, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of $CO_2$ (CARB 2017b). Recognizing their short-term lifespan and warming impact, short-lived climate pollutants are measured in terms of $CO_2e$ using a 20-year time period. The use of GWPs with a time horizon of 20 years better captures the importance of the short-lived climate pollutants and gives a better perspective on the speed at which emission controls will impact the atmosphere relative to $CO_2$ emission controls.

The Short-Lived climate Pollutant Reduction Strategy, which is discussed in Section 3.2.1, *Regulatory Setting*, addresses methane, hydrofluorocarbon gases, and anthropogenic black carbon. Methane has a lifetime of 12 years and a 20-year GWP of 72. Hydrofluorocarbon gases have lifetimes of 1.4 to 52 years and a 20-year GWP of 437 to 6,350. Anthropogenic black carbon has a lifetime of a few days to weeks and a 20-year GWP of 3,200 (CARB 2017b).

### Greenhouse Gas Reporting

A GHG inventory is a quantification of all GHG emissions and sinks[1] within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for global and national entities) or on a small scale (e.g., for a building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources. Table 3.2-2 outlines the most recent global, national, statewide, regional, and local GHG inventories to help contextualize the magnitude of potential project-related emissions.

**Table 3.2-2. Global, National, State, and Regional Greenhouse Gas Emission Inventories**

| Emissions Inventory | $CO_2e$ (metric tons) |
|---|---|
| 2010 IPCC Global GHG Emissions Inventory | 52,000,000,000 |
| 2019 EPA National GHG Emissions Inventory | 6,558,300,000 |
| 2017 CARB State GHG Emissions Inventory | 424,100,000 |
| 2015 BAAQMD GHG Emissions Inventory | 85,000,000 |
| 2005 City of Milpitas GHG Emissions Inventory | 642,670 |

Sources: Intergovernmental Panel on Climate Change 2014; U.S. Environmental Protection Agency 2021; California Air Resources Board 2019; Bay Area Air Quality Management District 2017b; City of Milpitas 2013.

## 3.2.3 Impacts and Mitigation

This section describes the change in Project impacts on greenhouse gas emissions that would occur with the Project Change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. The Certified EIR found that with implementation of the policies in the TASP, impacts on greenhouse gas emissions would be less than significant, and additional mitigation measures were not required. Because the policies have been changed from the TASP to the Metro Plan, the analysis includes a comparison of the TASP policies and the Metro Plan policies to determine if any changes in policies would result in an impact. If new

[1] A GHG sink is a process, activity, or mechanism that removes a GHG from the atmosphere.

mitigation measures are needed to reduce new impacts that would result from the Project Change, those measures are listed below.

This SEIR analysis evaluates the change in Project impacts with the Project Change, and, if applicable, changes in circumstances or new information that was not available at the time the Certified EIR was prepared. The analysis does not reevaluate the impacts of the Project that were already disclosed in the Certified EIR and are not altered due to the Project Change. Based on the change in the Project impact due to the Project Change, a determination is made as to whether there would be changes to the impact significance determinations for the Project in the Certified EIR.

### 3.2.3.1 Significance Criteria

State CEQA Guidelines Appendix G (14 CCR 15000 et seq.) has identified significance criteria to be considered for determining whether a project could have significant impacts on existing GHG emissions. An impact would be considered significant if construction or operation of the Project would have any of the following consequences.

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The California Supreme Court's decision in *Center for Biological Diversity v. Department of Fish and Wildlife* (62 Cal.4th 204) confirmed that there are multiple potential pathways for evaluating GHG emissions consistent with CEQA. Several air quality management agencies throughout the state have also drafted or adopted varying threshold approaches and guidelines for analyzing GHG emissions in CEQA documents. Common threshold approaches include (1) compliance with a qualified GHG reduction strategy, (2) performance-based reductions, (3) numeric "bright-line" thresholds, (4) efficiency-based thresholds, and (5) compliance with regulatory programs.

As discussed above, the BAAQMD is proposing updates to the CEQA GHG thresholds of significance from the 2017 CEQA Guidelines. Specifically, the BAAQMD is proposing the following updated thresholds of significance (BAAQMD 2021b).

For project-level analyses of land-use projects, there are two options for evaluating significance.

**Land-Use Projects** (must include either option A or option B):

A. Projects must include, at a minimum, the following project design elements:
    1) Buildings
        a) No natural gas infrastructure (residential and non-residential).
    2) Transportation:
        a) Achieve compliance with electric vehicle requirements in the most recently adopted version of CalGreen Tier 2.
        b) Achieve SB 743 target of 15 percent reduction in VMT per capita below regional average.
B. Be consistent with a local GHG reduction strategy that meets the criteria under the CEQA Guidelines section 15183.5(b)

For plan-level analyses, there are also two options for evaluating significance.

**Plan-Level Projects** (must include either option A or option B):

A. Meet the State goal to achieve 40 percent emissions below 1990 levels by 2030, and carbon neutrality by 2045; or

B. Be consistent with a local GHG reduction strategy that meets the criteria under the CEQA Guidelines section 15183.5(b)

For projects that involve stationary sources, such as generators, BAAQMD is proposing the following updated bright-line threshold.

**Stationary Sources:**

A. Compliance with Cap-and-Trade; or

B. 2,000 $MTCO_2e$/year

BAAQMD has noted that a justification report containing evidence and rationale for the proposed thresholds will be made available in early 2022. BAAQMD also noted that adoption of these thresholds is expected to occur in Spring 2022. While the City's most current cap, the 2013 CAP, is a qualified local GHG reduction strategy, the 2013 CAP analyzed a buildout year of 2020 and the AB 32 goals, which are no longer applicable. Thus, until the City's updated CAP is released and approved as a local GHG reduction strategy, the Project Change will analyze its ability to achieve the 40 percent emissions reduction below 1990 levels by 2030 and Carbon Neutrality by 2045. This approach is used to evaluate the Project Change operational emissions.

Additionally, BAAQMD confirmed during their Public Workshop that the existing methodology for analyzing construction GHG impacts is valid. BAAQMD recommends that GHG emissions from construction be quantified and disclosed, and that a determination regarding the significance of these GHG emissions be made with respect to whether a project is consistent with the emission reduction goals. BAAQMD further recommends incorporation of BMPs to reduce GHG emissions during construction, as feasible and applicable. This approach is used to evaluate construction-generated emissions.

## 3.2.3.2 Methods

GHG impacts associated with construction and operation of the Project Change were assessed and quantified (where applicable) using standard and accepted software tools, techniques, and emission factors. Specifically, GHG emissions from operations were quantified using industry-standard methodology and land use emissions model, the California Emissions Estimator Model (CalEEMod). Specifically, CalEEMod version 2020.4.0 is used in this analysis. Additionally, CARB's 2021 EMission FACtor (EMFAC 2021) Model was utilized to model mobile emissions. This section describes the key methods used to quantify emissions and estimate potential impacts for the Project Change. Assumptions used in the GHG analysis can be found in Appendix D. A summary of the methodology is provided below. A full list of assumptions can be found in Appendix D.

### Construction

Land uses that could be developed under the Metro Plan would generate construction-related GHG emissions from mobile and stationary construction equipment exhaust, employee and haul truck vehicle exhaust, electricity consumption, and tree removal. The specific size, location, construction

techniques, and scheduling that would be utilized for each individual development project occurring on the Metro Plan Area from implementation of the proposed Metro Plan is not currently known. With an anticipated buildout year of 2040, development of the various land uses associated with the Metro Plan would occur over an extended period of time and would depend on factors such as local economic conditions, market demand, and other financing considerations. As such, without specific project-level details it is not possible to develop a refined construction inventory.[2] Consequently, the determination of construction-related GHG impacts for each individual development project, or a combination of these projects, would require the City to speculate regarding such potential future project-level environmental impacts. Thus, in the absence of the necessary construction information required to provide an informative and meaningful analysis, the evaluation of potential construction-related impacts resulting from implementation of the Specific Plan is conducted qualitatively in this SEIR.

## Operation

Given that the Metro Plan requires General Plan Amendments and rezoning of land throughout the City, the operational emissions analysis accounts for the net change in emissions due to the Metro Plan. The land use changes, and proposed land use assumptions are outlined in **Error! Reference source not found.**. CalEEMod version 2020.4.0 quantifies operational GHG emissions for area sources (such as landscaping equipment), energy sources (such as lighting electricity), and water and waste emissions based on the size and type of a project's land use.

GHG impacts from motor vehicles associated with the Metro Plan were evaluated using the EMFAC 2021 emissions model. The mobile source emission factors (grams per mile and grams per trip) were averaged in EMFAC2021 based on vehicle and fuel types at aggregated speeds for the vehicle fleet operating within the SFBAAB at the horizon year of 2040. The emission factors were applied to the Project-specific daily VMT estimates and average daily trips (ADT) outlined in Table 3.1-3 in Section 3.1 to generate mobile-source emission estimates. An annual factor of 260 days was used to calculate yearly VMT and emissions per recommendation from the traffic engineers. Refer to Appendix D for additional information on the assumptions and model data used to estimate the Metro Plan's potential future operational emissions.

This analysis assumes that the updated policies in the Metro Plan would be implemented. Table 2-2 in Chapter 2 of this SEIR provides a summary of the policies in the Metro Plan related to GHG emissions. Table 2-2 identifies policies that require the following:

- *Electric Vehicles.* Reduce VMT and Climate Impacts by managing automobile demand and promoting low-carbon transportation to minimize emissions in the planning area
- *Sustainability.* New buildings shall include features that include the most impactful methods for reducing energy uses and greenhouse gas emissions. Specifically, all new residential and non-residential shall be all electric, as feasible.
- *Construction Equipment.* All off-road heavy-duty construction equipment shall use high-performance renewable diesel.
- *Electric Outlets*. All new development shall install sufficient exterior electrical outlets to power electric-powered landscaping equipment.

[2] Project-level information includes details such as the size and scale of the project to be constructed, construction schedule, equipment fleet, construction worker crew estimates, and demolition and grading quantities.

- *Generators*. All new residential and nonresidential buildings shall use zero-emission generator engines for generators with a supply of 25 kW or less.

### 3.2.3.3 Impacts and Mitigation Measures

This section includes a discussion of each impact as it corresponds to the significance criteria presented in Section 3.2.3.1, *Significance Criteria*.

#### Impact GHG-1: Implementation of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to the generation of GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

**Summary of Certified EIR Impact Analysis**

The Certified EIR conclude that the TASP would not result in a substantial increase in total VMT, and would not lead to an increase in GHG emissions that would prevent the state from achieving the statewide GHG emission reduction goal of 1990 levels. The Certified EIR concluded that GHG impacts would be less than significant. At the time of Certified EIR analysis (2008), the Certified EIR did not need to analyze consistency with applicable GHG plans, policies, or regulations, as this was not an Appendix G significance criterion.

**Impact Analysis**

***Construction***

Construction associated with future developments under the Metro Plan would result in the temporary generation of GHG emissions. Emissions would originate from mobile and stationary construction equipment exhaust and employee and haul truck vehicle exhaust. Construction-related GHG emissions would vary substantially depending on the level of activity, length of the construction period, specific construction operations, types of equipment, and number of personnel.

By its nature as a planning document, the Metro Plan does not propose any specific development projects. As discussed in Chapter 2 of this SEIR, the Metro Plan would add 7,000 dwelling units, 3 million square feet of office space, 300,000 square feet of retail space, and 700 hotel rooms, in addition to the development of the TASP. The exact types and sizes of future development under the Metro Plan would be driven by market conditions. It is anticipated that throughout the course of the buildout period, multiple development projects would be constructed intermittently within the Metro Plan Area. As the timing, density, and intensity of future development projects is not known, the precise effects of construction activities associated with buildout of the Metro Plan cannot be accurately quantified at this time. Impacts could be significant without mitigation.

BAAQMD has not established a quantitative threshold for assessing construction-related GHG emissions. Rather, BAAQMD recommends evaluating whether construction activities would conflict with statewide emission reduction goals and implement feasible BMPs. Therefore, construction-related GHG emissions from the Metro Plan would be required to comply with Mitigation Measure GHG-1, which would reduce construction emissions consistent with BAAQMD guidance and statewide emission reduction goals. Accordingly, this impact is less than significant with mitigation.

### Operation

Operation of the Metro Plan would generate direct and indirect GHG emissions. Sources of direct emissions include mobile vehicle trips, natural gas combustion, and landscaping activities. Indirect emissions would be generated by electricity consumption, waste and wastewater generation, and water use. The analysis accounts for benefits achieved by policies in the Metro Plan that are required or otherwise mandatory, including electrical outlets for landscaping equipment (Policy CB 7.8), zero-emission generator engines (Policy CB 7.3.2), onsite solar panels (Policy CB 7.3 and CB 7.3.1), and required compliance with the most current CALGreen code (i.e., installation of low-flow fixtures). The analysis also accounts for implementation of quantifiable state measures that will reduce GHG emissions (e.g., SB 100), as well as incorporation of Mitigation Measure GHG-2, which restricts natural gas infrastructure from being installed within the Metro Plan Area and promotes renewable energy (Policies CB 7.2.2 and CB 7.2.3). To evaluate the magnitude of the change in the GHG emissions due to implementation of the Project Change, the emissions under the Metro Plan buildout in 2040 are compared to the full buildout of the TASP. For specifics on the additional projected development for the Metro Plan for the buildout year 2040, please see Table 2-3 in Chapter 2. Table 3.2-3 presents the results of the analysis.

**Table 3.22-3. Estimated Annual Metro Plan Operational GHG Emissions (metric tons)**

| Condition/Source | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ | Percent of Total $CO_2e$ |
|---|---|---|---|---|---|
| **Project Change** | | | | | |
| Area Sources | 59 | <1 | 0 | 61 | <1% |
| Energy Sources | 9,839 | <1 | <1 | 9,907 | 18% |
| Mobile Sources | 41,382 | 1 | 2 | 41,975 | 78% |
| Waste Generation | 348 | 21 | <1 | 863 | 2% |
| Water Consumption | 388 | 28 | 1 | 1,272 | 2% |
| **Total Unmitigated Emissions** | **52,017** | **50** | **3** | **54,077** | |
| Area Sources | 59 | <1 | 0 | 61 | <1% |
| Energy Sources | 1,695 | <1 | <1 | 1,715 | 4% |
| Mobile Sources | 41,382 | 1 | 2 | 41,975 | 91% |
| Waste Generation | 348 | 21 | <1 | 863 | 2% |
| Water Consumption | 388 | 28 | 1 | 1,272 | 3% |
| **Total Mitigated Emissions** | **43,874** | **49** | **3** | **45,885** | |

Source: Refer to Appendix D for CalEEMod model outputs and mobile emissions calculations.
Notes:
As noted above, the emissions analysis reflects implementation of quantifiable state measures that will reduce GHG emissions (e.g., SB 100), including a Metro Plan policy related to use of green consumer products and compliance with CALGreen, which requires the installation of low-flow fixtures, solar panels, and electric vehicle (EV) charging. In addition, this includes Mitigation Measure GHG-2, which restricts future GHG infrastructure within the Metro Plan Area.
Values may not add due to rounding

The estimated emissions from the Metro Plan with incorporation of the Metro Plan policies and Mitigation Measure GHG-2 in 2040 are 45,885 $MTCO_2e$. These emissions are an increase compared to the full TASP buildout. The Metro Plan would achieve additional GHG reductions through sustainability features that encourage alternative transportation, onsite energy generation, and other GHG-reducing measures. However, these strategies were not quantified because the exact

number of installed systems and affected structures are currently unknown. As discussed above, the new proposed BAAQMD thresholds do not have an applicable quantitative operational threshold for plan-level documents.

### SB 32 and EO B-55-18 Consistency

As discussed above, the BAAQMD proposed GHG significance thresholds require that a plan-level project, such as the Metro Plan, show consistency with meeting the state's goal of achieving 40 percent emissions reduction below 1990 levels by 2030 (SB 32) and carbon neutrality by 2045 (EO-55-18). The following discussion presents a sector-by-sector analysis of the Metro Plan's operational GHG impacts and its consistency with the proposed BAAQMD plan-level GHG significance thresholds.

#### *Mobile Source Emissions*

GHG emissions associated with on-road mobile sources would be generated from workers, visitors, and delivery vehicles visiting the Metro Plan Area. As shown in Table 3.2-3, emissions from mobile sources represent the largest source of emissions from the Metro Plan (91 percent). This increase is primarily driven by the additional VMT expected as a result of the new Metro Plan land uses, highlighted in Table 3.1-3. The proposed transportation improvements identified in the Metro Plan would create stronger links for the pedestrian and bicycle network within the Metro Plan Area. For instance, the Metro Plan aims to create complete pedestrian and bicycle networks that connect trails and paths, maintain pedestrian and biking facilities, increase bicycle parking availability, construct street improvements and safety features to promote pedestrian trips, and install pedestrian-oriented signage to alert of potentially fast-moving traffic. Additionally, the Metro Plan encourages strengthening access and connection between the Metro Plan Area and the regional transit systems, including Milpitas BART and VTA transit centers. The Metro Plan also aims to effectively manage transportation demand and parking by supporting programs such as the guaranteed ride home program, carshare spaces, bike share, parking cash-out, and childcare services. Several policies further support the maintenance and expansion of the transportation network to enhance connectivity, accessibility, and safety (see Policy M 5, Policy M 6, and Policy M 7). Together, the proposed improvements and policies would lessen the severity of growth-oriented criteria pollutants by reducing VMT, encouraging transit use, fostering bicycle and pedestrian infrastructure, and supporting sustainable land use patterns, including mixed-use design and increased density and intensity.

CARB acknowledges that reductions in VMT are required to meet the state's long-term climate change goals. Recent CARB analysis demonstrates that a 14.3 percent reduction of VMT per service population by 2050 (compared to a 2015–2018 average) would be needed statewide to meet their GHG planning goals through 2050. As discussed in Section 3.7, *Transportation*, the Metro Plan would decrease the Metro Plan Area's VMT per service population because it would diversify land uses and provide additional employment that would ultimately reduce the distance people need to travel for work. As shown in Section 3.7, the Metro Plan would achieve a VMT per service population of 15.9 in 2040, which is a 25 percent reduction compared to the regional 2040 threshold. Therefore, the Metro Plan would be consistent with the CARB VMT reduction goal

However, it is infeasible at this time to confirm that the entire Metro Plan Area mobile fleet mix would be 100 percent electric by 2040. Thus, the Metro Plan may still have mobile source GHG emissions and thus would conflict with the state's long-term emission reduction trajectory, and impacts would be potentially significant.

***Area Source Emissions***

Area source GHG emissions from the Metro Plan would be generated by landscaping-related fuel combustion sources, such as lawn mowers. The Metro Plan would encourage all new development to install sufficient exterior outlets to power electric-powered landscaping equipment (Policy CB 7.8). The Scoping Plan does not include specific measures or 2030 emissions reduction requirements for landscaping equipment. However, achieving the state's long-term carbon neutral goal under EO B-55-18 (if legislatively adopted) will inevitably require the transition away from fossil-fuel power energy sources, including but not limited to landscaping equipment. The state has recently adopted AB 1346, which requires CARB, consistent with federal law, to adopt cost-effective and technologically feasible regulations to prohibit engine exhaust and evaporative emissions from new small off-road engines (e.g., landscaping equipment) by July 1, 2022. These regulations will be applicable to engines produced on or after January 1, 2024. As the full buildout of this Metro Plan is the year 2040, it is assumed in this analysis that all landscaping equipment will be electric by the buildout year and those area sources will be consistent with EO B-55-18; therefore, a less-than-significant impact would occur.

***Energy Emissions***

GHGs are emitted directly from buildings through the combustion of any type of fuel (e.g., natural gas for cooking). GHGs can also be emitted indirectly from the generation of electricity. The Scoping Plan outlines strategies to reduce energy demand and fossil fuel use, while increasing energy efficiency and renewable energy generation. These strategies include transitioning to cleaner fuels, achieving greater efficiency in existing buildings, and electrifying end uses in commercial sectors.

The Metro Plan requires building design features that reduce energy consumption and increase renewable energy generation, consistent with the Scoping Plan. This includes the electrification of all new developments by prohibiting natural gas infrastructure (Policies CB 7.2.2 and CB 7.2.3), installation of photovoltaic solar systems and implementing solar management plans (Policies CB 7.2.1 and Policy CB 7.3.1), onsite renewable energy generation (Policy CB 7.3), and overall energy reduction uses to help reduce GHG emissions (Policy CB 7.2). Furthermore, the City's 2040 General Plan Policy CON 1-3 recommends that new development achieve LEED certification and exceed the most current CalGreen codes. These policies would be consistent with the 2017 Scoping Plan's overall goal of reducing building energy emissions to meet the state's 2030 GHG reduction target.

The Metro Plan and Mitigation Measure GHG-2 requirements would ensure that new development include all-electric building design and green roofs (Policy 3-25), where feasible, consistent with the Scoping Plan and OPR recommendations to meet the state's expressed 2045 climate neutrality goal (EO B-55-18). Because SB 100 obligates utilities to supply 100 percent carbon-free electricity by 2045, all-electric buildings that do not consume any natural gas would not generate any emissions. Thus, with the prohibition of natural gas infrastructure (Mitigation Measure GHG-2) and Metro Plan Policies CB 7.2.2 and CB 7.2.3, the Metro Plan would be consistent with the energy goals of the Scoping Plan (SB 32) and EO B-55-18. Energy emissions would be less than significant with mitigation incorporated.

***Land Use Emissions***

The Metro Plan would encourage tree planting and landscaping that would increase carbon sequestration. As discussed in Section 3.6, *Public Services and Recreation*, the Metro Plan would include and require the development of open space for residents in the Metro Plan Area.

Additionally, the Metro Plan requires that private development must provide onsite open space at a rate of 100 feet per unit (Policy PPS 3.3). Thus, the Metro Plan would be consistent with the Scoping Plan's overall goal of avoiding losses in carbon sequestration and would assist with meeting the state's goals for climate neutrality (e.g., EO B-55-18) beyond 2030. Land use emissions would be less than significant.

***Waste Emissions***

Solid waste may be disposed of in landfills or diverted for recycling, composting, or reuse. GHG emissions from landfills are generated through anaerobic breakdown of material. The Scoping Plan aims to reduce waste emissions by diverting waste away from landfills through waste reduction, re-use, composting, and material recovery. In addition, AB 341 requires mandatory recycling for certain commercial businesses. The Metro Plan would encourage use of recycled building materials and require recycling and composting programs (Policy CB 7.7). These features, if implemented, would be consistent with the Scoping Plan and would support AB 341's overall goal of reducing landfill waste. Furthermore, as discussed in BAAQMD's 2017 CEQA Guidelines, biogenic $CO_2$ emissions should not be included in the quantification of GHG emissions for a project. Biogenic $CO_2$ emissions result from materials that are derived from living cells, as opposed to $CO_2$ emissions derived from fossil fuels, limestone and other materials that have been transformed by geological processes[3]. However, the Metro Plan waste emissions would include $CH_4$ and $N_2O$ emissions. There is currently no State legislation on reducing these emission sources by 2045 and thus, the Metro Plan's waste emissions would not meet the State's carbon neutrality goal by 2045. Waste impacts would be potentially significant within the Metro Plan Area.

***Water and Wastewater Emissions***

Indirect GHG emissions result from the production of electricity used to convey, treat, and distribute water and wastewater. The amount of electricity required to convey, treat, and distribute water depends on the volume of water as well as the sources of water. Additional wastewater emissions include $CH_4$ and $N_2O$, although these are generated by wastewater treatment at individual wastewater treatment plants (WWTP). The project does not include any new WWTPs.

The Scoping Plan outlines objectives and goals to reduce GHGs in the water sector, including using and reusing water more efficiently through greater water conservation, drought-tolerant landscaping, stormwater capture, and water recycling. Regulations have further targeted water supply and water conservation (e.g., SB X7-7) through building and landscaping efficiency (e.g., Title 24). The Metro Plan does not include any features that would conflict with these measures and programs. The Metro Plan would encourage water conservation features that would reduce indoor and outdoor water use. These features include encouraging water-efficient landscaping and water conserving appliances (Policy ICS 3.4 and Policy ICS 3.5). These voluntary features, if implemented, would be consistent with the Scoping Plan's water measures and the state's regulatory programs within the water sector. Additionally, because SB 100 obligates utilities to supply 100 percent carbon-free electricity by 2045, any electrical consumption in order to convey, treat, and distribute water and wastewater would be carbon free.

However, as noted, the Metro Plan wastewater emissions would include $CH_4$ and $N_2O$ emissions. There is currently no state legislation on reducing these emission sources by 2045 and thus, the

[3] Biogenic $CO_2$ contains carbon that is present in organic materials that include, but are not limited to, wood, paper, vegetable oils, animal fat, food, and animal and yard waste.

Metro Plan's waste emissions would not meet the state's carbon neutrality goal by 2045. Wastewater impacts would be potentially significant within the Metro Plan Area.

***Conclusion***

As discussed in Section 3.7, the Metro Plan would achieve the 14.3 percent VMT per service population reduction target by buildout year (2040). Achievement of the VMT per service population reduction target would ensure that the Metro Plan is consistent with regulatory programs such as SB 743 that expressly aims to reduce VMT consistent with the state's climate change goals. In addition to the VMT per service population reduction target, the Metro Plan would also be subject to ongoing regulatory programs related to fuel and vehicle efficiency (e.g., Pavley standards/Advanced Clean Cars, Low Carbon Fuel Standard). Vehicle electrification is also rapidly becoming part of the state's approach to reducing mobile source emissions (e.g., Title 24), and the state's cap-and-trade program continues to reduce emissions from transportation fuels. The Metro Plan would not conflict with these ongoing statewide efforts. Furthermore, the Metro Plan includes policies that would prioritize transit and pedestrian connectivity, support transit priority measures, and enhance existing and construct new transit infrastructure to reduce per service population VMT. However, it is infeasible at this time to confirm that the Metro Plan Area fleet mix would be 100 percent electric and thus would potentially still have GHG emissions by 2045. Thus, mobile emissions from the Metro Plan would not achieve the state's carbon neutrality goal by 2045.

The Metro Plan policies represent a robust suite of possible strategies that will reduce emissions from building energy consumption, area sources, water consumption, and waste generation. These features are consistent with the Scoping Plan (e.g., SB 32), and if fully implemented by all land uses within the Metro Plan would significantly reduce GHG emissions from these sources consistent with the state's near-term (2030) and long-term (2045) climate change goals. While the City, through the Metro Plan, would encourage implementation of voluntary sustainability features, there is no guarantee that all of these measures will be incorporated into the designs of all future developments. Furthermore, as discussed above, the Metro Plan Area will have waste and wastewater GHG emissions in 2045. Thus, this is a potentially significant impact.

Implementation of Mitigation Measure GHG-2 is therefore required to reduce operational GHG emissions in the sectors with the largest amount of emissions. Mitigation Measure GHG-2, which includes requirements for LEED certification or equivalent, electric space and water heating, solar roofs, and waste diversion programs, would ensure consistency with the Scoping Plan and the long-term statewide reduction trajectory. Should all measures included in Mitigation Measure GHG-2 be implemented by a future project sponsor within the Metro Plan Area, that development would be consistent with the Metro Plan and the state's reduction targets for 2030.

Additionally, because the extent of implementation of Mitigation Measure GHG-2 is currently unknown (e.g., applicability and feasibility), impacts from future development could remain significant for some sectors if all strategies are not implemented for a particular project or equivalent measures are not identified by a project sponsor. For projects where all of the requirements of Mitigation Measure GHG-2 (or their equivalent) are not implemented, implementation of Mitigation Measure GHG-3 is further required to reduce net operational GHG emissions through purchase of GHG mitigation credits. Furthermore, even with implementation of Mitigation Measures GHG-2 and Mitigation Measure GHG-3, the Metro Plan Area may still have GHG emissions by 2045 (as discussed above) and thus would not achieve carbon neutrality. Thus, operations of the Metro Plan would result in a significant and unavoidable impact.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for GHG impacts during construction and operations of the TASP.

### New Mitigation Measures

#### Mitigation Measure GHG-1: Require Implementation of BAAQMD-Recommended Construction Best Management Practices

All applicants within the Metro Plan Area shall require their contractors, as a condition of contracts, to reduce construction-related GHG emissions by implementing BAAQMD's recommended BMPs, including the following measures (based on BAAQMD's 2017 CEQA Guidelines):

- Ensure alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment make up at least 15 percent of the fleet.
- Use at least 10 percent local building materials (sourced from within 100 miles of the Metro Plan Area).
- Recycle and reuse at least 50 percent of construction waste or demolition materials.

#### Mitigation Measure GHG-2: Implement Operational GHG Reduction Measures or Their Equivalent

Applicants of future projects within the Metro Plan Area shall implement the following operational GHG emissions reduction strategies where feasible or demonstrate why a measure is not feasible, and implement equivalent GHG reductions to the foregone measure, or pay a mitigation fee per Mitigation Measure GHG-3 (see below) to compensate for any foregone GHG reductions not implemented. Applicants of future projects that do not propose to implement all of the strategies described below shall prepare a feasibility study outlining why the declined strategies were not implemented (e.g., feasibility, not applicable, etc.), estimating the foregone GHG reductions, and identifying any equivalent GHG reduction measures proposed (or proposal to pay a mitigation fee instead) for the City's review and concurrence prior to the issuance of building permits.

- **LEED Certification.** The United States Green Building Council (USGBC) is a private 501(c)3, non-profit organization that promotes sustainability in building design, construction, and operation. The USGBC developed the LEED program, which provides a rating system that awards points for new construction based on energy use, materials, water efficiency, and other sustainability criteria. LEED has certification systems for both commercial and residential use.

  While LEED allows some flexibility in choice of measures to meet LEED criteria, new construction shall be required to include specific committed measures in use of recycled and sustainable materials in construction, water efficiency, and efficiency of energy use. New development in the Metro Plan Area shall be required to achieve LEED Silver certification or equivalent, or a higher certification, or provide equivalent GHG reductions through proposed new measures or payment of a fee per Mitigation Measure GHG-3.

- **Natural Gas Infrastructure.** Future development within the Metro Plan Area shall utilize electric space and water heating to the maximum extent feasible or to the extent required by existing or future regulations. Natural gas infrastructure and appliances shall not be installed to the extent feasible as determined by the availability and capacity of electrical power distribution infrastructure.
- **Solar Roofs.** Mounted rooftop electricity-generating solar panels convert solar energy to electricity for use in commercial and residential buildings.

  New construction in the Metro Plan Area shall be required to either employ solar roofs on at least 30 percent of roof square footage or provide equivalent GHG reductions through proposed new measures or pay a mitigation fee per Mitigation Measure GHG-3. The inclusion of solar roofs may be part of meeting LEED Silver or equivalent requirements.
- **Waste Minimization Programs.** For waste that is generated by non-residential uses, recycling, composting of food waste and other organics, and the use of reusable products instead of disposal products diverts solid waste from the landfill stream.

  New non-residential uses in the Metro Plan Area shall be required to implement recycling (including organics recycling) and reusable product use programs or provide equivalent GHG reductions through proposed new measures or pay a mitigation fee per Mitigation Measure GHG-3. The inclusion of these measures may be part of meeting LEED Silver or equivalent requirements.

**Mitigation Measure GHG-3: Purchase GHG Mitigation Credits**

Where a future project in the Metro Plan Area does not propose to implement all of the GHG reduction measures in Mitigation Measure GHG-2 and does not propose equivalent reduction measures to compensate for the measures not implemented, the project applicant shall be required to pay on a pro rata basis for net operational GHG emissions to compensate for emissions foregone from not implementing all measure in Mitigation Measure GHG-2 or providing equivalent reductions.

Applicants may purchase GHG credits from a voluntary GHG credit provider[4] that has an established protocol that requires projects generating GHG credits to demonstrate that the reduction of GHG emissions are real, permanent, quantifiable, verifiable, enforceable, and additional (per the definition in California Health and Safety Code Sections 38562(d)(1) and (2)). Definitions for these terms are as follows.

- **Real**: Estimated GHG reductions should not be an artifact of incomplete or inaccurate emissions accounting. Methods for quantifying emission reductions should be conservative to avoid overstating a project's effects. The effects of a project on GHG emissions must be comprehensively accounted for, including unintended effects (often referred to as "leakage"). To ensure that GHG reductions are real, the reduction must be a direct reduction within a confined project boundary.
- **Additional**: GHG reductions must be additional to any that would have occurred in the absence of the Climate Action Reserve, or of a market for GHG reductions generally.

[4] Examples of potential GHG credit sources include the Climate Action Reserve Voluntary Offset Registry and Climate Forward program, the American Carbon Registry, or other providers using the Verified Carbon Standard.

"Business as usual" reductions (i.e., those that would occur in the absence of a GHG reduction market) should not be eligible for registration.

- **Permanent**: To function as offsets to GHG emissions, GHG reductions must effectively be "permanent." This means, in general, that any net reversal in GHG reductions used to offset emissions must be fully accounted for and compensated through the achievement of additional reductions.
- **Quantifiable**: GHG reductions or GHG removal enhancements must be able to be accurately measured and calculated relative to a project baseline in a reliable and replicable manner for all GHG emission sources, GHG sinks, or GHG reservoirs included within the offset project boundary, while accounting for uncertainty and activity-shifting leakage and market-shifting leakage.
- **Verified**: GHG reductions must result from activities that have been verified. Verification requires third-party review of monitoring data for a project to ensure the data are complete and accurate.
- **Enforceable**: The emission reductions from offset must be backed by a legal instrument or contract that defines exclusive ownership and the legal instrument can be enforced within the legal system in the country in which the offset project occurs or through other compulsory means. Please note that per this mitigation measure, only credits originating within the United States are allowed.

GHG credits must also meet the following requirements:

- GHG credits may be in the form of GHG offsets for prior reductions of GHG emissions verified through protocols or forecasted mitigation units for future committed GHG emissions meeting protocols.
- All credits shall be documented per protocols functionally equivalent in terms of stringency to CARB's protocol for offsets in the cap and trade program. The applicant must provide the protocols from the credit provider and must document why the protocols are functionally equivalent.
- Applicants shall identify GHG credits in geographies closest to Santa Clara County first and only turn to larger geographies (i.e., California, United States, global) if adequate credits cannot be found in closer geographies, or the procurement of such credits would create an undue financial burden. Applicants shall provide the following justification for not using credits in closer geographies in terms of either availability or cost prohibition:
    - Lack of enough credits available in closer geographies.
    - Prohibitively costly credits in closer geographies are defined as credits costing more than 300 percent the amount of the current costs of credits in the regulated CARB offset market.
    - Documentation submitted supporting GHG credit proposals shall be prepared by individuals qualified in GHG credit development and verification and such individuals shall certify the following: (1) proposed credits meet the definitions for the criteria provided in this measure; and (2) the protocols used for the credits meet or exceed the standards for stringency used in CARB protocols for offsets under the California cap-and-trade system.

This mitigation includes the following specific requirements for applicants of future projects within the Metro Plan Area:

- Applicants shall provide the City with a 30-year operational GHG emissions estimate for the final design that includes two scenarios: (1) project operations including all Mitigation Measure GHG-2 reduction measures; and (2) project operations only including those Mitigation Measure GHG-2 reduction measures the applicant proposes to implement and any alternative GHG reduction measures proposed by the applicant. The emissions estimate can be focused exclusively on the sectors where Mitigation Measure GHG-2 measures will not be fully implemented. The difference between the Scenario 1 and Scenario 2 operational emissions will define the amount of needed annual GHG reductions to be addressed through purchase of GHG mitigation credits. The City shall review the emission estimates to ensure they are representative and determine the total amount of annual GHG emissions required to be addressed through purchase of mitigation credits.
- Applicants shall purchase GHG mitigation credits meeting the above requirements and provide documentation to the City of how the credits meet the above requirements. Applicants shall provide the City with documentation of the retirement of sufficient GHG credits to meet the annual GHG reduction amount prior to January 1 of each calendar year for the following year. This requirement shall apply to operations for up to 30 years. Applicants may purchase credits up front or in advance as they choose.

**Conclusions for Impact GHG-1**

The Certified EIR concluded that after implementation of policies included in the TASP, GHG impacts would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would result in a significant and unavoidable impact related to operational GHG emissions and would be inconsistent with the state's carbon neutrality goal by 2045, even with implementation of Mitigation Measures GHG-2 and GHG-3. Thus, the Project Change would result in a change to the Certified EIR's impact determination related to GHG emissions. The Project Change would result in a new significant and unavoidable impact that was not identified in the Certified EIR.

# 3.3 Land Use and Planning

This section discloses and analyzes the potential change in Project impacts on land use and planning that would result from implementing the Project Change.

## 3.3.1 Regulatory Setting

The regulatory setting for land use and planning is described on pages 3.1-3 through 3.1-6 of the Certified EIR. These regulations include the Santa Clara County General Plan, 1994 Milpitas General Plan, Milpitas Midtown Specific Plan, and Milpitas Zoning Code. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIR.

This analysis includes the following two updated regional plans that were not available at the time the Certified EIR was prepared: Plan Bay Area 2050 and the Comprehensive Airport Land Use Plan for Santa Clara County. The City completed an update to their General Plan (referred to as the 2040 General Plan), which contains new information that was not known at the time the Certified EIR was prepared. In addition, the Milpitas Midtown Specific Plan was updated in 2010 and has been redesignated in the 2040 General Plan. For pertinent policies related to these plans, please refer to Impact LU-2 in Section 3.3.2.5, *Impacts and Mitigation Measures*.

### 3.3.1.1 Regional Plans

#### Plan Bay Area 2050

On October 21, 2021, the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) jointly adopted Plan Bay Area 2050 and its related supplemental reports. Plan Bay Area 2050 is a long-range, 30-year strategic plan for the nine-county Bay Area region that focuses on the interrelated elements of housing, the economy, transportation, and the environment. It focuses on short-term, tangible actions that ABAG, MTC, and their partners can take to realize the vision of Plan Bay Area 2050, which aims to chart a course for a Bay Area that is affordable, connected, diverse, healthy, and vibrant for all residents through 2050 and beyond (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021). Guiding principles of Plan Bay Area 2050 include the following:

1. Advance equity, particularly for people living in Equity Priority Communities.
2. Increase resilience (e.g., in the areas of economy, population growth, natural hazards, societally, and technologically).
3. Share a vision, through agency partnerships and collaboration.
4. Strategize for the future.
5. Plan for what's next with concrete action items.

#### Santa Clara County Airport Land Use Commission

The Santa Clara County Airport Land Use Commission (ALUC) was established to provide appropriate development of areas surrounding public airports in Santa Clara County. It is intended

to minimize the public's exposure to excessive noise and safety hazards, and to ensure that the approaches to airports are kept clear of structures that could pose an aviation safety. The Comprehensive Airport Land Use Plan for Santa Clara County for Norman Y. Mineta San Jose International Airport was adopted by the ALUC in 2011 and amended in 2016. The Metro Plan Area is approximately 5 miles to the northeast of Norman Y. Mineta San Jose International Airport, and is outside of the airport influence area (AIA) regarding noise, height, and safety policies. Policies T-1 and T-2 apply countywide and would pertain to the Metro Plan (Santa Clara County Airport Land Use Commission, 2016). For a discussion of these policies, see Impact LU-2.

### 3.3.1.2 Local Plans

#### 2040 Milpitas General Plan

On March 9, 2021, the City of Milpitas adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan is an update to the 1994 General Plan and supersedes and replaces the 1994 General Plan. The 2040 General Plan carries forward some of the major goals of the 1994 General Plan but has been substantially updated to address current local conditions and community priorities and goals. It has also been reorganized to make the document more user-friendly and straightforward.

Major objectives and visions for the 2040 General Plan include a focus on Milpitas's community character and sense of community; providing high-quality housing options; attracting and retaining businesses and industries that provide high-quality and high-paying jobs; environmental sustainability; expansion and improvement of neighborhood-serving shopping areas; multimodal transportation opportunities; strong fiscal sustainability to provide efficient and adequate public services; compliance with state law; and emerging transportation, housing, and employment trends. The 2040 General Plan focuses new residential and commercial growth on infill sites distributed throughout the City, with higher density uses focused around major transportation corridors, VTA's Light Rail lines, and the Milpitas Transit Center. The 2040 General Plan also includes goals and policies to support strong local job growth and economic development opportunities, and a range of housing types that are accessible to all income levels. The 2040 General Plan updates and changes some of the identified locations of various land use designations in the City. Land use designations in the 2040 General Plan include: residential; mixed use; commercial; industrial, manufacturing and business park; specific plan; and public, semi-public and conservation.

Section 65359 of the Government Code states that all new development occurring within each of the Specific Plan Areas of the City must adhere to the General Plan and to the development standards and guidelines established by the relevant Specific Plan. The Project Change involves an update of the original TASP land use plan, renaming it the Milpitas Metro Specific Plan. The Metro Plan includes all necessary actions needed for implementation and to make it consistent with the 2040 General Plan and other relevant master plans and land development regulations. Refer to Appendix C of this SEIR to see the land use and open space strategy and regulations for the Metro Plan (Chapter 2: Land Use and Public Space).

The 2040 General Plan states the following:

> The Milpitas Metro Specific Plan [formerly the TASP] designation creates a structure for a walkable, transit-oriented area with a mix of land uses, which encourages walking, biking, and transit trips and minimizes vehicle trips and reduces vehicle miles traveled (VMT). Development allowed within the Specific Plan area accommodates substantial growth, while minimizing impacts on local roadways,

and reduces urban sprawl at the periphery of the region. All new development occurring within the Milpitas Metro Specific Plan designation adheres to the development standards and guidelines established in the Specific Plan.

### Milpitas Midtown Specific Plan

Originally adopted in 2002, the Milpitas Midtown Specific Plan was amended in 2008 and updated in 2010 (City of Milpitas 2010). At the time of the Certified EIR, the Milpitas Midtown Specific Plan Area included the entire TASP Area. An amendment in 2008 removed approximately 100 acres and changed the boundaries of the Milpitas Midtown Specific Plan Area (City of Milpitas 2010). In addition, in 2010 the Milpitas Midtown Specific Plan was updated, such that the Milpitas Midtown Specific Plan Area did not overlap with the TASP Area. The boundaries of the Metro Plan would expand the original TASP boundaries to include additional parcels along Main Street (western expansion area), which were formerly part of the Milpitas Midtown Specific Plan. The City is currently updating the Midtown Specific Plan and renaming it the Milpitas Gateway-Main Street Specific Plan and will update its boundaries in conjunction with the adoption of the Metro Plan (City of Milpitas 2021b). As such, under the Project Change, the Metro Plan would no longer be included in the Milpitas Midtown Specific Plan Area.

#### 3.3.1.3 TASP Policies

Table 2-2 in Chapter 2, *Project Description* provides a summary of the policies in the TASP related to land use and planning. Table 2-2 identifies policies that require the following:

- *Fencing, Walls, and Safety.* Requirements for fencing or walls near the rail line; uniform safety standards for all at-grade rail crossings; safety fencing or solid walls installed along all Union Pacific rail lines along Piper Drive; an interim at-grade crossing for if the Milpitas Boulevard extension is constructed prior to the termination of Union Pacific rail line.
- *Noise and Vibration.* Requirements to adhere to noise levels in the General Plan; apply the FTA ground-borne vibration criteria for development projects in the vicinity of vibration sources; conduct a vibration impact analysis for developments near UPRR and BART alignments and if needed apply mitigation; mitigation to the extent possible of noise exposure to sensitive receptors during construction.
- *Disclosures.* Requirements to disclose to future residents potential impacts including but not limited to noise, ground-borne and airborne vibration, odors, and use of hazardous materials.
- *Sensitive Receptors.* Requirements to locate sensitive receptors away from sites which store or use hazardous materials and requirements for adequate buffers.
- *Temporary Buffers.* Requirement of temporary buffers when residential uses are developed adjacent to existing industrial uses.
- *Setback Requirements.* Setback requirements to limit potential incompatible uses.

## 3.3.2 Environmental Setting

### 3.3.2.1 Regional Setting

Located on the southern tip of San Francisco Bay in Santa Clara County, Milpitas is often called the "Crossroads of Silicon Valley" with most of its 13.63 square miles of land situated generally between

two major freeways (I-880 and I-680), and crossed by State Route 237, and a County expressway. The Milpitas BART station was completed near the Great Mall in 2018, within VTA's Milpitas Transit Center. It is the northernmost BART station in Santa Clara County but one of the southeasternmost stations in the BART system, and is part of the 10-mile BART to Silicon Valley extension from Fremont to San Jose. The Milpitas Transit Center opened in 2019 for bus and light rail service and opened for BART service in June 2020. It is central to the TASP as BART system's gateway to Silicon Valley, serving as a key local and regional connection to the high-tech, job-rich northwestern areas of Santa Clara County.

### TASP Area

The environmental setting for land use for the TASP Area is described on pages 3.1-1 through 3.1-3 of the Certified EIR. This discussion includes the physical setting of the TASP including the TASP location, descriptions and location of existing land uses in the TASP Area and adjacent areas, and information on population in the area. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1 of this SEIR for the locations available for the public to review the Certified EIR.

When the Certified EIR was prepared in 2008, the existing uses in the TASP Area were primarily industrial uses (50 percent) and retail/commercial uses (28 percent), with very little residential uses (3 percent). By 2019, 6,955 dwelling units; 10,630 square feet of office space; and 186,500 square feet of retail space was entitled in the TASP Area. Overall, through implementation of the TASP, land uses have changed in the TASP Area, in the form of transforming an industrial area into a more transit-oriented development area. Much of the vision to create a vibrant neighborhood surrounding the future Milpitas BART station has become a reality with the newly opened Milpitas BART station, new housing, parks, a grocery store, and other shops under development. Several large areas remain where development could still occur, including, but not limited to, the Great Mall area and the proposed geographic expansion areas, discussed below. Full buildout of the TASP is expected to occur by 2030.

## 3.3.2.2 Geographic Expansion Areas

The Metro Plan includes two geographic expansion areas, relative to the TASP Area. The 13-acre western expansion area is currently characterized as industrial with uses such as automotive services and some recent residential development. The 60-acre eastern expansion area is currently used for mini-storage, industrial, manufacturing, and R&D uses.

This section describes the change in Project impacts on land use and planning that would occur with the Project Change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. The Certified EIR found that with implementation of the policies in the TASP, impacts on land use and planning would be less than significant, and mitigation measures were not required. Because the policies have been changed and, in some cases, eliminated from the TASP, the analysis includes a comparison of the TASP policies and the Metro Plan policies to determine if any changes in policies would result in an impact. If new mitigation measures are needed to reduce new impacts that would result from the Project Change, those measures are listed below.

This SEIR analysis evaluates the change in Project impacts with the Project Change, and, if applicable, changes in circumstances or new information that was not available at the time the Certified EIR was prepared. *The analysis does not reevaluate the impacts of the Project that were*

*already disclosed in the Certified EIR and are not altered due to the Project Change.* Based on the change in the Project impact due to the Project Change, a determination is made as to whether there would be changes to the impact significance determinations for the Project in the Certified EIR.

### 3.3.2.3 Significance Criteria

The State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on land use and planning. An impact would be considered significant if construction or operation of the Project would do any of the following.

- Physically divide an established community.
- Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

### 3.3.2.4 Methods

This analysis considers current and proposed policies and goals for Plan Bay Area 2050, the Comprehensive Airport Land Use Plan for Santa Clara County, the 2040 General Plan, the existing and proposed land use conditions within the Metro Plan, and applicable regulations and guidelines. The Metro Plan buildout horizon has been updated compared to the TASP and would apply until the 2040 planning horizon year.

This analysis considers the potential impacts from the geographic expansion. The Metro Plan includes two geographic expansion areas, relative to the TASP Area. Under the Metro Plan, the western expansion area would permit mostly residential and mixed-use development; the eastern expansion area would create a focused Innovation District that would allow business park development with light industrial, R&D, and office uses, along with supporting service and retail uses.

In addition, this analysis considers the potential impacts from changes in the land use categories in the Metro Plan, compared to the TASP. Both the TASP and the Metro Plan identified different land use categories that would allow for higher densities. For the Metro Plan, the land use categories also allow for decreased parking ratios. The Metro Plan updates the land use classification in three different ways.

- First, the Metro Plan updates the allowable densities for some of the land use classifications in the TASP.
- Second, the Metro Plan adds additional land use classifications that were not included in the TASP.
- Third, the Metro Plan updates the locations of where the land use classifications would apply.

Section 2.5.2.1, *Land Use Classifications,* in Chapter 2 of this SEIR, provides a description of the land use designations in the TASP and the Metro Plan. Table 2-1 summarizes the differences in the development standards and density thresholds between the TASP and the Metro Plan. Overall, as summarized in Table 2-1, the Metro Plan would increase the allowable density, compared to the TASP. In addition, the Metro Plan identifies four new land use classifications that were not previously included in the TASP. Two new Business Park Research & Development land use classifications allow for light industrial, research and development, and office uses and would be

applied to parts of the Innovation District (eastern expansion area) and Great Mall District. The new Urban Residential land use classification would allow for high-density residential development and would be applied to an area along Capitol Avenue. The Metro Plan would also increase the allowable heights for buildings within designations for Residential Retail High Density Mixed Use (from 75 feet in the TASP to 85 feet in the Metro Plan), Boulevard Very High Density Mixed Use (from 170 feet in the TASP to 275 feet in the Metro Plan), and Multi-Family Very High Density Residential (from 75 feet in the TASP to 85 feet in the Metro Plan). The Metro Plan would allow buildings to a height of 100 feet in the new Urban Residential land use designation and 275 feet in the new Business Park Research & Development, Limited Residential land use designation.

This analysis assumes that the updated policies in the Metro Plan would be implemented. Table 2-2 in Chapter 2 provides a summary of the policies in the Metro Plan related to land use and planning. Table 2-2 identifies policies that require the following:

- *Fencing, Walls, and Safety.* Requirements for fencing or walls near the rail line.
- *Disclosures.* Requirements to disclose to future residents potential impacts including but not limited to noise, ground-borne and airborne vibration, odors, and use of hazardous materials.
- *Sensitive Receptors.* Requirements to locate sensitive receptors away from sites which store or use hazardous materials and requirements for adequate buffers.
- *Temporary Buffers.* Requirement of temporary buffers when residential uses are developed adjacent to existing industrial uses.
- *Setback Requirements.* Setback requirements to limit potential incompatible uses.

## 3.3.3 Impacts and Mitigation Measures

This section includes a discussion of each impact as it corresponds to the significance criteria presented in Section 3.3.3.1, *Significance Criteria*.

### Impact LU-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to physically dividing an established community.

#### Summary of Certified EIR Impact Analysis

The Certified EIR concluded that the TASP would not physically divide an established community because only one residential neighborhood existed within the area and because the TASP would provide improved connections for the existing residents and employees in the TASP Area. The Certified EIR determined that the TASP would have no impact on the physical division of an established community.

#### Impact Analysis

The Metro Plan would not divide an established community. In fact, the Metro Plan would create street and trail connections, and pedestrian bridges across major thoroughfares, thereby connecting the Metro Plan Area's existing and future residents and employees with jobs, services, parks, and transit. The overall urban design and development standards of the Metro Plan would contribute to fewer incompatible uses in the Metro Plan Area. Implementation of the Metro Plan would ensure

that the proposed land use changes do not conflict with adjacent uses or the established pattern of development.

***Geographic Expansion***

The Metro Plan would not result in any new significant impacts or more severe impacts regarding the division of an established community due to the proposed geographic expansion of the Metro Plan Area. The eastern expansion area is currently used for industrial, manufacturing, and R&D uses, and does not contain neighborhoods. It would be incorporated into the Innovation District in the Metro Plan.

The western expansion area currently contains an existing residential assisted living facility, as well as industrial and automotive service uses. The western expansion area would become part of the McCandless District in the Metro Plan. The Metro Plan would therefore enhance community connectivity for the existing residential uses in the Metro Plan Area because it would add more similar uses to the McCandless District. In addition, the Metro Plan would continue implementing similar goals as the TASP regarding community connectivity, including providing safer and more attractive multimodal connections for walking and biking; developing parks that provide pedestrian connectivity in each District; and implementing street, trail, and bridge improvements to connect existing residents and employees with jobs, services, parks, and transit. The additional development that would occur within the Metro Plan Area would generate additional impact fees that would help pay for this additional infrastructure. As such, the Project Change would not create a new or more severe impact regarding the division of an established community due to the geographic expansion of the Metro Plan.

***Metro Plan Buildout: Population Growth and Employment***

The Metro Plan would not result in any new significant impacts or more severe impacts regarding the division of an established community due to the additional growth that would be allowed due to the proposed changes in land use classifications of the Metro Plan. Most of the land use classification changes in the Metro Plan, such as changes to parking and density allowances, would not affect community division. However, changes to height limits and land use classifications could cause the physical division of an established community, if they were to allow for new uses that could create a height-related or other physical barrier between communities with buildings, passages, or utilities that were not designed or appropriately located. The Metro Plan would reduce the likelihood of community division, similar to the TASP, because its land use classification system would combine similar and compatible uses within Districts. For example, in the McCandless District, which contains existing residential uses, the Project Change would expand residential uses and would designate the new properties added into the McCandless District as Urban Residential. Similarly, the development of the Great Mall site, as envisioned in the Metro Plan, would expand residential and mixed uses and connect existing residential neighborhoods north of the Great Mall with similar new neighborhoods surrounding the Great Mall. Like the TASP, implementation of the Metro Plan, due to its policies and standards, would ensure that the proposed land use changes do not conflict with neighboring uses or the established pattern of development. The policies contained in the Metro Plan would also support community connectivity. As such, the Project Change would not create a new or more severe impact regarding the division of an established community due to the buildout associated with the Metro Plan.

***Changes in Land Use Classifications and Policies***

The Metro Plan would not result in any new significant impacts or more severe impacts regarding the division of an established community due to policy changes in the Metro Plan. The Metro Plan updates the policies in the TASP, including deleting some policies in the TASP; however, this would not result in any substantial changes to the requirements related to reducing impacts on the physical division of an established community. Changes to the TASP policies, as shown in Table 2-2 in Chapter 2 of this SEIR are either not substantially changed from the equivalent TASP policy, or the TASP policy is similarly and adequately covered under a 2040 General Plan policy, to which the Metro Plan would be required to adhere. Connectivity is typically provided by roadways, pedestrian paths, and bicycle paths. The Metro Plan would continue implementing similar goals as the TASP regarding community connectivity, including providing connections for walking and biking; developing parks that provide pedestrian connectivity in each District; and implementing street, trail, and bridge improvements to connect existing residents and employees with jobs, services, parks, and transit. As such, the Project Change would not create a new or more severe impact regarding the division of an established community due to the changes in policies in the Metro Plan.

### Certified EIR Mitigation Measures

The Certified EIR included no mitigation measures for impacts related to physical division of an established community.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact LU-1

The Certified EIR determined that the Project would not physically divide an established community. Based on the analysis above, with incorporation of the Project Change, the Project would have no impact related to physical community division. The Project Change would not alter the result of the Certified EIR's impact determination related to physical community division. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact LU-2: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to causing a significant environmental impact due to a conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

### Summary of Certified EIR Impact Analysis

The Certified EIR determined that the TASP would significantly change the land use designations and change the pattern of development within the TASP Area. New residential uses would be built in an existing industrial area causing periods of time when incompatible uses would be adjacent to each other. However, the Certified EIR concluded that with the implementation of TASP policies and programs regarding the reduction of incompatible uses as an overarching goal, the impact at final

buildout would be less than significant. The TASP was determined to be largely consistent with other applicable land use plans and included policies to ensure that the impact of inconsistency would be less than significant.

### Impact Analysis

The Metro Plan updates the policies in the TASP, including deleting some policies in the TASP. Several land use-related policies identified in the TASP, specifically TASP Policy 4.15 (requiring safety barriers along all Union Pacific rail lines along Piper Drive) and TASP Policy 4.23 (regarding the now-completed Milpitas Boulevard extension, on which the rail line identified in the policy is no longer active) are no longer applicable because the requirements in the policy have been completed. As such, these policies have been fulfilled and are no longer needed to reduce impacts on land use and planning. The Metro Plan would not result in any substantial changes to the requirements identified in the other TASP policies (listed on pages 3.1-11 and 3.1-12 of the Certified EIR) related to reducing impacts from a conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Changes to the other TASP policies, as shown in Table 2-2 in Chapter 2 of this SEIR are either not substantially changed from the equivalent TASP policy or the TASP policy is similarly and adequately covered under a 2040 General Plan policy, to which the Metro Plan would be required to adhere.

The Metro Plan would support the goals and policies of the 2040 General Plan with its focus on creating walkable, transit-oriented areas with a mix of neighborhood-serving uses; creating new opportunities for jobs near transit; providing more affordable and market-rate housing; and encouraging non-vehicular modes of transportation. Pertinent goals related to land use and planning from the 2040 General Plan, which the Metro Plan would be consistent with, are as follows:

- **Land Use Goals:**
    - **Goal LU-1.** Accommodate a well-balanced mix of land uses that meets the diverse needs of Milpitas residents, businesses, and visitors with places to live, work, shop, be entertained and culturally enriched.
    - **Goal LU-2.** Promote land use objectives and development patterns in special planning areas consistent with adopted specific plans, overlay districts, and density bonus provisions.
    - **Goal LU-3.** Participate in coordinated local and regional land use planning activities.
    - **Goal LU-4.** Coordinate and integrate land use and transportation objectives.
    - **Goal LU-5.** Ensure that new development is compatible with existing development in order to maintain a high quality of life for residents, while supporting successful business operations.
    - **Goal LU-6.** Support commercial centers that serve residential neighborhoods and provide for a variety of convenient, successful and attractive commercial uses throughout the city.
    - **Goal LU-7**. Promote the continued evolution of Milpitas' job generating land uses to support existing and future businesses.
- **Transportation and Circulation Goals**
    - **Goal CIR-1.** Provide a transportation system that efficiently, equitably and effectively supports the City's land use vision, minimizes vehicle miles traveled (VMT), enhances connectivity of the existing network, and supports the use of all modes of transportation.

- **Goal CIR-2.** Provide safe, healthy, comfortable, equitable and efficient transportation choices for all modes of transportation that enable people of all races, cultures, ethnicities, religions, sexual orientation, genders, income levels, ages and abilities, especially people of color and those disproportionately affected by access to a personal vehicle, systemic transportation inequities, racism, oppression, and poverty to increase safe physical activity, reduce usage of personal vehicles, access goods and services, employment opportunities, and for personal travel; to provide for efficient goods movement.
- **Goal CIR-3.** Support the development and maintenance of the public transit system to provide integrated, accessible, convenient, safe, equitable, health-promoting, comfortable, and effective mobility options.
- **Goal CIR-4**. Promote, provide, and maintain an expanded, safe, convenient and comprehensive network of facilities for pedestrians and bicyclists of all ages and abilities to support walking and bicycling as viable modes of transportation, for recreational use, and to promote public health.
- **Goal CIR-5**. Implement measures that increase transit use and other non-motorized travel modes that lead to improved utilization of the existing transportation system, such as accessibility improvements to public transit stops and stations by walking and biking, and provide transit stops near employment centers and higher density residential developments and in areas where infrastructure is lacking and access without a car is unsafe.

- **Community Design Goals**
  - **Goal CD-5**. Provide appropriate transitions between land uses to avoid conflicts and perpetuate the community's harmonious character.
  - **Goal CD-6.** Enhance the corridors, pathways, and edges that form physical boundaries and provide transitions and connections throughout the community.

The Project Change supports the above Land Use, Transportation and Circulation, and Community Design goals because the vision of the Metro Plan is to expand and promote higher density and intensity development opportunities in the Metro Plan Area (Goal LU-4 and Goal CIR-5), and in doing so create a more complete neighborhood that includes a variety of services (Goal LU-1). The Metro Plan would also further enable a walkable and transit-oriented community (Goal LU-2 and Goals CIR-1, CIR-2, CIR-3, CIR-4, and CIR-5) that is reflective of the progressive social conditions and growing economy. It would accommodate a vibrant mix of lifestyle retail and amenities, high density housing, and high intensity offices within the Metro Plan Area (Goals LU-5, LU-6, and LU-7) and would provide safer and more attractive multimodal connections for walking and biking (Goals CIR-1, CIR-2, CIR-3, CIR-4, and CIR-5; Goals CD-5 and CD-6). The Metro Plan would also promote the improvement and use of the City and County transportation network (Goal LU-3). As such, the Metro Plan would not conflict with the goals identified in the 2040 General Plan.

Furthermore, although the Metro Plan currently overlaps with the Midtown Plan, the boundaries of the Midtown Plan would be updated to remove the overlap when the Metro Plan is considered for approval by the City Council. Likewise, the land use map in the 2040 General Plan would be similarly updated when the Metro Plan is considered for approval by the City Council. As such, the policies and land use designations in the Midtown Plan would not apply to the Metro Plan.

The Metro Plan would be consistent with the guiding principles of Plan Bay Area 2050, regarding the interrelation of housing, the economy, transportation, and the environment by supporting more

affordable and market-rate housing near transit, increasing jobs near transit, and encouraging non-vehicular modes of transportation to reduce GHG emissions. The Project Change would support the Plan Bay Area 2050 vision because it would provide high to very high-density housing and/or high intensity office and employment uses along arterials, the light rail, and close to the BART station to support transit ridership and complementary activities. The Project Change would promote retail and amenities, high density housing, and high intensity offices within the Metro Plan Area and particularly within the Great Mall District, which is a transit hub. The Project Change would support housing near transit by accommodating up to 7,000 additional affordable and market-rate housing units to help the City meet its regional housing needs requirements and support transit ridership, and would aim to attract business investments and generate employment opportunities through commercial development near transit. The Project Change would also focus on improving the City and County transportation network and promote walking and bicycling. As such, the Metro Plan would not conflict with the vision of Plan Bay Area 2050 and, in fact, would promote the kind of projects envisions in Plan Bay Area 2050.

The Metro Plan would not conflict with the relevant policies of the Comprehensive Airport Land Use Plan for Santa Clara County for Norman Y. Mineta San Jose International Airport. Policies that apply countywide include the following:

- **Policy T-1**: The applicant for any proposed project anywhere in the County for construction or alteration of a structure (including antennas) higher than 200 feet above ground level shall submit to the FAA a completed copy of FAA Form 7460-1, Notice of Proposed Construction or Alteration. A copy of the submitted form shall be submitted to the Santa Clara County ALUC as well as a copy of the FAA's response to this form.
- **Policy T-2:** T-2 Any proposed project anywhere in the County for construction or alteration of a structure (including antennas) higher than 200 feet above ground level shall comply with FAR 77.13(a)(1) and shall be determined inconsistent if deemed to be a hazard by the FAA or if the ALUC determines that the project has any impact on normal aircraft operations or would increase the risk to aircraft operations.

The Metro Plan would allow for buildings in certain land use designations to be over 200 feet. Nonetheless, all future projects undertaken in the Metro Plan Area would be required to adhere to the relevant policies of the Comprehensive Airport Land Use Plan for Santa Clara County for Norman Y. Mineta San Jose International Airport. Because future projects would follow the protocols identified in Policy T-1 and Policy T-2, the Metro Plan would not conflict with the Comprehensive Airport Land Use Plan for Santa Clara County for Norman Y. Mineta San Jose International Airport.

Similar to the findings in the Certified EIR, with the implementation of the Metro Plan's policies and programs, this impact will be less than significant at final buildout. Thus, the Project Change would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR regarding conflicts with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to conflicts with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact LU-2

The Certified EIR determined that the TASP would result in a less-than-significant impact related to conflicts with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Based on the analysis above, with incorporation of the Project Change, the Project would have a less-than-significant impact related to conflicts with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The Project Change would not alter the result of the Certified EIR's impact determination related to conflicts with a land use plan, policy, or regulation. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

# 3.4 Noise

This section discloses and analyzes the potential change in Project noise and vibration impacts that would result from implementing the Project Change.

## 3.4.1 Regulatory Setting

The regulatory setting for noise is described on pages 3.7-6 through 3.7-9 of the Certified EIR. These regulations include Title 24 of the California Code of Regulations, policies from the City of Milpitas 1994 General Plan, and the City of Milpitas Noise Abatement Ordinance. Much of this information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. However, since the publication of the Certified EIR, the City completed and adopted an update to the General Plan (referred to as the 2040 General Plan). Therefore, a summary of relevant noise regulations for the Metro Plan, including pertinent components of the 2040 General Plan, is included below. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIR.

### 3.4.1.1 Federal

The Federal Transit Administration (FTA) has developed guidelines for the assessment of vibration effects, which are commonly used for the assessment of operational vibration from sources such as rail. Table 3.4-1 presents the FTA's general assessment criteria for evaluating potential construction-generated vibration effects. This identifies potential annoyance effects related to interference with interior operations, sleep, and institutional daytime use as a function of the frequency of the vibration event. The guidelines include three land use categories based on the types of uses occupying a given building.

**Table 3.4-1. Federal Transit Administration Ground-borne Vibration Impact Criteria**

| | GVB Impact Levels (VdB re 1 micro-inch/second) | | |
|---|---|---|---|
| **Land Use Category** | **Frequent Events[1]** | **Occasional Events[2]** | **Infrequent Events[3]** |
| Category 1: Buildings where vibration would interfere with interior operations | 65[4] | 65 | 65 |
| Category 2: Residences and buildings where people normally sleep | 72 | 75 | 80 |
| Category 3: Institutional land uses with primarily daytime use | 75 | 78 | 80 |

Source: Federal Transit Administration 2018.
1 "Frequent events" are defined as more than 70 vibration events from the same source per day. Most rapid transit projects fall into this category.
2. "Occasional events" are defined as between 30 and 70 vibration events from the same source per day. Most commuter trunk lines have operations in this range.
3 "Infrequent events" are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. For equipment that is more sensitive, a detailed vibration analysis must be performed.
GVB = ground-borne vibration; VdB = vibration decibels.

Except for long-term occupational exposure, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. People may tolerate infrequent, short-duration vibration levels, but human annoyance to vibration becomes more pronounced if the vibration is continuous or occurs frequently.

### 3.4.1.2 State

#### California Code of Regulations

The California Noise Insulation Standards (California Code of Regulations, Title 24, Section 1207.4) establish requirements for new residential units that may be subject to relatively high levels of exterior noise. In this case, the noise insulation criterion is 45 decibels (dB) day-night average sound level ($L_{dn}$)/Community Noise Equivalent Level (CNEL) inside noise-sensitive spaces.

#### California Department of Transportation

The California Department of Transportation (Caltrans) provides guidelines regarding vibration damage and annoyance associated with construction and operation of transportation infrastructure. Caltrans vibration criteria are commonly used throughout the state of California in the assessment of vibration-related impacts under CEQA for a variety of development project types.

Table 3.4-2 provides Caltrans' vibration guidelines for potential damage to different types of structures. With respect to vibration annoyance, people are generally more sensitive to vibration during nighttime hours, when sleeping, rather than daytime hours. Numerous studies have been conducted to characterize the human response to vibration. Table 3.4-3 provides Caltrans' guidelines regarding vibration annoyance potential expressed as peak particle velocity (PPV).

**Table 3.4-2. Caltrans Vibration Guidelines for Potential Damage to Structures**

| | Maximum Peak Particle Velocity (PPV, inch/second) | |
|---|---|---|
| **Structure Type and Condition** | **Transient Sources** | **Continuous/Frequent Intermittent Sources** |
| Extremely fragile historic buildings (ruins, ancient monuments) | 0.12 | 0.08 |
| Fragile buildings | 0.2 | 0.1 |
| Historic and some old buildings | 0.5 | 0.25 |
| Older residential structures | 0.5 | 0.3 |
| New residential structures | 1.0 | 0.5 |
| Modern industrial/commercial buildings | 2.0 | 0.5 |

Source: California Department of Transportation 2020.
Note: Transient sources create a single, isolated vibration event (e.g., blasting or the use of drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

**Table 3.4-3. Caltrans Guidelines for Vibration Annoyance Potential**

| | Maximum PPV (inch/second) | |
|---|---|---|
| **Human Response** | **Transient Sources** | **Continuous/Frequent Intermittent Sources** |
| Barely perceptible | 0.04 | 0.01 |
| Distinctly perceptible | 0.25 | 0.04 |
| Strongly perceptible | 0.9 | 0.10 |
| Severe | 2.0 | 0.4 |

Source: California Department of Transportation 2020.
Note: Transient sources create a single, isolated vibration event (e.g., blasting or the use of drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

### 3.4.1.3 Local

#### 2040 Milpitas General Plan

On March 9, 2021, the City of Milpitas adopted an update to the General Plan, which is referred to as the 2040 General Plan. The Noise Element of the 2040 General Plan includes goals, policies, and actions intended to help control and reduce environmental noise in the City and contains land use compatibility standards that outline acceptable outdoor noise environment standards for various land use categories. Policies from the 2040 Milpitas General Plan relevant to the Project's physical impacts on the environment, include the following:

- **Goal N-1:** Preserve a nuisance-free noise environment for existing and future land uses by minimizing exposure to harmful and excessive noise level.
- **Policy N 1-1:** Consider the noise compatibility of existing and future development when making land use planning decisions. Require development and infrastructure projects to be consistent with the land use compatibility standards contained in Tables N-1 and N-2 [included as Tables 3.4-4 and 3.4-5 below] to ensure acceptable noise exposure levels for existing and future development.
- **Policy N 1-2:** Require new development to mitigate excessive noise to the standards indicated in Tables N-1 and N-2 [included as Tables 3.4-4 and 3.4-5 below] through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-minimizing materials.

**Table 3.4-4. Land Use Compatibility for Community Noise Environment (General Plan Table N-1)**

**Table 3.4-5. Stationary (Non-Transportation) Noise Source Standards (General Plan Table N-2)**

| Land Use Receiving Noise | Hourly Noise Level Descriptor | Exterior Noise-Level Standard (dBA) | |
|---|---|---|---|
| | | Daytime (7:00 a.m. to 10:00 p.m.) | Nighttime (10:00 p.m. to 7:00 a.m.) |
| Residential | $L_{eq}$ | 55 | 45 |
| | $L_{max}$ | 70 | 65 |

Notes:
The residential standards apply to all properties that are zoned for residential use. The exterior noise level standard is to be applied at the property line of the receiving land use or at a designated outdoor activity area. For mixed-use projects, the exterior noise level standard may be waived in conjunction with Policy N 2-2 (at the discretion of the decision-making body) if the residential portion of the project does not include a designated activity area and mitigation of property line noise is not practical.
Each of the noise levels specified above shall be lowered by 5 dBA for tonal noises characterized by a whine, screech, or hum, noises consisting primarily of speech or music, or recurring impulsive noises. In no case shall mitigation be required to a level that is less than existing ambient noise levels, as determined through measurements conducted during the same operational period as the subject noise source.
In situations where the existing noise level exceeds the noise levels indicated in the above table, any new noise source must include mitigation that reduces the noise level of the noise source to the existing level plus 3 dB.
dBA = A-weighted decibels; $L_{eq}$ = equivalent continuous sound level; $L_{max}$ = maximum sound level.

- **Policy N 1-4:** Ensure that new development does not result in indoor noise levels exceeding 45 dBA $L_{dn}$ for residential uses by requiring the implementation of construction techniques and noise reduction measures for all new residential development.
- **Policy N 1-5:** Require acoustical studies for new discretionary developments and transportation improvements that have the potential to affect existing noise-sensitive uses such as schools, hospitals, libraries, care facilities, and residential areas; and for projects that would introduce new noise-sensitive uses into an area where existing noise levels may exceed the thresholds identified in this element.
- **Policy N 1-6:** For projects that are required to prepare an acoustical study to analyze noise impacts, the following criteria shall be used to determine the significance of those impacts:

  **Stationary and Non-Transportation Noise Sources**

  - A significant impact will occur if the project results in an exceedance of the noise level standards contained in this element [refer to Table 3.4-5, shown previously, and Table 3.4-6, included below]. In instances where the ambient noise level is already above the standards contained in this element, a significant impact will occur if the project will result in an increase in ambient noise levels by more than 3 dB. This does not apply to temporary construction activities.

  **Transportation Noise Sources**

  - Where existing traffic noise levels are 60 dB $L_{dn}$ or less at the outdoor activity areas of noise-sensitive uses, a +5 dB $L_{dn}$ increase in roadway noise levels will be considered significant;
  - Where existing traffic noise levels are greater than 60 dB $L_{dn}$ and up to 65 dB $L_{dn}$ at the outdoor activity areas of noise-sensitive uses, a +3 dB $L_{dn}$ increase in roadway noise levels will be considered significant; and
  - Where existing traffic noise levels are greater than 65 dB $L_{dn}$ at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB $L_{dn}$ increase in roadway noise levels will be considered significant.

**Table 3.4-6. Stationary (Non-Transportation) Noise Source Standards (Commercial Mixed-Use and Transit-Oriented (General Plan Table N-3)**

| Land Use Receiving Noise | Hourly Noise Level Descriptor | Exterior Noise-Level Standard (dBA) | | |
|---|---|---|---|---|
| | | Daytime (7:00 a.m. to 10:00 p.m.) | Late Night (10:00 p.m. to 12:00 a.m.) | Nighttime (12:00 a.m. to 7:00 a.m.) |
| Residential (Sunday Night – Thursday Night) | $L_{eq}$ | 60 | 55 | 50 |
| | $L_{max}$ | 70 | 65 | 65 |
| Residential (Friday Night- Saturday Night) | $L_{eq}$ | 65 | 60 | 55 |
| | $L_{max}$ | 75 | 70 | 65 |

- **Policy N 1-7:** Support noise-compatible land uses along Interstates 680 and 880, Highway 237, and other high-volume roadways.
- **Policy N 1-8:** Require construction activities to comply with standard best practices to reduce noise exposure to adjacent sensitive receptors (see Action N-1d).
- **Policy N 1-9:** Implement a range of traffic control measures, including but not limited to, light timing, asphalt alternatives (such as rubberized asphalt), and speed reduction measures to reduce roadway noise.
- **Policy N 1-10:** Work with Regional, State, and Federal agencies, including but not limited to, Caltrans, BART, VTA, and Santa Clara County to ensure that adequate noise studies are prepared prior to the approval of State and Regional transportation and infrastructure projects. Strongly encourage these agencies to ensure that that adequate noise mitigation measures are incorporated into future projects to protect Milpitas residents and businesses from exposure to excessive noise levels.
- **Policy N 1-12:** Require non-transportation related noise from site specific noise sources to comply with the standards shown in Table N-2 [Table 3.4-5 of this report].
- **Policy N 1-15:** Temporary emergency operations or emergency equipment usage authorized by the City shall be exempt from noise standard criteria set by this element.
- **Policy N 2-3:** Consider ground borne vibration and noise nuisance associated with rail operations prior to approving the development of sensitive uses.

  **Actions in Support of Goal N-1:**

  - **Action N-1a:** Require that new development projects are reviewed for compliance with the noise requirements established in this element, including the standards established in Tables N-1 and N-2, prior to project approval.
  - **Action N-1b:** Require acoustical studies for new development projects which have the potential to generate noise impacts which exceed the standards identified in this element. The studies shall include representative noise measurements, estimates of existing and projected noise levels, and mitigation measures necessary to ensure compliance with the noise standards included in this element. Studies shall be conducted by a qualified acoustical professional.

- **Action N-1c:** Require developers to prepare a construction management/noise mitigation plan that defines best management practices to reduce construction noise, and includes proposed truck routes (that comply with Section 12 V-100-12.05 - Truck Routes of the Milpitas Municipal Code) as part of the entitlement process.
- **Action N-1d:** During the environmental review process, determine if proposed construction will constitute a significant impact on nearby sensitive receptors and, if necessary, require mitigation measures in addition to the standard best practice controls. Suggested best practices for control of construction noise include:
  - Noise-generating construction activities, including truck traffic coming to and **from** the construction site for any purpose, shall be limited to between the hours of 7:00 a.m. and 7:00 p.m. No construction shall occur on National holidays.
  - All equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.
  - The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.
  - At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.
  - Unnecessary idling of internal combustion engines shall be prohibited for a duration of longer than five minutes.
  - Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible.
  - Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.
  - The construction contractor shall designate a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible for determining the cause of the noise complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures, as warranted, to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site
- **Action N-1k:** Update Title V, Chapter 213 – (Noise Abatement) of the Milpitas Municipal Code as necessary to comply with noise standards and criteria set by this element.

## City of Milpitas Municipal Code

The City of Milpitas Municipal Code contains noise regulations to protect the community from excessive noise, which are outlined in Chapter 213 of the Municipal Code. According to Section V-213-3(a) of the Municipal Code, it is unlawful for any person in any district zoned for residential use to generate any noise that increases the ambient noise level by 3 dB as measured from the property line of the noise source, or to a noise level of more than 65 dB as measured from the property line of the noise source, whichever is more restrictive. In addition, Section V-213-3(b) of the Municipal

Code states that construction activities are limited to between the hours of 7:00 a.m. and 7:00 p.m. daily. Construction is permitted to happen any day of the week, except for on holidays, as outlined in Section V-213-2-2.05 of the Municipal Code.

According to 2040 General Plan Action N-1k cited above, the City plans to update the Municipal Code to align with the noise standards contained in the 2040 General Plan Noise Element. The 2040 General Plan Noise Element includes more specific and detailed noise standards, which are commonly used in the assessment of noise impacts for CEQA by the City.

#### 3.4.1.4 TASP Policies

Table 2-2 from Chapter 2, *Project Description*, of this SEIR provides a summary of the policies in the TASP related to noise and vibration. Table 2-2 identifies policies that require the following:

- *General Plan* and *Noise Abatement Ordinance*. Requires compliance with guidelines in the 1994 General Plan and the Noise Abatement Ordinance.
- *Masonry Walls, Sound Walls, Temporary Buffers.* Requires installation of masonry walls, sound walls, temporary walls, landscaping, and setbacks to reduce noise impacts on receptors.
- *Vibration.* Requires application of the FTA ground-borne vibration criteria for projects in the vicinity of rail and requires a vibration impact analysis for sites near rail.
- *Disclosures.* Requirements to disclose potential impacts, including but not limited to noise, ground-borne and airborne vibration, odors, and use of hazardous materials, to future residents.

### 3.4.2 Environmental Setting

The environmental setting for noise within the Project area is described starting on page 3.7-5 of the Certified EIR. In addition, the Certified EIR includes a technical background discussion describing the fundamentals of noise and vibration, starting on page 3.7-1 of the Certified EIR. Existing noise measurement data is also included on page 3.7-6 of the Certified EIR. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1 of this SEIR for the locations available for the public to review the Certified EIR.

The noise environment in the Project area has changed since the Certified Plan was prepared due to additional growth in the area. For example, the recent BART extension to the City began passenger service to Milpitas in 2020. The 2005 noise levels for the TASP Area included in the Certified EIR, which is when the noise measurements were taken, may not be representative of conditions in the Metro Plan Area at this time. Therefore, new noise measurements were collected to ensure ambient noise in the Metro Plan vicinity is more accurately documented. The results of the 2021 noise measurements are included below.

#### 3.4.2.1 2005 Noise Measurements

To quantify the existing noise environment, five short-term measurements were completed on October 10, 2005, for the Certified EIR. Measured noise levels ranged from 54 dBA $L_{eq}$ to 72 dBA $L_{eq}$, and from 61 dBA $L_{max}$ to 86 dBA $L_{max}$. The primary contributors to the noise environment were traffic, overhead aircraft, pedestrians, and wildlife (e.g., birds). Table 3.7-1 on page 3.7-6 of the Certified EIR provides details about these measurements. As noted above, due to the age of these measurements (approximately 17 years old), this measurement data may not accurately represent

the existing ambient noise levels in the Metro Plan Area. As a result, new measurements were conducted in 2021, as described below.

### 3.4.2.2 2021 Noise Measurements

To quantify existing ambient noise levels in the Metro Plan Area, short- and long-term ambient noise measurements were conducted between Tuesday, September 14, 2021, and Thursday, September 16, 2021. Long-term measurements were conducted using Piccolo Type 2 sound level meters (SLM) for a period of approximately 48 hours. Measurement data was used to calculate 1-hour $L_{eq}$ and 24-hour average noise levels. Short-term measurements (of approximately 15 minutes in duration) were conducted using a Larson Davis LxT Type 1 SLM. Data from the short-term measurements included the $L_{max}$, $L_{min}$, and 15-minute average $L_{eq}$ noise level. Weather conditions were clear and sunny when the measurements were conducted, with an average wind speed of 1.2 mph and temperatures ranging from 77.2 to 96 degrees Fahrenheit.

Monitoring locations were selected to capture noise levels in areas that are sensitive to noise or representative of ambient levels throughout the day and night for areas in the vicinity of the Metro Plan. Measurement locations LT-3 and ST-4 are located near the western geographic expansion area, and measurement locations LT-4 and ST-1 are located near the eastern geographic expansion area. These measurement locations provide representative existing noise levels for these portions of the Metro Plan Area. Long-term data was used to calculate $L_{dn}$, CNEL, and average 12-hour $L_{eq}$ noise levels for daytime hours (7:00 a.m. to 7:00 p.m.). In addition, recorded data was reviewed to determine the highest and lowest 1-hour $L_{eq}$ recorded during the measurement window. Note that the $L_{dn}$ includes the application of an artificial 10-dB increase (or penalty) applied to each hour in the 10:00 p.m. to 7:00 a.m. window. CNEL applies a 5-dB increase (or penalty) to each hour during the evening hours of 7:00 p.m. to 10:00 p.m., as well as a 10-dB increase to each hour during the nighttime hours of 10:00 p.m. to 7:00 a.m.

Existing noise levels in the Metro Plan Area vary between measurement location, as some readings were taken near major roadways while others were conducted in more residential areas. Existing ambient noise levels in the Project vicinity were heavily influenced by the traffic on major and local roadways in the area. The locations of the noise measurement sites are shown on Figure 3.4-1. Appendix E includes the complete noise measurement data from the noise field survey.

#### Short-Term Noise Monitoring

Four short-term monitoring locations in and around the Project vicinity were selected to collect short-term ambient noise data. Noise levels during the short-term measurements ranged from 51.7 dBA $L_{eq}$ to 62.6 dBA $L_{eq}$. Table 3.4-7 provides a summary of the short-term noise measurement results.

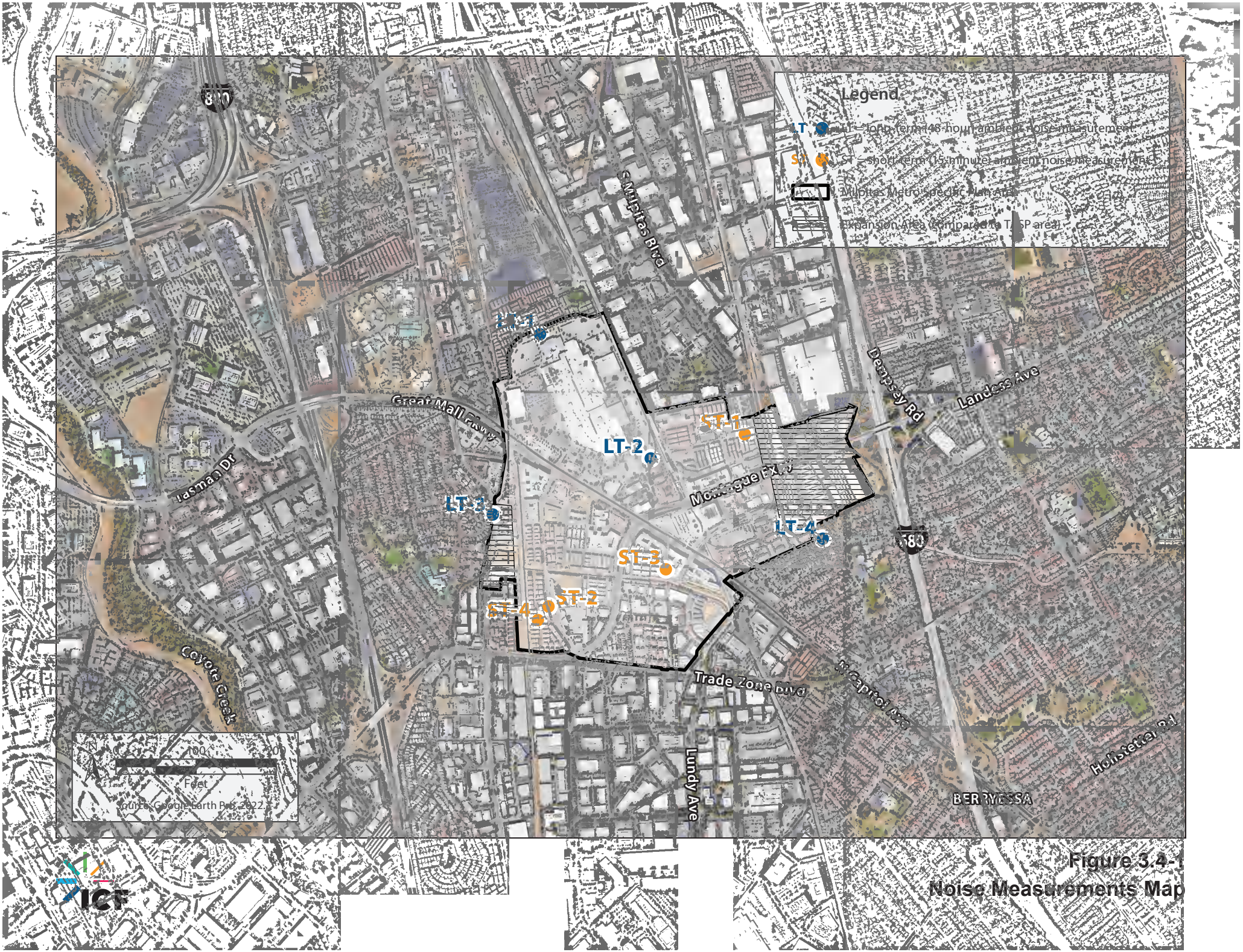


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**Figure 3.4-1**
**Noise Measurements Map**

ST-1 was located north of Garden Street, immediately to the west of 845 Garden Street, and approximately 170 feet west of South Milpitas Boulevard. Noise at this location was measured as 56.2 dBA $L_{eq}$ during the 15-minute measurement interval. The dominant source of noise was vehicle traffic on South Milpitas Boulevard.

ST-2, located west of McCandless Drive and approximately 230 feet north of DeLong Lane, is considered representative of nearby residential land uses. Measurements from this site showed ambient noise levels of 62.6 dBA $L_{eq}$. The dominant noise source during this measurement was vehicle traffic along McCandless Drive and temporary construction across McCandless Drive, near Mabel Mattos Elementary School, approximately 415 feet from the measurement location.

ST-3 was located on the southwest corner of Delano Street and Vineyard Avenue, approximately 400 feet south of East Capital Avenue. The recorded noise level was 51.7 dBA $L_{eq}$ during the 15-minute measurement interval. Overall noise levels were dominated by light traffic at the intersection of Delano Street and Vineyard Avenue. Intermittent aircraft overflight noise also influenced the measurement.

ST-4 was located on the west side of Lee Way, approximately 110 feet north of DeLong Lane. This measurement was taken to capture noise in the vicinity of ST-2, but farther from the active construction near Mabel Mattos Elementary School (with additional buildings located between the construction activity and the measurement location). Noise levels from this location were measured to be 59.4 dBA $L_{eq}$, and the dominant noise sources during this measurement was vehicular traffic along Lee Way.

**Table 3.4-7. Short-Term Noise Measurement Results**

| Noise Measurement | Site Description | Measurement Start Time | $L_{eq}$ | $L_{max}$ | $L_{min}$ | Dominant Noise Sources |
|---|---|---|---|---|---|---|
| ST-1 | 845 Garden Street | 09/14/2021 1:29 p.m. | 56.2 | 71.1 | 40.4 | Roadway traffic noise primarily from S Milpitas Avenue |
| ST-2 | 1747 McCandless Drive | 09/14/2021 12:43 p.m. | 62.6 | 77.0 | 46.2 | Roadway traffic noise primarily from McCandless Drive |
| ST-3 | 422 Vineyard Avenue | 09/14/2021 2:22 p.m. | 51.7 | 62.8 | 44.8 | Light traffic along Delano Street and Vineyard Avenue |
| ST-4 | Across the Street from 1900 Lee Way | 09/16/2021 2:08 p.m. | 59.4 | 83.5 | 42.4 | Light traffic along Lee Way |

Note: See Appendix E for additional noise measurement data.
ST = short-term (15-minute) ambient noise measurement.
All noise levels are reported in A-weighted decibels (dBA).

## Long-Term Noise Monitoring

Four long-term monitoring locations were selected throughout the Metro Plan Area to collect long-term ambient noise data. Measurements were conducted for a period of approximately 48 hours from September 14 to September 16, 2021. The 24-hour $L_{dn}$ noise levels from the long-term measurements ranged from 57.5 dBA $L_{dn}$ to 71.1 dBA $L_{dn}$.

LT-1, located on Great Mall Drive, north of Century 20 Great Mall, had an $L_{dn}$ of approximately 62.2 dBA for day one and 64.2 dBA for day two. LT-2, also positioned along Great Mall Drive, was located north of TownePlace Suites and near the Marriott Milpitas Silicon Valley. LT-2 had a measured $L_{dn}$ of 65.5 dBA for day one and 66.3 dBA for day two. LT-3, located across the street from 1400 South Main Street and approximately 800 feet north of Cedar Way had a measured noise level of 67.7 dBA $L_{dn}$ for day one and 71.1 dBA $L_{dn}$ for day two. Finally, LT-4, located approximately 160 feet north of the Trimble Road and Muirwood Court intersection, had a measured noise level of 58.2 dBA $L_{dn}$ for day one and 57.5 dBA $L_{dn}$ for day two. Table 3.4-8 provides a summary of the long-term noise measurement results.

**Table 3.4-8. Long-Term Noise Measurement Results**

| Noise Measurement | Site Description | Time Period | $L_{dn}$ | Peak 1-hr $L_{eq}$[1] Time of Occurrence | 12-Hour $L_{eq}$ Day 1 |
|---|---|---|---|---|---|
| LT-1 | North of Century 20 Great Mall and XD, on Great Mall Drive | 09/14/2021 to 9/15/2021 | 62.2 | 65.2 09/05/2021 7:00 p.m. | 62.1 |
| | | 9/15/2021 to 9/16/2021 | 64.2 | | 62.3 |
| LT-2 | North of TownePlace Suites by Marriott, on Great Mall Drive | 09/14/2021to 9/15/2021 | 65.5 | 67.9 09/14/2021 2:00 p.m. | 66.3 |
| | | 9/15/2021 to 9/16/2021 | 66.3 | | 66.6 |
| LT-3 | Across the Street from 1400 S Main Street | 09/14/2021to 9/15/2021 | 71.0 | 71.4 09/15/2021 6:00 p.m. | 69.2 |
| | | 9/15/2021 to 9/16/2021 | 71.5 | | 69.4 |
| LT-4 | 2141 Muirwood Court | 09/14/2021to 9/15/2021 | 59.9 | 67.6 09/14/2021 9:00 a.m. | 60.8 |
| | | 9/15/2021 to 9/16/2021 | 57.5 | | 55.2 |

[1] Peak $L_{eq}$ is the highest calculated $L_{eq}$ level during a 48-hour period.
Note: See Appendix E for additional noise measurement data.
LT = long-term (48-hour) ambient noise measurement.
All noise levels are reported in A-weighted decibels (dBA).
Primary noise source at all measurement locations was roadway traffic.

## 3.4.3 Impacts and Mitigation

This section describes the change in Project impacts on noise and vibration that would occur with the Project Change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. The Certified EIR found that with implementation of policies in the TASP, along with the application of 1994 General Plan policies, impacts related to noise and vibration would be less than significant, and mitigation measures were not required. Because the Metro Plan policies would replace policies in the TASP, the analysis includes a comparison of the TASP policies and the Metro Plan policies to determine if any changes

in policies would result in an impact. If new mitigation measures are needed to reduce new impacts that would result from the Project Change, those measures are identified below.

This SEIR analysis evaluates the change in Project impacts with the Project Change, and, if applicable, changes in circumstances or new information that was not available at the time the Certified EIR was prepared. The analysis does not reevaluate the impacts of the Project that were already disclosed in the Certified EIR and are not altered due to the Project Change. Based on the change in the Project impact due to the Project Change, a determination is made as to whether there would be changes to the impact significance determinations for the Project in the Certified EIR.

### 3.4.3.1 Significance Criteria

The State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on noise. An impact would be considered significant if construction or operation of the Project would do any of the following.

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Generation of excessive ground-borne vibration or ground-borne noise levels.
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.

### 3.4.3.2 Methods

#### Construction Noise

Noise levels associated with the Project Change are analyzed using the same general approach as discussed in the Certified EIR for the Project. Typical noise levels from individual equipment are presented, and combined noise levels from typical construction subphases are estimated. Because the Metro Plan proposes no specific development projects, a general analysis of construction noise from future projects is appropriate. In addition to the presentation of individual equipment noise levels, combined noise from given subphases of construction activities are evaluated by combining the noise levels of the three loudest pieces of equipment that would likely be used during a given activity. Noise levels for each equipment type are identified based on the noise reference levels in the Federal Highway Administration's (FHWA) *Roadway Construction Noise Model User's Guide* (Federal Highway Administration 2006). Estimated noise levels from typical construction activities are then compared to the applicable thresholds in the City. According to the Milpitas Municipal Code, during both daytime and nighttime hours, construction noise impacts may result if noise levels greater than 65 dBA, or increases in noise levels of 3 dB or more over the existing ambient sound level, occur at nearby sensitive land uses.

#### Operational Traffic Noise

Traffic data, in the form of daily turning movement volumes for intersections in the study area was provided by Kittelson & Associates Inc. The data included roadway speeds and estimated vehicle

mix percentages (i.e., the proportion of automobiles, medium trucks, and heavy trucks). The data was provided for the following scenarios: Existing conditions (2017, prior to the Coronavirus Pandemic), Year 2040 No Project, and Year 2040 with Project. Refer to Appendix E for the provided data.

Intersection turning movement data was converted into roadway segment Average Daily Traffic (ADT) data. Traffic noise modeling was then conducted using a spreadsheet based on the FHWA Traffic Noise Model, version 2.5. This spreadsheet calculates the traffic noise level at a fixed distance from the centerline of a roadway (50 feet), based on traffic volumes, roadway speeds, and vehicle mix percentages. Potential traffic noise impacts were evaluated based on the traffic noise threshold described in General Plan Policy N 1-6. The following thresholds were applied to determine the potential significance of Project-related traffic noise increases:

1. Where existing traffic noise levels are 60 dB $L_{dn}$ or less at the outdoor activity areas of noise-sensitive uses (e.g., residential backyards), a +5 dB $L_{dn}$ increase in roadway noise levels will be considered significant;
2. Where existing traffic noise levels are greater than 60 dB Ldn and up to 65 dB $L_{dn}$ at the outdoor activity areas of noise-sensitive uses, a +3 dB $L_{dn}$ increase in roadway noise levels will be considered significant; and
3. Where existing traffic noise levels are greater than 65 dB $L_{dn}$ at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB $L_{dn}$ increase in roadway noise levels will be considered significant.

## Operational Mechanical Equipment

Future development projects under the Metro Plan are not specifically known at this time; as such, the types and locations of future mechanical equipment is not known. The analysis of noise impacts related to mechanical equipment (e.g., heating, cooling and ventilation equipment, emergency generators) is therefore based on general source noise levels of equipment types that may be installed for future development in the Metro Plan Area. Equipment noise levels are compared to applicable local thresholds to determine the likelihood of noise exceedances.

## Construction Vibration

As discussed previously, the full details of future development projects under the Metro Plan are not known at this time. Therefore, to estimate vibration impacts from future construction for development under the Metro Plan, a general analysis of vibration impacts from typical construction equipment has been conducted. Vibration source data from the Federal Transit Administration, shown in Table 3.4-9, is used to evaluate the likelihood for future construction to result in excessive vibration. Estimated vibration levels from typical construction equipment at various distances are compared to Caltrans vibration-related annoyance and damage criteria, shown in Tables 3.4-2 and 3.4-3.

**Table 3.4-9. Estimated Vibration Levels of Typical Construction Equipment**

| Equipment | PPV at 25 Feet |
|---|---|
| Pile Driver (Impact) | 1.518 |
| Pile Driver (Vibratory) | 0.734 |
| Vibratory roller | 0.210 |
| Large bulldozer[1] | 0.089 |
| Auger drill | 0.089 |
| Loaded trucks | 0.076 |
| Small bulldozer[2] | 0.035 |

Source: Federal Transit Administration 2018.
[1] Representative of an excavator or other similarly-sized earth-moving equipment
[2] Representative of a front-end loader, small backhoe, or other similarly sized small earth-moving equipment.

## 3.4.3.3 Impacts and Mitigation Measures

This section includes a discussion of each impact as it corresponds to the significance criteria presented in Section 3.4.3.1, *Significance Criteria*.

### Impact NOI-1: Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.

#### Summary of Impacts from the Certified EIR

Construction noise for the TASP was evaluated in Impact 3.7-4 of the Certified EIR. Typical noise levels during different stages of construction were analyzed based on typical noise levels produced by various types of construction equipment. According to the construction noise analysis, construction activities could result in combined noise levels of 84 to 105 dBA at a distance of 50 feet to the nearest equipment,[1] and construction equipment noise from individual equipment could be in the range of 76 to 101 dBA at 50 feet. The analysis concluded that sensitive receptors could be exposed to high noise levels during construction activities, and construction noise levels could be substantially greater than existing noise levels at nearby sensitive receptor locations. Compliance with the 1994 General Plan, TASP, and City's Noise Abatement Ordinance were determined to reduce construction noise impacts to less-than-significant levels.

#### Impact Analysis

Construction of future development associated with the Metro Plan would generate noise, and temporarily increase noise levels at nearby land uses. The noise levels generated during construction would depend on the construction equipment used, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive receptors.

[1] Average Noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

Construction activities are allowed in the City between the hours of 7:00 a.m. and 7:00 p.m., daily, except for holidays, as outlined in Section V-213-2-2.05 of the Municipal Code. The Municipal Code includes exemptions to these allowable hours for certain circumstances, including emergency construction and repair, or particular circumstances where the City Manager deems that an exemption would be appropriate. In addition, and as stated in Section V-213-3 of the City of Milpitas Municipal Code, noise in the City is limited to 65 dBA or to a 3-dB increase over the local ambient noise level, whichever is more stringent, when measured from the property line of the receiving land use.

Table 3.4-10 includes individual equipment noise levels for typical construction equipment. As shown in this table, individual equipment noise levels could be in the range of 74 to 101 dBA $L_{max}$ and 70 to 94 dBA $L_{eq}$ at a distance of 50 feet. A similar table (which included slightly fewer pieces of construction equipment) was included in the Certified EIR (refer to Table 3.7-6 of the Certified EIR).

**Table 3.4-10. Project Construction Equipment Noise Levels**

| Construction Equipment | $L_{max}$ at 50 feet (dBA)[1] | $L_{eq}$ at 50 feet (dBA) |
|---|---|---|
| Air compressor | 78 | 74 |
| Backhoe/loader | 78 | 74 |
| Concrete mixer truck | 79 | 75 |
| Concrete pump truck | 81 | 74 |
| Concrete saw | 90 | 83 |
| Crane | 81 | 73 |
| Dozer | 82 | 78 |
| Excavator | 81 | 77 |
| Forklift[2] | 84 | 80 |
| Generator | 81 | 78 |
| Impact Pile driver | 101 | 94 |
| Paver | 77 | 74 |
| Rollers | 80 | 73 |
| Tractor | 84 | 80 |
| Water truck[3] | 76 | 72 |
| Welders | 74 | 70 |

Sound data source: Federal Highway Administration. 2006.
1 These values represent noise levels generated by each equipment type at a distance of 50 feet.
2 Represented by "tractor" from the FHWA User's Guide.
3 Represented by "dump truck" from the FHWA User's Guide.
$L_{eq}$ value, or the equivalent sound level value, is calculated from $L_{max}$ values using standard Federal Highway Administration (estimated) utilization factors (the percentage of time each piece of construction equipment is typically operating at full power over the specified time period).

Although the construction characteristics of individual Metro Plan developments within the Metro Plan Area would vary, buildout of development generally involves similar construction subphases (e.g., demolition, site preparation) and the use of similar equipment. For example, most development projects require site preparation, grading, building construction, paving, and architectural coating phases. Other or additional phases may also be included, depending on the development. If existing land uses are located on a site proposed for construction, a demolition

phase is also typical. Reasonable worst-case construction noise levels can be estimated for typical construction phases and can help approximate construction noise levels near a given development.

Table 3.4-11 shows estimated noise levels from a variety of construction activities or phases that could occur for a typical project (and assuming typical equipment usage) at a distance of 100 feet. These estimated combined noise levels are calculated by combining noise from the loudest three pieces of equipment typically used for each type of construction activity (in accordance with the FHWA recommendation for analyzing combined construction noise).

**Table 3.4-11. Typical Construction Activity Noise Levels**

| Construction Activity[1] | Assumes the Following Equipment | Combined $L_{max}$ at 100 Feet | Combined $L_{eq}$ at 100 Feet |
|---|---|---|---|
| Demolition | Tractor, Concrete Saw, Excavator | 85 | 79 |
| Site Preparation | Excavator, Dump Truck, Backhoe | 78 | 74 |
| Grading | Dozer, Grader, Compactor | 82 | 78 |
| Building and Utilities | Crane, Forklift, Concrete Pump | 81 | 76 |
| Architectural Coating | 2 Air Compressors | 75 | 71 |
| Paving | 2 Pavers, Roller | 77 | 72 |

Source: Federal Highway Administration 2006.
[1] Includes the three pieces of typical equipment used for each type of activity.

As shown in Table 3.4-11, combined noise levels from construction activities at a distance of 100 feet could be in the range of approximately 71 to 79 dBA $L_{eq}$, depending on the construction phase and the equipment used. Many developments under the Metro Plan may not require the use of pile driving; however, if pile driving were to occur, construction noise levels could be even higher, with noise levels of 95 dBA $L_{max}$ and 88 dBA $L_{eq}$ at a distance of 100 feet from pile driving alone.

Construction associated with future development under the Metro Plan would result in temporary increases in ambient noise levels in the vicinity of a construction site. Construction activities would typically be limited to the daytime allowable hours for construction defined in the Municipal Code. However, some construction activities for future development may occur outside of these daytime hours (e.g., when road closures are needed, when concrete pours must occur during nighttime hours, or in order to meet construction schedules or deadlines). In addition, during both daytime and nighttime hours, construction noise may result in noise levels greater than 65 dBA or greater than 3 dB over the existing ambient at nearby sensitive land uses.

Due to the temporary nature of construction noise, noise increases from construction activities would not lead to ongoing or long-term exceedances of the City's noise standards. In addition, according to the 2040 General Plan EIR, the ambient noise standards established by the General Plan are not intended to apply to temporary noise sources, such as construction activities, occurring during allowable hours (City of Milpitas 2020). However, because the construction noise from future development under the Metro Plan could occur during nighttime hours and/or could result in a substantial temporary increase in ambient noise levels in the City during daytime or nighttime hours, construction noise impacts from implementation of the Metro Plan would be considered potentially significant.

Construction noise would be reduced by General Plan Policies N 1-5 and N 1-8, as well as Action N-1b, Action N-1c, and Action N-1d. Compliance with these policies and actions would help minimize the construction noise impacts from development under the Metro Plan to nearby sensitive uses.

For example, Policy N 1-8 of the General Plan requires construction activities to comply with standard best practices to reduce noise exposure to adjacent sensitive receptors. In addition, General Plan Action N-1d requires that projects be evaluated individually during the environmental review process to determine if project construction would constitute a significant impact on nearby sensitive receptors. If impacts are identified, mitigation measures pertaining to construction noise would be required in addition to the standard best practices required in Action N-1d of the General Plan. Suggested best practices for control of construction noise under this Action include limiting construction activities to between 7:00 a.m. and 7:00 p.m. (except holidays), requiring all equipment engines be equipped with mufflers in good condition and appropriate for the equipment, requiring the use of "quiet" models of air compressors and other stationary noise sources where technology exists, locating stationary noise-generating equipment as far as practicable from sensitive receptors, prohibiting unnecessary idling of internal combustion engines for longer than 5 minutes, notifying neighbors of looming construction, and designating a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise.

The requirements in Action N-1d of the General Plan, which would apply to all development under the Metro Plan, would reduce impacts related to construction noise in the Metro Plan Area. However, it is not possible to ensure that in all instances and for all future projects, mitigation measures would reduce construction noise to less-than-significant levels. For example, certain projects may require construction noise during nighttime hours for various reasons (e.g., projects that require road closures, concrete pour activities that require early morning starts to prevent concrete curing prematurely). Therefore, even with the requirement that mitigation measures be applied to reduce construction noise for future projects, some future projects may result in significant construction noise impacts that cannot be reduced to less-than-significant levels with mitigation.

Therefore, the Project Change would result in a new impact related to construction noise that was not disclosed in the Certified EIR and impacts related to construction noise would be significant and unavoidable.

#### *Certified EIR Mitigation Measures*

The Certified EIR did not include mitigation for impacts related to construction noise.

#### *New Mitigation Measures*

The Project Change does not include additional mitigation measures beyond what would be required through implementation of the 2040 General Plan policies and actions.

### Conclusions for Impact NOI-1

The Certified EIR concluded that after implementation of policies included in the 1994 General Plan and TASP, construction noise impacts would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would result in a significant and unavoidable impact related to construction noise even with implementation of applicable General Plan policies. Thus, the Project Change would result in a change to the Certified EIR's impact determination related to construction noise. The Project Change would result in a new significant and unavoidable impact that was not identified in the Certified EIR.

## Impact NOI-2: Operation of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.

### Summary of Impacts from the Certified EIR

#### *Traffic Noise*

To assess the traffic noise impacts from development under the TASP, noise levels were projected in the Certified EIR using the FHWA noise prediction model for all intersections analyzed in the traffic study. According to the Certified EIR, the TASP would cause significant noise impacts (a 3-dB increase or greater from existing conditions) along segments of Alder Drive, Centre Point Drive, Great Mall Parkway, and McCandless Drive, with noise increases ranging from 3.1 to 6.3 dBA. The analysis determined that these residential uses would be significantly impacted by the roadway noise generated by the TASP. According to the Certified EIR, there are no existing residential uses or sensitive receptors along the other roadway segments (besides the segment identified above) expected to experience a significant increase in noise levels. The Certified EIR also notes that none of the predicted future noise levels along analyzed roadway segments would exceed the "conditionally acceptable" noise standards in the City.

In addition to the assessment of roadway noise impacts on existing land uses, the Certified EIR also evaluated traffic noise impacts on future uses. The analysis stated that proposed multi-family residential and hotel land uses along Great Mall Parkway between Centre Point Drive and Montague Expressway may experience noise levels that are considered normally unacceptable. Impacts were determined to be potentially significant. However, the Certified EIR stated that roadway noise impacts on new residential or hotel uses along this segment would be mitigated by policies from the 1994 General Plan and the TASP. Therefore, the conclusion related to roadway noise in the Certified EIR was that impacts related to roadway noise would be less than significant with the implementation of policies.

#### *Noise Impacts Related to Mixed-Use and Transit-Oriented Development*

Mixed-use and transit-oriented development was evaluated under Impact 3.7-2 of the TASP. The analysis considered noise exposure to new and existing development near railroad and BART tracks as well as major thoroughfares that bound and intersect the TASP Area. For example, existing Union Pacific railroad tracks are located along the western edge of the TASP Area. According to the analysis, residences located within 300 feet of the rail lines could be exposed to noise levels of 60 to 70 $L_{dn}$. In addition, the analysis states that the extension of the BART rail line (which intersects the TASP Area and is now completed) would expose residences located within 300 feet to noise levels of 60 to 70 $L_{dn}$.

This impact analysis also considered noise exposure at proposed residential land uses from Montague Expressway. Noise levels along Montague Expressway were projected using Year 2030 peak hour traffic volumes with the TASP and the FHWA noise prediction model. Peak hour roadside noise levels were projected to be 69 dBA $L_{eq}$ at locations 120 feet from the roadway center.

The Certified EIR concluded that mixed-use and transit-oriented development from the TASP could result in the exposure of existing and proposed residences to transportation noise, but that any

residential or sensitive uses proposed for development under the TASP would be required to incorporate adequate attenuation features to reduce noise impacts from BART to below 45 $L_{dn}$ (interior). In addition, the construction of specified sound walls (from VTA) would be required for the BART extension. For these reasons, with implementation of specified TASP policies in conjunction with the mitigation measures from the BART extension SEIR, impacts related to mixed-use and transit-oriented development were determined to be less than significant.

#### *Operational Mechanical Equipment Noise*

While the Certified EIR evaluated effects from operational sources of noise such as traffic and rail, the document did not include an evaluation of noise impacts from mechanical equipment associated with future development under the TASP.

### Impact Analysis

#### *Traffic Noise*

Implementation of the Project Change would result in changes to the land use classifications (i.e., increased allowable densities and intensities, new land use classifications, and change in location of land use classifications) within the Metro Plan Area and could, therefore, result in increases in traffic in certain portions of the Metro Plan Area or in the redistribution of traffic along new or different segments.

Traffic noise modeling was conducted for Existing Conditions, Year 2040 (No Project), and Year 2040 (Plus Project) using the project-specific traffic data provided by the project traffic engineer (Kittelson & Associates). The Year 2040 (No Project) condition is a scenario in which development would occur as currently anticipated, with implementation of the TASP as described in the Certified EIR. The differences between the Year 2040 (No Project) and the Year 2040 (Plus Project) condition represents the differences in traffic noise expected to occur due to the Metro Plan, relative to the TASP.

As recommended by Policy 1-6 from the 2040 General Plan:

- Where existing traffic noise levels are 60 dB $L_{dn}$ or less at the outdoor activity areas of noise-sensitive uses, a +5 dB $L_{dn}$ increase in roadway noise levels will be considered significant.
- Where existing traffic noise levels are greater than 60 dB $L_{dn}$ and up to 65 dB $L_{dn}$ at the outdoor activity areas of noise-sensitive uses, a +3 dB $L_{dn}$ increase in roadway noise levels will be considered significant.
- Where existing traffic noise levels are greater than 65 dB $L_{dn}$ at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB $L_{dn}$ increase in roadway noise levels will be considered significant.

According to the General Plan Noise Element, noise levels of up to 65 dBA $L_{dn}$ are considered normally acceptable for multi-family residential land uses, and noise levels of up to 60 dBA $L_{dn}$ are considered normally acceptable for single-family residential land uses. Refer to Table 3.4-12 for the traffic noise modeling results and Appendix E for the full traffic noise modeling results.

**Table 3.4-12. Modeled Traffic Noise Levels**

| Roadway | Segment Location | Existing[1] dBA $L_{dn}$ | Year 2040 No Project dBA $L_{dn}$ | Year 2040 Plus Project dBA $L_{dn}$ | Year 2040 No Project to Year 2040 Plus Project Noise Increase (dB) |
|---|---|---|---|---|---|
| Centre Pointe Drive | South of Great Mall Parkway | 49.7 | 63.6 | 64.2 | 0.6 |
| Dempsey Road | North of Landess Avenue | 62.8 | 64.3 | 64.4 | 0.1 |
| Fairlane Drive | North of Great Mall Parkway | 60.3 | 61.1 | 61.4 | 0.3 |
| Great Mall Parkway | East of Centre Point Drive/Mustang Drive | 69.0 | 70.0 | 70.0 | 0.0 |
| Great Mall Parkway | West of Centre Pointe Drive/Mustang Drive | 68.4 | 70.2 | 70.7 | 0.5 |
| Great Mall Parkway | East of McCandless Drive/Fairlane Drive | 68.4 | 70.2 | 70.6 | 0.5 |
| Great Mall Parkway | West of McCandless Drive/Fairlane Drive | 69.0 | 71.0 | 71.2 | 0.2 |
| Great Mall Parkway | East of Montague Expressway | 70.5 | 71.3 | 71.2 | -0.1 |
| Great Mall Parkway | West of Montague Expressway | 69.5 | 70.2 | 70.3 | 0.0 |
| Great Mall Parkway | East of South Abel Street | 68.3 | 69.2 | 69.7 | 0.5 |
| Great Mall Parkway | West of South Abel Street | 69.3 | 70.1 | 70.1 | 0.0 |
| Great Mall Parkway | East of South Main Street | 68.9 | 71.0 | 71.1 | 0.1 |
| Great Mall Parkway | West of South Main Street | 68.2 | 69.0 | 69.6 | 0.6 |
| Landess Avenue | East of Dempsey Road/ I680 NB Off Ramp | 70.2 | 70.5 | 70.6 | 0.1 |
| Landess Avenue | West of Dempsey Road/ I680 NB Off Ramp | 69.1 | 69.7 | 70.0 | 0.3 |
| McCandless Drive | North of Montague Expressway | 58.8 | 62.2 | 61.7 | -0.5 |
| McCandless Drive | South of Great Mall Parkway | 58.4 | 61.0 | 60.0 | -1.0 |
| McCarthy Boulevard | North of Montague Expressway | 66.4 | 70.1 | 70.1 | -0.1 |
| Montague Expressway | East of McCandless Drive/Trade Zone Boulevard | 72.3 | 74.5 | 74.5 | 0.0 |

| Roadway | Segment Location | Existing[1] dBA $L_{dn}$ | Year 2040 No Project dBA $L_{dn}$ | Year 2040 Plus Project dBA $L_{dn}$ | Year 2040 No Project to Year 2040 Plus Project Noise Increase (dB) |
|---|---|---|---|---|---|
| Montague Expressway | West of McCandless Drive/Trade Zone Boulevard | 74.1 | 75.1 | 75.5 | 0.4 |
| Montague Expressway | East of McCarthy Boulevard/O'Toole Avenue | 75.1 | 75.6 | 75.7 | 0.1 |
| Montague Expressway | West of McCarthy Boulevard/O'Toole Avenue | 75.1 | 76.1 | 76.2 | 0.1 |
| Montague Expressway | East of South Main Street/Oakland Road | 74.4 | 75.3 | 75.6 | 0.3 |
| Montague Expressway | West of South Main Street/Oakland Road | 75.5 | 76.0 | 76.0 | 0.1 |
| Montague Expressway | East of South Milpitas Boulevard | 71.2 | 72.2 | 72.4 | 0.2 |
| Montague Expressway | West of South Milpitas Boulevard | 71.5 | 72.8 | 72.4 | -0.4 |
| Montague Expressway | North of Great Mall Parkway | 71.6 | 73.3 | 73.9 | 0.6 |
| Montague Expressway | South of Great Mall Parkway | 68.4 | 71.7 | 72.1 | 0.4 |
| Mustang Drive | North of Great Mall Parkway | 58.7 | 60.9 | 60.4 | -0.4 |
| Oakland Road | South of Montague Expressway | 67.5 | 71.5 | 71.6 | 0.1 |
| O'Toole Avenue | South of Montague Expressway | 63.1 | 65.9 | 66.0 | 0.1 |
| South Abel Street | North of Great Mall Parkway | 66.8 | 70.1 | 70.1 | 0.0 |
| South Abel Street | South of Great Mall Parkway | 66.3 | 69.5 | 69.6 | 0.1 |
| South Main Street | North of Great Mall Parkway | 64.6 | 68.2 | 68.9 | 0.8 |
| South Main Street | South of Great Mall Parkway | 62.7 | 66.2 | 66.0 | -0.3 |
| South Main Street | North of Montague Expressway | 66.6 | 69.9 | 69.4 | -0.4 |
| South Milpitas Boulevard | North of Montague Expressway | 63.8 | 70.1 | 69.9 | -0.2 |
| South Milpitas Boulevard | South of Montague Expressway | 44.5 | 69.2 | 68.8 | -0.4 |

| Roadway | Segment Location | Existing[1] dBA $L_{dn}$ | Year 2040 No Project dBA $L_{dn}$ | Year 2040 Plus Project dBA $L_{dn}$ | Year 2040 No Project to Year 2040 Plus Project Noise Increase (dB) |
|---|---|---|---|---|---|
| Tasman Drive/GMP | East of I-880 SB Ramps | 69.9 | 70.4 | 70.6 | 0.1 |
| Tasman Drive/GMP | West of I-880 SB Ramps | 70.5 | 71.1 | 71.2 | 0.1 |
| Tasman Drive/GMP | East of Thompson Street | 69.1 | 69.9 | 70.0 | 0.1 |
| Tasman Drive/GMP | West of Thompson Street | 69.5 | 70.0 | 70.3 | 0.2 |
| Thompson Street | North of Tasman Drive/GMP | 61.2 | 63.1 | 63.5 | 0.5 |
| Trade Zone Boulevard | South of Montague Expressway | 68.2 | 69.9 | 69.4 | -0.5 |

[1] Existing = Year 2017 (Year 2017 used to capture existing conditions prior to the Coronavirus Pandemic).
Note: All Segments modeled at a fixed distance of 50 feet from the roadway centerline.

As shown in Table 3.4-12, the modeling results demonstrate that traffic noise increases along the roadway segments in the Metro Plan Area could be up to 0.8 dB, with some instances of noise reduction (i.e., a decrease in noise of up to 1 dB). Because the traffic noise increases along all analyzed roadway segments would be below the 1.5 dB, 3 dB, and 5 dB thresholds (described previously), traffic noise impacts from implementation of the Metro Plan would be less than significant.

Although traffic noise impacts from implementation of the Metro Plan would be less than significant, General Plan Policies N 1-5, N 1-6, N 1-7, N 1-9, and N 1-10 would further reduce traffic noise effects in the Metro Plan Area.

***Noise Impacts Related to Mixed-Use and Transit-Oriented Development***

When the Certified EIR was completed, the standard approach to CEQA analyses included an assessment of the effects of the existing environment on the project (i.e., an analysis of noise at future proposed land uses under the project). The California Supreme Court concluded in its 2015 *CBIA v. BAAQMD* decision that "CEQA generally does not require an analysis of how existing environmental conditions will affect a project's future users or residents." With this ruling, CEQA no longer considers the impact of the environment on a project, such as the impact of an existing road or railroad noise on planned development to be an impact requiring consideration under CEQA, unless the project could exacerbate an existing environmental hazard.

Although the Metro Plan could result in an increase or redistribution in vehicle traffic, the Metro Plan would not directly result in the relocation of rail or BART tracks, or in increases in rail or BART activity. Therefore, because CEQA requires an evaluation of a project's impacts on the environment (and not an evaluation of the impacts of the environment on a project), because the Metro Plan would not result in increases in noise to rail or BART activity, impacts associated with noise from rail and BART activity on developments associated with the Metro Plan would not be considered a CEQA impact. Noise impacts resulting from project-related increases in construction noise, operational noise, and construction vibration are evaluated under Impacts NOI-1, NOI-2, and NOI-3 of this assessment.

***Operational Mechanical Equipment Noise***

Future development within the Metro Plan Area would be expected to include the installation and operation of stationary sources of noise, such as heating, ventilation, and air-conditioning (HVAC) equipment and emergency generators, which could expose existing adjacent land uses to excessive noise. In the City, non-transportation sources of stationary noise are limited to 55 dBA $L_{eq}$ during the daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA $L_{eq}$ during the nighttime hours of 10:00 p.m. to 7:00 a.m., as measured at the property line of the receiving land use (refer to Table N-2 in the 2040 General Plan).

Because specific details for future development projects under the Metro Plan are not known at this time, the types of future mechanical equipment and the exact sizes and locations of future mechanical equipment are also unknown. Noise from HVAC equipment can vary depending on the type and size of the equipment. A typical air-handling unit with condensing units and fans can generate sound levels in the range of 70 to 75 dBA at 50 feet.[2] In addition, a large exhaust or ventilation fan can generate a noise level of 79 dBA at 50 feet,[3] a chiller (depending on the cooling capacity) can generate a noise level of 65 to 71 dBA at 50 feet,[4] and a typical boiler generates a noise level of 64 to 67 dBA at 50 feet.[5]

Emergency generator noise is typically considered exempt during actual emergencies. According to 2040 General Plan Policy N 1-15, temporary emergency operations or emergency equipment usage authorized by the City is considered to be exempt from the noise standards included in the 2040 General Plan. However, emergency generators may also result in excessive noise during testing (and the noise exemption does not apply during this time). For example, a Cummins 1,250 kilowatt (kW) generator model can result in an unattenuated noise level of up to 103 dBA at 50 feet (combined exhaust and engine noise), without accounting for attenuation from mufflers or weather and/or sound enclosures.[6] Even smaller generators can result in high noise levels. For example, a Cummins 500 kW generator (QSX15 series) can result in an estimated unattenuated noise level of up to 89 dBA at 7 meters, which equates to approximately 82 dB at 50 feet without accounting for attenuation from mufflers or weather and/or sound enclosures.[7]

Based on the noise levels cited above and depending on the distances between noise source and nearby receiver, equipment operations may result in excessive noise levels at nearby sensitive uses. Locating equipment behind screens/solid walls, or within enclosures would reduce noise from these sources. However, because the specific equipment for future projects would vary and potential screen or enclosure designs are unknown, potential reductions cannot be quantified. Therefore, depending on the proximity of noise-generating equipment to existing sensitive receptors, mechanical equipment for future development under the Project may result in noise levels in excess of the applicable 55 dBA $L_{eq}$ daytime or 45 dBA $L_{eq}$ nighttime thresholds. Impacts from mechanical equipment noise would be considered potentially significant.

The Metro Plan does not include policies related to mechanical equipment noise. However, General Plan Policies N 1-1, N 1-2, N 1-4, N 1-5, and N 1-6 would help reduce the effects of mechanical

[2] Hoover and Keith. 2000.

[3] Federal Highway Administration. 2006.

[4] Hoover and Keith. 2000.

[5] Hoover and Keith 2000. Calculated based on a sound power level of 96 to 99 dBA.

[6] Cummins, Inc. 2017.

[7] Cummins, Inc. 2015.

equipment noise on nearby sensitive uses. For example, Policy N 1-1 requires that the noise compatibility of existing and future development be considered when making land use planning decisions and requires that development projects ensure consistency with land use compatibility standards outlined in the General Plan Tables N-1 and N-2. In addition, implementation of Mitigation Measure NOI-1 requires the applicants of future projects under the Metro Plan to conduct a noise analysis to estimate noise levels of project-specific mechanical equipment and implement measures to ensure noise levels are below allowable limits. With the implementation of Mitigation Measure NOI-1, operational impacts due to operational mechanical equipment would be reduced to less than significant with mitigation.

***Siren Noise at Future Police Station***

The Metro Plan would allow a satellite police station to be developed in the Innovation District, with a potential location shown in Figure 2-4. The impacts from this proposed police station would be evaluated at a project-level detail during the project's environmental review phase.

This analysis considers the potential noise impacts from the police station in a programmatic level of detail. Operational mechanical equipment noise for all future projects (including a proposed police station) is evaluated above; however, the development of the police station could introduce operational noise in the form of siren noise. Police vehicle activity involving the use of sirens can occur any time during the day or night. For safety, sirens used during emergency response events are designed to be readily audible above surrounding ambient noise. In principle, the use of sirens depends heavily on traffic conditions at the time of an emergency call; therefore, their use may not always be necessary. Siren noise can be very loud but typically is audible in a given location only for a short period of time. Siren noise measurements have shown noise levels ranging from 101 to 116 dBA $L_{max}$, or 87 to 102 dBA $L_{eq}$ at a distance of 50 feet for the event (refer to Appendix E). The duration of the siren exposure at a given location is typically less than 30 seconds. The measurements cited in this analysis demonstrated event duration for siren noise in the range of 12–25 seconds per event. Because siren use would be temporary and periodic at a given location, it would be considered a nuisance noise effect that would generally result in a less-than-significant noise impacts. Nonetheless, CEQA review would be conducted when the police station is advanced and a project-level noise analysis will be conducted at that time.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation for impacts related to noise from operation of the TASP.

### New Mitigation Measures

The following mitigation measures would be required for the Metro Plan.

**Mitigation Measure NOI-1: Mechanical Equipment Noise Reduction Plan**

To reduce potential noise impacts resulting from mechanical equipment (including but not limited to HVAC equipment and emergency generators), the applicants of future projects under the Metro Plan shall conduct a noise analysis to estimate noise levels of project-specific mechanical equipment. The noise analysis shall be based on the selected equipment models and design features. The applicant for the project shall create a Noise Reduction Plan to

ensure noise levels of equipment, once installed, are below the applicable criteria described below.

The Noise Reduction Plan shall include any necessary noise reduction measures required to reduce project-specific mechanical equipment noise to a less-than-significant level. The plan shall also demonstrate that with the inclusion of selected measures, noise from equipment would be below the significance thresholds. Feasible noise reduction measures to reduce noise below the significance thresholds include, but are not limited to, selecting quieter equipment, utilizing silencers and acoustical equipment at vent openings, siting equipment farther from the roofline, and/or enclosing all equipment in a mechanical equipment room designed to reduce noise. Regarding emergency generators, additional noise reduction options include, but are not limited to, installing quieter model generators, incorporating noise-reducing emergency generator weather enclosures, and installing exhaust mufflers or silences. The results of the noise analysis and the final Noise Reduction Plan shall be provided to the City prior to the issuance of building permits.

The noise analysis and Noise Reduction Plan shall be prepared by persons qualified in acoustical analysis and/or engineering. The Noise Reduction Plan shall demonstrate with reasonable certainty that noise from mechanical equipment selected for the project, including the attenuation features incorporated into the project design, will not exceed the City of Milpitas property plane thresholds of 55 dBA during daytime hours or 45 dBA during nighttime hours for nearby residential land uses.

The applicants of future projects under the Metro Plan shall incorporate all feasible methods to reduce noise and any other feasible recommendations from the acoustical analysis and Noise Reduction Plan into the building design and operations, as necessary, to ensure that noise sources meet applicable requirements of the respective noise ordinances at receiving properties.

**Conclusions for Impact NOI-2**

The Certified EIR concluded that after implementation of policies in the 1994 General Plan and TASP, impacts related to traffic noise would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less-than-significant impact on traffic noise. The Project Change would not alter the result of the Certified EIR's impact determination related to traffic noise. For traffic noise impact the Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

The Certified EIR also concluded that noise impacts from rail or BART noise at mixed-use and transit-oriented development would be less than significant with implementation of policies and the required mitigation measure from the BART Extension SEIR. As discussed above, impacts associated with noise from rail and BART activity on developments associated with the Metro Plan would not be considered a CEQA impact. No impacts related to rail and BART noise in the Metro Plan Area would be expected to occur as a result of the Project Change. For rail and BART noise impacts, the Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

The Certified EIR did not make a determination regarding noise from operational equipment associated with the TASP. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would result in a significant noise impact from operational equipment that would be reduced to a less-than-significant level with Mitigation Measure NOI-1. The Project Change would result in a new impact (less than significant with mitigation) that was not identified in the Certified EIR.

## Impact NOI-3: Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to exposing persons to or generating excessive ground-borne vibration or ground-borne noise levels. Operation of the Metro Plan would not result in a new or substantially more severe impact than what was identified in the Certified EIR related to exposing persons to or generating excessive ground-borne vibration or ground-borne noise levels.

### Summary of Impact from the Certified EIR

#### *Construction*

The Certified EIR does not address vibration impacts from construction activities.

#### *Operations*

According to the Certified EIR, sensitive receptors could be exposed to ground-borne vibration from Amtrak and freight trains along the UPRR tracks, including the spur line, and from the operation of BART trains along the proposed BART extension into the TASP Area. Vibration from sources such as buses and trucks is rarely perceptible even at locations close to major roads. According to the Certified EIR, UPRR railroad tracks run adjacent to, or near, multiple portions of the TASP Area. Vibration analysis conducted for Santa Clara Valley VTA's BART Expansion SEIR indicated that vibration impacts at existing receptors approximately 100 feet from the centerline of the proposed tracks in the TASP Area would be mitigated to a less-than-significant level (less than the FTA 72 VdB significance criterion for frequent events for Category 2 land uses) through use of a floating slab track or tire derived aggregate under ballasted track. Implementation of this VTA BART Expansion SEIR mitigation measure, along with specified TASP policies pertaining to ground-borne vibration from sources such as BART trains and rail, were determined to reduce impacts to less-than-significant levels.

### Impact Analysis

#### *Construction*

Construction of the Metro Plan would involve the use of construction equipment that could generate ground-borne vibration. Potential vibration-related damage and annoyance impacts resulting from implementation of the Metro Plan are analyzed below.

*Vibration-Related Damage Effects*

Construction of future development under the Metro Plan would require equipment that could generate ground-borne vibration. Typical vibration levels associated with heavy-duty construction equipment at a distance of 25 feet, and various other distances, are shown in Table 3.4-13.

**Table 3.4-13. Peak Particle Velocity Vibration Levels for Construction Equipment**

| Equipment | PPV at 25 Feet | PPV at 55 Feet | PPV at 75 Feet | PPV at 100 Feet | PPV at 175 Feet |
|---|---|---|---|---|---|
| Pile driver (impact) | 1.52 | 0.47 | 0.29 | 0.19 | 0.08 |
| Pile driver (sonic) | 0.73 | 0.23 | 0.14 | 0.09 | 0.04 |
| Vibratory roller | 0.21 | 0.06 | 0.04 | 0.03 | 0.01 |
| Hoe ram | 0.09 | 0.03 | 0.02 | 0.01 | 0.00 |
| Drill | 0.09 | 0.03 | 0.02 | 0.01 | 0.00 |
| Large bulldozer | 0.08 | 0.03 | 0.01 | 0.01 | 0.01 |
| Loaded trucks | 0.04 | 0.02 | 0.01 | 0.00 | 0.00 |
| Jackhammer | 0.21 | 0.01 | 0.04 | 0.03 | 0.01 |
| Small bulldozer | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Source: Federal Transit Administration 2018.
PPV = peak particle velocity.

Table 3.4-2 identifies the Caltrans vibration-related damage thresholds for continuous or frequent intermittent sources of vibration, such as construction activity, suggested for various types of buildings. As shown in Table 3.4-2, some building types (e.g., fragile buildings or historic and some old buildings) are more susceptible to vibration-related damage effects. Vibration impacts on structures are usually significant if construction vibration could result in structural or cosmetic damage or, in the case of a historic resource, materially alter the resource pursuant to State CEQA Guidelines Section 15064.5. Depending on a structure's condition, potential vibration-induced damage may be cosmetic (e.g., plaster or wood ornamentation may be damaged) or structural, in which case the integrity of the building may be threatened.

Due to California regulations governing earthquake safety, structures that are considered to be "fragile buildings" (with a damage criterion of 0.1 inch/second [in/sec] PPV) or "extremely fragile historic buildings," such as ruins or ancient monuments (with a damage criterion of 0.08 PPV in/sec) are unlikely to be located in the Metro Plan Area. It is likely that the most sensitive category of buildings currently existing in the Metro Plan Area would fall into the "historic and some old buildings" category outlined in Table 3.4-2. In addition, most structures in the Metro Plan Area would be similar to "new residential structures," or "modern industrial/commercial buildings," with "older residential structures" also potentially located in the Metro Plan Area. According to Table 3.4-2, the damage criterion for both "modern industrial/commercial buildings" and "new residential structures" is 0.5 PPV in/sec. With respect to older residential structures, the applicable criterion is 0.3 PPV in/sec. Although less common in urban areas, such as the Metro Plan Area, "historic and old buildings" (which have a damage criterion of 0.25 PPV in/sec) may also be present.

This analysis assumes that construction in the Metro Plan Area could occur within 25 feet of the most sensitive buildings ("historic and some old buildings"). Vibration-generating activities would often occur farther than 25 feet from existing buildings; however, this analysis utilizes these assumptions to ensure a reasonably conservative assessment.

As shown in Table 3.4-13, at a distance of 25 feet, all construction equipment other than vibratory and impact pile drivers would result in vibration levels below the damage thresholds for "historic and some old buildings" (0.25 PPV in/sec), the most vibration-sensitive category of buildings expected to be located within the Metro Plan Area. The estimated vibration levels are also below the less stringent Caltrans vibration damage criteria for "older residential structures" (0.3 PPV in/sec),

"new residential structures" and "modern industrial/commercial buildings" (both 0.5 PPV in/sec). Therefore, vibration-related damage impacts from all equipment other than pile drivers on adjacent buildings would be less than significant, should construction take place at least 25 feet from nearby structures. However, should construction occur at closer distances than 25 feet from adjacent existing structures, further analysis would be required to confirm that vibration-related damage impacts would be less than significant.

Although most future projects would not require the use of pile driving, some projects may require the use of this equipment. At a distance of 100 feet, vibration levels from impact pile drivers would be below the vibration criteria for "historic and some old buildings," "older residential structures," "new residential structures," and "modern industrial/commercial buildings." However, should impact pile driving take place within 100 feet of structures in the "historic and some old buildings" category, the applicable Caltrans damage criterion of 0.25 PPV in/sec could be exceeded. In addition, should impact pile driving occur within 75 feet of buildings in the "older residential structures" category (0.3 PPV in/sec), and within 55 feet of buildings in the "newer residential" or "modern industrial/commercial buildings" categories (0.5 PPV in/sec), the applicable vibration-related damage thresholds for these building types may also be exceeded.

Because the exact distances between potential future pile driving activities and nearby buildings are not known at this time, it is conservatively assumed that pile driving could take place close enough to existing buildings that applicable damage criteria could be exceeded. Specifically, if impact pile driving should occur within 100 feet of a building in the "historic and some old building" category, within 75 feet of "older residential structures," and within 55 feet of "modern industrial/commercial buildings," vibration-related damage effects could occur. In addition, should construction activities with other non-pile driving equipment occur within 25 feet of existing structures, additional analysis may be required to confirm vibration levels would not be in excess of applicable damage criteria.

Therefore, because pile driving and non-pile driving activities could result in vibration levels in excess of applicable thresholds (depending on the proximity of future construction activities to nearby structures), vibration-related damage impacts would be considered potentially significant.

The Metro Plan does not include policies related to ground-borne vibration from construction activities. However, Policy N 1-8, Action N-1c, and Action N-1d in the 2040 General Plan would help reduce the effects of construction-related vibration on sensitive uses. For example, the implementation of standard best practices for construction noise (see General Plan Policy N 1-8) would also help reduce construction vibration. Actions under this policy include a requirement for developers to prepare a construction management/noise mitigation plan that defines BMPs to reduce construction noise and suggests that mitigation measures be implemented. For example, measures under this Action that would reduce construction-related vibration impacts are the requirements to locate stationary equipment as far as practical from sensitive receptors, and to locate construction staging areas farther from occupied sensitive uses. However, even with implementation of these policies, vibration-related damage impacts from future construction would still be potentially significant.

Mitigation Measure NOI-2 would be required to reduce construction-related damage impacts. However, it is not possible to ensure that in all instances and for all future projects, mitigation measures would reduce construction vibration to less-than-significant levels. For example, certain projects may require construction to take place at very close distances to existing structures.

Therefore, even with the requirement that mitigation measures be applied to reduce construction vibration for future projects, some future projects may result in significant vibration-related damage impacts from construction that cannot be reduced to less-than-significant levels with mitigation.

*Vibration-Related Annoyance Effects*

The potential for annoyance-related vibration impacts from construction depends on the proximity of construction activities to sensitive receptors, the number and types of construction equipment, the duration of construction equipment use, and the time of use. At least some future development projects under the Metro Plan may use pile drivers, and most development projects would at least be expected to use heavy-duty equipment, such as a large bulldozer or vibratory rollers. Typical vibration levels associated with heavy-duty construction equipment are shown in Table 3.4-13.

Humans are typically considered more sensitive to vibration that occurs during nighttime hours, when people generally sleep. For the purposes of this analysis, should strongly perceptible vibration levels (per the Caltrans Guidelines for Vibration Annoyance Potential) be expected to occur at residential land uses during nighttime hours, sleep disturbance could occur. As shown in Table 3.4-3, vibration generated by continuous or frequent intermittent sources, such as vibration from construction activities, is considered to be strongly perceptible if the vibration level is in excess of 0.1 PPV in/sec.

At this time, it is unknown if future development projects under the Metro Plan would include nighttime construction. However, because there are no policies requiring work be limited to daytime hours, it is possible that nighttime construction could take place. Therefore, depending on the types of equipment proposed for nighttime hours and the proximity to existing sensitive uses (e.g., residences), excessive vibration during nighttime hours when people typically sleep could occur.

Most construction equipment would result in vibration levels below the 0.1 PPV in/sec "strongly perceptible" threshold at distances of 25 feet or more (see Table 3.4-13). However, pile drivers (both vibratory and impact-style pile drivers) and vibratory rollers would result in vibration levels in excess of 0.1 PPV in/sec at a distance of 25 feet. Therefore, construction with equipment other than pile drivers and vibratory rollers that occurs at least 25 feet from residential land uses would not be expected to exceed the 0.1 PPV in/sec threshold. However, it is possible that some future projects under the Metro Plan would require nighttime construction closer than 25 feet from occupied residences. In addition, it is possible that some future projects would require the use of pile drivers or vibratory rollers during construction. It is very unlikely the pile driving, or other heavy equipment, would be used during nighttime hours. However, because there is no requirement in the City stating that this is prohibited, this analysis assumes any construction equipment needed for future development under the Metro Plan could be used during nighttime hours.

Should an impact pile driver be used within approximately 155 feet of a residential land use during nighttime hours, or a vibratory pile driver be used within approximately 100 feet of a residential land use during nighttime hours, vibration levels would exceed 0.1 PPV in/sec, and sleep disturbance could result. In addition, should a vibratory roller be used within approximately 40 feet of a residential land use during nighttime hours, vibration levels may exceed the 0.1 PPV in/sec "strongly perceptible" criterion. In addition, and although equipment other than rollers and pile drivers would be unlikely to result in annoyance impacts should it be used more than 25 feet from residences, it is possible that this equipment could be used closer than this distance from residences during nighttime hours. For these reasons, it is possible that construction activities from future

projects under the Metro Plan could result in vibration levels in excess of the 0.1 PPV in/sec thresholds at residential land uses during nighttime hours. Vibration-related annoyance impacts during nighttime hours would be considered potentially significant.

The Metro Plan does not include policies related to ground-borne vibration from construction activities. However, Policy N 1-8, Action N-1c, and Action N-1d in the 2040 General Plan would help reduce the effects of construction-related vibration on sensitive uses. For example, the implementation of standard best practices for construction noise (see General Plan Policy N 1-8) would also help reduce construction vibration. Actions under this policy include a requirement for developers to prepare a construction management/noise mitigation plan that defines BMPs to reduce construction noise and suggests that mitigation measures be implemented. One suggested mitigation measure is limiting the allowable hours for construction activity to between 7:00 a.m. and 7:00 p.m., when people are generally less sensitive to vibration and noise. Should construction for a future project be limited to these daytime hours, sleep disturbance and vibration-related annoyance impacts would be less than significant based on the thresholds defined in this analysis. Other suggested measures under this Action that would reduce construction-related vibration impacts include locating stationary equipment as far as practical from sensitive receptors, locating construction staging areas farther from occupied sensitive uses, notifying neighbors adjacent to the construction sites of upcoming construction, and designating a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise (or vibration). However, even with implementation of these policies, vibration-related damage and annoyance impacts from future constructions would still be potentially significant.

Mitigation Measure NOI-3 would be required to reduce construction-related annoyance impacts. However, it is not possible to ensure that mitigation measures would reduce construction vibration to less-than-significant levels in all instances and for all future projects. For example, certain projects may require construction take place at very close distances to existing occupied residences. Therefore, even with the requirement that mitigation measures be applied to reduce construction vibration for future projects, some future projects may result in significant vibration-related annoyance impacts from construction that cannot be reduced to less-than-significant levels with mitigation.

***Operations***

As was the case for the TASP, and as discussed in the Certified EIR, sensitive receptors could be exposed to ground-borne vibration from Amtrak and freight trains along the UPRR tracks, including the spur line, and from the operation of BART trains along the alignment in the Metro Plan Area. Vibration from sources such as buses and trucks is rarely perceptible, even at locations close to major roads. These sources of vibration already exist in the Metro Plan Area, and implementation of the Metro Plan would not be expected to result in greater levels of operational vibration than would exist without implementation of the Metro Plan. In addition, the Metro Plan would not directly result in the relocation of rail or BART tracks, or in increases in rail or BART activity. Therefore, and as a result of the *CBIA v. BAAQMD* decision that "CEQA generally does not require an analysis of how existing environmental conditions will affect a project's future users or residents," rail- or BART-related operational vibration not directly affiliated with the Metro Plan would not be considered a CEQA impact.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation for impacts related to exposing persons to or generating excessive ground-borne vibration or ground-borne noise levels.

### New Mitigation Measures

The following mitigation measures would be required for the Metro Plan.

#### Mitigation Measure NOI-2: Protect Potentially Susceptible Structures from Construction-Generated Vibration

If a future development project in the Metro Plan requires any of the following construction activities, then this measure would apply:

- Pile driving within approximately 100 feet of an existing structure.
- Construction with other ground-disturbing equipment (e.g., jackhammers, bulldozers, excavators, etc.) within 25 feet of an existing structure.

The construction contractor shall consult with the City to determine whether adjacent or nearby structures could be adversely affected by construction-generated vibration. If buildings adjacent to construction activity are identified that could be adversely affected, the project applicant will incorporate into construction specifications for their project a requirement that the construction contractor(s) use all feasible means to avoid damage to adjacent and nearby buildings. Such methods to help reduce vibration-related damage effects may include maintaining a safe distance between the construction site and the potentially affected building (e.g., at least 100 feet for "historic and some old buildings") or using "quiet" pile-driving technologies (such as predrilling piles or using sonic pile drivers).

Should pile driving be required within 100 feet of a building in the "historic or some old building" category, within 75 feet of buildings in the "older residential structures" category, and within 55 feet of buildings in the "modern industrial/commercial" category, the City will work with the construction contractor to implement a monitoring program to minimize damage to adjacent buildings and ensure that any such damage is documented and repaired. If required, the monitoring program will include the following components:

- Prior to the start of any ground-disturbing activity, the project applicant will engage a historic architect or qualified historic preservation professional to undertake a preconstruction survey of nearby affected buildings that may be considered historic. For buildings that are not potentially historic, a structural engineer or other professional with similar qualifications will document and photograph the existing conditions of potentially affected buildings within 100 feet of pile-driving activity.
- Based on the construction and condition of the resource(s), the consultant will also establish a standard maximum vibration level that will not be exceeded at any building, based on existing conditions, character-defining features, soil conditions, and anticipated construction practices. Common standards are a peak particle velocity of 0.25 inch per second for "historic and some old buildings," a peak particle velocity of 0.3 inch per second for "older residential structures," and a peak particle velocity of 0.5 inch per second for "new

residential structures" and "modern industrial/commercial buildings," as shown in Table 3.4-2.

- To ensure that vibration levels do not exceed the established standard, the project applicant will monitor vibration levels at each structure and prohibit vibratory construction activities that generate vibration levels in excess of the standard.
- Should vibration levels be observed in excess of the selected standard, construction will be halted, and alternative construction techniques put in practice, to the extent feasible (e.g., predrilled piles could be substituted for driven piles, if feasible, based on soil conditions, or smaller, lighter equipment could be used in some cases).
- The historic preservation professional (for effects on historic buildings) and/or structural engineer (for effects on non-historic structures) will conduct regular periodic inspections (every 3 months) of each building during ground-disturbing activity on the project site. Should damage to any building occur, the building(s) will be remediated to their preconstruction condition at the conclusion of ground-disturbing activity on the site.

**Mitigation Measure NOI-3: Implement Nighttime Construction Vibration Control Plan to Reduce Vibration-Related Annoyance Impacts on Adjacent Land Uses**

Should vibration-generating construction activities for future development under the Metro Plan be proposed outside of the daytime hours of 7:00 a.m. to 7:00 p.m., and should non-pile driving equipment be proposed within 25 feet of occupied residences or buildings where people sleep, the construction contractor for a project in the Metro Plan Area shall develop a nighttime construction vibration control plan. In addition, should nighttime pile driving activities be proposed within 100 feet of such buildings, the construction contractor for a project in the Metro Plan Area shall similarly develop a nighttime construction vibration control plan. The construction vibration control plan shall demonstrate that vibration levels at the residential land uses during nighttime hours will not exceed 0.1 PPV in/sec.

In addition, the construction contractor will appoint a project vibration coordinator who will serve as the point of contact for vibration-related complaints during project construction. The contact information for the project vibration coordinator shall be posted at the project site and on a publicly available project website for future development projects under the Metro Plan. Should residents in the project area submit complaints to the project vibration coordinator for nighttime construction vibration concerns, the project vibration coordinator shall work with the construction team to adjust activities to reduce vibration or to reschedule activities for a less sensitive time.

**Conclusions for Impact NOI-3**

The Certified EIR concluded that after implementation of a VTA BART Expansion SEIR mitigation measure and policies included in the TASP, vibration impacts from operation of the TASP would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less-than-significant impact related to operational sources of vibration. The Project Change would not alter the result of the Certified EIR's impact determination related to operational vibration impacts. For operational vibration impacts the Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no

substantial changes in circumstances have occurred that could result in new or substantially more severe effects than were in the Certified EIR.

The Certified EIR did not make a determination regarding vibration impacts from construction activities in the TASP area. Based on the analysis above, with incorporation of the Project Change, construction of the Metro Plan would result in a significant and unavoidable vibration impact, even with implementation of Mitigation Measure NOI-2 and Mitigation Measure NOI-3. Thus, the Project Change would result in a new significant and unavoidable impact that was not identified in the Certified EIR.

## Impact NOI-4: The Metro Plan would not result in a new or substantially more severe impact than what was identified in the Certified EIR related to being located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, and exposing people residing or working in the project area to excessive noise levels.

### Summary of Impacts from the Certified EIR

The Certified EIR does not address noise impacts from nearby airports.

### Impact Analysis

There are no private or public airport facilities in the City of Milpitas. The three closest airports to the Project site are the San Jose International Airport, Moffett Federal Airfield, and Reid Hillview County Airport. The San Jose International Airport is the closest airport to the Metro Plan Area and is approximately 2.8 miles to the southeast. Reid Hill County Airport is approximately 5.9 miles southeast of the Metro Plan Area, and Moffett Federal Airfield is approximately 7.5 miles west of the Metro Plan Area. Because there are no airports within a 2-mile radius of the Metro Plan, there would be no impact related to exposing people residing or working in the Metro Plan Area to excessive aircraft noise levels.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation for impacts related to exposing people residing or working in the Project area to excessive noise levels due to being located within an airport land use plan area, or within 2 miles of a public airport or public use airport.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact NOI-4

The Certified EIR did not make a determination regarding potential aircraft noise impacts from public airports or private air strips. Nonetheless, the Project Change would not result in an impact related to aircraft noise. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

# 3.5 Population and Housing

This section discloses and analyzes the potential change in Project impacts on population and housing that would result from implementing the Project Change.

## 3.5.1 Regulatory Setting

The Certified EIR did not identify any regulations that would apply to population and housing. The following provides a brief description of the regulations and plans related to population and housing that are relevant to the Project Change.

### 3.5.1.1 Federal Uniform Relocation Act

#### Federal Uniform Relocation Act

The Federal Uniform Relocation Act requires comparable, decent, safe, and sanitary replacement housing that is within a person's financial means to be made available before any person is displaced from a property or program that is federally funded or assisted. To the maximum extent practicable, the new housing should be of the tenant's choice and provided, in compliance with applicable federal and state laws, on a nondiscriminatory basis, without regard to race, color, religion (creed), national origin, handicap, age, or sex.

### 3.5.1.2 State

#### Government Code Sections 65580–65590 (Housing Element Legal Requirements)

California requires that all local governments adequately plan to meet the current and future housing needs of everyone in the community. Cities and counties meet this requirement by adopting housing plans as part of their general plans, which are required to be updated approximately every 8 years and commit to actions that will ensure a diverse and adequate supply of housing that is affordable and accessible to households at all income levels including special needs groups such as the elderly and people with disabilities. The City is currently in the process of updating its 2023–2031 housing element and is actively partnering in the planning process with other nearby cities in Santa Clara County (City of Milpitas 2021a).

#### Affirmatively Furthering Fair Housing Act

Effective January 1, 2019, AB 686 introduced a duty to affirmatively further fair housing into California state law. The process requires jurisdictions to consider ways to increase affordable housing in high opportunity areas, invest in disadvantaged neighborhoods, increase accessibility, and decrease housing disparities and discrimination. As part of the 2023–2031 Housing Element Update, the City is working on its 2021 Assessment of Fair Housing (City of Milpitas 2021a).

#### The Housing Development and Housing 2019–2020 Budget Act

AB 101 requires local governments to provide, "by right," CEQA-exempt approvals to certain qualifying navigation centers that move homeless Californians into permanent housing. Signed into

law by Governor Newsom on July 31, 2019, the act also creates additional incentives for cities to comply with mandates to plan for adequate housing in their housing elements and provides some modest additional remedies that the state can use in court when cities fail to comply with housing element law.

### The Housing Crisis Act of 2019

Senate Bill 330 was signed into law October 9, 2019, to tighten the protections for development projects under the Housing Accountability Act by limiting a jurisdiction's ability to change development standards and zoning applicable to a project once a preliminary application is submitted. The bill is intended to reduce the time it takes to approve housing developments in California. SB 8, discussed below, extends the provisions of SB 330 beyond the original sunset date of 2025 through 2030.

### Senate Bills 8, 9, and 10

In October 2021, Governor Newsom signed three bills into law (SB 8, SB 9, and SB10) to produce more affordable housing in California. As stated above, SB 8 extends the Housing Crisis Act of 2019 to 2030. SB 9 allows property owners to have two units on a parcel zoned for single-family housing, thereby creating a duplex, and split a residential parcel into two pieces. If a property owner uses both provisions, a space that once contained a single home could eventually contain four. The bill would also require cities to approve participating development ministerially, meaning that officials could approve the development as long as it would not conflict with zoning standards. However, amendments would allow agencies to deny housing projects if a building official finds that such projects "would have a specific, adverse impact upon health and safety or the physical environment" and the impact could not be mitigated or would be unavoidable. SB 10 would allow, but would not require, cities to zone a parcel for up to 10 residential units if the parcel is located in a "transit-rich area." Cities would be required to adopt an ordinance that would allow this type of up-zoning. According to the state definition, parcels on a fixed-route bus line that meet certain service-interval requirements or are within 0.5 mile of a major transit stop would qualify.

## 3.5.1.3 Regional

### San Francisco Bay Area Housing Need Plan, 2023–2031

The Regional Housing Need (RHNA) process is part of a state mandate to address the need for housing throughout the state. As part of the RHNA, the state requires each jurisdiction to plan for its share of the region's housing need, including the needs of people from all income categories. The Bay Area's regional housing need is specified by California Department of Housing and Community Development (HCD) and finalized through negotiations with Association of Bay Area Governments (ABAG). ABAG then allocates a portion of the regional need, for all income groups, to every jurisdiction in the Bay Area. The jurisdictions must then plan for that need in their local housing elements, which eventually must be certified by HCD. The RHNA process does not necessarily encourage or promote growth but, rather, requires communities to anticipate projected growth so that they can grow in ways that enhance the quality of life; improve access to jobs, transportation, and housing; and avoid adverse impacts on the environment. The process consists of two measurements of housing need: existing need and future need. The *Regional Housing Needs Allocation Plan: San Francisco Bay Area, 2023–2031* (adopted December 16, 2021) specifies the

current housing allocations for Milpitas and is discussed in Section 3.5.2.4, *Regional Housing Needs Allocation* (Association of Bay Area Governments 2021).

### 3.5.1.4 Local

#### 2040 Milpitas General Plan

On March 9, 2021, the City adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan is an update to the 1994 General Plan and supersedes and replaces the 1994 General Plan. Pertinent goals and policies from the 2040 Milpitas General Plan related to population and housing include the promotion of jobs-generating land uses; meeting regional housing needs; maintenance of existing housing; and new, affordable, and equitable housing. The City's Housing Element was adopted in 2015 and covers the 2015–2023 housing cycle. In 2021, the City began updating the Housing Element to cover the 2023–2031 housing cycle. Growth under the TASP, which was approved in 2008, was considered in the 2040 General Plan but growth under the Metro Plan was not.

According to the 2040 General Plan, estimated household growth for 2010 to 2040 is based on Association of Bay Area Government (ABAG) projections from 2013. According to the 2040 General Plan, Milpitas is anticipated to experience significant household growth between 2010 and 2040. Milpitas is expected to gain approximately 12,500 households between 2010 and 2040, a 65 percent increase, considerably outpacing the growth rate in Santa Clara County (35 percent) and the Bay Area (27 percent). Household growth in Milpitas is expected to occur at a relatively even pace throughout this period, at an average rate of 417 households per year.

According to the 2040 General Plan, employment growth is also based on ABAG projections from 2013. In summary, Milpitas is expected to experience moderate employment growth between 2010 and 2040. In fact, estimates show a 28 percent increase in the number of jobs in Milpitas between 2010 and 2040. During the same period, employment is expected to increase by 33 percent in Santa Clara County and the Bay Area overall, outpacing employment growth in Milpitas. The moderate employment growth rate in Milpitas relative to other areas and the substantial rate of household growth in Milpitas suggest that the City is poised to provide additional housing units that will help to reduce the disparity between jobs and employed residents, potentially offering additional housing opportunities for people employed in Milpitas. Employment growth was expected to occur at a faster rate during the first ten years of the projection period (2010-2020) than in the subsequent twenty years. Milpitas was expected to gain 7,330 jobs between 2010 and 2020, at an average rate of over 733 jobs per year, and 2,010 jobs between 2020 and 2030, at an average rate of 201 jobs per year. Job growth is then projected to increase slightly between 2030 and 2040, with an average rate of 328 jobs per year.

According to the 2040 General Plan, the City is committed to supporting strong local job growth and economic development opportunities, and a range of housing types that are accessible to all income levels. New residential and commercial growth is focused on infill sites distributed throughout the City, with higher density uses focused around major transportation corridors, VTA's Light Rail lines, and the Milpitas Transit Center (City of Milpitas 2015).

#### Milpitas Midtown Specific Plan

Originally adopted in 2002, the Milpitas Midtown Specific Plan was updated in 2010 (City of Milpitas 2010). At the time of the Certified EIR, the Milpitas Midtown Specific Plan Area included the entire

TASP Area. An amendment in 2008 removed some areas and changed the boundaries of the Milpitas Midtown Specific Plan Area (City of Milpitas 2010). The boundaries of the Metro Plan would expand the original TASP boundaries to include additional parcels along Main Street, which were formerly part of the Milpitas Midtown Specific Plan. The City is currently updating the Midtown Specific Plan and renaming it the Milpitas Gateway-Main Street Specific Plan and will update its boundaries in conjunction with the adoption of the Metro Plan (City of Milpitas 2021b). As such, under the Project Change, the Metro Plan would no longer be included in the Milpitas Midtown Specific Plan Area.

#### Milpitas Municipal Code

The Milpitas Municipal Code includes the following regulations that pertain to population and housing:

- Chapter 2, Title XII – Housing is intended to protect tenants and to avoid displacement by permitting landlords a fair and reasonable return on their property, while at the same time protecting tenants from arbitrary, capricious, or unreasonable rent increases. The City Council encourages property owners to limit rent increases to fair and reasonable amounts, provide well maintained living units, and cooperate with tenants toward resolving rent-related disputes.
- Chapter 2, Section 11 – Demolition of Buildings requires that no building shall be demolished without first obtaining a permit from the City.

### 3.5.1.5 TASP Policies

The Certified EIR did not identity TASP policies that are specifically related to population and housing. However, the overall vision of the TASP is to create attractive high density urban neighborhoods with a mix of land uses around the Milpitas Transit Center. The updates to the land use designations in the TASP promote the development of housing in the TASP Area, which would lead to additional population growth.

## 3.5.2 Environmental Setting

### 3.5.2.1 Population, Housing, and Employment

#### City of Milpitas

**Population.** Based on estimates from the California Department of Finance, as of January 1, 2021, Milpitas had a population of 75,663 people. This is a 2-percentage point decline from 2020 (77,180 people) (California Department of Finance 2021a). According to the 2040 General Plan, Milpitas has experienced moderate (8 percent) population growth in recent years from approximately 63,000 in 2000 to approximately 68,000 in 2013. Population growth rates were comparable in Santa Clara County overall (9 percent) and the Bay Area as a whole (8 percent) between 2000 and 2013.

**Housing.** Based on estimates from the California Department of Finance, in 2020 Milpitas had 25,183 total housing units (California Department of Finance, 2021b).

**Employment.** Like employment throughout much of Santa Clara County, employment in Milpitas is strongly impacted by the Silicon Valley technology sector. In 2011 Milpitas had 42,698 total jobs. Milpitas has a considerable net inflow of workers to the City, with 1.7 jobs for every employed person in Milpitas in 2011. There is also a net inflow of workers to Santa Clara County overall, but

the ratio of jobs to employed residents is lower than in Milpitas, at 1.1 jobs for every employed worker. These figures suggest a potential need for additional housing for people employed in Milpitas that currently commute from other areas (City of Milpitas 2015).

### TASP Area

The environmental setting for the TASP Area related to population, housing, and employment is described on pages 5-3 and 5-4 of the Certified EIR. The discussion includes the TASP's role in potentially fostering economic or population growth or causing the need for construction of additional housing, either directly or indirectly. The discussion includes projected growth, projected employment, housing demand, and jobs/housing balance. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIR.

When the Certified EIR was prepared in 2008, the existing uses in the TASP Area were primarily industrial uses (50 percent) and retail/commercial uses (28 percent), with very little residential uses (3 percent) in a 437-acre area. By 2019, 6,955 dwelling units, 10,630 square feet of office space, and 186,500 square feet of retail space was entitled in the TASP Area. Overall, through implementation of the TASP, housing and jobs have significantly increased in the TASP Area.

### Geographic Expansion Areas

The Metro Plan includes two geographic expansion areas, relative to the TASP Area. The 13-acre western expansion area is currently characterized as industrial with uses such as automotive services and some recent residential development. Therefore, some jobs and some homes currently utilize this site. The 60-acre eastern expansion area is currently used for industrial, manufacturing, and research and development (R&D) uses and does not include any residences.

## 3.5.2.2 Projected Growth

### Plan Bay Area 2050

Plan Bay Area 2050, adopted in October 2021, is a 30-year regional plan that is updated every 2 years by ABAG and the Metropolitan Transportation Commission (MTC) and is a long-term forecast regarding population, housing units, and employment in the Bay Area. Milpitas is partially within the forecasting for "North Santa Clara County" and for "East Santa Clara County." The forecasts are designed to be realistic assessments of growth in the region through the year 2050. The strategies in Plan Bay Area 2050 for housing are to: (1) protect and preserve affordable housing, (2) spur housing production for residents of all income levels, and (3) create inclusive communities (ABAG and MTC 2021a). Plan Bay Area 2050 estimates that between now and 2050, the Bay Area's population will rise from nearly 8 million to over 10 million. Plan Bay Area 2050 also forecasts significant and continuing increased growth in housing and jobs in North and East Santa Clara County through the year 2050 (ABAG and MTC 2021b).

"Projections 2040" is the most recent in the ABAG series of statistical compendia on demographic, economic, and land use changes in each local Bay Area local jurisdiction to 2040. Full buildout of the TASP was planned for 2030 and full buildout of the Metro Plan is expected by 2040. Based on "Projections 2040," Milpitas is expected to have a total population of approximately 103,970 people, approximately 30,430 households, and approximately 58,030 total jobs by 2040 (ABAG and MTC

2018). Table 3.5-1 shows the total forecasted population, households, and jobs in Milpitas in 2030 and 2040 from "Projections 2040" and the percent increase between 2030 and 2040.

**Table 3.5-1. Milpitas' Projected 2030 and 2040 Population, Households, and Jobs**

| | Population | Households | Jobs |
|---|---|---|---|
| 2030 | 95,605 | 28,835 | 56,035 |
| 2040 | 103,970 | 30,430 | 58,030 |
| Change | 8,365 (8.7%) | 1,595 (5.5%) | 1,995 (3.5%) |

Source: ABAG and MTC 2018.

### Regional Housing Needs Allocation

The *Regional Housing Needs Allocation Plan (RHNA), San Francisco Bay Area* identifies the total number of housing units, separated into four affordability levels, that every local government in the Bay Area must plan to accommodate for the given period. The RHNA allocation for Milpitas for 2023 to 2031 is a total of 6,713 housing units as shown below in Table 3.5-2.

**Table 3.5-2. City of Milpitas RHNA Allocation 2023 to 2031**

| Very Low Income Units (<50% of area median income) | Low Income Units (50–80% of area median income) | Moderate Income Units (80–120% of area median income) | Above Moderate Income Units (>120% of area median income) | Total Units |
|---|---|---|---|---|
| 1,685 | 970 | 1,131 | 2,927 | 6,713 |

Source: ABAG 2021

## 3.5.3 Impacts and Mitigation

This section describes the change in Project impacts on population and housing that would occur with the Project Change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. If new mitigation measures are needed to reduce new impacts that would result from the Project Change, those measures are listed below.

This SEIR analysis evaluates the change in Project impacts with the Project Change, and, if applicable, changes in circumstances or new information that was not available at the time the Certified EIR was prepared. The analysis does not reevaluate the impacts of the Project that were already disclosed in the Certified EIR and are not altered due to the Project Change. Based on the change in the Project impact due to the Project Change, a determination is made as to whether there would be changes to the impact significance determinations for the Project in the Certified EIR.

### 3.5.3.1 Significance Criteria

The State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on population and housing. An impact would be considered significant if construction or operation of the Project would do any of the following.

- Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

- Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

## 3.5.3.2 Methods

This analysis assumes that the updated policies in the Metro Plan would be implemented. Table 2-2 in Chapter 2, *Project Description,* of this SEIR provides a summary of the policies in the Metro Plan; however, none have been identified that are specific to population, employment, and housing. Some of the land use classification updates and the four new land use classifications in the Metro Plan, however, pertain to employment, population, and housing. These updates would add uses that would increase employment opportunities or the need for more workers in the Metro Plan Area, such as for uses that include office, R&D, retail, hotel, and business-support services.

The Metro Plan acknowledges that significant development has occurred as part of the TASP, including entitling approximately 92 percent of the residential uses planned for in the TASP. However, there are several large areas where development could still occur as a part of the Project Change, including the Great Mall area and the proposed geographic expansion areas (which total approximately 73 acres, resulting in a Metro Plan Area of 510 acres). Based on the capacity of the remaining undeveloped parcels, an anticipated buildout for the Metro Plan was developed and is shown in Table 2-3, in Chapter 2 of this SEIR. In summary, the Metro Plan at buildout, as compared to the TASP, would result in approximately 7,000 additional dwelling units, 3,000,000 additional square feet of office (including industrial), 300,000 additional square feet of retail, and 700 added hotel rooms. The Project Change would result in an estimated 14,000 more people[1] and approximately 12,283 more jobs[2] in the Metro Plan Area beyond what was estimated and approved at buildout in the TASP.

## 3.5.3.3 Impacts and Mitigation Measures

This section includes a discussion of each impact as it corresponds to the significance criteria presented in Section 3.5.3.1, *Significance Criteria*.

### Impact POP-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to inducing substantial unplanned population growth in an area, either directly or indirectly.

#### Summary of Certified EIR Impact Analysis

The Certified EIR generally discussed population, housing, and employment growth under the TASP in the context of growth-inducing impacts (see Chapter 5.3 of the Certified EIR). Thus, an impact determination was not made. The Certified EIR identified that the additional growth approved under the TASP would result in an approximately 27 percent population increase in the TASP Area

[1] The calculation of 14,000 additional people is based on the assumption of two people per dwelling unit in the Metro Plan Area. Because the new housing that would be developed as part of the Metro Plan would be apartments and because apartments tend to generate a smaller household size, the assumption of two people per dwelling unit was used.

[2] The calculation of 12,283 additional jobs is based on the assumptions of one job per 350 square feet of retail uses, one job per 260 square feet of office uses, one job per one hotel room, and one job per 450 square feet of industrial/R&D uses. The calculation is summarized in Table 1-3 of the Metro Plan (Appendix C).

by 2030 (about 17,915 more people). This growth would be approximately 69 percent of the citywide growth assumed under 2030 ABAG projections. The TASP gross estimate of new jobs in the TASP Area was 4,200 at buildout with a net increase of around 1,200 jobs due to displacement of demolished uses. Regarding regional housing demand, the Certified EIR determined that with increased employment in Santa Clara County under the TASP, increased population and housing demand would likely follow in both the City and the region. The Certified EIR did not state whether the projected employment and housing growth would be within ABAG's 2030 growth projections for Milpitas. The Certified EIR identified that the City's Housing Element duly includes programs that would address regional housing needs and the City's RHNA, and there was no identified impact related to substantial unplanned population growth. The Certified EIR found that because the TASP would create additional residential development it would thereby improve the jobs/housing balance in the City by providing housing opportunities for more of the City's workers.

### Impact Analysis

The Project Change includes policies that seek to increase housing and jobs production in the City and would result in an estimated population increase of 14,000 people in the Metro Plan Area, as well as an increase of 12,283 more jobs, at 2040 buildout, compared to the original TASP buildout in 2030. Because SEIRs focus on changes relative to a certified EIR, the baseline used for an SEIR is the conditions associated with buildout of the project in the certified EIR. The following information compares the projected population and number of employees between 2030 (TASP buildout and environmental baseline) and 2040 (Metro Plan buildout). According to the projections provided by ABAG and MTC, the population and number of jobs in Milpitas in 2040 (Metro Plan buildout) is anticipated to increase by about 8,365 people (approximately 8.7 percent) and 1,995 employees (approximately 3.5 percent), from 2030 (TASP buildout). As such, the additional population associated with the Metro Plan alone would be beyond the population projections estimated between 2030 and 2040 by ABAG and MTC.

Although the population growth associated with the Metro Plan is beyond the estimated projections by ABAG and MTC, the population growth would be considered planned for several reasons identified below. For over 10 years, the City has planned for the development of multi-use neighborhoods around transit. When it first developed the TASP, the City identified the potential of redeveloping the TASP Area from an industrial area into one where people could work, live, and take advantage of the proximity to, what was then, a future BART station. The planning process included the development of a Specific Plan with policies that would address the demands from the population growth associated with the TASP. Since the development of the TASP, the City has identified ways to plan for additional growth in the area, as a way of helping meet its RHNA requirements, and in doing so identified the need for the Metro Plan. The Milpitas Metro Specific Plan is a document that includes the City's plan for the population growth that would be generated from its implementation, including policies to guide the growth of the Metro Plan Area.

The Metro Plan also includes a series of area-wide infrastructure improvements to accommodate residential and mixed-use development, make it more accessible and comfortable for pedestrians, improve vehicle navigability, provide open space amenities, and reduce obstructions to development. As such, the Metro Plan includes a plan for the movement of individuals that will live and work in the Metro Plan Area. Furthermore, as documented in Section 3.8, *Utilities and Service Systems,* the City has planned for the demand on utilities due to additional population growth through the development of Master Plans (see Appendix F).

In addition, the Project Change supports the growth anticipated by the General Plan and is consistent with the population and housing goals from the 2040 General Plan, including Goal LU-7 to promote job-generating land uses; and Housing Element Goals A, B, C, D, and E to provide adequate sites to accommodate the City's share of the regional housing need; maintain and preserve housing resources; maintain high-quality residential neighborhoods and preserve existing housing resources; facilitate new housing production; support housing diversity and affordability; and eliminate housing discrimination.

Overall, the population growth associated with the Metro Plan is consistent with overall goals in the region to establish housing and jobs near transit. The Metro Plan would be consistent with the guiding principles of Plan Bay Area 2050, regarding the interrelation of housing, the economy, transportation, and the environment by supporting more affordable and market-rate housing near transit, increasing jobs near transit, and encouraging non-vehicular modes of transportation to reduce GHG emissions. Because the City has planned for the population and employment growth associated with the Metro Plan through the development of the Specific Plan and Master Plans, and because the population and employment growth that would be generated by the Metro Plan would be consistent with the kind of growth envisioned for the Bay Area, the population and employment growth associated with the Metro Plan would be considered planned.

The Project Change would, therefore, not create a new or more severe impact regarding the induction of substantial unplanned population growth in an area, either directly or indirectly than what was identified in the Certified EIR.

### Certified EIR Mitigation Measures

The Certified EIR included no mitigation measures for impacts related to unplanned population growth.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact POP-1

The Certified EIR determined that the Project would not induce substantial unplanned population growth in an area, either directly or indirectly. Based on the analysis above, with incorporation of the Project Change, the Project would have a less-than-significant impact related to unplanned population growth. The Project Change would not alter the result of the Certified EIR's impact determination related to induction of substantial unplanned population growth in an area, either directly or indirectly. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact POP-2: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to displacing substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

### Summary of Certified EIR Impact Analysis

The Certified EIR did not address the Project's impact related to the displacement of substantial numbers of existing people or housing that could necessitate the construction of replacement housing elsewhere.

### Impact Analysis

#### *Metro Plan Buildout and Changes in Land Use Classifications and Policies*

Approximately 6,995 residential units have been entitled in the TASP Area as of 2019, which is close to the total number planned for in the TASP. It is estimated that the Metro Plan at 2040 buildout would result in approximately 7,000 additional dwelling units. One main purpose and objective of the Project Change is to provide more housing in the Metro Plan Area by providing affordable and market rate housing. This would be achieved through changes in land use classification. As such, the Project Change would not displace substantial numbers of existing people or housing and would not necessitate the construction of replacement housing elsewhere. Existing federal, state, and local regulations are in place, as discussed above, that would avoid the displacement of people and housing through requirements for replacement housing, preservation of and increases in accessible and affordable housing, rental increase limits, and landlord-tenant dispute resolution.

#### *Geographic Expansion*

The Metro Plan's eastern expansion area is currently used for industrial, manufacturing, and R&D uses, and does not contain neighborhoods. Therefore, no residences would be displaced in the eastern expansion area. The western expansion area contains an existing residential assisted living facility, as well as industrial and automotive service uses. It is not anticipated that any existing housing would be demolished or cause displacement of people under the Metro Plan. Furthermore, individual projects in the Metro Plan Area in the future would be required to undergo separate environmental review under CEQA prior to approval to assess and avoid the possibility of displacement of people or housing.

The Project Change would, therefore, not create a new or more severe impact related to the displacement of substantial numbers of existing people or housing, or the construction of replacement housing elsewhere, and there would be no impact.

### Certified EIR Mitigation Measures

The Certified EIR included no mitigation measures for impacts related to the displacement of people or housing.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact POP-2

The Certified EIR did not make a determination regarding the TASP's impact related to the displacement of substantial numbers of existing people or housing that could necessitate the construction of replacement housing elsewhere. Nonetheless, the Project Change would not result in an impact related to the displacement of substantial numbers of existing people or housing and would not necessitate the construction of replacement housing elsewhere. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

# 3.6 Public Services and Recreation

This section discloses and analyzes the potential change in Project impacts on public services and recreation that would result from implementing the Project Change.

## 3.6.1 Regulatory Setting

The regulatory setting for public services and recreation is described on page 3.9-5 of the Certified EIR. These regulations include: provisions from the Milpitas Unified School District, Berryessa Union School District, and East Side Union High School District; California Fire Code and the City's Municipal Code as it relates to construction and design guidelines for fire protection; Midtown Specific Plan policies related to open space requirements for new development; and provisions from the City of Milpitas Police Department, California Highway Patrol, and Transit Patrol Division of the Santa Clara County Sheriff. In addition, pertinent policies from the Midtown Specific Plan are described on pages 3.9-11 and 3.9-17 of the Certified EIR. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIR. For pertinent policies related to the General Plan, please refer to the description below.

### 3.6.1.1 City of Milpitas Parks and Recreation Master Plan

The City of Milpitas adopted a Parks and Recreation Master Plan in 2009, which analyzed park conditions and provided recommended improvements to each of the City's 33 existing parks. The Master Plan has since been updated and the Draft City of Milpitas Park and Recreation Master Plan Update was released in October 2021 for public review. An Initial Study/Negative Declaration (IS/ND) for the Draft City of Milpitas Park and Recreation Master Plan Update was prepared in September 2021. The City Council adopted the Milpitas Park and Recreation Master Plan Update and IS/ND on December 14, 2021.

The City of Milpitas Parks and Recreation Master Plan Update provides a road map to guide decision making to help the City maintain, manage, and develop its envisioned park and recreation system and provide the community with the recreational opportunities that they desire. The Parks and Recreation Master Plan studies the existing park and recreation system and draws on extensive community engagement to identify a planning blueprint to expand, improve, and protect these assets for the future.

The City of Milpitas Parks and Recreation Master Plan Update includes the Recreational Value System Matrix, which is a City-developed tool to assess park amenities in the Milpitas Park and Recreation system. This matrix is intended to provide a method for quantifying current park offerings and prioritizing future improvements (City of Milpitas n.d.).

### 3.6.1.2 2040 Milpitas General Plan

On March 9, 2021, the City of Milpitas adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan is an update to the 1994 General Plan and supersedes and replaces the 1994 General Plan. Policies from the 2040 General Plan relevant to the Project's physical impacts on the environment include the following:

- **Policy PROS-1.3:** Achieve and maintain a minimum overall citywide ratio of 5 acres of park land for every 1,000 residents outside of the City's adopted Specific Plan areas. Within adopted Specific Plan areas, achieve and maintain the parks standards and ratios specified in the Specific Plan, with an emphasis on publicly accessible spaces and facilities.
- **Policy PROS 1-4:** Park land acreage dedications and/or equivalent in-lieu fees shall be required for new development in accordance with the following standards:
    - For areas outside of a Specific Plan, require land dedication or in lieu fees equivalent to the 5 acre/1,000 resident standard, but allow credit for private recreation space for up to 2 acres/1,000 residents for private open space. Private recreation credit will be given at the discretion of the City and pursuant to the criteria specified in the City's Subdivision Regulations (Title XI, Chapter 1, Section 9.08 of the Milpitas Municipal Code).
    - For areas within a Specific Plan, require land dedication or in-lieu fees equivalent to the park land standard established in the relevant Specific Plan, allowing credit for private recreation space for up to 1.5 acres/1,000 residents for private recreation space. Private recreation credit will be given at the discretion of the City and pursuant to the criteria specified in the City's Subdivision Regulations (Title XI, Chapter 1, Section 9.08 of the Milpitas Municipal Code).
- **Action UCS-8a**: Maintain a close, collaborative relationship with the local school districts to ensure the adequate provision of school and related facilities to serve existing and future development. The City should work with the local school districts to develop criteria for the designation of school sites, identify locations for new school sites, and consider a range of opportunities available to the City reduce the cost of land for school facilities. Such opportunities may include, but are not limited to, designating lands as School (SCH) on the General Plan Land Use map when future school sites are identified. The City shall encourage the local school districts to comply with City standards in the design and landscaping of school facilities.
- **Action UCS-8c**: Require new development to pay applicable school facility impact fees and work with developers and the school districts to ensure that adequate school and related facilities will be available.
- **Policy SA-4.9**: Ensure that fire and emergency medical services meet existing and future demand by maintaining a response time of four minutes or less for all urban service areas.

### 3.6.1.3 TASP Policies

Table 2-2 in Chapter 2, *Project Description,* of this SEIR provides a summary of the policies in the TASP related to public services and recreation. Table 2-2 identifies policies that require the following:

- *Schools*. Payment of school impact fees from projects, implementation of a new school in the TASP Area, and coordination with school districts.
- *Fire Protection*. Implementation of a "standards of cover" analysis for the Fire Department, requirements for additional fire department staff and equipment, environmental requirements for a new Fire Station, requirements to update the City's emergency and disaster response plans, and requirements for streets to meet Milpitas Fire Department fire apparatus design requirements for access and firefighting operations.

- *Police Protection.* Requirements to hire additional police staff and equipment to provide an adequate level of service.
- *Recreation*. Requirements to provide recreational space, open space, and trails.
- *Pedestrian Access.* Requirements for small blocks for easy and direct access for pedestrians to walk from the Piper/Montague District to BART, light rail, and the Great Mall.

## 3.6.2 Environmental Setting

### 3.6.2.1 TASP Area

The environmental setting for the TASP Area is described on pages 3.9-1 through 3.9-4 of the Certified EIR. This discussion includes: an overview of the three different school districts that would be used by residents in the TASP Area (Milpitas Unified School District [MUSD], Berryessa Union School District, and East Side Union High School District); on overview of the fire protection services provided by the Milpitas Fire Department (MFD); an overview of the police services, service ratios, and response times for the City of Milpitas Police Department (MPD), California Highway Patrol, and Transit Patrol Division of the Santa Clara County Sheriff; and an overview of parks within the City and the TASP Area. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1 of this SEIR for the locations available for the public to review the Certified EIR.

The setting with regard to public services and recreation within the TASP Area has not changed substantially since the Certified Plan was prepared; however, new facilities and updated information about public services and recreation is described below.

### 3.6.2.2 Project Change

The Metro Plan includes two geographic expansion areas, relative to the TASP Area. Although the Metro Plan would be expanded, these expanded areas would be served by the same school districts as identified in the TASP. The 13-acre western expansion area located along a portion of South Main Street would be served by the Milpitas Unified School District. The 60-acre eastern expansion area associated with the Innovation District would be served by Berryessa Union School District and East Side Union High School District. Students who live in the Metro Plan Area would attend the same schools identified in the TASP (Zanker Elementary School, Rancho Milpitas Middle School, and Milpitas High School; Brooktree Elementary, Northwood Elementary, Morrill Middle School, and Independence High School) with one addition. In 2018, Milpitas Unified School District opened a new school, Mabel Mattos Elementary, which is located within the Metro Plan Area. Some students in the Metro Plan Area would attend this school. Construction of Mabel Mattos Elementary has two phases. The first phase was completed in 2018 and the second phase is anticipated to be completed for the 2022–2023 school year and would accommodate a maximum of 800 students (Mable Mattos Elementary 2022 and JL Construction 2022).

The Metro Plan Area, including the two areas of geographic expansion, would receive fire protection services similar to those described in the Certified EIR. The Metro Plan Area would be serviced by the Milpitas Fire Department, including the three fire stations identified in the TASP (Fire Stations #1, #3, #4). In addition, the City of Milpitas is currently replacing one of its fire stations (Fire Station #2). Fire Station #2 would be located close to the Metro Plan Area (approximately 0.7 mile from the

Innovation District). Construction of Fire Station #2 is expected to be completed in spring of 2022 (Alaban 2020).

The Metro Plan Area, including the two areas of geographic expansion, would receive police services similar to those described in the Certified EIR. The Metro Plan Area would be serviced by the City of Milpitas Police Department, the California Highway Patrol, and the Transit Patrol Division of the Santa Clara County Sheriff. The Milpitas Police Department headquarters continues to be located at 1275 N. Milpitas Boulevard, approximately 2 miles from the Metro Plan Area. The 2040 General Plan EIR identified that the department has 93 funded positions and 33 professional staff positions and that response time for in-progress emergency calls averaged 2 minutes and 38 seconds in 2019, which is within the City's goal of 3 minutes (City of Milpitas 2020).

The recreational resources available for the Metro Plan Area, including the two areas of geographic expansion, would be similar to those described in the Certified EIR, with a couple of exceptions. Future residents of the Metro Plan Area would be able to use the recreational resources noted in the TASP, including the two parks identified near the TASP Area (Parc Metro East and Pinewood Park). In addition, since preparation of the Certified EIR, additional parks and open space areas have been developed within the Metro Plan Area and would be available to any future residents from the Metro Plan. These new parks include McCandless Park, Bob McGuire Park, Augusts Rathbone Park, and Creeks Trail.

## 3.6.3 Impacts and Mitigation

This section describes the change in Project impacts on public services and recreation that would occur with the Project Change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. The Certified EIR found that with implementation of the policies in the TASP, impacts on public services and recreation would be less than significant and additional mitigation measures were not required. Because the policies have been changed from the TASP to the Metro Plan, the analysis includes a comparison of the TASP policies and the Metro Plan policies to determine if any changes in policies would result in an impact. If new mitigation measures are needed to reduce new impacts that would result from the Project Change, those measures are listed below.

This SEIR analysis evaluates the change in Project impacts with the Project Change, and, if applicable, changes in circumstances or new information that was not available at the time the Certified EIR was prepared. The analysis does not reevaluate the impacts of the Project that were already disclosed in the Certified EIR and are not altered due to the Project Change. Based on the change in the Project impact due to the Project Change, a determination is made as to whether there would be changes to the impact significance determinations for the Project in the Certified EIR.

### 3.6.3.1 Significance Criteria

The State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on public services and recreation. An impact would be considered significant if construction or operation of the Project would do any of the following.

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain

acceptable service ratios, response times, or other performance objectives for any of the following public services:

- Fire protection
- Police protection
- Schools
- Parks
- Other public facilities

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

### 3.6.3.2 Methods

Evaluation of the Project Change is based on considering how population growth resulting from implementation of the Metro Plan would affect schools, fire protection services, police protection services, and recreational facilities.

According to the State CEQA Guidelines, the Metro Plan would have an adverse environmental impact if it were to result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for public services.

Potential impacts related to public services are evaluated by (a) assessing the potential for the Project to increase demand for public services based on goals established by service providers and (b) comparing the ability of the service provider/public facility to serve the Project and accommodate the associated increase in demand. A determination is then made as to whether the existing facilities are capable of meeting the demand of the Project and, if not, if expansion of existing facilities could cause an adverse environmental effect. The analysis is based on the review of City documents and communications with City service providers.

This analysis assumes that the updated policies in the Metro Plan would be implemented. Table 2-2 in Chapter 2 of this SEIR provides a summary of the policies in the Metro Plan related to public services and recreation. Table 2-2 identifies policies that require the following:

- *Schools*. The Metro Plan would have policies related to ensuring impact fees from development are paid and coordination with affected school districts is conducted.
- *Fire Protection*. The Metro Plan would have policies related to implementation of a "standards of cover" analysis for the Fire Department, requirements for additional fire department staff and equipment, environmental requirements for a new Fire Station, requirements to update the City's emergency and disaster response plans, and requirements for streets to meet Milpitas Fire Department fire apparatus design requirements for access and firefighting operations.

- *Police Protection.* Requirements to hire additional police staff and equipment to provide an adequate level of service.
- *Recreation*. Requirements to provide recreational space, open space, and trails.
- *Pedestrian Access.* Requirements for small blocks to encourage an interconnected, walkable urban fabric.

### 3.6.3.3 Impacts and Mitigation Measures

This section includes a discussion of each impact as it corresponds to the significance criteria presented in Section 3.7.3.1, *Significance Criteria*.

#### Impact PS-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantial adverse physical impacts associated with the provision of new or physically altered schools or the need for new schools.

**Summary of Certified EIR Impact Analysis**

The Certified EIR identified that the additional growth associated with the TASP would result in the following:

- **Milpitas Unified School District**. Growth from the TASP would require a new K-6 or K-8 school for the Milpitas Unified School District and construction of a new onsite facility for high school.
- **Berryessa Union School District**. There is adequate capacity at Berryessa Union School District schools to accommodate the growth from the TASP; any future expansion of facilities would likely occur on previously developed sites, and the fair share costs to expand or upgrade facilities would be borne by developers (in accordance with California Government Code 65995 and Education Code 17620).
- **East Side Union High School District. The** East Side Union High School District would like to negotiate a school fee per residential square foot with individual developers, within the limits permitted by state regulation, to cover the costs of accommodating additional students.

The Certified EIR (as revised in the Final EIR) identified that the school impact fees and the school districts' methods of implementing measures specified by Government Code 65996 would offset project-related increases in student enrollment. As revised in the Final EIR, the Certified EIR identified that the payment of school impacts is sufficient to offset a project's effect on school facilities and concluded that impacts on schools due to the TASP would be less than significant.

**Impact Analysis**

***Geographic Expansion***

The Metro Plan would not result in any new significant impacts or more severe impacts on schools due to the geographic expansion of the Metro Plan Area. Any potential impacts on schools would be limited to the additional growth associated with the Metro Plan, which is discussed below.

***Metro Plan Buildout: Population Growth and Employment***

Table 3.6-1 provides a summary of the number of students expected to be generated by implementation of the Metro Plan. In total, it is expected that the Metro Plan would generate 1,407 school-aged children across Milpitas Unified School District, Berryessa Union School District, and East Side Union High School District. The number of school-aged children expected to attend schools in each district is shown in Table 3.6-1.

**Table 3.6-1. Project Student Enrollment**

| School District | Grade Level | Market-Rate Housing Student Generation Rate[1] | Market-Rate Housing Units[2] | Below Market-Rate Housing Student Generation Rate[1] | Below Market-Rate Housing Units[2] | New Students |
|---|---|---|---|---|---|---|
| Milpitas Unified School District | K–6 | 0.087 | 3,752 | 0.246 | 938 | 557 |
| Milpitas Unified School District | 7–8 | 0.017 | 3,752 | 0.047 | 938 | 108 |
| Milpitas Unified School District | 9–12 | 0.030 | 3,752 | 0.076 | 938 | 184 |
| Berryessa Union School District | K–5 | 0.046 | 1,848 | 0.300 | 462 | 224 |
| Berryessa Union School District | 6–8 | 0.016 | 1,848 | 0.159 | 462 | 103 |
| East Side Union High School District | 9–12 | 0.1 | 1,848 | 0.1 | 462 | 231 |

[1] Student generation rates are consistent with the Certified EIR.

[2] This assumes 4,690 residential units in the Milpitas Unified School District, 2,310 residential units in the Berryessa Union School District and East Side Union High School District, and that 20 percent of housing units would be below market rate.

It is expected that the Phase II expansion of Mabel Mattos Elementary will accommodate some of the new students generated by the Metro Plan. In addition, Berryessa Union and East Side Union High have existing capacity for more students. Nonetheless, additional school facilities may be needed to accommodate the additional demand from the Metro Plan. California Government Code Sections 65995–65998 set forth provisions for the payment of school impact fees by new development as the exclusive means of "considering and mitigating impacts on school facilities that occur or might occur as a result of any legislative or adjudicative act, or both, by any state or local agency involving, but not limited to, the planning, use, or development of real property" (Section 65996(a)). The

legislation goes on to say that the payment of school impact fees is "hereby deemed to provide full and complete school facilities mitigation" under CEQA [Section 65996(b)]. School districts are responsible for implementing the specific methods for mitigating school impacts under the Government Code. The school impact fees and the school districts' methods of implementing measures specified by Government Code 65996 would offset Project-related increases in student enrollment.

The additional demand for school facilities, due to the new development that would result from implementation of the Project Change, would be minimized through the payment of school impact fees, per Government Code Section 65995. Impacts on schools due to the Project Change would be reduced to a less-than-significant level and would be the same as the impact identified in the Certified EIR (as revised in the Final EIR). The additional demand from the Project Change on schools would not result in a new or more severe impact than what was identified in the Certified EIR.

***Changes in Land Use Classifications and Policies***

The Metro Plan updates the policies in the TASP, including deleting certain policies in the TASP. Several of the policies identified in the TASP, including Policies 6.43, 6.44, 6.45, and 4.74, included requirements related to the development of a new school in the TASP Area. Because Mabel Mattos Elementary has been constructed and is operational and because this school is located within the TASP Area/Metro Plan Area, these policies have been fulfilled and are no longer needed to reduce impacts on schools. The Metro Plan would not result in any substantial changes to the requirements identified in the remaining TASP policies related to reducing impacts on schools. Thus, changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

### Certified EIR Mitigation Measures

The Certified EIR included no mitigation measures for impacts related to schools.[1]

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.[2]

### Conclusions for Impact PS-1

The Certified EIR concluded that after implementation of policies included in the TASP and implementation of Government Code Section 65995, impacts on schools would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Project would continue to have a less-than-significant impact on schools. The Project Change would not alter the Certified EIR's impact determination for impacts related to schools. The Project Change would not

[1] The Certified EIR (as revised in the Final EIR) identified that Government Code Section 65995 states that the payment of school impact fees is sufficient to offset a project's effect on school facilities. Implementation of Government Code Section 65995 is guaranteed through implementation of Policy 6.44 in the TASP.

[2] Like implementation of the TASP, implementation of the Metro Plan would be required to follow Government Code Section 65995. Implementation of Government Code Section 65995 is guaranteed through implementation of Policy ICS 10.2 in the Metro Plan. The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact PS-2: Implementation of the Metro Plan could result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities or the need for new fire protection facilities.

### Summary of Certified EIR Impact Analysis

The Certified EIR identified that implementation of the TASP would require additional MFD staff (approximately 18 new firefighters), as well as another engine and a potentially new station (depending on the results of the standard cover of analysis). The Certified EIR suggested that Fire Station #2 is a likely candidate for expansion but that a "standards of cover" analysis would need to be conducted to determine any required facility enhancements from the implementation of the TASP. Overall, the Certified EIR concluded that the policies in the General Plan and TASP would ensure that response times are consistent with National Fire Protection Association Standard 1710 and would evaluate the potential sites for a new fire station, resulting in a less-than-significant impact on fire protection services.

### Impact Analysis

Compared to the TASP, the Metro Plan would increase the demand for fire protection services due to (1) the expansion of the Metro Plan to include additional areas where people could work and live and (2) the additional population growth related to development that would be allowed in the Metro Plan.

The Certified EIR identified that Fire Station No. 2 is a likely candidate for expansion. Since then, construction has gotten under way to demolish the existing station and replace Fire Station No. 2 with a new facility. The replacement of Fire Station No. 2 is expected to be completed in spring of 2022 (Alaban 2020). The Metro Plan would be served by this new facility. Nonetheless, the Metro Plan would place an increased demand on fire services due to the additional population that would be generated from buildout. The Metro Plan includes the same policies in the TASP to minimize physical impacts on the environment due to the need for new or altered fire protection facilities. Policy ICS 8.1 requires that the City prepare a "standards of cover" analysis to determine the Metro Plan's precise impact on the Fire Department's staffing and equipment, and any required facility needs. Policy ICS 8.2 requires the City to hire additional fire department staff and purchase equipment to provide an adequate level of service. Policy ICS 8.4 requires that if a new fire station is built to meet the service needs of the Metro Plan Area, it must be sited and developed in such a way as to not create substantial adverse physical impacts or significant environmental impacts. Policy ICS 8.5 requires that new facilities minimize noise and traffic impacts on existing land uses. In addition, Chapter 6 of the Metro Plan identifies that the Community Facilities District (CFD) would require that new residential development pay an annual special tax to cover the cost of additional public service provision, including fire services. Overall, there would be no substantial changes in the Metro Plan policies compared to the TAPS policies.

Nonetheless, as acknowledged in Policies ICS 8.1, 8.4, and 8.5, there is the potential for additional fire protection staffing, equipment, and facilities to be needed to meet the demands of the additional buildout from the Metro Plan. However, it is not possible to identify the specific nature, extent, and significance of physical impacts on the environment that could result from the construction and operation of future fire protection facilities without knowing the size and nature of the facility, or where it would be located. For example, a new facility could feasibly be housed in an existing building, which would have much less of a physical impact on the environment than the construction of a new facility. The evidence necessary to make a significance conclusion regarding the physical consequences of additional fire protection facilities will only be available during the environmental review of the future facility. CEQA requires significance determinations to be made on the basis of substantial evidence, not speculation. As such, although a conclusion can be made that the Metro Plan could potentially trigger the need for new fire protection facilities, it is not possible to make a significance determination concerning the specific secondary impacts on the environment due to the construction of future fire protection facilities without engaging in speculation; therefore, no significant impact is identified. New public facilities, including those for fire protection services, are subject to CEQA; thus, CEQA review would be conducted if and when such new facilities are advanced.

#### Certified EIR Mitigation Measures

The Certified EIR included no mitigation measures for impacts related to fire protection facilities.

#### New Mitigation Measures

At this time, a CEQA conclusion cannot be made, and no mitigation measures can be identified. Mitigation measures may be developed when additional CEQA review is prepared.

#### Conclusions for Impact PS-2

The Certified EIR concluded that after implementation of policies included in the TASP, impacts on fire protection services would be less than significant. Based on the analysis above, with incorporation of the Project Change, it is currently unknown whether the potential implementation of fire protection facilities would result in adverse physical impacts on the environment. As such, a CEQA conclusion cannot be made, and additional CEQA review would be required to analyze and disclose this impact.

### Impact PS-3: Implementation of the Metro Plan could result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities or the need for new police protection facilities.

#### Summary of Certified EIR Impact Analysis

The Certified EIR identified that the increase in population, business traffic, and vehicular traffic resulting from the buildout of the TASP would increase the workload of the MPD and the nature of police needs. The Certified EIR also identified that an increase in staffing would be necessary due to the TASP (approximately 26.3 officers). Overall, the Certified EIR concluded that construction of new

police facilities would not be warranted and that with implementation of TASP Policy 6.54,[3] which requires hiring additional police staff and purchasing equipment to provide an adequate level of service, impacts on police services would be less than significant.

**Impact Analysis**

Compared to the TASP, the Metro Plan would increase the demand for police services (by approximately 25 additional police officers) due to (1) the expansion of the Metro Plan to include additional areas where people could work and live and (2) the additional population growth related to development that would be allowed in the Metro Plan. The Metro Plan includes Policy ICS 9.1, which includes the same requirement as TASP Policy 6.54 to hire additional police staff and purchase equipment to provide an adequate level of service. In addition, Chapter 6 of the Metro Plan identifies that the CFD would require that new residential development pay an annual special tax to cover the cost of additional public service provision, including police services. As such, the potential impacts related to the need for additional staffing and equipment for the Metro Plan would be the same as the impacts identified in the TASP.

However, the City of Milpitas has also determined that an additional police station is necessary in the Metro Plan Area. The station would be located near the Milpitas Transit Center, though the exact location has not yet been determined. One potential location is the vacant parcel near the Milpitas Transit Center, as indicated in Figure 2-2. The Metro Plan includes Policy ICS 9.2, which states the following: *Construct an additional Police Substation in the Metro Area on the Milpitas Boulevard Extension adjacent to Berryessa Creek, or in another location determined by the City*.

Overall, the one substantial change in the policies in the Metro Plan is the addition of Policy ICS 9.2. The potential impact from the addition of this policy is included below. The Metro Plan has identified the need for a new police substation due to the additional population growth associated with the Metro Plan. Because the police substation is located within the Metro Plan Area, many of the impacts identified in this SEIR would also apply to the police substation. For example, due to its location within the Metro Plan Area, the police substation is expected to have the same impacts on biological resources and cultural resources, as analyzed in the Initial Study (see Appendix B). Furthermore, because the police substation would include police cars that use sirens, a qualitative analysis of these potential noise impacts is included in Section 3.4, *Noise.*

However, it is not possible to identify the specific nature, extent, and significance of physical impacts on the environment that could result from the construction and operation of a future police facility without knowing the size and nature of the facility, or its location. For example, a new police facility could feasibly be housed in an existing building, which would have much less of a physical impact on the environment than the construction of a new facility. The evidence necessary to make a significance conclusion regarding the physical consequences of an additional police facility will only be available during the environmental review of the future facility. CEQA requires significance determinations to be made on the basis of substantial evidence, not speculation. As such, although a conclusion can be made that the Project would trigger the need for a new police facility, it is not possible to make a significance determination concerning the specific physical impacts on the environment due to the construction of a future police facility without engaging in speculation; therefore, no significant impact is identified. New public facilities, including those for police services,

[3] Note: The Certified EIR identifies policy numbers 6.45 and 6.53; however, these were typographic errors. The correct policy number related to police services is Policy 6.54.

are subject to CEQA; thus, CEQA review would be conducted if and when such new facilities are advanced.

#### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to police protection facilities.

#### New Mitigation Measures

At this time, a CEQA conclusion cannot be made, and no mitigation measures can be identified. Mitigation measures may be developed when additional CEQA review is prepared.

#### Conclusions for Impact PS-3

The Certified EIR concluded that after implementation of policies included in the TASP, impacts on police protection facilities would be less than significant. Based on the analysis above, with incorporation of the Project Change, it is currently unknown whether the implementation of the police substation would result in adverse physical impacts on the environment. As such, a CEQA conclusion cannot be made and additional CEQA review would be required to analyze and disclose this impact.

### Impact PS-4: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantial adverse physical impacts associated with the provision of new or physically altered parks or the need for new parks; related to the increased use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or including recreational facilities or requiring the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

#### Summary of Certified EIR Impact Analysis

The Certified EIR identified that the TASP Area is bounded by high volume arterial roadways, industrial land, and a railroad, and that no public parks were located nearby in 2008. The Certified EIR identified that the TASP would be required to include 38.2 acres of public parks to meet the ratio of 2.0 acres of public parks per 1,000 residents. The Certified EIR also identified that the TASP would result in the creation of public park space and that parks would be located on already-developed properties, which would not have an adverse physical effect on the environment and would increase the biological resources and water quality in the TASP Area. Overall, the Certified EIR concluded that the TASP would provide public parks and that the policies and standards in the TASP, which require parks to be built as designated, would ensure a less-than-significant impact on recreational facilities.

## Impact Analysis

### *Geographic Expansion and Metro Plan Buildout: Population Growth and Employment*

Compared to the TASP, the Metro Plan would increase the demand for recreational facilities due to (1) the expansion of the Metro Plan to include additional areas where people could work and live and (2) the additional population growth related to development that would be allowed in the Metro Plan. In order to provide additional recreational opportunities to the future residents and employees of the Metro Plan Area, the Metro Plan identifies new parks that would be constructed as a part of the Metro Plan (see Figure 2-4). In addition, the Metro Plan includes policies to provide recreational facilities in the form of a trail system (see Policy PPS 3.3) and open space, as a part of new developments (see Policy COS 1).

Policy PROS 1-4 from the 2040 General Plan identifies that for areas within a Specific Plan, land dedication or in-lieu fees for park land would be required according to the standard established in the relevant Specific Plan. The standards established in the Metro Plan to require park land have been updated, relative to the TASP. The Metro Plan includes the four guiding principles in the policies established by the Metro Plan:

- Require that phased projects prioritize the development of public amenities to serve new populations.
- Require residential and mixed-use projects to develop and maintain private public spaces that are accessible to residents and the general public.
- Use a hybrid model of an acres ratio and the Recreational Value System to assess public space facilities and identify opportunities for growth.
- Ensure that each District will ultimately include open space with amenities suitable to serve the uses and activity within or planned for the area.

Using the same ratio for public parks as the TASP (2.0 acres of public parks per 1,000 residents), the Metro Plan would require the construction of 28 acres of additional public parks. However, one of the updates that the Metro Plan makes to the TASP is to add the Recreational Value System, as a way of assessing public space facilities. Rather than relying solely on the metric of acres of public parks per residents, the Metro Plan uses the Recreational Value System to quantify a public space's level of service. The Recreational Value System provides a quantitative system for evaluating existing and proposed public parks on their capacity to provide social gathering, contemplative, and active recreational opportunities. This system ensures that parks are meeting their maximum potential in providing residents and workers with flexible and usable space. This type of value system prioritizes the variety of experiences, access and proximity to experiences, and a comprehensive range of spaces. The Recreational Value System strives to provide a more holistic picture of the City's park systems and illuminate future park opportunities.

The Metro Plan acknowledges some of the challenges that the City (as well as other cities) face when relying solely on an acres-to-persons ratio, including development of parks with limited amenities and limited or deferred maintenance. As such, use of the Recreational Value System (as required by Policies PPS 3 and PPS 3.1) would ensure that the parks that are developed in the Metro Plan provide resources that are meeting their maximum potential of recreational use. By adhering to the policies identified in the Metro Plan that require the development of new public parks, trails, open space (as a part of development), and adherence to the Recreational Value System, the Metro Plan

would ensure that the population generated by the Project Change would have recreational facilities that they could use.

The Metro Plan would require the development of open space in order to meet the additional demand placed by new residences associated with the Metro Plan. The proposed and potential parks that are currently envisioned in the Metro Plan are shown in Figure 2-5 in Chapter 2 of this SEIR. Any potential adverse effects from the incorporation of open space features as part of the Metro Plan would result from the construction of the open space, such as noise or air quality impacts (e.g., site preparation; emissions of dust and other pollutants). These potential impacts are addressed throughout Chapter 3 of this SEIR as part of the analysis of construction impacts for the Metro Plan as a whole, with mitigation measures provided as necessary. Overall, no significant physical effect on the environment associated with construction of these open space areas is anticipated beyond any impacts already disclosed elsewhere in this SEIR, and no long-term effects from physical operation of these facilities are anticipated. Therefore, construction of these recreational facilities in connection with the proposed project would have a less-than-significant impact on the environment.

***Changes in Land Use Classifications and Policies***

The Metro Plan updates the policies in the TASP, including deleting certain TASP policies. Several of these policies, including Policies 3.43, 3.49, 3.50, 3.53, and 3.56, contained requirements related to the development of specific recreational facilities. Because the facilities identified in these policies have been constructed and are operational, these policies have been fulfilled and are no longer needed to reduce impacts on recreation. There have been some updates in Metro Plan policies to include the Recreational Value System (Policies PPS 3 and PPS 3.1) but as explained above, this change would result in better recreational facilities and would, therefore, not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR. In addition, the Metro Plan updates the locations of proposed parks, in comparison to the TASP (see Figure 2-5 in Chapter 2 of this SEIR). The potential impact of these new parks is identified above, and there would be no new significant impacts or more severe significant impact from this change. The remaining TASP policies related to reducing impacts on recreational facilities (Policies 3.41, 3.42, 3.44, 3.48, 3.51, 3.52, 3.54, 3.55, and 3.57) have not been substantially changed in the Metro Plan. As such, changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to recreational facilities.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact PS-4

The Certified EIR concluded that after implementation of policies included in the TASP, impacts on recreational resources would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Project would continue to have a less-than-significant impact on recreational resources. The Project Change would not alter the Certified EIR's impact determination for impacts related to recreational resources. The Project Change would not result in

new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

# 3.7 Transportation

This section discloses and presents the analysis of the potential change in Project impacts on transportation that would result from implementing the Project Change.

## 3.7.1 Regulatory Setting

The regulatory setting for transportation is described on page 3.3-26 of the Certified EIR. These regulations include: the City's transportation impact analysis guidelines; guidelines from the Santa Clara Valley Transportation Authority, including requirements related to the county's Congestion Management Program (CMP); and an overview of the jurisdiction of roadways, including the jurisdictions of the City of Milpitas, City of San Jose, Caltrans, and the Santa Clara County Roads and Airports Department. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIR. Pertinent policies adopted since the adoption of the Certified EIR are described below.

### 3.7.1.1 State

### 3.7.1.2 Senate Bill 743

On September 27, 2013, SB 743 was signed into law, supporting previous climate-focused and transportation legislation, including the Sustainable Communities and Climate Protection Act of 2008 (SB 375) and the California Global Warming Solutions Act of 2006 (AB 32). SB 743 also supports implementation of the Complete Streets Act (AB 1358), which requires local governments to plan for a balanced, multimodal transportation network that meets the needs of all users. To further the state's commitment to the goals of SB 375, AB 32, and AB 1358, SB 743 added Chapter 2.7, Modernization of Transportation Analysis for Transit-Oriented Infill Projects, to Division 13 (Section 21099) of the Public Resources Code.

SB 743 introduced fundamental changes in the assessment of transportation impacts through the CEQA process. These changes include the elimination of auto delay (measured as Level of Service, or LOS) as a basis for determining significant transportation impacts. SB 743 included amendments that revised the definition of "infill opportunity zones" to allow cities and counties to opt out of traditional LOS standards established by CMPs and required the California Governor's Office of Planning and Research (OPR) to update the State CEQA Guidelines and establish "criteria for determining the significance of transportation impacts of projects within transit priority areas." As part of the new CEQA guidelines, the new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." SB 743-compliant CEQA analysis became mandatory on July 1, 2020. Since the CEQA transportation analysis in the Certified EIR predated SB 743, potentially significant impacts were defined differently (i.e., in terms of vehicle delay) at that time and vehicle miles traveled (VMT) was not evaluated, as is currently required.

SB 743 also addressed the provision of parking in determining transportation impacts under CEQA. Public Resources Code, Subsection 21099(b)(3) was modified to state that "the adequacy of parking for a project shall not support a finding of significance."

In December 2018, OPR released a final advisory to guide lead agencies in implementing SB 743, which was titled: "Technical Advisory on Evaluating Transportation Impacts in CEQA." Key guidance includes the following:

- VMT is the most appropriate metric to evaluate a project's transportation impact under CEQA.
- Tour- and trip-based travel models are recommended for estimating VMT, but local agencies have the authority to select the tools they use.
- VMT for residential and office projects are generally assessed using efficiency metrics, i.e. on a "per rate" basis. Specifically, the OPR-recommended metrics are: VMT per capita for residential projects and VMT per employee for office projects.
- The recommended threshold of significance for residential and office projects is VMT per capita or per employee that is 15 percent below the city or regional average (whichever is applied). In other words, an office project that generates VMT per employee that is more than 85 percent of the regional VMT per employee could result in a significant impact. This threshold is in line with statewide GHG emission reduction targets.
- For retail projects, the recommended metric is the net change in total VMT in the study area as a result of the project. It is recommended that projects resulting in a net increase in VMT be considered as having a significant impact.
- Lead agencies have the discretion to set or apply their own significance thresholds in lieu of those recommended in the advisory, provided they are based on substantial evidence.
- Cities and counties still have the ability to use metrics such as LOS for other plans, studies, or network monitoring. However, LOS and similar metrics cannot constitute the sole basis for CEQA impacts.

### 3.7.1.3 Local

#### Plan Bay Area 2050

Plan Bay Area 2050 was adopted in October 2021 by the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). As a single plan for the nine-county San Francisco Bay Area that includes the Sustainable Communities Strategy (SCS), Regional Transportation Plan (RTP), and Regional Housing Needs Allocation (RHNA), Plan Bay Area 2050 sets forth regional transportation policy and provides capital program planning for all regional, state, and federally funded projects.

As the RTP, Plan Bay Area provides strategic investment recommendations to improve regional transportation system performance, including investments in regional highway, transit, local roadway, bicycle, and pedestrian facilities. These projects were identified through regional and local transportation planning processes, and for Santa Clara County this includes projects listed in the VTA's CMP. Projects were selected based on their support for goals related to maintaining existing infrastructure, increasing transportation system efficiencies, improving traffic and transit operations, and providing strategic expansions of the regional transportation system (Metropolitan Transportation Commission and Association of Bay Area Governments 2021).

## Valley Transportation Plan 2040

The Valley Transportation Plan 2040 (VTP 2040) is the comprehensive countywide long-range transportation plan for Santa Clara County developed by VTA. Through its policy and planning framework, VTP 2040 covers location-specific improvements for all modes of travel via three programs. The Highways Program includes major freeway improvements, local freeway interchanges, and express lanes. The Local Systems Program includes local roadway improvements, expressway improvements, pedestrian and bicycle projects, and technology-related projects. The Transit Program includes improvements in transit efficiency and new transit improvement projects. VTP 2040 projects in the Metro Plan Area include the Montague Expressway bicycle/pedestrian overcrossing (Santa Clara Valley Transportation Authority 2015).

## VTA Bicycle Technical Guidelines

The 2012 update to the VTA Bicycle Technical Guidelines outlines standards and guidance for planning, designing, operating, retrofitting, and maintaining roadways and bikeways throughout Santa Clara County. The guidelines aim to improve the quality of bicycle facilities and ensure countywide consistency in the design and construction of both bicycle facilities and roadways. The guidelines apply to projects that are part of the countywide bicycle network, projects that are funded by the Countywide Bicycle Expenditure Program, and all VTA-funded roadway projects. The manual includes general guidance as well as guidance for roadways, on-roadway bicycle facilities, and bicycle-only facilities (Santa Clara Valley Transportation Authority 2012).

## Santa Clara Countywide Bicycle Plan

The 2018 Santa Clara Countywide Bicycle Plan assists VTA and member agencies "establish, protect, and enhance bicycling as a viable transportation mode and to assure that bicycling is a practical and safe mode of travel, by itself and in combination with other modes." The Santa Clara Countywide Bicycle Plan identifies bicycle facility projects that have regional or countywide significance, including three specific types of projects: the Cross County Bicycle Corridor network, bike routes to major transit stations and centers, and non-motorized crossings of major physical barriers (Santa Clara Valley Transportation Authority 2018).

## 2040 Milpitas General Plan

On March 9, 2021, the City of Milpitas adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan is an update to the 1994 General Plan and supersedes and replaces the 1994 General Plan. Policies from the 2040 General Plan (City of Milpitas 2021c) relevant to the Project's physical impacts on the environment include the following:

- **Policy CIR 1-1**: Prioritize and measure infrastructure and facility safety on streets and public rights-of-way.
- **Policy CIR 1-2**: Ensure that the City's transportation system supports planned land uses and removes barriers to all types of transportation options as envisioned in the Land Use Element.
- **Policy CIR 1-3:** Promote interconnectivity of the transportation network in existing and new developments and actively measure the quality of conditions in neighborhoods to better understand what barriers exist in order to support use of and access to the network.

- **Policy CIR 1-4**: Coordinate development of safe, inclusive and health-promoting transportation infrastructure with local, county, regional, and state agencies to optimize efficiency of the transportation network for all users, and increase opportunities for physical activity for all types of users.
- **Policy CIR 1-5:** Encourage reduced block size in new developments to develop a grid or modified grid network to enhance walkability.
- Policy CIR 1-7: Coordinate with neighboring jurisdictions regarding planned developments and transportation improvements that impact communities in both jurisdictions.
- **Policy CIR 1-8**: Prioritize multi-modal infrastructure improvements that improve pedestrian, bicyclist and transit user safety and equity for inclusion in the CIP.
- **Policy CIR 1-9:** Evaluate the impacts of development proposals and capital improvements on intersection and roadway operations using measures that may include Level of Service. Higher levels of delay may be considered acceptable at selected high activity locations where mitigations would negatively impact other transportation modes.
- **Policy CIR 1-11:** Maintain acceptable operations for all major streets and intersections for all modes of transportation, with an emphasis on comfort and safety to increase choices for pedestrians and people who ride bicycles. Examples of multimodal evaluation considerations may include tradeoffs between addition of turn lanes and the resulting impacts to continuity of bike lanes or increases in pedestrian crossing distance and delay.
- **Policy CIR 1-12**: Identify strategies to maximize person throughput to support the efficient and safe mobility of people, regardless of transportation mode. Approaches to achieving this may include transportation systems management (TSM), intelligent transportation systems (ITS), traffic signal coordination, and transit signal priority.
- **Policy CIR 2-1:** Promote multimodal transportation options by developing an interconnected system of streets, roads, bridges, and highways that provides continuous, efficient, safe and convenient travel for all users regardless of mode, age or ability and encourage users to walk, ride a bicycle, or use transit for shorter, local trips.
- **Policy CIR 2-2**: Design intersections to safely and comfortably accommodate all transportation modes and users, especially those who are disproportionately impacted by health, income, or access disparities.
- **Policy CIR 2-3**: Seek opportunities to implement and assess traffic calming strategies that reduce vehicle speeds and establish a safer, more comfortable environment for pedestrians and bicyclists.
- **Policy CIR 2-5:** Ensure adequate routes to meet needs of truck traffic to serve the needs for regional and local goods movement.
- **Policy CIR 2-6:** Provide thoughtful circulation and off-street parking and loading facilities for trucks while not compromising pedestrian or bicycling access to goods and services.
- **Policy CIR 2-7**: Provide inclusive and diverse wayfinding measures to provide directional guidance for pedestrians, bicyclists, and transit riders.

- **Policy CIR 3-1:** Coordinate with VTA and BART to design and implement capital improvements that support safety and access to rail stations and bus stops.
- **Policy CIR 3-2**: Coordinate transit planning and provision of transit-supportive infrastructure with Caltrans, VTA, BART, and other service providers to provide seamless service for users across transit modes and to facilitate transfers.
- **Policy CIR 3-3:** Work with local stakeholders and VTA to ensure that paratransit services adequately meet the needs of people with disabilities in Milpitas.
- **Policy CIR 3-4:** Ensure that all transit-supportive infrastructure, sidewalks, and bike lanes are adequately maintained to provide high-quality facilities for users.
- **Policy CIR 4-1**: Encourage a shift to active transportation modes by expanding and enhancing current pedestrian and bicycle facilities to accommodate pedestrians and bicyclists of all ages and abilities and encourage all users to reduce vehicle trips and utilize active transportation options with an increase in density of pedestrian and bicycle-supportive infrastructure.
- **Policy CIR 4-2**: Link and expand City pedestrian and bicycle circulation facilities to existing and planned local and regional networks, with an emphasis on expanding infrastructure options near transit.
- **Policy CIR 4-3**: Encourage walking, biking and transit use by prioritizing and implementing "first-mile/last mile" improvements, wayfinding and educational efforts in the vicinity of the Great Mall transit center, light rail stations, the BART station, and heavily used bus stops.
- **Policy CIR 4-4:** Provide secure bicycle parking and end-of-trip support facilities (publicly accessible lockers, changing rooms and showers) at centers of civic, retail, recreation, education, and work activity.
- **Policy CIR 4-5:** Support building bridges or under-crossings across creek channels, railroad lines and roadways in a manner that will enhance safety, improve network connectivity, and facilitate bicycling and walking between high density residential developments, retail centers, civic buildings, and recreational centers.
- **Policy CIR 4-6:** Eliminate gaps in the pedestrian and bicycle network, especially between neighborhoods, trails that access schools, and areas with higher health disparities.
- **Policy CIR 4-7**: Work collaboratively with the community to discover and develop connections between the multi-use paths and the on-street bicycle system to support development of a comprehensive network, with an emphasis on areas with limited access and/or higher health disparities.
- **Policy CIR 4-8:** Preserve and enhance the natural environment of the creek corridors in conjunction with each trail project.
- **Policy CIR 4-9:** Identify and investigate the feasibility of trail development along rights-of-way including abandoned, unused, or active railroad corridors, utility corridors, and waterways.
- **Policy CIR 5-3:** Encourage existing employers to adopt strategies to implement programs to reduce employee vehicle trips, including purchasing passes through VTA's annual transit pass

program; providing facilities such as secure bike parking, lockers, changing rooms, and showers; telework, and flexible work schedules.

- **Policy CIR 5-4**: Encourage developers to provide enhanced TDM programs and alternative transportation infrastructure that exceeds minimum requirements in exchange for reduced parking requirements, with a focus on priority development areas and locations in proximity to high capacity transit.
- **Policy CIR 6-2:** Support development of healthier communities through support the use of lower- or non-polluting modes of transportation to reduce GHG vehicle emissions and local air pollution levels.
- **Policy CIR 6-4:** Prioritize transportation improvements in part based on consideration of benefits to disadvantaged communities.
- **Policy CIR 6-5**: Include a robust, inclusive and interactive community engagement and educational process in transportation planning efforts to help ensure that project will address the needs of local stakeholders, especially disadvantaged populations.
- **Policy CIR 6-7:** Develop impact fees to provide revenues to be used to construct pedestrian and bicycle infrastructure that will support new development.
- **Policy CIR 6-8:** Use repaving projects as an opportunity to cost-effectively implement new bicycle facilities in accordance with City plans.
- **Policy CIR 6-9**: Maximize efficient maintenance of transportation infrastructure of all modes, such as coordinating roadway paving or striping projects to include maintenance of pedestrian and bicycle infrastructure.
- **Policy CIR 7-3:** Seek opportunities to develop public/private partnerships to provide transportation infrastructure and services.
- **Policy CIR 7-4**: Ensure that construction detour routes provide safe and convenient access for users of all modes of transportation, including people with disabilities.

## TASP Policies

Table 2-2 in Chapter 2, *Project Description,* of this SEIR provides a summary of the policies in the TASP related to Transportation. Table 2-2 identifies policies that require the following:

- *Roadway, Bicycle, and Pedestrian Facilities.* Construction of new pedestrian and bicycle facilities to provide access throughout the TASP Area and review of development projects to ensure that adequate street right-of-way, bicycle facilities, and pedestrian facilities are provided.
- *Transit.* Coordination with VTA to provide sufficient amenities (such as transit shelters) at all transit stops within the plan area.
- *Public Safety*. Requirements to ensure public safety near rail.
- *Transportation Impact Fee Program.* Establishment of a Transportation Impact Fee Program to mitigate impacts on traffic operations.

## Trail, Pedestrian, and Bicycle Master Plan Update

The Draft City of Milpitas Trail, Pedestrian, and Bicycle Master Plan, under public review at the time of this writing in 2022, would supersede the City's previous bicycle/pedestrian and trails plans. An Initial Study/Mitigated Negative Declaration was prepared in and made available for public review on March 2022. The City expects to adopt the Draft City of Milpitas Trail, Pedestrian, and Bicycle Master Plan in spring 2022. The City of Milpitas Trail, Pedestrian, and Bicycle Master Plan provides recommendations to enhance the local active transportation network to serve people of all ages and abilities, with projects intended to improve safety, access, and connectivity to key destinations and recreational opportunities, including the BART station and transit center. Proposed infrastructure improvements include provision of additional protection for bicyclists by converting existing bike lanes to cycle tracks along arterial roadways, enhancements to signal operations and striping at signalized intersections, and installation of pedestrian hybrid beacons or rectangular rapid flashing beacons at unsignalized crossings. Recommended locations and project types for linear bikeways, linear pedestrian improvements, pedestrian spot improvements, and bicycle spot improvements are summarized in Tables 3.7-1, 3.7-2, 3.7-3, and 3.7-4, respectively.

**Table 3.7-1. Metro Plan Area Recommended Linear Bikeway Improvements**

| Street | From | To | Facility Type[1] |
|---|---|---|---|
| Montague Exp | S Milpitas Blvd | Piper Dr | Class I |
| Montague Exp – Landess Ave | Piper Dr | S Park Victoria Dr | Class II |
| Main St | Calaveras Blvd | Abel St | Class IIB |
| Great Mall Parkway – E Capitol Ave | McCarthy Blvd | Trimble Rd | Class IV |
| S Main St | Abel St | Montague Exp | Class IV |
| Milpitas Blvd | City limit | Montague Exp | Class IV |

Source: City of Milpitas 2021a.
[1] Class I = multi-use path, Class II = bike lane, Class IIB = buffered bike lane, Class IV = cycle track.

**Table 3.7-2. Metro Plan Area Recommended Linear Pedestrian Improvements**

| Street | From | To | Facility Type |
|---|---|---|---|
| Landess Ave –Montague Exp | S Milpitas Blvd | S Victoria Park Dr | Sidewalk Improvement |
| Montague Exp | Berryessa Creek | Trade Zone Blvd | Sidewalk Improvement |

Source: City of Milpitas 2021a.

**Table 3.7-3. Metro Plan Area Recommended Pedestrian Spot Improvements**

| Location | Cross Street | Project Type |
|---|---|---|
| Main St | Cedar Way | Commercial Signalized |
| Great Mall Pkwy | Main St | Commercial Signalized |
| Great Mall Pkwy | Montague Exp | Commercial Signalized |
| Penitencia Creek | Coffee Berry Ln | Commercial Unsignalized |
| Montague Exp | Berryessa Creek | Commercial Unsignalized |

Source: City of Milpitas 2021a.

**Table 3.7-4. Metro Plan Area Recommended Bicycle Spot Improvements**

| Location | Cross Street | Project Type |
|---|---|---|
| Montague Exp | E Capitol Ave | Bike Lane Connectivity |
| S Milpitas Blvd | Montague Exp | Bike Lane Connectivity |
| Great Mall Pkwy | S Main St | Bike Lane Connectivity |
| E Capitol Ave | Trimble Rd | Bike Lane Connectivity |

Source: City of Milpitas 2021a.

### City of Milpitas Transportation Analysis Policy

In response to SB 743, the City of Milpitas adopted its "Transportation Analysis Policy" in May 2021, identifying the countywide average VMT as the City's baseline for use in CEQA analysis and including thresholds of significance for determining transportation impacts under CEQA. For most project types, the City's policy incorporated the OPR-recommended thresholds. For residential development, the City policy established a threshold of 15 percent below the countywide per capita VMT, which considers only home-based trips. For employment-based uses, the City's significance threshold is 15 percent below the countywide VMT per employee, which is calculated based on employee commute trips. The policy does not provide specific guidance regarding programmatic CEQA analysis (City of Milpitas 2021b).

## 3.7.2 Environmental Setting

### 3.7.2.1 TASP Area

The environmental setting for the TASP Area is described on pages 3.3-4 through 3.3-26 of the Certified EIR. This discussion includes a review of the characteristics of the existing street network; the presence of bicycle facilities, sidewalks, bridges, and other bicycle and pedestrian infrastructure; and a description of bus and light rail transit service providing access to and from the TASP Area. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1 of this SEIR for the locations available for the public to review the Certified EIR.

The following changes to the setting have occurred since the Certified EIR was prepared.

- The extension of South Milpitas Boulevard from Montague Expressway to Great Mall Parkway was constructed.
- The Milpitas BART station was completed, and passenger service was initiated.

- The Milpitas Transit Center was relocated from the northwest corner of the intersection of Great Mall Parkway/Fairlane Drive to its current site adjacent to the Milpitas BART station.
- VTA has implemented changes to bus routes serving the TASP Area, which is currently served by VTA Routes 20, 44, 47, 60, 66, 70, 71, 77, and 104.
- Bicycle facilities have been expanded since the completion of the Certified Plan, including adding Class II bike lanes to Montague Expressway, South Milpitas Boulevard, and Capitol Avenue from Montague Expressway to Trimble Road.
- Sidewalks have been added at numerous locations in the TASP Area in conjunction with incoming new development. Locations include the south side of Great Mall Parkway and East Capitol Avenue and segments of Montague Expressway.

#### 3.7.2.2 Project Change

The section of Main Street along the western expansion area currently includes sidewalks and bicycle lanes from Great Mall Parkway to Trade Zone Boulevard. The Draft City of Milpitas Trail, Bicycle, and Pedestrian Plan calls for the development of a Class IV cycle track between Trade Zone Boulevard and Abel Street; from Abel Street to Great Mall Parkway, a striped buffer would be added to the existing bike lane. This area is located within one-half mile of the Great Mall light rail station, and South Main Street is served by VTA's Route 66 bus, with stops at South Abel Street and Cedar Way. The streets serving the eastern expansion area do not currently include pedestrian or bicycle facilities. A small portion of the eastern expansion area would be located more than one-half mile from the BART station. The remainder of the Metro Plan Area is located within one-half mile of the station. Bus service is available in the eastbound direction from VTA Routes 47, 70, and 71 at the intersection of Montague Expressway and South Milpitas Boulevard.

### 3.7.3 Impacts and Mitigation

This section describes the change in Project impacts on transportation that would occur with the Project Change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. The Certified EIR identified several transportation impacts that, with implementation of the policies in the TASP, would be less than significant, and additional mitigation measures were not required. In addition, the Certified EIR identified operational impacts on numerous intersections in the study area that were determined to be significant and unavoidable. These impacts are not discussed further in this SEIR because vehicle delay is no longer an environmental impact under CEQA. Because the Metro Plan policies would replace policies in the TASP, the analysis includes a comparison of the TASP policies and the Metro Plan policies to determine if any changes in policies would result in an impact. If new mitigation measures are needed to reduce new impacts that would result from the Project Change, those measures are listed below.

This SEIR analysis evaluates the change in Project impacts with the Project Change, and, if applicable, changes in circumstances or new information that was not available at the time the Certified EIR was prepared. The analysis does not reevaluate the impacts of the Project that were already disclosed in the Certified EIR and are not altered due to the Project Change. Based on the change in the Project impact due to the Project Change, a determination is made as to whether there would be changes to the impact significance determinations for the Project in the Certified EIR.

### 3.7.3.1 Significance Criteria

The State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on transportation. An impact would be considered significant if construction or operation of the Project would do any of the following.

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.
- Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b).
- Substantially increase hazards because of a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.

SB 743 resulted in changes to the assessment of transportation impacts under CEQA. In accordance with significance thresholds in effect at the time the Certified EIR was prepared, the Certified EIR included an operational analysis of key intersections and roadway segments in and around the TASP Area, and identified impacts using the metric of LOS. Because vehicle delay is no longer an environmental impact under CEQA, pursuant to SB 743, VMT was used to assess transportation impacts in this SEIR and traffic operations impacts (i.e., LOS impacts) were not evaluated. While changes to traffic operations as a result of the Project Change were not considered in assessing environmental impacts under CEQA, per City of Milpitas policy and for purposes of CMP compliance, LOS was assessed as part of the planning effort for the Metro Plan and compiled in the *Draft Milpitas Metro Specific Plan Traffic Operations Report* (W-Trans 2022).

### 3.7.3.2 Methods

As noted above, CEQA requirements have been modified since the completion of the Certified EIR. Therefore, while information from the Certified EIR was used to the extent feasible, additional analysis was performed as required to comply with current CEQA requirements.

Due to the changes in CEQA thresholds and requirements, the Certified EIR predated SB 743 and therefore did not include an assessment of VMT. For this SEIR, VMT was assessed using the VTA Countywide Travel Demand Model. This is consistent with the method used to analyze the impacts of the Milpitas 2040 General Plan, adopted in 2021. It is noted that the potential impact of VMT on Air Quality as well as Greenhouse Gas and Climate Change was considered in the Certified EIR. Those impacts were based on the Santa Clara County VMT per capita, as estimated in 2002 by the Bay Area Air Quality Management District, not through transportation modeling. In the Certified EIR, VMT was estimated based on the anticipated population increase associated with the TASP. As such, the assessment in the Certified EIR did not consider potential changes in VMT resulting from factors such as new local or regional land use patterns, the availability of BART service, or the addition of pedestrian and bicycle infrastructure.

Given the concentration and mix of land uses in the Metro Plan, VMT is largely based, not only on the proposed land uses but also the proximity to transit. If some of the residential units are reallocated to other sites within the Metro Plan Area, even if there was a shift in land use from one transportation analysis zone (TAZ) to another, the total VMT as well as VMT per capita would only be expected to be nominally different, if at all, as the total number of units proposed in the Metro

Plan Area overall would not change, and the proximity to BART and VTA transit services would be approximately equivalent. Any change to VMT as a result of changing the specific location of proposed residential units would therefore not result in any additional impacts under CEQA, nor any changes in the findings, recommendations or conclusions in the CEQA document. Such a reallocation of land uses could result in effects on projected traffic operations at some local intersections, however, this is outside the scope of CEQA analysis.

Analysis scenarios were selected to be consistent with those that were used in the Milpitas 2040 General Plan EIR and to account for the updated horizon year in the Metro Plan (2040). Therefore, 2015 was used as the base year for the VTA Travel Demand Model and 2040 was selected as the horizon year. The following scenarios were used:

- 2015 Conditions: Reflects conditions based on the 2015 iteration of the VTA Countywide Travel Demand Model.
- 2040 Cumulative No Project: Assumes buildout of all approved development identified in the 2040 General Plan. For the Metro Plan Area, this equates to the full buildout of the TASP.
- 2040 Cumulative Plus Project: For the Metro Plan Area, development identified as the Project Change was added to the approved 2040 General Plan land uses, which includes full buildout of the TASP.

For this analysis it was assumed that the updated policies in the Metro Plan would be implemented. That is, impact determinations prior to mitigation assume implementation of the Metro Plan policies. Table 2-2 in Chapter 2 of this SEIR provides a summary of the policies in the Metro Plan related to Transportation, including the following:

- *Roadway, Bicycle, and Pedestrian Facilities.* Construction of new pedestrian and bicycle facilities to provide access throughout the Metro Plan Area and review of development projects to ensure that adequate street right-of-way, bicycle facilities, and pedestrian facilities are provided.
- *Public Safety*. Requirements to ensure public safety near rail.
- *Transportation Impact Fee Program.* Establishment of a Transportation Impact Fee Program to mitigate impacts on traffic operations.

In addition to the policies identified in Table 2-2, the following Metro Plan policy would also be pertinent to this analysis:

- *TDM Program*. Implementation of a TDM Program that would be incorporated into new development projects in the Metro Plan.

### 3.7.3.3 Impacts and Mitigation Measures

This section includes a discussion of each impact as it corresponds to the significance criteria presented in Section 3.7.3.1, *Significance Criteria*.

As noted above, the CEQA transportation significance criteria have been modified since the Certified EIR was prepared. Impacts regarding traffic operations (i.e., LOS impact) at intersections and along roadway segments are no longer considered environmental impacts under CEQA and are therefore not addressed in this SEIR. Similarly, impacts that were identified regarding parking are not considered impacts under CEQA and are not discussed.

## Impact TR-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to conflicting with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

### Summary of Certified EIR Impact Analysis

The Certified EIR did not include an evaluation of whether the TASP would conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. The Certified EIR identified and analyzed impacts that were expected to result from the additional growth and increased intensity of land uses associated with the TASP. Specifically, the TASP was determined to result in increased demand for pedestrian, bicycle, and transit trips in the TASP Area, and that adequate facilities to accommodate these trips were not present. The Certified EIR identified that this impact would be minimized by TASP Policies 3.15, 3.28, and 3.29, which required review of individual development applications to generally ensure adequacy of pedestrian and bicycle facilities, as well as the implementation of several specific improvements. The Certified EIR also identified that the construction of proposed pedestrian/bicycle bridges crossing Montague Expressway at Penitencia Creek, Montague Expressway at Piper Drive, and at the north end of Piper Drive over the railroad tracks would minimize this impact. The Certified EIR also identified that Policies 6.32 and 6.33 would minimizing these impacts by providing funding to implement the necessary infrastructure improvements. The Certified EIR concluded that with the inclusion of the TASP policies, the impact of the TASP on pedestrian and bicycle access would be less than significant. Nonetheless, the Certified EIR did not include a determination regarding the TASP's impacts regarding conflicts with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

### Impact Analysis

The Metro Plan would not result in any new significant or more severe impacts on pedestrian, bicycle, or transit access due to the geographic expansion of the Metro Plan Area, the proposed changes in land use classifications, or the population growth and employment associated with the Metro Plan buildout.

#### *Geographic Expansion*

The size of the Metro Plan Area is 73 acres larger than the TASP, an increase in area of 17 percent. This would be expected to result in an increase in demand for pedestrian, bicycle, and transit trips compared to the TASP. The western expansion area is proposed as a site for high-density urban residential development. Sidewalks and bicycle facilities are present along existing streets serving these sites and this area is located within acceptable walking distance of the Great Mall/Main Street light rail station. The eastern expansion area would be primarily devoted to lower- and higher-density business park/research and development uses. Evaluation of pedestrian and bicycle accommodations in the eastern expansion area would be required, and such facilities would need to be provided in accordance with 2040 General Plan Action CIR 4t in conjunction with incoming development projects.

All locations within the TASP boundaries were located within one-half mile of the Milpitas BART station. A portion of the eastern expansion area in the Innovation District lies over one-half mile from the Milpitas BART station, but the addition of a pedestrian-bicycle bridge over Berryessa Creek

will provide enhanced connectivity to BART, light rail, and bus service at the transit center. Bus service is typically modified to serve the characteristics of surrounding development, and it is expected that VTA would implement such modifications in conjunction with the completion of development associated with the Metro Plan. Per General Plan Goal CIR-3, the City would coordinate with transit providers to ensure convenient transit service to support this development.

***Metro Plan Buildout: Population Growth and Employment***

The Project Change would result in the intensification of development in the Metro Plan Area, which is expected to result in an increase in demand for pedestrian, bicycle, and transit trips. As noted in Measure T-3, *Provide Transit-Oriented Development* of the Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity, a land use pattern that is compact, with a mix of land uses, and is walkable with convenient transit access would be expected to increase transit use and reduce VMT by up to 31 percent (CAPCOA 2021). "Project site residents, employees, and visitors would have easy access to high-quality public transit, thereby encouraging transit ridership and reducing the number of single-occupancy vehicle trips and associated GHG emissions." The proposed addition of multifamily housing, retail development, and other commercial uses within the Metro Plan Area would result in convenient, walkable access to a range of services and employment opportunities. Both BART and VTA have adopted transit-oriented development policies in support of development in the vicinity of stations throughout its system as part of a strategy to increase ridership.

Increased transit demand resulting from the Project Change would be distributed among the various transit providers and routes serving the Metro Plan Area, including BART, VTA light rail, nine VTA bus routes, two Altamont Commuter Express (ACE) shuttles, and an AC Transit line providing service to and from Fremont. Local bus service currently operates with headways ranging from 15 to 30 minutes, light rail headways of approximately 20 to 30 minutes, and two BART lines operating on 15-minute headways to both Daly City and Richmond. Transit agencies will also adjust services as demand changes over time. Therefore, based on the range of transit service providers and routes available in the Metro Plan Area, it can reasonably be assumed that project-generated transit trips would be accommodated.

Regarding active transportation, in addition to the existing infrastructure in the Metro Plan Area, the Metro Plan includes enhanced facilities and programs to serve pedestrians and bicyclists. The following Metro Plan policies are expected to minimize potential impacts to pedestrians, bicyclists, and transit users:

- **Policy M 2.** Enhance arterial streets - Montague Expressway, Great Mall Parkway/Capitol Avenue, South Main Street, and Trade Zone Boulevard - to include facilities for active transportation: pedestrians, bicyclists, and more. Where the City does not control an arterial street, as in the case of Montague Expressway, work with the relevant agency to increase multimodal safety and accessibility over time.
- **Policy M 2.1.** Great Mall Parkway. Transform Great Mall Parkway/Capitol Avenue into multimodal complete streets that provides for the mobility needs and safety of transit users, bicyclists, pedestrians, and drivers as indicated in Figure 4-7 [of the Metro Plan] and by providing bike lanes and sidewalks on both sides of the road.
- **Policy M 2.1.1.** Maintain the number of vehicle lanes and reduce land widths on Great Mall Parkway to calm traffic, create a more comfortable environment for non-vehicular modes.

- **Policy M 2.1.2.** Provide protected bike lanes in both directions on Great Mall Parkway.
- **Policy M 2.1.3**. Develop a multi-use path between Montague Expressway and Main Street on the Great Mall Subdistrict side of the street.
- **Policy M 2.1.4.** Provide a linear park and pedestrian path along Great Mall Parkway from Montague Expressway to Main Street.
- **Policy M 2.1.5**. Provide enhancements to pedestrian crossings along Great Mall Parkway and other major roadways through measures including curb extensions, traffic signal modifications, and/or other amenities.
- **Policy M 2.2.** Great Mall Parkway and Main Street Intersection. Accommodate bicycle and pedestrian improvements and improve the connection between the Great Mall VTA Light Rail Station to the Great Mall (Figure 4-8 [of the Metro Plan]).
- **Policy M 2.2.1**. Remove fencing and redesign the bus drive to become a multi-use path that directly connects the VTA Light Rail Station with the Great Mall.
- **Policy M 2.2.2**. Redesign the plaza by the Light Rail Station Elevator on the north side of Great Mall Parkway to be more landscaped, more usable as a public plaza, with commercial uses oriented to it and features that activate the plaza. Coordinate with VTA and developers to improve the pedestrian and transit user experience at the LRT Station.
- **Policy M 2.2.3.** Use colored paving to define bike lanes, particularly in areas with potential conflict with vehicular traffic.
- **Policy M 2.2.4**. Remove the existing separated right turn lane at Great Mall Parkway and Main Street to expand the plaza on the south side of Great Mall Parkway at the train tracks. Replace the through lane with an optional right turn lane. Redesign the plaza to include hardscape and softscape treatment to make the plaza as activated and usable as possible.
- **Policy M 2.2.5.** Build a new pedestrian overcrossing from the elevated level at the Great Mall Light Rail Station to the corner plaza at Main and Great Mall Parkway.
- **Policy M 5.1.** Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area.
- **Policy M 8**. Parking and Transportation Demand Management. Establish and implement a travel demand management (TDM) program with the non-compulsory goal of reducing VMT by 15 percent or more below the regional baseline per employee or resident and efficiently provides parking that meet the needs of residents, employees, and visitors. TDM measures should be incorporated into all new development and may be implemented by individual uses or through TMA oversight.

***Changes in Land Use Classifications and Policies***

The proposed land use classifications in the Metro Plan would result in changes to the trip generation estimates, in comparison to the TASP. This difference was addressed in the assumptions used in VTA's Travel Demand Model. Therefore, any potential impacts associated with the Project

Change would be identified as part of the assessment of VMT impacts for the Metro Plan (see Impact TR-2).

Changes to the TASP policies, as shown in Table 2-2 in Chapter 2 of this SEIR, either do not substantially alter the equivalent TASP policy, or the TASP policy is similarly and adequately covered under a 2040 General Plan policy, to which the Metro Plan would be required to adhere. Connectivity is typically provided by roadways, pedestrian paths, and bicycle paths. The Metro Plan would continue implementing similar goals as the TASP regarding community connectivity, including providing connections for walking and biking; developing parks that provide pedestrian connectivity in each subdistrict; and implementing street, trail, and bridge improvements to connect existing residents and employees with jobs, services, parks, and transit. As such, the Project Change would not create a new or more severe impact regarding the division of an established community due to the changes in policies in the Metro Plan.

The Metro Plan updates the policies in the TASP; however, as shown in Table 2-2, the updated Metro Plan policies would not be substantially different than the TASP policies. The Metro Plan would continue to include requirements to implement pedestrian and bicycle facilities, maintain public safety, and implement a transportation impact fee program to fund transportation projects. As such, the Project Change would not create a new or more severe impact related to conflicts with adopted policies, plans, or programs supporting alternative transportation due to the changes in policies in the Metro Plan.

The Metro Plan identifies the following transportation infrastructure improvements that were not included in the TASP: the development of new trails along Berryessa Creek; paving City-owned trails with all-weather surfacing; and construction of pedestrian connections between subdistricts, including at-grade bridges and crossings, and overhead pedestrian bridges. There are several proposed minor street connections in the Metro Plan to provide site access and enhance connectivity between existing streets in the Tango District and to provide connectivity within the Great Mall site; however, because they provide only local access, the addition of these segments would not be reflected in the countywide Travel Demand Model. The two geographic expansion areas do not include any modifications of the City's street network in these areas. The proposed infrastructure improvements would increase the capacity of the Metro Plan Area to accommodate walking and bicycling trips and enhance the user experience by creating a more interconnected network and more direct access to sites within the Metro Plan Area.

***Plan Consistency***

*Draft Trail, Pedestrian, and Bicycle Plan*

The Draft Trail, Pedestrian and Bicycle Plan reaffirms and restates the policies identified in the 2040 General Plan regarding active transportation. Goals developed specifically for this plan emphasized the development of an active transportation network that would serve users of all ages and abilities, provide enhanced connectivity to destinations throughout the City, and enhance safety. Implementation of the Metro Plan would result in increased capacity to accommodate pedestrians and bicyclists and would enhance the quality of the active transportation infrastructure. The Project Change is therefore consistent with the Trail, Pedestrian, and Bicycle Plan.

*City of Milpitas Transportation Analysis Policy*

The City's Transportation Analysis Policy provides direction for the implementation of SB 743, based on the OPR technical advisory and in support of statewide goals to reduce VMT and GHG emissions. The policy supports the type of development envisioned in the Metro Plan, as it includes screening criteria out projects within one-half mile of rail stations and major transit hubs from VMT analysis. The policy cites the following 2040 General Plan goal and policies:

- **Goal CIR-1:** Provide a transportation system that efficiently, equitably and effectively supports the City's land use vision, minimizes vehicle miles traveled (VMT), enhances connectivity of the existing network, and supports the use of all modes of transportation.
- **Policy LU 3-1:** Support regional efforts that promote higher densities near major transit and travel facilities and reduce regional miles traveled by supporting active modes of transportation including walking, biking, and public transit. Support local and regional land use decisions that promote safe access to and the use of alternatives to auto transit.
- **Policy LU 4-2:** Emphasize efforts to reduce regional vehicle miles traveled by supporting land use patterns and site designs that promote active modes of transportation, including walking, biking, and public transit.

Expansion of the multimodal transportation network was cited as one of the outcomes of implementation of this policy. The Metro Plan's mix of land uses, proximity to transit, and measures to encourage and accommodate non-automobile trips support the intent of the Transportation Analysis Policy and SB 743 more generally. The Metro Plan is, therefore, consistent with this policy.

*Plan Bay Area 2050*

The strategies included in Plan Bay Area 2050 are designed to achieve a vision for the region that requires a greater reliance on a multimodal transportation system and a shift toward increased rates of transit use, walking, bicycling, and other alternatives to automobile travel. Investments were identified in the plan for building a complete streets network and expanding transportation demand management initiatives. The mix of land uses, and increased density included in the Project Change would enable Metro Plan residents and workers to meet many of their needs locally via short trips using non-vehicle transportation. The change to travel patterns associated with the Project Change is therefore consistent with the goals of Plan Bay Area 2050 and supports the achievement of broader regional goals.

*Valley Transportation Plan 2040*

One of the objectives of Valley Transportation Plan 2040 cites support for the creation of a multimodal transportation system, which is further explained in the themes underlying the plan: Efficiency and Mobility, Sustainability and Growth, Connectivity and Technology, and Air Quality and Energy Use. As noted regarding the Air Quality and Energy Use theme: "[u]ltimately, VTP 2040 seeks to foster changes in development patterns to make trips shorter, allow for reductions in Vehicle Miles Traveled (VMT), and increases in transit, bicycle, and walk trips." The Project Change provides for increased intensity of residential and commercial land uses in proximity to high quality transit service, and is therefore consistent with the objectives of VTP 2040.

*Santa Clara Countywide Bicycle Plan*

The Santa Clara Countywide Bicycle Plan includes a network of Cross-County Bicycle Corridors (CCBCs), including facilities on Great Mall Parkway-East Capitol Avenue, South Milpitas Boulevard, Montague Expressway, and Trade Zone Boulevard in the Metro Plan Area. This network is consistent with the recommendations of the Draft Trail, Pedestrian, and Bicycle Plan and supports the expansion of the local bikeway network to provide additional capacity to accommodate additional users. The countywide plan also addresses the quality of facilities to be provided, identifying design expectations for the CCBCs, which indicate that bikeways along local roadways should be designed as "lowest stress bicycle facility that is appropriate for the local context and community needs." Quantifying this, the Santa Clara Countywide Bicycle Plan also indicates that these facilities should be designed based on several criteria, including that they be rated as a Level of Traffic Stress (LTS) of 1 or 2, which represent conditions that typical adult bicyclists find comfortable. The LTS methodology is referenced in the Santa Clara Countywide Bicycle Plan. For CCBCs along expressways, which includes Montague Expressway in the Metro Plan Area, the plan indicates that the Santa Clara County Bicycle Accommodation Guidelines should be followed and that opportunities should be sought to develop facilities that provide physical separation between bicyclists and vehicle traffic. The Metro Plan's emphasis on enhancements to bicycle infrastructure along major roadways is therefore consistent with the countywide plan.

*VTA Bicycle Technical Guidelines*

VTA's Bicycle Technical Guidelines establish recommended facility designs, incorporating other design manuals, and identifying best practices. These practices address the application of designs in different contexts and would be applied during the design phase. Based on the bicycle facilities recommended in the Metro Plan, there would be no conflicts between with the guidelines.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to conflicts with policies related to the circulation system.

### New Mitigation Measures

The Project Change would not result in the need for any new mitigation measures to reduce Project impacts.

### Conclusions for Impact TR-1

The Certified EIR concluded that after implementation of policies included in the TASP, impacts related to conflicts with adopted policies, plans, or programs supporting alternative transportation would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Project would continue to have a less-than-significant impact on pedestrians, bicyclists, and transit users. The Project Change would not alter the Certified EIR's impact determination for impacts related to consistency with adopted policies, plans, or programs supporting alternative transportation. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact TR-2: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to conflicting or being inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b).

### Summary of Certified EIR Impact Analysis

As part of the analysis of potential Air Quality and Greenhouse Gas and Climate Change impacts, the Certified EIR identified that VMT would increase as a result of the population and employment growth associated with the TASP. However, a VMT impact analysis consistent with the requirements of PRC Section 21099, and CCR Section 15064.3(b) was not conducted because it was not required under CEQA at the time; and thus, no significance conclusion related to VMT was provided in the Certified EIR.

### Impact Analysis

As a result of the more intensive development associated with the Project Change, the Metro Plan would result in increased VMT compared to the TASP. In accordance with the City's Transportation Analysis Policy and the OPR technical advisory, VMT impacts associated with the Project Change were assessed based on efficiency metrics, which measure VMT generated per person rather than the total miles traveled.

The City VMT policy includes significance thresholds for residential development and employment-based uses but does not specify thresholds for programmatic CEQA analysis. Because the Metro Plan includes a range of land uses, including visitor-focused uses such as retail and hotels, the metric identified as most appropriate for this analysis was VMT per service population, which is calculated by dividing the Project's total VMT by the sum of population and employment. The significance threshold used for this analysis was 15 percent below the countywide average.

While neither OPR nor City policies identify VMT per service population as a metric, it is commonly used in plans and mixed-use projects. While VMT per capita includes only home-based trips (trips that either begin or end at a place of residence) and VMT per employee includes only employee commute trips, total VMT includes other trips not included in the VMT per capita or per employee calculations, such as customer trips to and from retail sites, trips, and deliveries. The thresholds identified in the City VMT policy were also applied to analyze the VMT for the residential and employment-based components of the Project. The City's adopted metrics of VMT per capita (for residential projects) and VMT per employee (for employment-based projects) were also analyzed. To illustrate the influence that the proposed Metro Plan development pattern would have on VMT, a comparison of the VMT for each of these metrics for Santa Clara County, the City of Milpitas, and the Metro Plan is shown in Table 3.7-5.

**Table 3.7-5. Estimated VMT for Santa Clara County, City of Milpitas 2040 General Plan, and the Metro Plan**

| *VMT Metric* | Trips Measured | 2040 Santa Clara County VMT | 2040 General Plan VMT[1] | 2040 Metro Plan VMT |
|---|---|---|---|---|
| VMT per Service Population | All project-related trips (total VMT) | 25.0 | 30.5 | 15.9 |
| VMT per Capita | Home-based trips | 14.1 | 11.9 | 5.5 |
| VMT per Employee | Employee commute trips | 19.3 | 20.7 | 14.3 |

[1] This includes full buildout of the TASP.

As shown, the Metro Plan (2040 Cumulative Plus Project) scenario is estimated to substantially lower VMT per service population, per capita, and per employee than both the 2040 Santa Clara countywide average and the Milpitas 2040 General Plan (2040 Cumulative No Project) scenario.

The reduction in VMT per service population, per resident, and per employee is expected, as these metrics evaluate the characteristics of travel by individuals, not the overall total miles traveled as a result of the Metro Plan. VMT is the number of miles traveled generated by a particular project, calculated by multiplying the average trip length by the total number of trips. Therefore, the mix of land uses, the density of development, and the availability of alternative modes of travel are all among the key factors that influence how far people are required to travel to meet their needs. The addition of new residences, new retail opportunities, and new employment sites within the Metro Plan Area will enable many incoming residents to meet their needs locally. The nearby BART and light rail stations provides convenient access to high quality transit, and the proposed expansion of pedestrian and bicycle infrastructure would make the Metro Plan Area a more comfortable and attractive place to walk or bicycle. Therefore, it is expected that residents, employees, and visitors to the Metro Plan Area would opt to walk, bicycle, and/or use transit for many types of trips.

To determine if the Metro Plan would produce a significant VMT impact, the amount of VMT generated by the proposed development was determined by comparing the VMT estimates from the Milpitas 2040 General Plan (Cumulative No Project) and Metro Plan (2040 Cumulative Plus Project). VMT per service population, per capita, and per employee were then calculated. Applying the City's VMT policy approach, the countywide average was used as the baseline; a significance threshold of 15 percent below this level was applied; and VMT per service population, per capita, and per employee was estimated for the total proposed development (residential and employment-based land uses, respectively). For all three metrics, VMT was found to be lower than the significance threshold, and the Metro Plan was determined to have a less-than-significant VMT impact, as shown in Table 3.7-6.

**Table 3.7-6. Metro Plan VMT Significance Assessment**

| VMT Metric | 2040 Santa Clara County VMT | 2040 Metro Plan VMT | VMT Significance Threshold[1] | Significant Impact? |
|---|---|---|---|---|
| VMT per Service Population | 25.0 | 15.9 | 21.3 | Less than significant |
| VMT per Capita | 14.1 | 5.5 | 12.0 | Less than significant |
| VMT per Employee | 19.3 | 14.3 | 16.4 | Less than significant |

1. The significance threshold was calculated as follows, assuming that VMT would need to be 15 percent below the countywide average to be less than significant:
25 – (0.15 * 25) = 21.3
14.1 – (0.15 * 14.1) = 12.0
19.3 – (0.15 * 19.3) = 16.4

A reduction in the estimated VMT compared to the countywide average is expected, given the characteristics of the Metro Plan, which includes mixed land uses, proximity to high quality transit, and increased density.

Furthermore, Metro Plan Policy M 8 requires new development identified in the Metro Plan to implement TDM measures. The goal of the requirement is to achieve a 15 percent reduction in VMT per resident or employee compared to the countywide average. Among the required measures are marketing/education, unbundled parking, transit passes, and non-residential bike parking. Applying estimated VMT reductions (for the four strategies listed above) developed by the California Air Pollution Control Officers Association (CAPCOA) in their Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (CAPCOA 2021), it was estimated that VMT in the Metro Plan Area would be reduced by 16.51 percent compared to the model-generated estimate. This estimate accounts for double-counting of reductions as a result of deploying multiple measures. As a result, it is expected that VMT would be reduced to a level below what was estimated by the model. The TDM-related VMT reductions are summarized in Table 3.7-7.

**Table 3.7-7. Estimated VMT Reductions from Required Metro Plan TDM Strategies**

| TDM Strategy | VMT Reduction |
|---|---|
| Marketing/Education | 4.00% |
| Unbundled Parking | 7.83% |
| Transit Passes | 5.50% |
| Non-Residential Bicycle Parking | 0.14% |
| Total VMT Reduction (unadjusted) | 17.47% |
| VMT Reduction (adjusted for dampening of combined measures) | 16.51% |

Source: W-Trans 2021, CAPCOA 2021.

### Certified EIR Mitigation Measures

The Certified EIR included no mitigation measures for impacts related to VMT because analysis of VMT impacts was not required by CEQA at the time the Certified EIR was prepared.

### New Mitigation Measures

The Project Change would not result in the need for any new mitigation measures to reduce Project impacts.

### Conclusions for Impact TR-2

Based on the analysis above, implementation of the Project Change would result in a less-than-significant impact on VMT. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact TR-3: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to substantially increasing hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

### Summary of Certified EIR Impact Analysis

The Certified EIR did not discuss an impact related to increased hazards due to a geometric design feature.

### Impact Analysis

Improvements to the transportation and circulation system in the Metro Plan Area would be implemented over time. Any such improvements would be designed and constructed to local, regional, and federal standards and, as such, would not be expected to introduce any hazardous design features. The design of new streets, circulation improvements, and access points would be reviewed for compliance with safety guidelines and standards as part of the development review process. Safety considerations include maintenance of a substantially clear line of sight at driveways between the driver of a vehicle waiting to enter the through street and the driver of an approaching vehicle.

The proposed infrastructure improvements in the Metro Plan include safety and access improvements for pedestrians and bicyclists, such as multi-use paths, pedestrian- and bicycle-only bridges allowing for connectivity between land uses, and separated bikeways that would provide users with greater protection from vehicle traffic along arterial roadways. For locations where sidewalks, bike lanes, and paths would be added to create a more comprehensive facilities network, more direct and convenient travel routes would be established for these users. Proposed facilities associated with the Metro Plan would be expected to enhance access and safety for nonmotorized users.

Overall, the Metro Plan is expected to have a less than significant impact regarding hazards due to a geometric design feature.

### Certified EIR Mitigation Measures

The Certified EIR included no mitigation measures for impacts related to increased hazards due to a geometric design feature.

### New Mitigation Measures

The Project Change would not result in the need for any new mitigation measures to reduce Project impacts.

### Conclusions for Impact TR-3

Based on the analysis above, implementation of the Project Change would result in a less-than-significant impact regarding hazards due to a geometric design feature. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact TR-4 Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to resulting in inadequate emergency access.

### Summary of Certified EIR Impact Analysis

The Certified EIR did not discuss an impact related to inadequate emergency access.

### Impact Analysis

Buildout of the Metro Plan would not be expected to result in inadequate emergency access. Projects that would be developed in the Metro Plan would be required to comply with City and County standards and requirements, and would undergo review by public safety officials as part of the approval process. Safety, Fire, and Building Codes would be adhered to for all proposed development in the Metro Plan. The proposed addition of a police substation in the Metro Plan Area would provide broader distribution of emergency response resources, resulting in reduced travel distances and response times for emergency vehicles addressing incidents within the Metro Plan Area.

Emergency vehicles would use vehicle preemption technology (where possible) and sirens to maintain adequate response times. Roadway segments that would experience a reduction in vehicular roadway capacity, if any, would undergo individual operations analyses to assess the potential impacts on emergency vehicle access, and measures would be developed as needed to reduce impacts to less-than-significant levels.

### Certified EIR Mitigation Measures

The Certified EIR included no mitigation measures for impacts related to adequacy of emergency access.

### New Mitigation Measures

The Project Change would not result in the need for any new mitigation measures to reduce Project impacts.

### Conclusions for Impact TR-4

Based on the analysis above, implementation of the Project Change would result in a less-than-significant impact regarding adequacy of emergency access. The Project Changes would not result in

new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

# 3.8 Utilities and Service Systems

This section discloses and analyzes the potential change in Project impacts on utilities and service systems that would result from implementing the Project Change.

## 3.8.1 Regulatory Setting

The regulatory setting for utilities and service systems is described on pages 3.11-15 to 3.11-16 of the Certified EIR. These regulations include: the Clean Water Act and Porter-Cologne Water Quality Control Act, which is administered by the San Francisco Bay Regional Water Quality Control Board (RWQCB) for potable water, sanitary sewers, storm drains; Health and Safety Code, Water Code, and Titles 22 and 17 of the California Code of Regulations (CCR), which are administered by the RWQCB and California Department of Health Services for recycled water; Safe Drinking Water Act (SDWA) and Titles 22 and 17, Chapter 5 of the California Code of Regulations, which are administered by California Department of Health Services for potable water; Milpitas Sanitary Code, which prohibits the discharge of hazardous and polluted matters into the sanitary sewer system; California Integrated Waste Management Act of 1989 (AB 939), which regulates solid waste; regulations administered by the California Integrated Waste Management Board (CIWMB), which governs solid waste regulations on the state level; and regulations on investor-owned-utilities, which are administered by the California Public Utilities Commission (CPUC). In addition, pertinent policies from the Midtown Specific Plan are described on page 3.11-36 of the Certified EIR. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIR. For pertinent policies related to the General Plan, please refer to the discussion below.

Additional regulations that would apply to the Metro Plan, which were not applicable at the time the Certified EIR was prepared are included below.

### 3.8.1.1 State

#### Senate Bill 610

Senate Bill (SB) 610 requires cities and counties to confirm through a Water Supply Assessment (WSA) that sufficient water supply sources are available before certain large developments are approved (see California Water Code Sections 10910 through 10915). The WSA for a project must be included in that project's CEQA documentation. A WSA must be prepared if a project includes, among other things: (1) the equivalent demand of 500 residential units; or (2) a shopping center or business establishment that employs more than 1,000 persons or has a floor space of more than 500,000 square feet; or (3) a commercial office building that employs more than 1,000 persons or has a floor space of more than 250,000 square feet. The Metro Plan is required to prepare a WSA. The Metro Plan meets the definition of a "project" requiring a WSA pursuant to SB 610 (California Water Code Section 10910(a) and 10912(a)(3)).

#### Senate Bill 221

SB 221 adds Government Code Section 66455.3, requiring that the local water agency be sent a copy of any proposed residential subdivision of more than 500 dwelling units within five days of the

subdivision application being accepted as complete for processing by the city or county. It also adds Government Code Section 66473.7, establishing detailed requirements for establishing whether a "sufficient water supply" exists to support any proposed residential subdivisions of more than 500 dwellings, including any such subdivision involving a development agreement. When approving a qualifying subdivision tentative map, the city or county must include a condition requiring availability of a sufficient water supply. The applicable public water system must provide proof of availability. If there is no public water system, the city or county must undertake the analysis described in Government Code Section 66473.7. The analysis must include consideration of effects on other users of water and groundwater.

### Assembly Bill 1826

Assembly Bill 1826 (AB 1826) requires that state agencies, businesses, and multifamily complexes that generate specific quantities of organic or solid waste each week enroll in organic recycling programs through an applicable solid waste disposal company. AB 1826 defines organic waste as food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. Solid waste is defined as the total of trash, recycling, and organics. Organic recycling programs may take the form of composting, mulching, or anaerobic digestion. Businesses and multifamily residential housing complexes that generate the following quantities are required to implement organic or solid waste recycling programs under AB 1826:

- Eight or more cubic yards of organic waste per week as of April 1, 2016.
- Four of more cubic yards of organic waste per week as of January 1, 2017.
- Four or more cubic yards of solid waste per week as of January 1, 2019.
- Two or more cubic yards of solid waste per week as of January 1, 2020, if statewide disposal of organic waste is not reduced by half.

In September 2020, CalRecycle reduced the threshold to 2 cubic yards of solid waste generated by covered businesses.

### Title 24, California Green Building Standards (CALGreen)

In accordance with CCR Title 24, part 6 (last amended in 2019, effective January 1, 2020), buildings constructed after June 30, 1977, must comply with the standards identified in CCR Title 24. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. Title 24 requires the inclusion of state-of-the-art energy conservation features in building designs and construction, such as specific energy-conserving design features and non-depletable energy resources. In addition, it must be demonstrated that a building would comply with a designated energy budget. Part 11 of the Title 24 Building Standards Code is referred to as the California Green Building Standards Code (CALGreen Code). Unless otherwise noted in a regulation, all newly constructed buildings in California are subject to the requirements of the CALGreen Code.

## 3.8.1.2 2040 Milpitas General Plan

On March 9, 2021, the City of Milpitas adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan is an update to the 1994 General Plan and supersedes

and replaces the 1994 General Plan. Policies and Actions from the 2040 General Plan relevant to the Project's physical impacts on the environment include the following:

- **Policy UCS 2-4:** Ensure that all new development provides for and funds its fair share of the costs for adequate water distribution, including line extensions, easements, and dedications.
- **Policy UCS 2-7:** Maintain existing groundwater wells as a source of emergency water supply and a resource for supplemental supply.
- **Policy UCS 2-8**: Maintain water interties with the San Jose Water Company (SJWC) and Alameda County Water District (ACWD) for emergency water supply.
- **Policy UCS 3-3:** Ensure that all new development provides for and funds its fair share of the costs for adequate sewer collection and treatment, including line extensions, easements, and dedications.
- **Action UCS 3b:** Require new development to provide for and fund a fair share of the costs for adequate sewer distribution, including line extensions, easements, and plant expansions.
- **Policy UCS 4-2**: Require all development projects to demonstrate how storm water runoff will be detained or retained on-site and/or conveyed to the nearest drainage facility as part of the development review process and as required by the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit.
- **Policy UCS 4-3**: Require all future development projects to analyze their drainage and stormwater conveyance impacts and either demonstrate that the City's existing infrastructure can accommodate increased stormwater flows, or make the necessary improvements to mitigate all potential impacts.
- **Policy UCS 4-4:** Applicable projects shall incorporate Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.
- **Policy UCS 4-5:** Applicable projects shall control peak flows and duration of runoff to prevent accelerated erosion of downstream watercourses.
- **Policy UCS 4-6:** Applicable projects shall minimize directly connected impervious areas by limiting the overall coverage of paving and roofs, directing runoff from impervious areas to adjacent pervious areas, and selecting permeable pavements and surface treatments.
- **Policy UCS 4-14**: Construction sites shall incorporate measures to control erosion, sedimentation, and the generation of runoff pollutants to the maximum extent practicable. The design, scope and location of grading and related activities shall be designed to cause minimum disturbance to terrain and natural features. (Title II, Chapter 13 of the Municipal Code).
- **Policy UCS 5-2:** Implement and enforce the provisions of the City's Source Reduction and Recycling Program and update the program as necessary to meet or exceed the State waste diversion requirements.

### 3.8.1.3 TASP Policies

Table 2-2 in Chapter 2, *Project Description* provides a summary of the policies in the TASP related to Utilities and Service Systems. Table 2-2 identifies policies that previously required the following:

- *Wastewater.* Construct improvements from the 2007 Sewer Master Plan and acquire 1.0 mgd of additional wastewater treatment.
- *Water*. Provide water supply, reduce water consumption, construct recycled water mains, requirements to use recycled water, and upgrade and expand the water distribution system.
- *Solid Waste*. Participation by development projects in solid waste source reduction and diversion programs and negotiate agreements for solid waste disposal.

## 3.8.2 Environmental Setting

### 3.8.2.1 TASP Area

The environmental setting for the TASP Area is described on pages 3.11-1 through 3.11-15 of the Certified EIR. This discussion includes the following:

- *Potable Water Supply.* The Certified EIR identifies its municipal water system, which purchases its water from the San Francisco Public Utilities Commission (SFPUC) and Valley Water (VW)[1]; its emergency supply; its supply assurance amount from the SFPUC (9.23 million gallons per day [mgd] or 10,340 acre-feet per year [AFY]); and its anticipated demand in 2005–2006 of VW water (6,500 AFY); and the City of Milpitas' Water Conservation Programs.
- *Water Demands (2030).* The Certified EIR identifies that water demand in 2030 for the City of Milpitas is estimated to be 17.10 mgd, which is not expected to exceed supplies during normal years but is expected to exceed supply during dry years. The Certified EIR also identifies options for alleviating the deficit during dry years (i.e., imposing allocations within the SFPUC service area, operating supplemental emergency wells, adjusting SFPUC and VW service areas to supplement supplies with more VW water).
- *Potable Water Infrastructure.* The Certified EIR identifies the existing water distribution system in the TASP Area. The Certified EIR also identifies the results from the 2002 Water Master Plan, including improvements that would be required. The Certified EIR also notes that the 2007 Water Master Plan supersedes the 2002 Water Master Plan and is presented in the impacts section of the Certified EIR.
- *Sanitary Sewer Treatment.* The Certified EIR identifies that the San Jose/Santa Clara Water Pollution Control Plant (WPCP) provides wastewater treatment for the TASP Area; the capacity of the WPCP (167 mgd); the average annual influent (125 mgd); the City of Milpitas's allowable average dry weather peak 5-day flow (12.5 mgd or 7.5 percent of the total average dry weather flow capacity); the purchase of an additional 1 mgd of flow capacity in 2006 from West Valley Sanitation District (increasing the limit to 13.5 mgd); and that the City of Milpitas's flow levels are within the 13.5 mgd inflow limit (average of 8 and 9 mgd).
- *Wastewater Disposal.* The Certified EIR identifies the regulatory disposal requirements for treated water that is discharged by the WPCP.
- *Sanitary Sewer Infrastructure.* The Certified EIR identifies the existing sanitary sewer infrastructure, including the collection system within the TASP Area. The Certified EIR also identifies the results from the 2004 Sewer Master Plan, including improvements that would be required.

[1] Previously known as Santa Clara Valley Water District.

- *Storm Drains.* The Certified EIR identifies that the city of Milpitas owns and maintains a system of underground pipes and a network of street gutters that convey flows from urban runoff to the San Francisco Bay. The Certified EIR also identifies the results from the 2001 Storm Drain Master Plan, including improvements that would be required.
- *Recycled Water.* The Certified EIR identifies that the South Bay Water Recycling Program provides recycled water to the TASP Area, with existing recycled water mains located within the TASP Area.
- *Electricity.* The Certified EIR identifies that Pacific Gas & Electric Company (PG&E) provides electricity to the TASP Area, with underground lines, overhead lines, and transformers located within the TASP Area. A substation is located adjacent to the TASP Area.
- *Natural Gas.* The Certified EIR identifies that PG&E provides natural gas to the TASP Area, with transmission lines and gas mains located within the TASP Area.
- *Phone/Communications.* The Certified EIR identifies that AT&T provides phone/communications service to the TASP Area, with telecommunication lines located in the TASP Area.
- *Cable.* The Certified EIR identifies that Comcast provides cable service in the TASP Area with cable lines located along the southern and western borders of the TASP Area.
- *Solid Waste.* The Certified EIR identifies that solid waste in the city of Milpitas is disposed at the Newby Island Sanitary Landfill (NISL) and the City of Milpitas participates in Santa Clara County's Hazardous Waste Program.

This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of this SEIR for the locations available for the public to review the Certified EIS.

Overall, the setting with regard to the providers of the utilities and service systems within the TASP Area has not changed substantially since the Certified Plan was prepared; however, there have been some updates, which are summarized in the section below.

### 3.8.2.2 Project Change and Updates to the Environmental Setting

The environmental setting identified above would apply for the expanded areas identified in the Metro Plan. The areas of geographic expansion would be served by the same utility providers identified above. In the time since the Certified EIR has been prepared, updates have been made to the Water Master Plan, Sewer Master Plan, and Storm Drain Master Plan. These updated plans are included in Appendix F of this SEIR. These three Draft Master Plans were developed using modeling that assumed buildout of the Metro Plan. As such, the demand on water, sewer, and storm drain utilities due to the growth associated with Metro Plan would be met through the utility improvements identified in the Draft Master Plans.

#### Water

In 2021, the City of Milpitas prepared the 2020 Urban Water Management Plan (2020 UWMP), which provided updates to the current water use and forecasted water use, as well as updated

planning efforts for water shortages in the future. The 2020 UWMP forecasts water use in 2040 to be 4,776 million gallons per year (MGY), which is approximately 13.1 mgd.[2]

The 2020 UWMP identifies that in December 2018, the State Water Board adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay Delta Plan), which could result in reductions to the City's water supply during dry years. The SFPUC has initiated an Alternative Water Supply Planning Program to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

The 2020 UWMP identifies that due to the continued uncertainty for the SFPUC water supply during droughts and impacts from the implementation of the Bay Delta Plan on its water supply reliability, the 2020 UWMP includes information for water supply reliability based on implementation of the Bay Delta Plan. Assuming implementation of the Bay Delta Plan, the 2020 UWMP identified that the City will be able to meet the projected water demands presented in the 2020 UWMP in normal years but would experience supply shortages in single dry years and multiple dry years. The 2020 UWMP includes a Water Shortage Contingency Plan (WSCP), which would be implemented if water supplies by the SFPUC and VW are reduced. The WSCP contains documented processes and procedures, which are given legal authority through the Water Shortage Contingency Response Ordinance. The WSCP includes the steps to assess if a water shortage is occurring and how to respond to a water shortage. The WSCP has prescriptive elements, including an analysis of water supply reliability; the drought shortage actions for each of the six standard water shortage levels that correspond to water shortage percentages ranging from 10 percent to greater than 50 percent; an estimate of potential to close supply gap for each measure; protocols and procedures to communicate identified actions for any current or predicted water shortage conditions; procedures for an annual water supply and demand assessment; monitoring and reporting requirements to determine customer compliance; and reevaluation and improvement procedures for evaluating the WSCP (City of Milpitas 2021).

## Wastewater

Since the preparation of the Certified EIR, the City's inflow limit at the San Jose/Santa Clara Water Pollution Control Plant has been updated from 13.5 mgd to 14.25 mgd (City of Milpitas 2021). In addition, the amount of wastewater that the City is generating and that is being treated at the San Jose/Santa Clara Water Pollution Control Plant has decreased from the average of 7.5 mgd in 2006 (City of Milpitas 2006) to an average of 5.57 mgd in 2020 (City of Milpitas 2021).[3]

[2] 13.1 mgd was calculated by dividing 4,776 MGY by 365 days per year.

[3] The 5.57 mgd number was estimated by dividing the amount of wastewater generated in the City (2,032 MGY), which was identified in the 2020 UWMP by 365 days per year.

### Solid Waste

In the time since the Certified EIR has been prepared, the setting for solid waste disposal has changed. On December 8, 2016, the City of Milpitas entered into a Franchise Hauler Agreement with the Milpitas Sanitation, Inc. (MSI), and the term of the contract is from September 6, 2017, to August 31, 2032. Per the Franchise Hauler Agreement, the City of Milpitas uses the following facilities:

- Kirby Canyon Landfill for solid waste.
- GreenWaste Recovery Materials Recovery Facility (MRF) for recyclables and yard trimmings.
- Sustainable Organic Solutions (SOS) for food scraps.
- Mission Trails Waste Systems (MTWS) for Construction and Demolition (C&D) waste.

In addition, Alameda County Industries Material Recovery Facility, the Sunnyvale Materials Recovery and Transport Station, East Bay Municipal Utility District Treatment Plant, Zanker Road Resource Management Facilities, and Guadalupe C&D Recovery Facility are alternative approved facilities that the City of Milpitas could use. Hazardous Waste continues to be managed through Santa Clara County's Hazardous Waste Program.

## 3.8.3 Impacts and Mitigation

This section describes the change in Project impacts on utilities and service systems that would occur with the Project Change. It describes the methods used to evaluate the impacts and the thresholds used to determine whether an impact would be significant. The Certified EIR found that with implementation of the policies in the TASP, utilities and service systems impacts would be less than significant and additional mitigation measures were not required. Because the Metro Plan policies would replace policies in the TASP, the analysis includes a comparison of the TASP policies and the Metro Plan policies to determine if any changes in policies would result in an impact. If new mitigation measures are needed to reduce new impacts that would result from the Project Change, those measures are listed below.

This SEIR analysis evaluates the change in Project impacts with the Project Change, and, if applicable, changes in circumstances or new information that was not available at the time the Certified EIR was prepared. The analysis does not reevaluate the impacts of the Project that were already disclosed in the Certified EIR and are not altered due to the Project Change. Based on the change in the Project impact due to the Project Change, a determination is made as to whether there would be changes to the impact significance determinations for the Project in the Certified EIR.

### 3.8.3.1 Significance Criteria

The State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.) identifies significance criteria to be considered for determining whether a project could have significant impacts on transportation. An impact would be considered significant if construction or operation of the Project would do any of the following.

- Require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

- Not have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years.
- Result in a determination by the wastewater treatment provider that serves or may serve the Project that it does not have adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments.
- Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.
- Not comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

### 3.8.3.2 Methods

Utilities and service systems impacts associated with construction and operation of the Metro Plan were assessed and quantified, where applicable, using information available from the updated Master Plans included in Appendix F—including the Draft City of Milpitas Water Master Plan, Draft City of Milpitas Sewer Master Plan, and Draft City of Milpitas Storm Drain Master Plan—as well as the WSA prepared for the Metro Plan (also included in Appendix F), the 2020 UWMP, and information available regarding the existing capacity of utilities and service systems. The utilities and service systems impact analysis considers whether implementation of the Metro Plan would result in substantial impacts on utilities systems due to either construction or operation. Impacts could include exceedances of existing system capacity, a need to expand utilities systems to meet future needs with Metro Plan implementation, or supply availability impacts, such as potential Metro Plan-related exceedances of available water resources.

This analysis assumes that the updated policies in the Metro Plan would be implemented. Table 2-2 in Chapter 2 of this SEIR provides a summary of the policies in the Metro Plan related to Public Services. Table 2-2 identifies policies that require the following:

- *Wastewater.* Construct improvements from the Draft Sewer Master Plan, as well as improvements requires to serve new projects, and consider additional review of available wastewater treatment capacity.
- *Water*. Provide water supply, update the water supply (if needed), reduce water consumption, install recycled water mains, requirements to use recycled water, and upgrade and expand the water distribution system.
- *Solid Waste*. Reduction of solid waste generations during construction and operation of development projects.

### 3.8.3.3 Impacts and Mitigation Measures

This section includes a discussion of each impact as it corresponds to the significance criteria presented in Section 3.8.3.1, *Significance Criteria*.

## Impact UTIL-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to requiring or resulting in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which would cause significant environmental effects.

### Summary of Certified EIR Impact Analysis

The Certified EIR did not include an impact analysis or significance determination related to the relocation or construction of new or expanded storm water drainage, electric power, natural gas, or telecommunications facilities because it was not required under CEQA at the time. The Certified EIR identified the water and wastewater facilities that would be required by the TASP. While the Certified EIR concluded that demands for water and wastewater would be met through the implementation of policies, no conclusion was made as to whether implementation of these facilities would result in significant effects on the physical environment.

### Impact Analysis

The Metro Plan would involve the relocation, construction, or expansion of numerous utility facilities in order to provide utilities services for the new land uses associated with the Metro Plan. The additional water, sewer, and storm drain facilities that would be required due to the additional population that would be generated by the Metro Plan is included in the Draft Master Plans that were prepared by the City (see Appendix F). These proposed utility expansions are a part of the Project Description, and the potential impacts that would result from construction of these facilities are evaluated throughout this SEIR (e.g., air quality and noise impacts due to construction). The purpose of the analysis is to evaluate whether the proposed facilities would have adequate capacity to serve the Metro Plan's demand for utilities and service systems during construction and operation, or whether further relocation or construction of new or expanded facilities would be required.

#### *Construction*

The Metro Plan would require construction activities within the Metro Plan. Construction activities within the Metro Plan would be served by existing utility systems and infrastructure. Because there is adequate utility service available in the Metro Plan Area, it is reasonably expected that construction activities requiring electricity, such as lighting and operation of construction equipment, would be serviced by existing electric infrastructure and that no expansion of electrical facilities would be necessary to serve construction activities. Additionally, because it is expected that construction equipment would operate with gasoline- or diesel-powered engines, the need to install additional electric connections is not anticipated. Furthermore, natural gas and telecommunications facilities are generally not used during construction. Limited construction-phase water needs for activities such as dust suppression would be met through the metered use of water conveyed by water trucks and tanks. Because portable restrooms would be temporarily installed on site, construction is not anticipated to result in substantially elevated wastewater generation levels into the local sanitary sewer system.

Temporary construction dewatering could be required during certain site preparation and subterranean construction within the Metro Plan Area associated with excavation for the

subterranean garages. Groundwater dewatering would only be required for major excavations in the Metro Plan Area. Dewatering would be discharged into the storm drain system, subject to applicable regulatory controls. Discharging to the public storm drainage system is permitted by the RWQCB under either the VOC and Fuel Discharge Permit (Order R2-2017-0048) if there are priority pollutants identified, or by the Construction General Permit (Order 2009-0009-DWQ) if there are no pollutants. Dewatering could also be discharged to the sanitary sewer system, depending on the volume and duration of dewatering. Discharging to the sanitary sewer system is permitted by the City of San Jose Environmental Services Department and an applicant for a project would be required to obtain a discharge permit from the City of San Jose Environmental Services Department.

Based on the analysis above, project construction activities would not require the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities to serve construction activities, and impacts would be less than significant.

***Operation***

Appendix G of the Draft City of Milpitas Water Master Plan identifies several recommended improvements to the water system (see Appendix F). Only two of these improvements are identified in the Draft City of Milpitas Water Master Plan as being located within the Metro Plan: the new turnout at the intersection of Piper Drive and Garden Street, and a new pressure reducing valve near the intersection of Cedar Way and South Main Street. In addition, the Draft City of Milpitas Water Master Plan recommends the implementation of a new 2 million gallon storage reservoir in the VW service area and a new pump station with a firm capacity of 4,000 gallons per minute. The Certified EIR previously identified the need for a storage reservoir in the VW service area and a pump station, as documented in the 2007 Water Master Plan. The updated Water Master Plan from 2021 supersedes the recommendation from the 2007 Water Master Plan. The locations of these facilities are not currently known. The evidence necessary to make a significance conclusion regarding the physical consequences of implementing these facilities will only be available during the environmental review of the future facilities. CEQA requires significance determinations to be made on the basis of substantial evidence, not speculation. As such, although a conclusion can be made that the Project would trigger the need for the storage reservoir and pump station, it is not possible to make a significance determination concerning the specific physical impacts on the environment due to the construction of these facilities without engaging in speculation; therefore, no significant impact is identified. New public facilities, including the reservoir and pump station, are subject to CEQA; thus, CEQA review would be conducted when such new facilities are advanced. In summary, the physical impacts from the two improvements identified by the Draft City of Milpitas Water Master Plan as being located within the Metro Plan (new turnout and new pressure reducing valve) have been considered in this SEIR and would not result in any additional impacts beyond those identifies in this SEIR, and the physical impacts from the storage reservoir and pump station are not currently known at this time and CEQA review would be conducted in the future to determine the impacts from these facilities. There would be no additional water improvements that would be required due to the additional buildout associated with the Metro Plan, beyond those discussed above.

Figure 10-1 of the Draft City of Milpitas Sewer Master Plan identifies several recommended improvements to the sewer system (see Appendix F). Only one of these improvements is located within the Metro Plan: a low priority improvement near the Great Mall. There would be no additional wastewater system improvements that would be required due to the additional buildout

associated with the Metro Plan (note: impacts on the wastewater treatment are assessed under Impact UTIL-3). Therefore, the Metro Plan would not require or result in the relocation or construction of new wastewater system facilities beyond those already identified in the Draft City of Milpitas Storm Drain Master Plan and analyzed in this SEIR. This impact would be less than significant.

Figure 3-1 of the Draft City of Milpitas Storm Drain Master Plan identifies several recommended improvements to the storm water drainage system (see Appendix F). Only one of these improvements is located within the Metro Plan: a low priority improvement on Montague Expressway. There would be no additional storm water drainage system improvements that would be required due to the additional buildout associated with the Metro Plan. Therefore, the Metro Plan would not require or result in the relocation or construction of new or expanded storm water drainage facilities beyond the facilities already identified in the Draft City of Milpitas Storm Drain Master Plan and analyzed in this SEIR. This impact would be less than significant.

As discussed in Section 3.2, *Greenhouse Gas Emissions*, the Metro Plan would include building design features that reduce energy consumption and increase renewable energy generation. In addition, development associated with the Metro Plan would be required to comply with the California Green Building Standards Code, Title 24, Part 11, of the California Code of Regulations. This state code includes green and sustainable building requirements to achieve energy efficiency. The Metro Plan Area is a highly urbanized area that already includes electrical facilities that future projects would be able to connect to. Because the Metro Plan would create energy efficient buildings, generate renewable energy, and because there are existing electrical facilities that future developments could connect to, it is expected that the Metro Plan would not place a substantial demand that would require the construction of new or expanded electrical facilities. This impact would be less than significant.

The Metro Plan identifies policies to limit the use of natural gas. The Metro Plan includes Policy CB 7.2.2, which identifies that all new residential buildings shall be all-electric (i.e., no natural gas would be used by residential development). In addition, Policy CB 7.2.3 identifies that all new nonresidential buildings shall be all-electric, unless uses essential to the key functions of the internal business, such as manufacturing or laboratory work, require natural gas. Because the additional demand on natural gas would be limited to non-residential development that requires natural gas for manufacturing or laboratory work, it is expected that this demand would not place a substantial demand that would require the construction of new or expanded natural gas facilities. This impact would be less than significant.

The Metro Plan Area is a highly urbanized area that already includes telecommunication facilities. Future developments would connect to the existing telecommunication facilities that already serve the residences and businesses that have been developed as a part of the TASP. Because there are existing telecommunication facilities that future development from the Metro Plan could connect to, it is expected that the Metro Plan would not require the construction of new or expanded telecommunication facilities. This impact would be less than significant.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to the relocation or construction of new or expanded water, wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact UTIL-1

Based on the analysis above, implementation of the Project Change would result in a less-than-significant impact regarding the relocation or construction of new or expanded electric power, natural gas, or telecommunications facilities. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

Based on the analysis above, implementation of the Project Change would involve the relocation, construction, or expansion of numerous utility facilities in order to provide utilities services for the new land uses associated with the Metro Plan. The additional water, sewer, and storm drain facilities that would be required due to the additional population that would be generated by the Metro Plan is included in the Draft Master Plans that were prepared by the City (see Appendix F). These proposed utility expansions are a part of the Project Description, and the potential impacts that would result from construction of these facilities are evaluated throughout this SEIR. There would be no additional need for relocation or construction of new or expanded water, sewer, and storm drain facilities beyond those already identified in the Draft Master Plans, and as such the Metro Plan would result in a less-than-significant impact. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact UTIL-2: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to having sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.

### Summary of Certified EIR Impact Analysis

The Certified EIR identified that a WSA was prepared for the TASP and determined that the increased water demand from the TASP would be 1.0 mgd and would be adequately offset by the supplies available from VW (see Impact 3.11-2 in the Certified EIR). The Certified EIR identified that during extended droughts, the City has the ability to run emergency wells for additional supply; can increase the use of recycled water to offset potable water demand; and that TASP policies would require the use of recycled water (TASP Policies 6.18, 6.19, 6.21). The Certified EIR concluded that TASP impacts on water supply would be less than significant.

### Impact Analysis

Compared to the TASP, the Metro Plan would result in additional water demand, as a result of the increased population growth that would be allowed in the Metro Plan. A WSA has been prepared for the Metro Plan to consider whether water supplies would be sufficient to cover the growth associated with the Metro Plan and is included as Appendix F of this Draft SEIR.

The WSA identifies that the estimated potable water demand for the Metro Plan is approximately 500 MGY. The WSA notes that actual potable demands for the Metro Plan may be lower because water use factors were developed from existing water users that may have less efficient plumbing fixtures than what will be provided for the Metro Plan. The Metro Plan would require ultra-low-flow fixtures in residential and nonresidential development (see Policy CB 7.5.1), as well as encourage incorporation of water collection and retention devices, such as rain barrels and cisterns, into building design to allow for water reuse(see Policy CB 7.6.1).

The WSA considered the demand from the Metro Plan from its two water providers (SFPUC and Valley Water). The WSA identifies that the City's 2020 UWMP assumes the Bay-Delta Plan Amendment is implemented, which significantly reduces SFPUC supplies during dry years. Furthermore, the WSA identifies that supplies from Valley Water may have drought shortages of up to 20 percent in the future if some of Valley Water's Water Supply Master Plan 2040 projects are not implemented, or provide less benefits than expected, and imported supplies are reduced by 25 percent or severe allocation cuts occur during droughts as have been experienced in other droughts. The City's 2020 UWMP assumes three groundwater wells (each pumping at 1.2 mgd) will be online by 2030, with a fourth online by 2035. It should also be noted that the Draft City of Milpitas Water Master Plan identifies infrastructure improvements needed to serve proposed new development within the City's service area. These include supply (e.g., a new Valley Water turnout) and storage capacity improvements (e.g., new storage reservoir) that are also triggered by future development projected in the City's service area and that will be funded through associated development impact fees.

The WSA concludes that during normal hydrologic years, the City's water supplies can meet projected demands for the Metro Plan through 2045. Once the City's groundwater wells come online (assumed in 2030, before Metro Plan buildout), and assuming that the wells produce sufficient flow while meeting water quality standards, the City's dry year supplies can better meet projected demands in single dry and multiple dry years. There are small supply shortfalls starting in the third year of a 5-year drought starting in 2030 and the fourth year of a 5-year drought starting in 2045. To address these supply shortfalls, the City expects to implement its WSCP and reduce water demands as needed. The WSA concludes that the City finds that the total projected water supplies determined to be available for the Metro Plan during a 20-year projection will meet the projected water demand associated with the Metro Plan, in addition to existing and planned future uses.

Furthermore, although the Metro Plan would include some updates to policies related to water supply, as documented in Table 2-2, the Metro Plan would not result in a substantial change to the policies compared to what was included in the TASP. The Metro Plan would continue to include policies that would require reductions in water consumption through use of recycled water, water-saving features, and drought-tolerant landscaping; requirements for recycled water usage for new developments; and upgrades to the water distribution system, per the Draft City of Milpitas Water Master Plan.

Overall, as documented in the WSA, there would be sufficient water supplies available to serve the Metro Plan and reasonably foreseeable future development during normal, dry, and multiple dry years. As such, impacts from the Metro Plan would be less than significant.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to water supplies.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact UTIL-2

The Certified EIR concluded that after implementation of policies included in the TASP, impacts related to water supplies would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less-than-significant impact on water supplies. Thus, the Project Change would not result in a change to the Certified EIR's impact determination for impacts related to water supplies. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## Impact UTIL-3: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to resulting in a determination by the wastewater treatment provider which serves or may serve the project it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

### Summary of Certified EIR Impact Analysis

The Certified EIR identified that implementation of the TASP would generate 2.30 mgd of wastewater; that the City discharged wastewater to the San Jose/Santa Clara Water Pollution Control Plant at a rate of approximately 8.232 mgd in 2006; and that the total existing plus project flows would be approximately 10.5 mgd. The Certified EIR concluded that this would be well below the City's inflow limit at the San Jose/Santa Clara Water Pollution Control Plant, which was 13.5 mgd at the time. The Certified EIR concluded that there would be a less-than-significant impact.

### Impact Analysis

The following details regarding wastewater capacity, wastewater generation, and water use are based on the City's 2020 UWMP (City of Milpitas 2021). Since the preparation of the Certified EIR, the City's inflow limit at the San Jose/Santa Clara Water Pollution Control Plant has been updated from 13.5 mgd to 14.25 mgd. In addition, the amount of wastewater that the City is generating has actually decreased from what was identified in the Certified EIR (2006 number). In 2020, the City generated 2,032 MGY of wastewater, which is an average of approximately 5.57 mgd.[4] In 2040, when full buildout of the Metro Plan is expected, the 2020 UWMP estimates that total water demand would be 4,776 MGY. The 2020 UWMP also identified that in 2020, approximately 40 percent of the water use was for non-sewer uses, meaning that 60 percent of 2020 water use generated wastewater. Using the assumption that 60 percent of the water in 2040 (4,776 MGY) would generate wastewater, it is expected that in 2040 approximately 2,866 MGY or 7.85 mgd of wastewater would be generated.[5]

[4] This was calculated by dividing 2,035 MGY by 365 days per year.

[5] This was calculated using the following formula

4,776 MGY * 0.6 = 2,866 MGY

2,866 MGY/365 days per year = 7.85 mgd

As identified in Impact UTIL-2, the Metro Plan is expected to result in a demand of 500 MGY or approximately 1.37 mgd.[6] This is a conservative estimate because water use is expected to be lower due to Metro Plan policies that require ultra-low-flow fixtures, as well as encouraging incorporation of water collection and retention devices. Furthermore, as identified in the 2020 UWMP, not all of the water that is used ends in the San Jose/Santa Clara Water Pollution Control Plant. Thus, it is expected that the Metro Plan would generate less than 1.37 mgd of wastewater; however, for the purposes of this analysis, this number is used to approximate what the wastewater treatment capacity would be in 2040. With the Metro Plan, the City is expected to generate approximately 9.22 mgd, which is well below the City's capacity of 14.25 mgd. As such, there would be adequate capacity to serve the Metro Plan's projected demand, in addition to the provider's existing commitments, by the San Jose/Santa Clara Water Pollution Control Plant. The Metro Plan's impact on wastewater demand would be less than significant.

#### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to wastewater treatment capacity.

#### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

#### Conclusions for Impact UTIL-3

The Certified EIR concluded that impacts related to the wastewater treatment capacity would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less-than-significant impact on the capacity of wastewater treatment by the San Jose/Santa Clara Water Pollution Control Plant. Thus, the Project Change would not result in a change to the Certified EIR's impact determination for impacts related to wastewater treatment capacity. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

### Impact UTIL-4: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to generating solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.

#### Summary of Certified EIR Impact Analysis

The Certified EIR identified that implementation of the TASP would generate 7,400 pounds per day of solid waste over the existing buildout land use designations; that the TASP would not result in appreciable change to the filling rate of the Newby Island landfill; that the City would comply with the City's Source Reduction and Recycling (SRR) Program and policies requiring and promoting recycling in the Midtown Specific Plan and the TASP; that the 1994 General Plan includes goals to promote recycling; that the City participates in the County's Integrated Waste Management Plan

[6] This was calculated by dividing 500 MGY by 365 days per year.

(IWMP); and that there is sufficient landfill capacity for Santa Clara County's projected needs for at least 30 more years. Overall, the Certified EIR concluded a less-than-significant impact related to the increased demand on existing solid waste facilities.

### Impact Analysis

#### *Geographic Expansion and Metro Plan Buildout: Population Growth and Employment*

The additional growth associated with the Project Change is expected to generate additional solid waste beyond what was identified in the TASP. Table 3.8-1 identifies the additional solid waste that could be generated from the buildout proposed by the Metro Plan. A total of 55,350 pounds of solid waste per day (or approximately 28 tons per days) is expected to be generated by the Project Change.

**Table 3.8-1. Metro Plan Solid Waste Generation**

| Land Use | Solid Waste Generation Rate[1] | Number of Dwelling Units, Square Feet, or Hotel Rooms | Total Waste Generation (pounds per day) |
|---|---|---|---|
| Residential | 5.1 lbs per dwelling unit per day[2] | 7,000 dwelling units | 35,700 |
| Office | 6 lbs per 1,000 sf, per day | 2,500,000 sf | 15,000 |
| Industrial | 5 lbs per 1,000 sf, per day | 500,000 sf | 2,500 |
| Retail | 2.5 lbs per 1,000 sf, per day | 300,000 sf | 750 |
| Hotel | 2 lbs per hotel room per day | 700 rooms | 1,400 |
| Total | -- | -- | 55,350 |

[1] Waste generation rates were identified based on data compiled by CalRecycle (CalRecycle 2021a).
[2] This number was calculated by taking the average of the five different rates for multifamily buildings (CalRecyle 2021a).

As identified in Section 3.8.2.2, *Project Change and Updates to the Environmental Setting,* solid waste would be sent to the Kirby Canyon Landfill with recyclables, yard trimmings, food scraps, and C&D waste diverted to other facilities. The Kirby Canyon Landfill has a remaining capacity of 16,191,600 cubic yards as of 2015, is expected to cease operations in 2059, and is permitted to receive 2,600 tons per day (CalRecycle 2021b). The 28 tons per day expected to be generated by the Project Change represents approximately 1.1 percent of the solid waste that is permitted to be received daily. As such, the Kirby Canyon Landfill would have adequate capacity to serve the Project. In addition, the Metro Plan would still be required to adhere to the similar regulations identified in the Certified EIR to reduce the amount of solid waste that is generated. The Project Change would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair attainment of solid waste reduction goals. Therefore, impacts from solid waste disposal associated with the Project Change would be less than significant.

#### *Changes in Land Use Classifications and Policies*

The Metro Plan updates the policies in the TASP, including deleting certain policies in the TASP. TASP Policy 6.24, requiring negotiations to handle long-term disposal of its solid waste past the closure of the Newby Island Sanitary Landfill, is no longer applicable because the City no longer deposes solid waste at the Newby Island Sanitary Landfill. Solid waste is disposed of per the Franchise Hauler Agreement. The Metro Plan would not result in any substantial changes to the requirements identified in the TASP policy to reduce waste (Policy 6.23). Thus, changes in policies

would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

#### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to generating solid waste.

#### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

#### Conclusions for Impact UTIL-4

The Certified EIR concluded that after implementation of policies included in the TASP, impacts related to solid waste facilities would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less-than-significant impact on solid waste facilities. Thus, the Project Change would not result in a change to the Certified EIR's impact determination for impacts related to solid waste facilities. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

### Impact UTIL-5: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to complying with federal, state, and local management and reduction statutes and regulations related to solid waste.

#### Summary of Certified EIR Impact Analysis

The Certified EIR did not include an impact analysis or significance conclusion related to complying with federal, state, and local management and reduction statutes and regulations related to solid waste. The Certified EIR did, however, identify the requirements under the California Integrated Waste Management Act of 1989 (AB 939), including the requirement that each county prepare an Integrated Waste Management Plan and each city prepare a Source Reduction and Recycling Element. The Certified EIR also identified that the City would comply with the City's Source Reduction and Recycling Program and would also participate in the County's IWMP. The following goals were adopted as part of the City's Source Reduction and Recycling Element:

- Meet or exceed state-mandated solid waste disposition rates by maximizing source reduction, recycling and composting opportunities for Milpitas residents and businesses.
- Motivate the residential and business sectors to reduce and recycle solid waste.
- Ensure that all land development projects provide adequate space and design for waste reduction and management activities and equipment.
- Encourage the development and expansion of local and regional markets for diverted materials.
- Provide solid waste management services that minimize environmental impacts, ensure public health and safety and facilitate waste reduction efforts.
- Increase residents' awareness of proper disposal and reduction methods for wastes

Nonetheless, the Certified EIR did not include a conclusion regarding compliance with waste diversion programs.

### Impact Analysis

Future development associated with the Metro Plan would be required to comply with the same regulations requiring waste diversion (i.e., AB 939, City's Source Reduction and Recycling Program, and IWMP). In addition, the Metro Plan includes policies to provide organic waste collection services in residential and non-residential development (Policies CB 7.7.3 and CB 7.7.4), which would comply with the requirements in AB 1826. Overall, because future development would be required to comply with waste diversion regulations (including through compliance with Policies CB 7.7, CB 7.7.2, CB 7.7.3, and CB 7.7.4), impacts related to complying with waste reduction regulations would be less than significant for the Metro Plan.

### Certified EIR Mitigation Measures

The Certified EIR did not include mitigation measures for impacts related to solid waste facilities.

### New Mitigation Measures

The Project Change would not result in the need for new mitigation measures to reduce Project impacts.

### Conclusions for Impact UTIL-5

Based on the analysis above, implementation of the Project Change would result in a less-than-significant impact regarding complying with waste reduction regulations. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

Chapter 4
# Other CEQA Discussions

## 4.1 Cumulative Impacts

Section 15130 of the State CEQA Guidelines requires lead agencies to evaluate a proposed undertaking's potential to contribute to cumulative impacts in the project or program area. A "cumulative impact" is defined in Section 15355 as an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects which increase environmental impacts. CEQA requires the lead agency to identify projects and programs related to the undertaking being analyzed and evaluate the combined effects of those projects on the environment. If cumulative impacts are identified as significant, the lead agency must then assess the degree to which the proposed undertaking would contribute to those impacts and identify ways of avoiding or reducing any contribution evaluated as "cumulatively considerable".

A cumulative analysis was provided in the Certified EIR. The focus of the analysis in this SEIR is on the potential changes in cumulative impacts, considering the impacts of the Project Change. The cumulative analysis includes a discussion of the following environment resource topics and identifies the sections where the analysis can be found:

- Section 4.1.3, Aesthetics
- Section 4.1.4, Air Quality
- Section 4.1.5, Biological Resources
- Section 4.1.6, Cultural Resources
- Section 4.1.7, Energy
- Section 4.1.8, Geology and Soils
- Section 4.1.9, Greenhouse Gas Emissions
- Section 4.1.10, Hazards and Hazardous Materials
- Section 4.1.11, Hydrology and Water Quality
- Section 4.1.12, Land Use
- Section 4.1.13, Noise
- Section 4.1.14, Population and Housing
- Section 4.1.15, Public Services and Recreation
- Section 4.1.16, Transportation
- Section 4.1.17, Utilities and Service Systems

## 4.1.1 Approach and Method

Section 15130(b) of the State CEQA Guidelines states that the discussion of cumulative impacts should be guided by the standards of practicality and reasonableness, and should include the following elements, which are necessary to an adequate discussion of cumulative impacts:

- Either 1) a list of past, present, and probable future projects producing related or cumulative impacts or 2) a summary of projections contained in an adopted general plan or similar document.
- A discussion of the geographic scope of the area affected by the cumulative impact.
- A summary of expected environmental effects to be produced by these projects.
- Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

This SEIR makes use of both a list approach (for all subjects other than air quality and greenhouse gas emissions) as well as a projection approach (for air quality and greenhouse gas emissions).

### 4.1.1.1 Projects Considered for List Approach

Reasonably foreseeable future projects are projects which have either been adopted or have otherwise demonstrated the likelihood to occur. Cumulative analysis for this SEIR includes activities within 0.5 miles of the Metro Plan Area, which might cause either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment and could be classified as a "Project" under Section 21065 of the State CEQA Guidelines.

Table 4-1 presents the projects considered in this analysis. The list of cumulative project was compiled through review of the City of Milpitas Project Pipeline, which includes data of projects that are planned in the City of Milpitas (City of Milpitas 2022).

**Table 4-1. Projects Considered in Cumulative Analysis**

| Project Name | Project Status | Project Type | Description | Distance from Project Change Site |
|---|---|---|---|---|
| 1000 Gibraltar Drive | Planning Permit Approved | Industrial | 503,000 square feet warehouse | 500 feet |
| Arco Gas Station | Under Construction | Gas Station | New 3,180 square foot gas station | 0.38 mile |
| New Car Wash | Planning Permit Approved | Car Wash | New car wash | 0.35 mile |
| New Retail Building | Under Construction | Commercial | 54,000 square feet retail Building | 0.5 mile |
| 612 S Main Street | Planning Permit Filed | Residential | 40 residential unit building | 0.28 mile |
| Milpitas Gateway-Main Street Specific Plan | Identified in 2040 General Plan, Development of Specific Plan is in process | Specific Plan | Entertainment, retail, commercial, residential, civic, cultural, office, and high-density mixed use residential in a compact, walkable, and unique centralized setting | Adjacent |

#### 4.1.1.2 Projection Approach

For certain subjects, the impacts are regional or global in nature. Thus, a projection approach was used for these subjects, including criteria pollutants for air quality, greenhouse gas emissions, and transportation. The projection used for criteria pollutants is considering the regional forecast of emissions in the BAAQMD 2017 Clean Air Plan, and Metro Plan criteria pollutant impacts are considered as to whether they contribute to regional criteria pollutant impacts. For greenhouse gas emissions, the context is statewide GHG emissions and their contribution to global GHG emissions, and Metro Plan GHG emissions are considered in terms of how they contribute to state and global emissions.

### 4.1.2 Environmental Resources with No Impact

The Metro Plan would have no impact on agriculture and forestry resources, mineral resources, tribal cultural resources, or wildfire. Because the Metro Plan would have no impact on these environmental resources, the Metro Plan would not contribute to any cumulative impact. As such, these environmental topics are not discussed further.

### 4.1.3 Aesthetics

**Impact C-AES-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative aesthetics impacts.**

#### 4.1.3.1 Certified EIR Conclusion

The Certified EIR concluded that cumulative visual impacts would be less than significant because the changes associated with the TASP would be benefit the wider city and regional populations that visit and travel through the TASP Area, as well as residents in adjacent properties.

#### 4.1.3.2 Cumulative Impact Analysis

As discussed in the Initial Study (Appendix B), the majority of the projects that would be developed as a part of the Metro Plan would not result in aesthetic impacts pursuant to Public Resources Code Section 21099. Future development projects that meet Public Resources Code Section 21099 would, therefore, not result in a cumulatively considerable contribution to a cumulative impact related to aesthetics.

Nonetheless, some features and future projects in the Metro Plan would not meet the Public Resources Code Section 21099. The cumulative impact analysis focuses on these features of the Metro Plan. As identified in the Initial Study (Appendix B), there are no scenic vistas or scenic resources located within the Metro Plan Area, and the Metro Plan would have no impact on scenic vistas or scenic resources. As such, the Metro Plan would not result in a cumulatively considerable contribution to a cumulative impact related to scenic vistas or scenic resources. There is the potential that cumulative projects as well as future projects in the Metro Plan could block views of hills east of the Metro Plan Area, which would result in a cumulative impact. However, because the Metro Plan would include setbacks that would minimize visual impacts from development, the Metro Plan would not result in a cumulatively considerable contribution to a cumulative impact related to scenic vistas or scenic resources. In addition, new multi-story structures in the Metro Plan

Area will enhance views of the hillsides by providing new viewpoints from rooftop amenity decks. Furthermore, a cumulative lighting or glare impact would not occur because all cumulative projects, as well as the Metro Plan would be required to adhere to Citywide Objective Design Standards for lighting that include requirements to minimize light and glare impacts.

#### 4.1.3.3 Conclusion

The Certified EIR concluded that cumulative impacts related to aesthetics would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to aesthetics. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative aesthetics impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

### 4.1.4 Air Quality

**Impact C-AQ-1: Implementation of the Metro Plan would result in new and substantially more severe cumulative air quality impacts that were not identified in the Certified EIR.**

#### 4.1.4.1 Certified EIR Conclusion

The Certified EIR identified that the air quality analysis in section 3.6 of the Certified EIR represents the cumulative air quality impacts for the TASP. As identified in Section 3.1, *Air Quality*, the Certified EIR identified the following significant and unavoidable impacts, which would also be considered significant and unavoidable cumulative impacts:

- Significant and unavoidable impact with regard to conflicts with air quality plans, except for the TCMs of the 2005 Ozone Plan.
- Significant and unavoidable impact related to criteria air pollutant (ozone, PM10, and PM2.5) impacts due to operation, for which the SFBAAB is in nonattainment.

#### 4.1.4.2 Cumulative Impact Analysis

The Metro Plan would support the goals of BAAQMD's 2017 Clean Air Plan, would support the applicable control measures in the 2017 Clean Air Plan, and would not conflict with the 2017 Clean Air Plan implementation. The purpose of the 2017 Clean Air Plan is to improve regional air quality in the San Francisco Bay Area Air Basin (SFBAAB); therefore, the analysis and less-than-significant finding under Impact AQ-1 is inherently cumulative. For these reasons, the Metro Plan, in combination with past, present, and reasonably foreseeable future projects would not contribute to or result in a significant cumulative impact related to air quality plan consistency. The cumulative impact would be less than significant.

BAAQMD has identified project-level thresholds to evaluate criteria pollutant impacts. In developing these thresholds, BAAQMD considers levels at which project emissions are cumulatively considerable. As noted in BAAQMD's guidelines:

> In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts on the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary.

Per BAAQMD guidelines, exceedances of project-level thresholds would be cumulatively considerable, and the cumulative impact would be significant. As discussed in Impacts AQ-2a and AQ-2b, construction and operational emissions resulting from individual projects developed under the Specific Plan could exceed BAAQMD's regional ROG, NOX, PM10, and PM2.5 thresholds. Mitigation Measures AQ-1 through AQ-8 could reduce regional emissions of ROG, NOX, PM10, and PM2.5 to a level below BAAQMD's regional thresholds. Because it cannot be concluded that offset programs per Mitigation Measures AQ-6 and AQ-8 would be available in the future at the time and in the amount needed for any given future development under the Metro Plan, for the purposes of this SEIR analysis, impacts during construction and operation related to regional criterial pollutants quality impacts from the project are conservatively assumed to result in a significant and unavoidable cumulative impact.

The analysis of localized criteria pollutants in Impact AQ-3 included consideration of CO hot-spot concentrations. As identified, in Impact AQ-3, traffic volumes in all scenarios, including a cumulative scenario, would not exceed the screening criterion that BAAQMD recommends. Accordingly, sensitive receptors would not be exposed to substantial concentrations of CO. This impact was concluded to be less than significant. Because the project-level CO hot-spot analysis already accounts for (1) background concentrations of CO as measured at local air quality monitoring stations and (2) cumulative background traffic in the project analysis year of 2040, the significance determination is inherently cumulative. The Metro Plan impact determination for CO hotspots therefore serves as the impact determination for impacts related to exposing sensitive receptors to substantial pollutant concentrations due to CO, which would be less than significant.

Existing nearby DPM sources and the Metro Plan could contribute to a cumulative health risk for sensitive receptors near the Metro Plan Area. As discussed under Impact AQ-3, a quantitative evaluation of potential health risk impacts for the Metro Plan is not possible. Mitigation Measures AQ-1 through AQ-9 would develop and maintain best practices for reducing emissions associated with construction and operational activities and require that new development with sensitive receptors adjacent to TAC sources be designed to minimize health risks, which would reduce construction and operational health risks for existing and future receptors. However, there may be instances where project-specific conditions would preclude a reduction in the health risk to a level below adopted thresholds and expose receptors to cumulative health risks. For instance, this may include the installation or operation of new stationary sources of TACs (e.g., generators) on the project site that result in significant PM2.5 concentrations. However, BAAQMD permitting would ensure that cancer risks and the hazard index would be below the applicable thresholds but would not ensure that PM2.5 concentrations would be below the applicable threshold. In addition, future development projects under the Metro Plan could generate DPM, PM2.5, or other TACs that could expose adjacent receptors to significant health risks (e.g., from construction and operational sources that are adjacent to sensitive receptors). Therefore, it is conservatively assumed that the Metro Plan in combination with other past, present, and reasonably foreseeable future projects would result in a cumulative impact that would be significant and unavoidable.

As discussed under Impact AQ-4, the Metro Plan would not generate substantial odors. The cumulative projects do not include land uses that are known to generate adverse odors.

Construction activities would generate odors from diesel exhaust, asphalt paving, and the use of architectural coatings and solvents, but these activities would be temporary and would not result in nuisance orders that would violate BAAQMD's Regulation 7. In addition, odors during operation could emanate from the emergency diesel generators and the reapplication of architectural coatings. These odors would be limited to within the project site and occur infrequently. Given mandatory compliance with BAAQMD rules, the Metro Plan in combination with other past, present, and reasonably foreseeable future projects would not result in significant odor impacts. The cumulative impact would be less than significant.

#### 4.1.4.3 Conclusion

The Certified EIR concluded that cumulative impacts on to air quality would be significant and unavoidable due to conflicts with air quality plans and criteria air pollutants due to operation. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a significant and unavoidable cumulative impact on air quality due to impacts during construction and operation related to regional criterial pollutants quality impacts and exposing adjacent receptors to significant health risks. The Project Change would result in new cumulative air quality impacts (criteria air pollutants during construction and exposing adjacent receptors to significant health risks) and substantially more severe cumulative air quality impacts (criteria air pollutants during operation) than what was analyzed in the Certified EIR.

### 4.1.5 Biological Resources

**Impact C-BIO-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative biological resources impacts.**

#### 4.1.5.1 Certified EIR Conclusion

The Certified EIR concluded that cumulative biological resources impacts would be less than significant because impacts would be limited to disturbed barren or ruderal vegetation types.

#### 4.1.5.2 Cumulative Impact Analysis

The cumulative geographic context for biological resources is the immediate vicinity of Metro Plan Area, which is the area where construction activities, including tree removal, could potentially affect biological resources including nesting special-status bird and bat species, nesting migratory birds, and protected trees that may be present on or near the site. The cumulative projects located within approximately 0.5 mile of the Metro Plan Area are described in Table 4-1.

Similar to the Metro Plan, the sites for cumulative projects primarily contained disturbed areas with buildings and landscaping; therefore, habitat for candidate, sensitive, or special-status species is marginal. The future cumulative projects would primarily involve the construction of new buildings on previously developed sites or modifications to existing buildings or infrastructure, and associated tree removals. Therefore, as with the Metro Plan, such development could have an impact on nesting special-status bird and bat species, nesting migratory bird species, the movement of native resident or migratory wildlife species, established native resident or migratory wildlife corridors, the use of native wildlife nursery sites, and local policies or ordinances for protecting biological resources. In addition, there are jurisdictional waters in the City of Milpitas, and these may also be affected by the

cumulative projects. Cumulative impacts on these biological resources could be significant because reasonably foreseeable projects would affect or remove additional structures and trees and erect new structures. Structures and trees provide roosting and nesting habitat for special-status and migratory birds and act as potential nursery sites; new structures could affect the movement of species. However, these future projects would also be subject to the requirements of the wildlife protection laws, including the California Endangered Specs Act, Migratory Bird Treaty Act, and the California Fish and Game Code, as well as wildlife protection policies and provisions in the 2040 General Plan. This includes 2040 General Plan Action CON-3b, which requires mitigation when sensitive biological habitat has been identified on or immediately adjacent to a project site, providing protection for special-status species including burrowing owl. Nonetheless, cumulative impacts on these biological resources would be potentially significant because reasonably foreseeable projects could affect or remove a substantial number of structures and trees and erect new structures. As identified in the Initial Study, the Metro Plan includes a policy to protect nesting birds (Policy SC 5.1), policies to minimize bird strikes (Policy SC 5.2), a policy to protect roosting bats (Policy SC 5.3), and policies requiring coordination with jurisdictional agencies and the implementation of development standards to minimize impacts on riparian areas and creeks (Policies SC 8.1, SC 8.2, SC 8.3). Implementation of these policies would ensure that the Metro Plan's contribution to cumulative impacts on biological resources would be less than cumulatively considerable.

#### 4.1.5.3 Conclusion

The Certified EIR concluded that cumulative impacts related to biological resources would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to biological resources. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative biological resources impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

### 4.1.6 Cultural Resources

**Impact C-CUL-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative cultural resources impacts.**

#### 4.1.6.1 Certified EIR Conclusion

The Certified EIR concluded that cumulative cultural resources impacts would be less than significant because impacts because significant resources that could be affected by construction activities would be avoided, or if this is not possible, recovered for scientific value.

#### 4.1.6.2 Cumulative Impact Analysis

The cumulative geographic context for historical resources is the Metro Plan Area. The Metro Plan Area is 510 acres and as discussed in the Initial Study (Appendix B) has the potential to include potential historic resources. For historic resources, a cumulative impact would be one in which the

impacts from multiple projects combine to affect the same historic resource, exceeding established thresholds. One way in which this could happen is by multiple projects physically affecting the same resource. This is unlikely because historic structures are likely to be buildings and are unlikely to be affected my multiple projects. Nonetheless, the Initial Study included an analysis of the potential impacts of potential historic resources in the Metro Plan Area.

The Initial Study identified that future projects in the Metro Plan Area would be required to implement Metro Plan Policy SC 1, which establishes a review process that evaluates the historical significance of historic-aged built-environment resources in the Metro Plan Area at the time a future project is proposed, and which requires that future project design be assessed for its conformance with the Secretary of the Interior's Standards. The Initial Study concluded that after implementation of this policy, impacts to any historic resources within the Metro Plan Area would be less than significant. Because all future projects in the Metro Plan Area would be required to follow this policy that identifies and protects historic resources, multiple projects would not combine to result in a cumulative impact on historic resources.

A second way in which there could be a cumulative impact would be if multiple projects were constructed near a historic resource and the construction of these cumulative projects resulted in a change to the setting, such that the historic building would no longer be considered historic. This is unlikely to occur because the Metro Plan Area and its vicinity is in a highly urbanized area that has undergone drastic changes in the last decade. New residential, office, and retail uses have been added to the Metro Plan Area, associated with buildout of the TASP. Considering the urban nature of the area, as well as the changes that have recently occurred, it is unlikely that cumulative projects would change the setting of the area, such that a cumulative impact would occur on the historic status of historic resources. As such, cumulative impacts on historic resources would be less than significant.

The cumulative geographic context for archaeological resources and human remains is the immediate vicinity of the project site, which is the area where construction activities, including ground-disturbing activities, could encounter archaeological resources and human remains that may be present on or near the site. The cumulative projects located within approximately 0.5 mile of the Metro Plan Area are described in Table 4-1. The cumulative projects in the vicinity of the project site would be constructed on infill sites in highly disturbed areas. It is likely that the cumulative projects would be constructed on sites where the ground surface has been disturbed and/or covered with fill and gravel.

Similar to the Metro Plan, all cumulative projects would be required to adhere to the actions in the 2040 General Plan, including Action CON-4a, which requires surveys prior to approval of any project that would require excavation in an area that is sensitive for cultural or archaeological resources and Action CON-4b, which provides guidance for the inadvertent discovery of previously unknown archaeological resources. Action CON-4b also requires that if human remains are encountered during construction and are determined to be of Native American origin, then the NAHC and MLDs must be consulted. In addition, all cumulative projects would be required to adhere to Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the California Public Resources Code (if the remains are Native American), which provides guidance for the treatment of human remains. Because all cumulative projects, as well as the Metro Plan would be required to adhere to these actions and regulations that protect archaeological resources, then cumulative impacts on archaeological resources would be less than significant.

### 4.1.6.3 Conclusion

The Certified EIR concluded that cumulative impacts related to cultural resources would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to cultural resources. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative cultural resources impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## 4.1.7 Energy

**Impact C-EN-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to energy impacts.**

### 4.1.7.1 Certified EIR Conclusion

The Certified EIR concluded that the impact of increased energy consumption in the Transit Area is less than significant. The Certified EIR identified that this would be considered a project-level impact, as well as a cumulative impact.

### 4.1.7.2 Cumulative Impact Analysis

The cumulative geographic context for energy is the service area of PG&E (i.e., the electric and natural gas service area), which comprises the larger Northern California area. Continued growth throughout PG&E's service area could contribute to ongoing increases in demand for electricity and natural gas. These anticipated increases would be countered, in part, as state and local requirements related to renewable energy become more stringent and energy efficiency increases. The extent to which cumulative development through 2040, the Metro Plan's buildout year, could result in the wasteful, inefficient, or unnecessary consumption of energy resources would depend on the specific characteristics of new development, which are not known at this time. SB 100 obligates utilities to supply 100 percent carbon-free electricity by 2045. PG&E reached California's 2020 renewable energy goal 3 years ahead of schedule and is currently projected to meet the new SB 100 goal, which calls for 60 percent renewable energy by 2030, ahead of schedule. Similarly, the Pavley standards are expected to increase average fuel economy to roughly 54.5 miles per gallon by 2025, thereby lowering the demand or fossil fuels. Therefore, it is anticipated that future energy users will become more efficient and less wasteful over time.

The Metro Plan requires building design features that reduce energy consumption and increase renewable energy generation. This includes the electrification of all new developments by prohibiting natural gas infrastructure (Policy CB 7.2.2 and Policy CB 7.2.3), installation of photovoltaic solar systems and implementing solar management plans (Policy CB 7.2.1 and Policy CB 7.3.1), onsite renewable energy generation (Policy CB 7.3), and overall energy reduction uses (Policy CB 7.2). Furthermore, the City's 2040 General Plan Policy CON 1-3 recommends that new development achieve LEED certification and exceed the most current CalGreen codes. Because buildout under the Metro Plan would not result in the wasteful, inefficient, or unnecessary consumption of energy resources, and because cumulative development would be subject to

increasingly robust standards regarding energy efficiency and would be required to comply with all adopted state and local renewable energy and energy efficiency regulations and plans, the cumulative impact would be less than significant.

#### 4.1.7.3 Conclusion

The Certified EIR concluded that cumulative impacts related to energy would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to energy. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative energy impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

### 4.1.8 Geology and Soils

**Impact C-GEO-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative geology and soils impacts.**

#### 4.1.8.1 Certified EIR Conclusion

The Certified EIR concluded that cumulative geology and soils impacts would be less than significant because all future projects would be required to adhere to existing regulations.

#### 4.1.8.2 Cumulative Impact Analysis

In general, a project's potential impacts related to geology and soils are individual and localized, depending on the project site and underlying soils. Each structure will have different levels of excavation, cut-and-fill work, and grading, which would affect local geologic conditions in different ways. Therefore, the geographic context for cumulative impacts to geology and soils is site-specific.

The cumulative projects located within approximately 0.5 mile of the Metro Plan Area are described in Table 4-1. The cumulative projects could require various levels of excavation or cut-and-fill, which would affect local geologic conditions. However, the cumulative projects would be required to go through environmental and regulatory review and comply with local and state building codes. In addition, each project would also be required to have a site-specific geotechnical investigation performed, which would provide design recommendations to reduce each project's impacts related to geologic and seismic safety. Similar to the Metro Plan, mandatory seismic safety standards, design review and conditions of approval would apply to the reasonably foreseeable future projects. For these reasons, the Metro Plan, in combination with other past, present, and reasonably foreseeable future projects, would not result in a cumulative geology and soils impact. The cumulative impact would be less than significant. No mitigation is required.

The geographic context for paleontological resources is the full extent of geologic units with high or unknown paleontological sensitivity that underlie the construction area. For purposes of evaluating potential cumulative impacts on paleontological resources, the cumulative projects are those located within approximately 0.5 mile of the project site, as shown in Table 4-1. The cumulative projects in the geographic context for paleontological resources would be constructed on infill sites in highly

disturbed areas. It is likely that the cumulative projects would be constructed on sites where the ground surface has been disturbed and/or covered with fill and gravel. However, deep excavation could reach areas of undisturbed native sediments that could contain significant paleontological resources. Reasonably foreseeable projects planned or proposed for construction on these sensitive geologic units could encounter paleontological resources. However, all cumulative projects within the City of Milpitas would be required to adhere to 2040 General Plan Action CON 4b, which requires appropriate protection and preservation measures, in the event paleontological resources are encountered during construction. Because future projects in the Metro Plan, as well as any other cumulative projects in the City of Milpitas would be required to implement 2040 General Plan Action CON 4b, the Metro Plan, in combination with other past, present, and reasonably foreseeable future projects, would not result in a cumulative paleontological resources impact. The cumulative impact would be less than significant. No mitigation is required.

#### 4.1.8.3 Conclusion

The Certified EIR concluded that cumulative impacts related to geology and soils would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to geology and soils. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative geology and soils impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

### 4.1.9 Greenhouse Gas Emissions

**Impact C-GHG-1: Implementation of the Metro Plan would result in new cumulative greenhouse gas emissions impacts that were not identified in the Certified EIR.**

#### 4.1.9.1 Certified EIR Conclusion

The Certified EIR identified that the GHG analysis in section 3.12 of the Certified EIR represents the cumulative air quality impacts for the TASP. As identified in Section 3.2, *Greenhouse Gas Emissions*, the Certified EIR concluded that GHG impacts would be less than significant, which would also be considered less than significant cumulative impacts.

#### 4.1.9.2 Cumulative Impact Analysis

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (e.g., ozone precursors), which are primarily pollutants of regional and local concern. Given the long atmospheric lifetimes, GHGs emitted by sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG emissions impacts are inherently cumulative. The analysis included in Section 3.2, *Greenhouse Gas Emissions* is inclusive of cumulative impacts. As documented in Section 3.2, *Greenhouse Gas Emissions*, GHG impacts would be considered significant and unavoidable. Accordingly, cumulative GHG impacts would also be considered significant and unavoidable.

### 4.1.9.3 Conclusion

The Certified EIR concluded that cumulative GHG impacts would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a significant and unavoidable cumulative GHG impact. The Project Change would result in new cumulative GHG impacts than what was analyzed in the Certified EIR.

## 4.1.10 Hazards and Hazardous Materials

**Impact C-HAZ-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative hazards and hazardous materials impacts.**

### 4.1.10.1 Certified EIR Conclusion

The Certified EIR concluded that cumulative hazards and hazardous materials impacts would be less than significant because the TASP would likely improve existing issues associated with soil and groundwater contamination and because of compliance with existing regulations.

### 4.1.10.2 Cumulative Impact Analysis

The cumulative geographic context for hazards and hazardous materials is the Metro Plan Area and nearby properties in the immediate vicinity. Similar to the Metro Plan, reasonably foreseeable projects could result in construction impacts related to the routine transport, disposal, or handling of hazardous materials; intermittent use and transport of petroleum-based lubricants, solvents, and fuels; and transport of affected soil to and from sites. However, hazardous waste generated during construction of any project would be collected, properly characterized for disposal, and transported in compliance with federal, state and local regulations as described in the Initial Study (Appendix B). Hazardous materials are strictly regulated by local, state, and federal laws. Specifically, these laws are designed to ensure that hazardous materials do not result in a gradual increase in toxins in the environment. For each of the reasonably foreseeable projects under consideration, various project-specific measures (such as the ones identified for this project) would be implemented as a condition of development approval to mitigate risks associated with exposure to hazardous materials. With implementation of applicable regulatory requirements, cumulative impacts related to hazards and hazardous materials would be less than significant, and the Metro Plan would not result in a cumulatively considerable contribution to a significant cumulative hazard or hazardous materials impact.

The Metro Plan would contribute to a cumulative increase in the amount of hazardous materials transported to and from the surrounding area. Cumulative increases in the transportation of hazardous materials and wastes would not be significant because the probability of accidents is relatively low due to stringent regulations that apply to transport, use and storage of hazardous materials. The Metro Plan, in combination with other development in the immediate vicinity would add to cumulative traffic congestion on those roadways used for evacuation. However, the 2040 General Plan EIR identifies that the 2040 General Plan would ensure “that the City’s emergency access routes, emergency contact lists, and public information regarding designated facilities and routes are regularly reviewed to ensure that up to date information is available to the City and the public in the event of an emergency” (City of Milpitas 2020b). As such cumulative impacts related to

interference with an adopted emergency response plan or emergency evacuation plan would be less than significant.

Development of the Metro Plan would contribute to a cumulative increase in the demand for emergency response capabilities. Any growth involving increased use of hazardous materials has the potential to increase the demand for emergency response capabilities. First response capabilities and hazardous materials emergency response capabilities are currently available and sufficient for all cumulative projects. Substantive hazardous materials accidents within the Metro Plan Area or its vicinity are expected to be rare, and if such incidents were to occur, only one such incident would be expected at any one time (except during major catastrophes).

For these reasons, the Metro Plan, in combination with other past, present, and reasonably foreseeable future projects located within the immediate vicinity of the Metro Plan Area, would not result in a significant cumulative hazards or hazardous materials impact. The cumulative impact would be less than significant.

### 4.1.10.3 Conclusion

The Certified EIR concluded that cumulative impacts related to hazards and hazardous materials would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to hazards and hazardous materials. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative hazards and hazardous materials impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## 4.1.11 Hydrology and Water Quality

**Impact C-HYD-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to hydrology and water quality impacts.**

### 4.1.11.1 Certified EIR Conclusion

The Certified EIR concluded that the TASP would decrease stormwater runoff through the implementation of more pervious surfaces and that cumulative projects and the TASP would not contribute to a cumulative impact because future projects would be required to mitigate specific hydrologic impacts on a project-by-project basis

### 4.1.11.2 Cumulative Impact Analysis

The cumulative geographic context for impacts related to surface water hydrology and water quality is the Lower Penitencia Creek-Frontal San Francisco Bay Estuaries watershed. The cumulative geographic context for impacts related to groundwater hydrology and water quality is the Santa Clara Valley Groundwater Basin. Given the size of each area, it is beyond the scope of this SEIR to identify every cumulative project within their boundaries. However, it is reasonable to assume that other cumulative projects would be similar to the past, present, and reasonably foreseeable future

projects identified within a 0.5-mile radius of the Metro Plan Area (refer to Table 4-1) in that they would be anticipated to consist predominantly of urban development on similar paved, in-fill sites.

Assuming concurrent implementation of the Metro Plan with other reasonably foreseeable cumulative development, adverse cumulative effects on hydrology and water quality could include construction impacts related to increases in stormwater runoff and pollutant loading to the San Francisco Bay. The Metro Plan, together with cumulative projects, could degrade stormwater quality during construction through land disturbance.

The cumulative geographic areas, inclusive of the Metro Plan Area, are fully developed. Buildout of cumulative projects would be anticipated to primarily involve redevelopment of existing developed sites that contain substantial impervious surfaces. The Metro Plan, together with cumulative projects, could degrade stormwater quality through an increase in potential runoff during construction. Like the Metro Plan, cumulative projects would be required to comply with the Construction General Permit to control runoff and regulate water quality at each development site, in addition to regional and local requirements regarding protection of water quality. Because cumulative projects would be required to adhere to the same regulations as the Metro Plan, cumulative impacts on water quality due to construction would be less than significant.

Buildout of cumulative projects, as well as the Metro Plan could result in an increase in discharges of pollutants in stormwater due to the new residents and additional vehicular traffic, which would result in pollutants in runoff. However, the Metro Plan would require the implementation of open space, in the form of parks and private open space that would be implemented by future developments. The Metro Plan would reduce the area of impervious surfaces and would reduce stormwater runoff. In addition, future developments in the Metro Plan and cumulative projects would be required to adhere to existing regulations that regulate the discharge of pollutants. As such, the Metro Plan would not contribute to a water quality impact due to buildout.

The Metro Plan is located in a flood hazard zone and other cumulative projects may also be located in a flood hazard zone. As described in the Initial Study, any projects that are located in a flood hazard zone, including cumulative projects would be required to adhere to regulations by stipulated by the Federal Emergency Management Agency and the National Flood Insurance Program. The City of Milpitas also has its own regulations to address development within flood hazard zones. Because cumulative projects and future projects in the Metro Plan would all be required to adhere to existing regulations, cumulative impacts related to the risk of release of pollutants due to flooding in flood hazard areas, would be less than significant.

The Metro Plan would not contribute to a cumulative impact related to groundwater recharge because the Metro Plan would increase the area of pervious surfaces and would not interfere with groundwater recharge. The Metro Plan would also not contribute to a cumulative impact related to the alteration of existing drainage patterns because the Metro Plan is not expected to alter the creeks in the Metro Plan Area (the Metro Plan includes setback requirements near creeks) and because the Metro Plan would decrease the area of impervious surfaces. Furthermore, because the Metro Plan Area is not within an area subject to flooding by tsunami or seiche, the Metro Plan would not contribute to a cumulative impact related to releasing pollutants due to inundation from tsunami or seiche.

### 4.1.11.3 Conclusion

The Certified EIR concluded that cumulative impacts related to hydrology and water quality would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to hydrology and water quality. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative hydrology and water quality impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## 4.1.12 Land Use

**Impact C-LU-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative land use impacts.**

### 4.1.12.1 Certified EIR Conclusion

The Certified EIR concluded that the TASP's incremental impact on land use would be less than significant because future projects would be required to mitigate their land use impacts.

### 4.1.12.2 Cumulative Impact Analysis

As discussed in Impact LU-1, the Metro Plan would result in no impact related to physically dividing an established community. For this reason, the Metro Plan would not result in a cumulatively considerable contribution to a cumulative impact related to physically dividing an established community.

CEQA requires an EIR to consider whether a proposed project may conflict with any applicable land use plan, policy, or regulation that was adopted for the purpose of avoiding or mitigating an environmental impact. For there to be a cumulative impact related to conflict with a land use plan, policy, or regulation that was adopted for the purpose of avoiding or mitigating an environmental impact, then multiple projects would have to result in several conflicts that would result in physical impacts on the environment that would exceed significance thresholds.

As documented in Impact LU-2, the Metro Plan would not conflict with the 2040 General Plan, Plan Bay Area 2050, or the Comprehensive Airport Land Use Plan for Santa Clara County for Norman Y. Mineta San Jose International Airport. In fact, the Metro Plan would support meeting the goals identified in the 2040 General Plan and the Plan Bay Area 2050 by creating neighborhoods where people can live and work near transit. For this reason, the Metro Plan would not contribute considerably to a cumulative impact related to conflicting with the 2040 General Plan or Plan Bay Area 2050. In addition, Impact LU-2 identifies that any future buildings that are greater than 200 feet would be required to adhere to procedures in the Comprehensive Airport Land Use Plan for Santa Clara County for Norman Y. Mineta San Jose International Airport, to minimize hazards. Because any future cumulative projects taller than 200 feet would be required to adhere to the same procedures, there would be no cumulative impact related to conflicts with the Comprehensive Airport Land Use Plan for Santa Clara County for Norman Y. Mineta San Jose International Airport.

### 4.1.12.3 Conclusion

The Certified EIR concluded that cumulative impacts related to land use would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have no cumulative impacts related to land use. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative land use impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## 4.1.13 Noise

**Impact C-NOI-1: Implementation of the Metro Plan would result in new cumulative noise impacts that were not identified in the Certified EIR.**

### 4.1.13.1 Certified EIR Conclusion

The Certified EIR concluded that cumulative noise impacts would be less than significant because the analysis in Section 3.7 of the Certified EIR is based upon the cumulative numbers of the traffic analysis, and therefore already represents a cumulative scenario that was found to be less than significant.

### 4.1.13.2 Cumulative Impact Analysis

The cumulative geographic context for noise and vibration varies, depending on the source of the noise or vibration. Specifically, the geographic context for cumulative construction noise impacts typically encompasses cumulative projects within 1,000 feet of the project site. Beyond 1,000 feet, the contributions of noise from the construction of other projects would be greatly attenuated through both distance and intervening structures, and their contribution would be expected to be minimal. The cumulative context for stationary-source noise impacts, such as noise effects from heating and cooling or other mechanical equipment, as well as vibration effects from construction activities is generally smaller than this distance (a few hundred feet, at most). Finally, cumulative impacts related to vehicular traffic noise are based on the overall forecast average daily traffic along roadway segments near the Metro Plan Area, which includes traffic increases from all growth in the Metro Plan Area, as predicted in the traffic model. The cumulative projects located within approximately 0.5 mile of the Metro Plan Area are described in Table 4-1.

#### Construction Noise

Construction noise is a localized impact that reduces as distance from the noise source increases. In addition, intervening features (e.g., buildings) between construction areas and nearby noise-sensitive land uses result in additional noise attenuation by providing barriers that break the line of sight between noise-generating equipment and sensitive receptors. These barriers can block sound wave propagation and somewhat reduce noise at a given receiver.

The cumulative setting for construction noise impacts is considered to be approximately 1,000 feet from the project site, since projects located within this distance could expose receptors between the two projects to noise, depending on the intervening distances. Only one cumulative project is located within 1,000 feet of the Metro Plan, and that's the 1000 Gibraltar Drive, located

approximately 500 feet from the Metro Plan Area. The schedule for this cumulative project is currently unknown at this time. As such, cumulative noise impacts could occur if construction of the 1000 Gibraltar Drive occurs concurrently with the construction of a future individual Metro Plan project. In addition, regarding the potential for construction noise from future individual Metro Plan projects to combine with construction noise from other future Metro Plan projects, should an individual receiver be located between two Metro Plan projects undergoing concurrent construction, that receiver may be exposed to greater noise levels than would be experienced from either project alone. In addition, the limits of the Milpitas Gateway-Main Street Specific Plan are adjacent to the limits of the Metro Plan. Because the Milpitas Gateway-Main Street Specific Plan has not yet been prepared, it is not currently known whether development would be proposed within 1,000 feet of the Metro Plan Area. Nonetheless, should an individual receiver be located between a Metro Plan project and a Milpitas Gateway-Main Street Specific Plan project undergoing concurrent construction, that receiver may be exposed to greater noise levels than would be experienced from either project alone.

As discussed in Chapter 3.4, *Noise*, of this SEIR, the requirements in Action N-1d of the General Plan would apply to all development under the Metro Plan, as well as the Milpitas Gateway-Main Street Specific Plan and would reduce impacts related to construction noise in the Metro Plan Area and the Milpitas Gateway-Main Street Specific Plan. However, it is not possible to ensure that in all instances and for all future projects, mitigation measures would reduce construction noise to less-than-significant levels. Therefore, even with the requirement that mitigation measures be applied to reduce construction noise for future projects, it was determined that some future projects may result in significant construction noise impacts that cannot be reduced to less-than-significant levels with mitigation.

Direct impacts related to construction noise were determined to be significant and unavoidable. Similarly, construction noise from individual Metro Plan projects could combine with construction noise from other Metro Plan projects or Milpitas Gateway-Main Street Specific Plan project to result in a cumulative construction noise impact. Because concurrent construction of multiple projects could expose individual receivers located between two Metro Plan projects to greater construction noise levels than would be experienced from either project alone, because concurrent construction of multiple projects could expose individual receivers located between a Metro Plan project and a Milpitas Gateway-Main Street Specific Plan project to greater construction noise levels than would be experienced from either project alone, and because direct construction noise impacts would be considered significant and unavoidable, cumulative construction noise impacts would also be significant and unavoidable*.*

## Operational Noise

### Traffic

To determine potential cumulative traffic noise impacts in the Metro Plan Area, traffic volumes from buildout of the 2040 General Plan (assumes full buildout of the TASP but no buildout of the Metro Plan) was compared to full buildout of the Metro Plan in 2040. The analysis in Impact NOI-2 included this analysis and is therefore considered cumulative in nature. As described in Impact NOI-2, traffic noise increases (i.e., comparison of 2040 General Plan buildout with 2040 Metro Plan buildout) along the roadway segments in the Metro Plan Area could be up to 0.8 dB, with some instances of noise reduction (i.e., a decrease in noise of up to 1 dB). Because the traffic noise increases along all analyzed roadway segments would be below the 1.5 dB, 3 dB, and 5 dB

thresholds from the 2040 General Plan (described in Impact NOI-2), traffic noise impacts from implementation of the Metro Plan would be less than significant. Cumulative traffic noise impacts would be less than significant.

### Operational Mechanical Equipment Noise

In general, most operational sources of noise do not generate noise that is perceptible far beyond the edge of a project site. Although noise from Metro Plan heating and cooling equipment would be localized and would attenuate rapidly with distance, it is possible that heating and cooling equipment could generate noise in excess of allowable levels, depending on the type of equipment installed and the location of the equipment. It is also possible that noise-generating uses from nearby projects could be close enough to one another that heating and cooling noise from multiple projects could combine and result in a cumulative noise impact.

Only one cumulative project, the 1000 Gibraltar Drive Project, is located within 1,000 feet of the Metro Plan. This project is located approximately 500 feet from the Metro Plan Area and would involve the installation of HVAC units and/or exhaust fans. There are no existing noise-sensitive receptors located between this project and the proposed Metro Plan Area. In addition, according to the EIR for the 1000 Gibraltar Drive Project, the nearest residential receptors to 1000 Gibraltar Drive are over 575 feet from the project rooftop equipment (City of Milpitas 2020a). Mechanical equipment noise levels at these nearby residences were estimated to be 35 dBA in the EIR noise analysis; impacts were determined to be less than significant, and no mitigation was required. For these reasons, noise from equipment at 1000 Gibraltar Drive would not be expected to combine with noise from Metro Plan HVAC or mechanical equipment to expose the same receptors to greater HVAC/mechanical equipment noise levels than would be experienced from either project alone.

Regarding the potential for mechanical equipment noise from future individual Metro Plan projects to combine with mechanical equipment noise from other future Metro Plan projects, the specific locations and equipment details for future projects are not known at this time. However, it is possible that equipment noise from multiple future Metro Plan projects could be located close enough to one another to combine, and to expose individual receptors to greater noise levels than they would experience from one project alone. Cumulative impacts from Metro Plan mechanical equipment noise would be considered significant.

With implementation of Metro Plan Mitigation Measure NOI-1, which requires the applicants of future Metro Plan projects to implement measures to ensure mechanical equipment noise levels are below allowable limits, impacts from mechanical equipment noise would be reduced to below the allowable levels. Cumulative mechanical equipment noise impacts would be less than significant with mitigation.

Emergency generators included in the development of future buildings under the Metro Plan would result in the generation of audible noise during testing. With regard to the potential for cumulative impacts, the nearest cumulative project to the Metro Plan Area is the 1000 Gibraltar Drive Project, located 500 feet from the Metro Plan Area. The Draft EIR for the 1000 Gibraltar Drive Project identified that the project would include emergency generators. Should generator testing occur simultaneously for a nearby project and the Metro Plan, a potential cumulative impact could occur.

Emergency generators are tested intermittently (often on the order of once per month for 30 to 60 minutes), and their use is often exempted during actual emergencies. Although specific details

regarding the emergency generators proposed for the Metro Plan or nearby cumulative projects are not known at this time, in general, it is very unlikely that the testing of an emergency generator for the Metro Plan would occur concurrently with the testing of a generator at a nearby project. Even if testing were to occur simultaneously, which is unlikely, it is not likely that the generators would be close enough to one another for the noise to combine at a given individual receptor. Cumulative noise impacts related to emergency generator testing would be less than significant.

### Vibration

Vibration impacts are based on instantaneous PPV levels. Therefore, because PPV is a measure of the peak instantaneous vibration level, rather than an average, other sources of vibration operating simultaneously (e.g., for other project sites, or even on the same project site) would not be expected to combine to raise the overall peak vibration level experienced at a nearby sensitive use. Worst-case ground-borne vibration levels are generally determined by whichever equipment generates the highest vibration level at the affected location, so vibration would be dominated by the closest and most vibration-intensive equipment being used at a given time. For example, unlike the analysis for average noise levels, in which noise levels of multiple pieces of equipment can be combined to generate a maximum combined noise level, instantaneous peak vibration levels do not combine in this way**.** Vibration from multiple construction sites, even if they are close to one another, would not combine to raise the maximum PPV level at sensitive uses near the project site. For this reason, the cumulative impact of construction vibration from multiple construction projects near one another (or even adjacent to one another) would generally not combine to increase PPV vibration levels. Therefore, the cumulative geographic context for vibration is highly localized.

The cumulative projects located within approximately 0.5 mile of the Metro Plan Area are described in Table 4-1. The nearest cumulative project to the Metro Plan Area is the 1000 Gibraltar Drive Project, located 500 feet from the Metro Plan Area. At this distance, peak vibration levels resulting from construction of the Metro Plan would not be expected to combine with vibration effects from the construction of this cumulative project, even if they were to be under construction simultaneously. Therefore, cumulative ground-borne vibration impacts related to both potential damage and annoyance would be less than significant.

As discussed in Impact NOI-4, the Metro Plan would be no impact related to exposing people residing or working in the Metro Plan Area to excessive aircraft noise levels. For this reason, the Metro Plan would not result in a cumulatively considerable contribution related to exposing people residing or working in the Metro Plan Area to excessive aircraft noise levels.

## 4.1.13.3 Conclusion

The Certified EIR concluded that cumulative impacts related to noise would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a significant and unavoidable cumulative noise impact, related to cumulative construction noise impacts. In addition, the Project change would have a less than significant with mitigation cumulative impact related to operational mechanical equipment noise. The Project Change would result in new cumulative noise impacts (significant and unavoidable construction noise impacts; and less than significant with mitigation operational mechanical equipment noise impacts) than what was analyzed in the Certified EIR.

# 4.1.14 Population and Housing

**Impact C-POP-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative population and housing impacts.**

## 4.1.14.1 Certified EIR Conclusion

The Certified EIR did not include a conclusion for cumulative population and housing impacts.

## 4.1.14.2 Cumulative Impact Analysis

As previously discussed, Plan Bay Area 2050 is the current Regional Transportation Plan and Sustainable Communities Strategy adopted by the Metropolitan Transportation Commission and ABAG in October 2021, in compliance with California's governing greenhouse gas reduction legislation, SB 375. Plan Bay Area 2050 identifies growth geographies, used to guide where future growth in housing and jobs would be focused. These growth geographies include areas near transit.

As discussed in Impact POP-1, the Metro Plan would result in planned growth and not unplanned growth. The Metro Plan would spur growth consistent with what is envisioned in the Plan Bay Area 2050, meaning housing and land uses that generate employment in proximity to transit. Because the Metro Plan would not result in unplanned population growth, the Metro Plan would not result in a cumulatively considerable contribution to unplanned population growth.

As discussed in Impact POP-2, the Metro Plan would result in no impact related to displacing substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. For this reason, the Metro Plan would not result in a cumulatively considerable contribution to displacing substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

## 4.1.14.3 Conclusion

The Certified EIR did not include a conclusion related to cumulative population and housing impacts. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to population and housing. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

# 4.1.15 Public Services and Recreation

**Impact C-PS-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative public services and recreation impacts.**

## 4.1.15.1 Certified EIR Conclusion

The Certified EIR concluded that cumulative impacts to police services, fire services, and parks would be less than significant because new development would provide required parkland to serve

its residents and would pay fair share for police and fire equipment. The Certified EIR also concluded that cumulative impacts to schools would be significant and unavoidable. It should be noted that in the Response to Comments of the Certified EIR, the conclusion of the TASP's impacts on schools was updated from significant and unavoidable to less than significant; however, the conclusion in the Cumulative Impacts section was not updated.

### 4.1.15.2 Cumulative Impact Analysis

The geographic context for cumulative impacts related to schools, fire protection, police protection, and recreational resources is the City because these services are provided on a Citywide basis. The Metro Plan, in combination with other past, present, and reasonably foreseeable projects, would increase the number of residents and employees in the City, leading to an increase in demand for schools, fire protection, police protection, and recreational facilities.

With respect to schools, any cumulative projects within the City that would generate school-aged children would be required to pay for school impact fees per California Government Code Sections 65995–65998. As described in Impact PS-1, California Government Code Sections 65995–65998 set forth provisions for the payment of school impact fees by new development as the exclusive means of "considering and mitigating impacts on school facilities that occur or might occur as a result of any legislative or adjudicative act, or both, by any state or local agency involving, but not limited to, the planning, use, or development of real property" (Section 65996(a)). The legislation goes on to say that the payment of school impact fees is "hereby deemed to provide full and complete school facilities mitigation" under CEQA [Section 65996(b)]. Because all cumulative projects would be required to adhere to California Government Code Sections 65995–65998, cumulative impacts on schools would be less than significant.

With respect to fire protection and police protection services, the 2040 General Plan includes a range of policies and actions that would ensure that public services are provided in a timely fashion, are adequately funded, are coordinated between the City and appropriate service agency, and that new development funds its fair share of services. The 2040 General Plan includes policies to ensure that fire protection and law enforcement services keep pace with new development. Payment of applicable impact fees, and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the future projects, would ensure that the City maintains acceptable service ratios. Thus, cumulative impacts related to fire protection and police protection services would be less than significant.

With regard to recreational facilities, the 2040 General Plan includes a range of policies and actions to ensure that parks and recreational facilities are adequately funded, and that new development funds its fair share of services needed to meet 2040 General Plan objectives. New development is required to participate in the provision and expansion of public services, recreational amenities, and facilities, and is also required to demonstrate that the City's public services and facilities can accommodate the increased demand for said services and facilities associated with future projects during the entitlement process. Thus, cumulative impacts related to recreational facilities would be less than significant.

### 4.1.15.3 Conclusion

The Certified EIR concluded that cumulative impacts related to fire protection, police protection, and recreation would be less than significant, and that cumulative impacts to schools would be

significant and unavoidable. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to public services and recreation. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative public services and recreation impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## 4.1.16 Transportation

### Impact C-TR-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to cumulative transportation impacts.

### 4.1.16.1 Certified EIR Conclusion

The Certified EIR identified that the transportation analysis in section 3.3 of the Certified EIR represents the cumulative air quality impacts for the TASP. As identified in Section 3.7, *Transportation*, the Certified EIR did not include conclusions related to conflicts with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities; VMT; increased hazards due to a geometric design feature; or emergency access. As such, no cumulative transportation impacts were discussed in the Certified EIR.

### 4.1.16.2 Cumulative Impact Analysis

Cumulative plus-Project conditions represent the 2040 future baseline condition with the addition of the buildout of the Metro Plan.

As identified in Impact TR-1, the Metro Plan would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. In fact, the Metro Plan would help implement plans through the creation of a multimodal network and by placing housing and land uses that generate employment near transit. Because the Metro Plan would not conflict with plans related to the circulation system, including transit, roadway, bicycle, and pedestrian facilities, the Metro Plan would not result in a cumulatively considerable contribution to a cumulative impact.

As identified in Impact TR-2, buildout of the General Plan in 2040 (without the Metro Plan) is expected to have a higher VMT per service population, per capita, and per employee than full buildout of the Metro Plan by 2040 (see Table 3.7-5). Due to the addition of dense housing and land uses that would generate employment near transit, the Metro Plan is expected to reduce VMT on a per unit basis. For this reason, the Metro Plan would not result in a cumulatively considerable contribution to a cumulative impact related to VMT.

As discussed under Impact TR-3, the Metro Plan would have a less-than-significant impact related to design hazards. The design of new streets, circulation improvements, and access points associated with cumulative development projects would be reviewed for compliance with safety guidelines and standards as part of the development review process. In addition, potential design hazards are generally site-specific, the cumulative development projects outside the Metro Plan Area would be

unlikely to have the potential to combine with the project to create a substantial design hazard. Cumulative impacts would be less than significant.

As discussed under Impact TR-4, the Metro Plan would have a less-than-significant impact related to emergency access. Emergency vehicles would use signal preemption technology (where possible) and sirens to maintain adequate response times. To the extent that cumulative development projects would result in reduced vehicular travel times along roadways in the Metro Plan Area, analysis of potential impacts emergency response time would need to be conducted and measures would need to be developed to address such impacts. Cumulative impacts would be less than significant.

### 4.1.16.3 Conclusion

The Certified EIR did not include a conclusion related to cumulative transportation impacts. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to transportation. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## 4.1.17 Utilities and Service Systems

**Impact C-UTIL-1: Implementation of the Metro Plan would not result in new or substantially more severe impacts than what was identified in the Certified EIR related to utilities and service systems impacts.**

### 4.1.17.1 Certified EIR Conclusion

The Certified EIR concluded that cumulative impacts on utilities and service systems would be less than significant because infrastructure improvement, including water and sewer mains, will alleviate deficiencies in distribution and collection capacity brought on by the increased residential density and because future development projects would be required to mitigate impacts on a project-by-project basis.

### 4.1.17.2 Cumulative Impact Analysis

The cumulative geographic contexts for utilities and service systems are the service territories of the various utility providers. For water, the geographic context is the City's water supply from SFPUC and Valley Water. For wastewater, the geographic context is the eight cities and four sanitation districts that flow to the San Jose/Santa Clara Water Pollution Control Plant. For stormwater, the geographic context is the Lower Penitencia Creek-Frontal San Francisco Bay Estuaries watershed. For solid waste, the geographic context is the service areas of the Kirby Canyon Landfill. For electricity, natural gas, and telecommunications, the geographic context is the service areas of PG&E and the various telecommunication providers. Given the size of each area, it is beyond the scope of this EIR to identify every cumulative project within their boundaries.

Over time, growth throughout the City and county will result in increased demand for water, wastewater treatment, solid waste disposal, natural gas, electricity, and telecommunications. Citywide and countywide growth would also generate increased demand for utilities. Much of the

analysis presented in Section 3,8, Utilities and Service Systems also includes analysis of potential cumulative impacts to utilities and service systems. The Metro Plan, in combination with other cumulative development, would result in increased demands on utilities and service systems, as summarized below.

## New or Expanded Water, Wastewater Treatment or Storm Water Drainage, Electric Power, Natural Gas, or Telecommunications Facilities

The City's Water Master Plan takes into account anticipated development in the City and was updated in 2002, 2009, and 2021. Therefore, the Sewer Master Plan evaluates impacts related to water facilities from cumulative projects. The Water Master Plan identifies the capital improvements needed to address supply capacity, storage capacity, pumping capacity, and the distribution system. As such, the City has already identified the infrastructure needed to address growth in the City and will implement these facilities to address cumulative growth. Because the City has already identified the water infrastructure that would be needed to address cumulative growth, cumulative projects would not require or result in the relocation or construction of new or expanded water facilities beyond the facilities already identified in the Water Master Plan. The cumulative impact would be less than significant.

The City's Sewer Master Plan takes into account anticipated development in the City and was updated in 2004, 2009, and 2021. Therefore, the Sewer Master Plan evaluates impacts related to wastewater facilities from cumulative projects. The Sewer Master Plan identifies the capital improvements needed to address sewer infrastructure with risk of failure. As such, the City has already identified the infrastructure needed to address growth in the City and will implement these facilities to address cumulative growth. Because the City has already identified the sewer infrastructure that would be needed to address cumulative growth, cumulative projects would not require or result in the relocation or construction of new or expanded sewer facilities beyond the facilities already identified in the Sewer Master Plan. The cumulative impact would be less than significant.

The City's Storm Drain Master Plan takes into account anticipated development in the City and was updated in 2001, 2013, and 2021. Therefore, the Storm Drain Master Plan evaluates stormwater drainage impacts from cumulative projects. The Storm Drain Master Plan identifies the capital improvements needed to maintain recommended levels of protection against local flooding from stormwater runoff and to keep the storm drain system in working order into the future. As such, the City has already identified the infrastructure needed to address growth in the City and will implement these facilities to address cumulative growth.

Additionally, cumulative development would likely be constructed on infill sites in highly urbanized areas where there is a substantial amount of existing impervious surface area. All cumulative projects would be required to include post-construction stormwater management features, such as LID measures, to reduce flows to pre-project conditions. New projects would be subject to the requirements of the San Francisco Bay MS4 Permit, the Construction General Permit, and the City's General Plan and Municipal Code related to protecting water resources. Thus, the Metro Plan, in combination with anticipated cumulative development, would not substantially increase impervious surfaces compared to existing conditions. Pervious surfaces would increase under the Metro Plan; accordingly, post-construction peak stormwater flows would not increase compared to existing conditions. For these reasons, the Metro Plan, in combination with other past, present, and

reasonably foreseeable future projects, would not result in a significant cumulative stormwater facilities impact. The cumulative impact would be less than significant.

The cumulative development in the PG&E and telecommunication providers service areas would likely be constructed on infill sites in highly urbanized areas; it is anticipated that these cumulative projects would not substantially increase electric power, natural gas, and telecommunications demands. There are also no known capacity limitations within the existing electrical system or gas system. Service providers of these utilities will be able to serve new cumulative development from known and available sources. In addition, similar to the proposed project, the anticipated cumulative development would comply with all applicable City and state water conservation measures, including title 24, part 6, the California Energy Code, with baseline standard requirements for energy efficiency; the 2019 Building Energy Efficiency Standards; and the 2019 CALGreen Code. For these reasons, the Metro Plan, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative natural gas, electricity, and telecommunications demand and facilities impact. The cumulative impact would be less than significant.

## Water Supplies and Wastewater Treatment Capacity

Regarding water supply, The analysis in Impact UTIL-2 is inherently cumulative because it is based on demand and supply projections for the City in the 2020 UWMP. For the reasons identified in Impact UTIL-2, cumulative impacts on water supplies during normal, dry, and multiple dry years, would be less than significant.

Regarding wastewater treatment capacity, the analysis in Impact UTIL-3 estimated the amount of wastewater that would be generated in 2040 by adding the estimated wastewater that would be generated by the Metro Plan in 2040 to the projected estimated wastewater that would be generated by the future growth in the City in 2040, as identified in the 2020 UWMP. As such, the analysis in Impact UTIL-3 is inherently cumulative. For the reasons identified in Impact UTIL-3, cumulative impacts on wastewater treatment capacity would be less than significant.

## Solid Waste

Construction of the Metro Plan, as well as construction activities required for cumulative development within the service areas of the Kirby Canyon Landfill, would generate substantial solid waste, including demolition waste. However, all of these projects would be required to comply with regulations requiring waste diversion (i.e., AB 939, City's Source Reduction and Recycling Program, and IWMP). Therefore, through compliance with local requirements, the Metro Plan, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative construction-generated solid waste impact related to solid waste generation or failure to comply with federal, state, and local management and reduction statutes and regulations related to solid waste. The cumulative impact would be less than significant.

In 2020, residents of the city generated approximately 3.7 pounds of solid waste per capita per day and employees within the city generated 5.7 pounds of solid waste per capita per day (Cal Recycle 2021). CalRecycle's 2020 disposal goals for the city were 6.3 pounds per day for residents and 9.7 pounds per day for employees; therefore, the city met its per capita solid waste disposal goals in 2020 (Cal Recycle 2021). The anticipated cumulative development within the service areas of Kirby Canyon Landfill would incrementally increase the amount of solid waste generated by increasing the number of employees and residents in the service areas; excavation, demolition, and

remodeling activities associated with growth would also increase total solid waste generation. However, the Kirby Canyon Landfill had a remaining capacity of approximately 16,191,600 cubic yards as of 2015. The Metro Plan, in combination with anticipated cumulative development, would generate a small amount of solid waste in comparison to the total remaining capacities of the landfill.

In addition, the increasing rate of diversion citywide and in the service areas, achieved through recycling, composting, and other methods, would decrease the total amount of waste deposited in landfills. The Metro Plan, in combination with the anticipated cumulative development in the service areas, would not cause a significant impact on regional landfill capacity because the projects would be required to comply with the City's waste reduction and diversion requirements. Compliance with such regulatory requirements would reduce the Metro Plan's and the cumulative projects' contribution to overall solid waste volumes generated during construction and operation.

Given the future long-term capacity available at Kirby Canyon Landfill, the Metro Plan and anticipated cumulative development in the services areas would be served by a landfill with adequate permitted capacity to accommodate their solid waste disposal needs. For these reasons, the Metro Plan, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative solid waste impact related to solid waste generation or failure to comply with federal, state, and local management and reduction statutes and regulations related to solid waste. The cumulative impact would be less than significant.

### 4.1.17.3 Conclusion

The Certified EIR concluded that cumulative impacts related to utilities and service systems would be less than significant. Based on the analysis above, with incorporation of the Project Change, the Metro Plan would have a less than significant cumulative impact related to utilities and service systems. The Project Change would not alter the result of the Certified EIR's impact determination related to cumulative utilities and service systems impacts. The Project Change would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR.

## 4.2 Significant and Unavoidable Impacts

Section 15126.2(b) of the State CEQA Guidelines requires an EIR to describe any significant impacts that cannot be mitigated to a level of insignificance. All of the impacts associated with the Project Change would be less than significant or reduced to a less-than-significant level through the implementation of identified mitigation measures with the following exception:

- Impact AQ-2a: Construction of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.
- Impact AQ-2b: Operation of the Metro Plan would result in a substantially more severe significant air quality impact than that identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.

- Impact AQ-3: Implementation of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to exposing sensitive receptors to substantial pollutant concentrations.
- Impact GHG-1: Implementation of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to the generation of GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.
- Impact NOI-1: Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.
- Impact NOI-3: Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to exposing persons to or generating excessive ground-borne vibration or ground-borne noise levels.
- Impact C-AQ-1: Implementation of the Metro Plan would result in new and substantially more severe cumulative air quality impacts that were not identified in the Certified EIR.
- Impact C-GHG-1: Implementation of the Metro Plan would result in new cumulative greenhouse gas emissions impacts that were not identified in the Certified EIR.
- Impact C-NOI-1: Implementation of the Metro Plan would result in new cumulative noise impacts that were not identified in the Certified EIR.

## 4.3 Significant Irreversible Environmental Changes

In accordance with CEQA Section 21100(b)(2)(B), and CEQA Guidelines Section 15126.2(c), an EIR must identify any significant irreversible environmental changes that could result from implementation of the proposed project. An EIR is required to consider whether "uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or non-use thereafter unlikely" (per CEQA Guidelines Section 15126.2[c]). "Nonrenewable resource" refers to the physical features of the natural environment, such as land, waterways, etc. This may include current or future uses of non-renewable resources and secondary or growth-inducing impacts that commit future generations to similar uses. According to the CEQA Guidelines, irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified.

The Initial Study (Appendix B) and Chapter 3 of this SEIR discusses topics that could be affected by irreversible environmental impacts, such as agricultural and forestry resources, biological resources, cultural resources, energy, hydrology, and population and housing. None of these environmental topics were found to have significant impacts as a result of the Metro Plan.

No significant irreversible environmental damage related to hazardous materials is anticipated to occur with implementation of the Metro Plan. Compliance with federal, state, and local regulations, as well as policies in the 2040 General Plan would ensure that the possibility that hazardous substances from the demolition, construction, and operation of the Metro Plan would not cause significant and unavoidable environmental damage.

The Metro Plan would involve demolition of existing on-site buildings, excavation of soils for grading and to accommodate utility trenches, and construction activities to build new structures and subterranean parking garages, installation of the new roadway, infrastructure, and landscaping improvements. Grading would be required for general site preparation, subterranean parking garages, and for proper on-site stormwater flows. However, grading would not be excessive or greater than what is necessary to complete the future development associated with the Metro Plan and achieve compliance with stormwater requirements.

Construction and implementation of the Metro Plan would not result in a large commitment of natural resources, require highway improvements to previously inaccessible areas, or cause irreversible damage due to environmental accidents. No other irreversible permanent changes such as those that might result from construction of a large-scale mining project, hydroelectric dam, or other industrial project would result from development of the Metro Plan.

### 4.3.1 Energy and Consumption of Nonrenewable Resources

Section 21100(b)(3) of CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing any inefficient, wasteful, and unnecessary consumption of energy. Implementation of the Metro Plan would commit future generations to an irreversible commitment of energy resources in the form of usage of nonrenewable fossil fuels due to vehicle and equipment use during demolition, construction, and operation of the proposed project. Consumption of nonrenewable resources, other than through energy consumption, may include conversion of agricultural lands to urban uses, and loss of access to mineral reserves.

As discussed in the Initial Study (Appendix B), the Metro Plan is located in a developed, urban area of the city. No existing agricultural lands would be converted to non-agricultural uses. In addition, as discussed in the Initial Study, the Metro Plan Area does not contain known mineral deposits and is not a locally important mineral resource recovery site; thus, development of the Metro Plan would not result in the loss of access to mining reserves.

Resources consumed during demolition, construction, and operation would include lumber, concrete, gravel, asphalt, masonry, metals, and water. Similar to the existing uses in the Metro Plan Area, the Metro Plan would irreversibly use water and solid waste landfill resources, as described in more detail in section 3.8, *Utilities and Service Systems*. However, the Metro Plan would not involve a large commitment of resources relative to existing conditions or relative to supply, nor would it consume any of those resources wastefully. Section 3.8, *Utilities and Service Systems*, describes the water supply and demand aspects of the Metro Plan. As discussed, the Metro Plan would result in a less-than-significant impact on water supply and would include policies in the Metro Plan to use water efficiently.

In addition, the Metro Plan Area is serviced by existing water, wastewater, stormwater, electric, telecommunications, and waste and recycling services. New on-site facilities would be connected to new services through the installation of new, localized connections. Expansion of or an increase in capacity of off-site infrastructure would occur as required by the utility providers.

Project construction and operation would require the irreversible commitment of limited, renewable, and non-renewable resources. However, consumption of such resources would not be considered substantial or wasteful. The Metro Plan requires building design features that reduce energy consumption and increase renewable energy generation. This includes the electrification of

all new developments by prohibiting natural gas infrastructure (Policy CB 7.2.2 and Policy CB 7.2.3), installation of photovoltaic solar systems and implementing solar management plans (CB 7.2.1 and Policy CB 7.3.1), onsite renewable energy generation (Policy CB 7.3), and overall energy reduction uses (Policy CB 7.2). Furthermore, the City's 2040 General Plan Policy CON 1-3 recommends that new development achieve LEED certification and exceed the most current CalGreen codes. Therefore, the Metro Plan would not result in the wasteful use of energy, water, and other non-renewable resources.

# 4.4 Growth-Inducing Impacts

As required by CEQA Guidelines Section 15126.2(d), an EIR must consider the ways in which the proposed project could directly or indirectly foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth-inducing impacts can result from the elimination of obstacles to growth; through increased stimulation of economic activity that would, in turn, generate increased employment or demand for housing and public services; or from the implementation of policies or measures that do not effectively minimize premature or unplanned growth.

This section of the EIR discusses the manner in which the Metro Plan could affect growth in the City and the larger Bay Area. In accordance with the CEQA Guidelines, Section 15126.2(e), this discussion of growth inducement is not intended to characterize the Metro Plan as necessarily beneficial, detrimental, or of little significance to the environment. This growth inducement discussion is provided for informational purposes so that the public and local decision-makers have an understanding of the potential long-term growth implications of the Metro Plan. Although CEQA requires disclosure of growth inducement effects, an EIR is not required to anticipate and mitigate the effects of a particular project on growth in other areas.

Growth-inducing impacts such as those associated with job increases that might affect housing and retail demand in other areas over an extended time period are difficult to assess with precision, since future economic and population trends may be influenced by unforeseeable events and business development cycles. Moreover, long-term changes in economic and population growth are often regional in scope; they are not influenced solely by changes in policies or specific development projects. Business trends are influenced by economic conditions throughout the state and country as well as around the world.

Another consideration is that the creation of growth-inducing potential does not automatically lead to growth. Growth occurs through capital investment in new economic opportunities by the private and/or public sector. Investment patterns reflect, in turn, the desires of investors to mobilize and allocate their resources to development in particular localities and regions. A combination of these and other pressures serve to fashion local land use and development policy. The regulatory authority of local governments serves to mediate the growth-inducing potential or pressure created by a project or plan. Business decisions to pursue new development within the City are generally guided by non-CEQA factors such as proximity to existing infrastructure (e.g., public transportation) and workforce talent. Despite these limitations on the analysis, it is still possible to qualitatively assess the general potential growth-inducing impacts of the Metro Plan.

### 4.4.1 Projected Growth

Development of infrastructure could remove obstacles to population growth if it would allow for development in an area that was not previously considered feasible for development because of infrastructure limitations. The Metro Plan would include the development of infrastructure, future development would connect to existing infrastructure, and new streets would be implemented to serve the future development. The Metro Plan constitutes infill development within an already existing urban environment, and the other required infrastructure improvements would consist of localized improvements intended to serve the demand of the Metro Plan. Therefore, these improvements would not extend infrastructure into other unserved or underserved areas and, as such, no indirect impacts related to population growth as a result of expansion of infrastructure would occur.

Section 3.5, *Population and Housing*, discusses population and employment growth as a result of the Metro Plan. The Metro Plan would directly introduce housing (7,000 units) and associated population growth (14,000 peeople). The Metro Plan would also result in an increase of approximately 12,283 new employees. As discussed in Section 3.5, *Population and Housing*, ABAG forecasts that between 2030 and 2040 in Milpitas, the population will increase by 8,365 people and the number of employees will increase by 1,595. The population and employment growth that would be generated by the Metro Plan would exceed ABAG's projections.

Population and employment impacts are largely social and economic impacts, and CEQA establishes that social and economic impacts are not considered significant impacts unless they contribute to, or are caused by, physical impacts on the environment (Public Resources Code Section 21080). Thus, the project's exceedance of ABAG's growth projection for the City is not, in and of itself, a significant impact on the environment.

Other potential environmental impacts that could result from the new population and employees in the Metro Plan Area are evaluated throughout this EIR. These include impacts related to vehicle travel (including attendant air and noise impacts) and increased demand for public services and utilities. Refer to Section 3.1, *Air Quality*; Section 3.2, *Greenhouse Gas Emissions*; Section 3.4, *Noise and Vibration*; Section 3.6, *Public Services and Recreation;* Section 3.7, *Transportation*; and Section 3.8, *Utilities and Service Systems*. These sections evaluate whether activities associated with the population and employment from the Metro Plan would cause significant impacts on the environment.

The features of the Metro Plan are expected to generate direct population and employment growth. While the Metro Plan would include infrastructure improvements, these would be implemented to address the direct population and employment growth and is not expected to induce additional growth. Overall, implementation of the Metro Plan is expected to directly generate additional population and employment growth. The City has identified the Metro Plan Area as a good location for dense population and employment, in order to take advantage of its proximity to various forms of high-quality regional transit at the Milpitas Transit Center. Overall, the Metro Plan establishes a rational strategy with an appropriate mix of land uses for the area, and as identified in Section 3.5, *Population and Housing*, the additional growth from the Metro Plan would be consistent with the City's vision in the 2040 General Plan, as well as the overall Bay Area's vision (Plan Bay Area 2050). The Metro Plan would not generate substantial unplanned population growth.

Chapter 5
# Alternatives

# 5.1 Introduction

## 5.1.1 CEQA Requirements for Alternatives Analysis

According to Section 15126.6 of the State CEQA Guidelines, an EIR must describe and evaluate a reasonable range of alternatives to the project or project location that would feasibly attain most of the basic project objectives and that would avoid or substantially lessen any identified significant environmental impacts of the project. An EIR is not required to present the alternatives analysis in the same level of detail as the assessment of the project, and it is not required to consider every conceivable alternative to a project. Rather, an EIR must consider a reasonable range of potentially feasible alternatives that will foster informed decision making. Additionally, the EIR must analyze the No Project alternative and must identify the environmentally superior alternative other than the No Project alternative.

## 5.1.2 Project Change Objectives

The City is proposing the Project Change in order to achieve the following objectives:

1. **To enhance the sense of place and identity of the Metro Plan Area with visually memorable structures and buildings.**
    - This is achieved through:
        - Providing high to very high-density housing and/or high intensity office and employment uses along arterials, the light rail, and close to the BART station to support transit ridership and complementary activities by responding to strong market interest in high-density development in an appropriate setting.
        - Accommodating a vibrant mix of pedestrian-accessible retail and amenities, high density housing and high-intensity office and other employment uses within the Metro Plan Area and particularly within the Great Mall District, along Great Mall Parkway and Montague Expressway; and promoting public art and wayfinding strategies.
2. **To provide safer and more attractive multimodal connections for walking and biking.**
    - This is achieved through:
        - Creating a multi-modal network that includes pedestrian pathways and bikeways to reinforce a pedestrian scale and grid where appropriate.
        - Creating a streetscape that encourages multimodal connections with an attractive and richly detailed urban environment with good connectivity between desired destinations.
        - Improving the City transportation network and contributing to the Countywide transportation network and transportation demand management over the next 20

years by improving the multimodal network and implementing the Active Transportation Plan. Key enhancements include creating safer and more accessible connections for pedestrians and bicyclists and establishing a plan-wide transportation demand management (TDM) program.

3. **To provide a greater variety of shared public spaces.**
    - The Metro Plan will establish urban design policies to ensure adequate public open space to serve residential development. In compliance with the General Plan, the goal for open space development is 3.5 acres per 1,000 residents or the equivalent in terms of recreational value. Some recreational opportunities may be provided outside the Metro Plan Area, and a Recreational Value metric may be used to evaluate intensively-programmed and high quality spaces as equivalent to larger spaces in meeting open space goals.
    - Develop parks, trails, and public open spaces that provide active and passive recreation opportunities, pedestrian connectivity, and places for community interaction in each District, as per the Parks and Recreation Master Plan. Encourage the development of creative, usable private and public outdoor space, such as on building rooftops and balconies and on other accessible public areas.
4. **To expand neighborhood services and the variety of retail.**
    - Create additional neighborhood-serving retail to serve demand from Metro Plan Area residents, community members, and the local workforce, including up to 300,000 additional square feet of retail and restaurant space.
    - Require local-serving retail on particular sites where it is feasible and appropriate, and permit it in otherwise residential and commercial-only structures.
    - Promote the development of hotels where appropriate to meet demand, and support commercial activity to provide an important revenue source for the City.
5. **To create and expand available space for jobs near transit.**
    - Attract business investments and generate employment opportunities through commercial development near transit, with up to 3,000,000 square feet of new office/Research and Development (R&D)/light manufacturing space.
    - To support the development of an Innovation District in the industrial area east of the Milpitas Transit Center and west of I-680, and particularly east of Berryessa Creek and on the four corners at the intersection of South Milpitas Boulevard and Montague Expressway, as a hub of employment and R&D, integrating Milpitas into Silicon Valley with high-density office, research, light manufacturing uses, and services primarily to the east of Berryessa Creek.
6. **To provide both affordable and market-rate housing.**
    - Accommodate up to 7,000 additional housing units to help the City meet its regional housing needs requirements and support transit ridership.
    - As part of the vision, several key elements of the Metro Plan support this objective:
        - Support the evolution of the Great Mall site from a purely retail-based mall site into a mixed-use, retail and amenity-rich area that is well integrated into the Metro Plan Area.

- Support mixed-use housing in both vertical and horizontal configurations to provide living nears jobs and services, as well as transit.

- Enhance Great Mall Parkway as a landmark street with a new linear park, streetscape improvements, and public art.
- Improve connectivity with the Tango District to and from the VTA Transit Station and McCandless Dsitrict with a pedestrian/bicycle bridge connection and improvements that complete the multi-use trail system.

## 5.1.3 Significant Impacts of the Project Change

Based on the analysis provided in the various Chapter 3 sections of this SEIR, the Project Change would have the following significant impacts:

- **Impact AQ-2a:** Construction of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.
- **Impact AQ-2b:** Operation of the Metro Plan would result in a substantially more severe significant air quality impact than that identified in the Certified EIR related to a cumulatively considerable net increase in any criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard.
- **Impact AQ-3:** Implementation of the Metro Plan would result in a new significant air quality impact that was not identified in the Certified EIR related to exposing sensitive receptors to substantial pollutant concentrations.
- **Impact GHG-1:** Implementation of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to the generation of GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.
- **Impact NOI-1:** Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.
- **Impact NOI-2:** Operation of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.
- **Impact NOI-3:** Construction of the Metro Plan would result in a new significant impact that was not identified in the Certified EIR related to exposing persons to or generating excessive ground-borne vibration or ground-borne noise levels.

## 5.1.4 Overview of Alternatives Considered

In addition to the required No Project Alternative, six alternatives to the Project Change were considered initially. To determine which of the alternatives should be evaluated in the SEIR, each

alternative was screened to determine whether it would meet most of the Project Change objectives, reduce any of the potentially significant impacts identified in the SEIR, and be potentially feasible.

# 5.2 Alternatives Considered but Rejected

Section 15126.6(c) of the State CEQA Guidelines provides that an EIR should "identify any alternatives that were considered by the lead agency but rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination." The screening process for identifying the viable EIR alternatives included consideration of the following criteria.

- Ability to meet the Project Change objectives.
- Potential ability to substantially lessen or avoid environmental effects associated with the Project Change.
- Potential feasibility, taking into account economic, environmental, social, technological, and legal factors.

The discussion below describes the alternatives that were considered during preparation and scoping of this SEIR, and gives the rationale for eliminating these alternatives from detailed consideration, including because they would not fulfill most of the basic objectives of the Project Change, would not avoid or substantially lessen significant environmental impacts, and/or would be infeasible. The rejected alternatives are described below in Sections 5.2.1 through 5.2.4.

## 5.2.1 Residential-Only Alternative

Residential uses typically generate fewer vehicle trips than commercial uses, on a per-square foot basis. Accordingly, an alternative that would develop all residential uses in the Metro Plan Area was considered based on its potential to reduce or avoid the significant impacts related to criteria air pollutant emissions during operation (Impact AQ-2b), operational health risks at sensitive receptors (Impact AQ-3), greenhouse gas emissions (Impact GHG-1), and operational equipment noise impacts (Impact NOI-2). The Residential-Only Alternative could also reduce the Metro Plan's air quality and noise impacts during construction (Impact AQ-2a, Impact NOI-1, and Impact NOI-3).

The Residential-Only Alternative would only include the 7,000 dwelling units proposed in the Metro Plan. While this alternative would be technically feasible, this alternative is rejected for not meeting the Project Change objectives. Specifically, the Residential-Only Alternative would not meet Project Change Objective 5, to create and expand available space for jobs near transit. Under the Residential-Only Alternative, no land uses that generate jobs would be implemented, and the Innovation District envisioned by the Project Change would not be implemented. As envisioned in the 2040 General Plan, the creation of an Innovation District is an integral part of the Metro Plan, and its development—needed to create and expand available space for jobs near transit—is a primary objective for the Project. For this reason, the Residential-Only Alternative has been rejected.

## 5.2.2 Off-site Alternative

An alternative that would construct the Project at a different location in the City was considered based on its potential to reduce or avoid the Project Change's significant impacts related to health risks at sensitive receptors (Impact AQ-3) and construction noise at sensitive receptors (Impact

NOI-1). The Metro Plan Area is uniquely and ideally situated with respect to public transit. The Metro Plan Area includes the Milpitas Transit Center, which provides BART and VTA service. The underlying purpose of the Project Change is to update the TASP, an existing specific plan, and to allow for additional housing and land uses that generate employment in proximity to the Milpitas Transit Center.

Several of the Project Change objectives are specifically and inextricably tied to the Metro Plan Area's location with respect to the Milpitas Transit Center (e.g., to create and expand available space for jobs near transit and accommodate up to 7,000 additional housing units to help the City to meet its regional housing needs requirements and support transit ridership). To implement these objectives, the Metro Plan includes pedestrian improvements to improve pedestrian access to the Milpitas Transit Center. Thus, proximity to public transit is key to meeting the fundamental objectives of the Project Change.

Additionally, creating a unified neighborhood requires the acquisition of adequate acreage, most likely consisting of multiple contiguous properties. No other sites that are comparable in size and proximity to public transit are available for new development in the City. Approximately 150 acres of the original TASP Area are still available for development of housing and jobs within 0.5 mile of the BART and VTA light rail stations. The addition of acreage to the Metro Plan Area increases potential development of housing and jobs near transit. Additionally, the Great Mall site is the largest site for potential redevelopment under one owner in the City. Therefore, this alternative was rejected due to its infeasibility and inconsistency with the Project Change objectives.

### 5.2.3 Remove the Eastern Expansion Area Alternative

An alternative that would remove the Eastern Expansion Area (i.e., Innovation District east of Berryessa Creek) was considered based on its potential to reduce or avoid the significant impacts related to criteria air pollutant emissions during operation (Impact AQ-2b), operational health risks at sensitive receptors (Impact AQ-3), greenhouse gas emissions (Impact GHG-1), and operational equipment noise impacts (Impact NOI-2). The Remove the Eastern Expansion Area Alternative would reduce the amount of office space by 2,000,000 square feet, the amount of retail by 20,000 square feet, and the number of hotel rooms. As such, the reductions in density are expected to also result in reductions to criteria air pollutant emissions during operation; operational health risks at sensitive receptors; greenhouse gas emissions; and the number of operational equipment, which would reduce operational noise impacts.

In addition, because there would be less construction under the Remove the Eastern Expansion Area Alternative, this alternative would also reduce the Metro Plan's air quality and noise impacts during construction (Impact AQ-2a, Impact NOI-1, and Impact NOI-3). The Remove the Eastern Expansion Area Alternative would also avoid impacts on a known archaeological resource located in the Eastern Expansion Area. While this alternative would be technically feasible, this alternative is rejected for not fulfilling most of the basic objectives of the Project Change. Specifically, one of the primary objectives is to support the development of an Innovation District that would help create and expand available space for jobs near transit (Objective 5).

The creation of an Innovation District is envisioned in the Milpitas General Plan and is an integral part of the Metro Plan. Development of the Innovation District is needed to create and expand available space for jobs near transit, which is a primary objective for the Project. The Remove the Eastern Expansion Area Alternative would reduce the amount of floor space dedicated to office and

retail as described above, substantially reducing the available space for jobs near transit. For this reason, the Remove the Eastern Expansion Area Alternative has been rejected.

### 5.2.4 No Great Mall Change Alternative

An alternative that would keep the Great Mall under its current condition was considered based on its potential to reduce or avoid the significant impacts related to criteria air pollutant emissions during operation (Impact AQ-2b), operational health risks at sensitive receptors (Impact AQ-3), greenhouse gas emissions (Impact GHG-1), and operational equipment noise impacts (Impact NOI-2). The No Great Mall Change Alternative would reduce the number of dwelling units by approximately 3,500 units, the amount of office space by 500,000 square feet, the amount of retail by 250,000 square feet, and the number of hotel rooms by 350. As such, the reductions in density are expected to also result in reductions to criteria air pollutant emissions during operation; operational health risks at sensitive receptors; greenhouse gas emissions; and the number of operational equipment, which would reduce operational noise impacts.

In addition, because there would be less construction under the No Great Mall Change Alternative, this alternative would reduce the Metro Plan's air quality and noise impacts during construction (Impact AQ-2a, Impact NOI-1, and Impact NOI-3). While this alternative would be technically feasible, this alternative is rejected for not fulfilling most of the basic objectives of the Project Change. Specifically, one of the primary objectives is to support the evolution of the Great Mall site from a purely retail-based mall site into a mixed-use, retail, and amenity-rich area that is well integrated into the Metro Plan Area (Objective 6). The transformation of the Great Mall is an integral part of the Metro Plan, and its transformation—needed to provide both affordable and market-rate housing—is a primary objective for the Project Change, and removal of the Great Mall from the Project Change would eliminate nearly 100 acres of development potential from the area, substantially constraining the ability to develop additional housing in the City. Additionally, the Great Mall site is the largest site for potential redevelopment under one owner in the City. For this reason, the No Great Mall Change Alternative has been rejected.

## 5.3 Alternatives Selected for Further Review

### 5.3.1 No Project Alternative

#### 5.3.1.1 Description

State CEQA Guidelines Section 15126.6(e)(3)(A) identifies the following: "[w]hen the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the "no project" alternative will be the continuation of the existing plan, policy or operation into the future. Typically this is a situation where other projects initiated under the existing plan will continue while the new plan is developed. Thus, the projected impacts of the proposed plan or alternative plans would be compared to the impacts that would occur under the existing plan."

Consistent with State CEQA Guidelines Section 15126.6(e)(3)(A), the No Project Alternative assumes that the Metro Plan would not be implemented and that the TASP would be the governing Specific Plan. The No Project Alternative assumes full buildout of the TASP, as disclosed in the Certified EIR. This includes the remaining development of only a few hundred of the 7,109 residential units,

approximately 980,000 of the 993,843 square feet of office space, just over 100,00 of the 287,075 square feet of retail space, and over 200 of the 350 hotel rooms to complete the Plan.

Under the No Project Alternative, the City would continue to experience the need for additional housing, including the need to fulfill its Regional Housing Needs Allocation (RHNA) obligations. Under the No Project Alternative, the City would not plan for additional housing beyond that already allowed in the TASP. The No Project Alternative, therefore, assumes that the City would plan for housing elsewhere in the City in order to fulfill its RHNA obligations. The City's 6th cycle RHNA is 6,713 housing units between 2023 and 2031; the RHNA is also stratified by housing for specific income levels. To address the RHNA, the City must update its Housing Element to demonstrate where this level of housing can be built and to identify the strategies to meet the RHNA obligation. The sites selected for housing must be realistic accounting for elements such as dimensions of parcels, existing use of sites, economic considerations, environmental factors, and other considerations. The housing units in the Project Change would count toward both the prior cycle RHNA and 6th Cycle RHNA. Therefore, if the Project Change is not approved, the City would have to plan for housing units elsewhere in the City to meet its RHNA obligations. Additionally, aside from the City's RHNA obligations, there is a crisis related to housing affordability in the Bay Area that in part is related to a need for more housing (ABAG 2022). Therefore, it is reasonable to assume that a reduction in units built in the City, regardless of RHNA requirements, would result in housing planned for and constructed elsewhere. However, it cannot currently be known where those housing units may be located or what the characteristics of those units (e.g., density, height, etc.) would be.

The No Project Alternative also assumes full buildout of the 2040 General Plan, which otherwise relies upon the Metro Plan Area to provide more housing opportunities and specifically calls for development of an Innovation District in the area east of the Milpitas Transit Center.

#### 5.3.1.2 Project Change Objectives

Because the No Project Alternative would not build any of the development or infrastructure associated with the Metro Plan, the No Project Alternative does not meet any of the Project Change objectives.

#### 5.3.1.3 Potential Feasibility

This alternative is potentially feasible. However, it would reduce the amount of housing set aside in the Regional Housing Needs Allocation (RHNA) for this cycle and the prior cycle of the Housing Element.

### 5.3.2 Reduced Height Alternative

#### 5.3.2.1 Description

The Reduced Height Alternative would place a height restriction across the Metro Plan Area that limits building heights to 75 feet. This restriction would reduce the additional projected dwelling units by 1,000 units compared to the proposed Metro Plan. About 500 fewer units would be projected at both Great Mall and the Tango District. This alternative would also reduce office space by about 500,000 square feet compared to the proposed Metro Plan by reducing the square footage projected for the Innovation District. Projected retail space and hotel rooms would remain the same

as projected under the proposed Metro Plan. Under this Alternative, it is expected that the infrastructure improvements identified in the Metro Plan (i.e., circulation, open space, utilities) would remain the same and that the policies in the Metro Plan related to sustainability (i.e., electric buildings, TDM, low-flow fixtures etc.) would also be the same.

This alternative was considered based on its potential to reduce or avoid the significant impacts related to criteria air pollutant emissions during operation (Impact AQ-2b), operational health risks at sensitive receptors (Impact AQ-3), greenhouse gas emissions (Impact GHG-1), and operational equipment noise impacts (Impact NOI-2). In addition, because there would be less construction under this alternative, this alternative would also reduce the Metro Plan's air quality and noise impacts during construction (Impact AQ-2a, Impact NOI-1, and Impact NOI-3).

As for the No Project Alternative, a reduction in housing units would likely result in construction of housing elsewhere. However, it cannot currently be known where those housing units may be located or what the characteristics of those units (e.g., density, height, etc.) would be.

In addition, the Reduced Height Alternative was also considered based on the comments made by CDFW on the NOP to consider alternatives that reduce bird strikes, including buildings that are not as tall, as proposed in the Metro Plan.

#### 5.3.2.2 Project Change Objectives

This alternative would meet all six Project Change objectives. However, it would meet Objective 5 (to create and expand available space for jobs near transit) to a lesser extent than the proposed Metro Plan because it would reduce by 25 percent the amount of office square footage in the Innovation District. Similarly, this alternative would meet Objective 6 (to provide both affordable and market-rate housing) to a lesser extent than the proposed Metro Plan because it would reduce the dwelling unit capacity in the Metro Plan Area.

#### 5.3.2.3 Potential Feasibility

This alternative is potentially feasible. However, it would reduce the amount of housing set aside in the RHNA for this cycle of the Housing Element and would also reduce the amount of land uses in the Innovation District by 25 percent.

### 5.3.3 Removal of Western Expansion Area Alternative

#### 5.3.3.1 Description

This alternative would remove the western expansion area from the Metro Plan Area. This restriction could reduce the additional projected dwelling units by 500 units compared to the proposed Metro Plan. Projected office space, retail space, and hotel rooms would remain the same as projected under the proposed Metro Plan. Under this Alternative, it is expected that the infrastructure improvements identified in the Metro Plan (i.e., circulation, open space, utilities) would remain the same and that the policies in the Metro Plan related to sustainability (i.e., electric buildings, TDM, low-flow fixtures etc.) would also be the same.

This alternative was considered based on its potential to reduce or avoid the significant impacts related to criteria air pollutant emissions during operation (Impact AQ-2b), operational health risks at sensitive receptors (Impact AQ-3), greenhouse gas emissions (Impact GHG-1), and operational

equipment noise impacts (Impact NOI-2). In addition, because there would be less construction under this alternative, this alternative would also reduce the Metro Plan's air quality and noise impacts during construction (Impact AQ-2a, Impact NOI-1, and Impact NOI-3).

As for the No Project Alternative, a reduction in housing units would likely result in construction of housing elsewhere. However, it cannot currently be known where those housing units may be located or what the characteristics of those units (e.g., density, height) would be.

#### 5.3.3.2 Project Change Objectives

This alternative would meet all six Project Change objectives. However, it would meet Objective 6 (to provide both affordable and market-rate housing) to a lesser extent than the proposed Metro Plan because it would reduce the dwelling unit capacity in the Metro Plan Area.

#### 5.3.3.3 Potential Feasibility

This alternative is potentially feasible. However, it would reduce the amount of housing set aside in the RHNA for this cycle of the Housing Element.

## 5.4 Impact Analysis

The environmental impact analysis focuses on the same subjects analyzed for the Project Change to provide a meaningful comparison of impacts. Those subjects are only those where the Project Change has a potential to result in a significant impact. See further discussion in Chapter 1, *Introduction*.

Under the No Project Alternative, Reduced Height Alternative, and Removal of Western Expansion Area Alternative, a reduction in housing units would likely result in planning and construction of housing elsewhere, as previously described. However, it cannot currently be known where those housing units may be located or what the characteristics of those units (e.g., density, height) would be. CEQA Guidelines section 15126.6 states the following regarding evaluation of alternatives:

> The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. . . . If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.

CEQA does not require speculation about an impact (CEQA Guidelines section 15145). It can be concluded that the No Project Alternative, Reduced Height Alternative, and Removal of Western Expansion Area Alternative would result in planning for housing elsewhere within the City and/or outside of the City, which could result in construction of housing elsewhere. However, there is insufficient information on which to base conclusions about the specific secondary physical impacts on the environment because of construction of housing elsewhere. Therefore, no specific environmental impacts are identified in the analysis of alternatives related to planning for or constructing housing elsewhere. However, some additional general discussion of RHNA and housing development is provided below where it can be reasonably presumed that the alternative could have impacts on development patterns within the City or in other jurisdictions.

## 5.4.1 No Project Alternative

### 5.4.1.1 Aesthetics

Under the No Project Alternative, there would be no demolition or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. No new land uses would be introduced, beyond what was already approved for in the TASP. There would be no potential to affect aesthetics, beyond what was already approved for in the TASP. The Metro Plan Area would be built out consistent with the TASP. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of existing regulations, as well as Metro Plan and 2040 General Plan policies.

### 5.4.1.2 Agricultural and Forestry Resources

Under the No Project Alternative, no additional development would occur within the TASP Area beyond what was included in the TASP. The No Project Alternative would have no impact on agriculture and forestry resources, which is the same as the Metro Plan.

### 5.4.1.3 Air Quality

Under the No Project Alternative, there would be no demolition, grading, excavation, or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. No new operational sources of air pollutants would be introduced to the Metro Plan Area, beyond what was already approved for in the TASP. The Metro Plan Area would be built out consistent with the TASP, and the mitigation measures required for the Metro Plan would not be required for this alternative. Therefore, the No Project Alternative would avoid the Metro Plan's significant and unavoidable impacts related to a cumulatively considerable net increase in any criteria pollutant for which the region is classified as a nonattainment area during construction and operation, as well as exposing sensitive receptors to substantial pollutant concentrations. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan.

### 5.4.1.4 Biological Resources

Under the No Project Alternative, there would be no demolition, grading, excavation, or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. There would be no potential to affect biological resources (i.e., burrowing owl; non-listed special-status raptor and other bird species; significant trees protected by the Tree Maintenance and Protection Ordinance; wetlands, creeks, and drainages protected under Clean Water Act Section 404; patches of riparian habitat; movement of fish and wildlife). The Metro Plan Area would be built out consistent with the TASP. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of Metro Plan and 2040 General Plan policies.

### 5.4.1.5 Cultural Resources

Under the No Project Alternative, there would be no demolition, grading, excavation, or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. There

would be no potential to affect historic resources or encounter previously unknown archaeological resources or human remains. The Metro Plan Area would be built out consistent with the TASP. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of Metro Plan and 2040 General Plan policies.

#### 5.4.1.6 Energy

Under the No Project Alternative, there would be no demolition, grading, excavation, or construction activities within the Metro Plan Area, and there would be no temporary or permanent demand for energy use during construction or operations. The Metro Plan Area would be built out consistent with the TASP. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of Metro Plan and 2040 General Plan policies.

#### 5.4.1.7 Geology and Soils

Under the No Project Alternative, there would be no demolition, grading, excavation, or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. There would be no potential to encounter previously unknown paleontological resources. The Metro Plan Area would be built out consistent with the TASP. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of Metro Plan and 2040 General Plan policies.

#### 5.4.1.8 Greenhouse Gases

Under the No Project Alternative, there would be no demolition, grading, excavation, or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. No new operational sources of GHG emissions would be introduced to the Metro Plan Area, beyond what was already approved for in the TASP. The Metro Plan Area would be built out consistent with the TASP, and the mitigation measures required for the Metro Plan would not be required for this alternative. Therefore, the No Project Alternative would avoid the Metro Plan's significant and unavoidable impacts related to the generation of GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan.

#### 5.4.1.9 Hazards and Hazardous Materials

Under the No Project Alternative, there would be no demolition or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. No new land uses would be introduced that could generate population or employment, beyond what was already approved for in the TASP. There would be no potential to encounter hazardous materials during construction or generate additional hazardous materials with new land uses, beyond what was already approved for in the TASP. The Metro Plan Area would be built out consistent with the TASP. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of existing regulations, as well as Metro Plan and 2040 General Plan policies.

### 5.4.1.10 Hydrology and Water Quality

Under the No Project Alternative, there would be no demolition or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. No new land uses would be introduced that could generate population or employment, beyond what was already approved for in the TASP. There would be no potential to alter drainage patterns in the Metro Plan Area or affect water quality, beyond what was already approved for in the TASP. The Metro Plan Area would be built out consistent with the TASP. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of existing regulations, as well as Metro Plan and 2040 General Plan policies.

### 5.4.1.11 Land Use

Under the No Project Alternative, no new land uses would be introduced, beyond what was already approved for in the TASP, and the Metro Plan Area would be built out consistent with the TASP. None of the additional housing; office, retail, and industrial uses that would generate jobs; hotel uses; open space; pedestrian and bicycle amenities; or infrastructure associated with the Metro Plan would be built under the No Project Alternative. As such, compared to the Metro Plan, the No Project Alternative would be less consistent than the goals identified in the 2040 General Plan to promote higher density and intensity development opportunities in the Metro Plan Area, enable a walkable and transit-oriented community, and provide safer and more attractive multimodal connections for walking and biking. The No Project Alternative would likely have greater impacts on land use than the proposed Metro Plan because it would require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. Other locations within the City would not be located near the BART station and are thus unlikely to have the same transit-oriented development benefits as the proposed Metro Plan. Nonetheless, because the No Project Alternative's inconsistencies with the 2040 General Plan would not result in physical impacts on the environment, the No Project Alternative's impact on land uses would be less than significant.

### 5.4.1.12 Mineral Resources

Under the No Project Alternative, no additional development would occur within the TASP Area beyond what was included in the TASP. The No Project Alternative would have no impact on mineral resources, the same as the Metro Plan.

### 5.4.1.13 Noise

Under the No Project Alternative, there would be no demolition, grading, excavation, or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. No new sources of noise or vibration would be introduced to the Metro Plan Area during construction or operation, beyond what was already approved for in the TASP. The Metro Plan Area would be built out consistent with the TASP, and the mitigation measures required for the Metro Plan would not be required for this alternative. Therefore, the No Project Alternative would avoid the Metro Plan's significant and unavoidable impacts related to generating a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in a local general plan or noise ordinance or applicable standards during construction and operation, as well as generating excessive ground-borne vibration or ground-borne noise levels during

construction. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan.

### 5.4.1.14 Population and Housing

Under the No Project Alternative, there would be no demolition or construction activities within the Metro Plan Area, beyond what was already approved for in the TASP. No new land uses would be introduced in the TASP that could generate population or employment, beyond what was already approved for in the TASP. The Metro Plan Area would be built out consistent with the TASP. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant. However, it should be noted that the No Project Alternative would require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. This would result in population growth either elsewhere in the City or outside the City that might be unaccounted for in other jurisdictions' planning.

### 5.4.1.15 Public Services and Recreation

Under the No Project Alternative, there would be no demolition or construction activities in the Metro Plan Area, beyond what was already approved for in the TASP. No new land uses would be introduced that could generate population or employment, and the alternative would not increase the demand for public services and recreational facilities beyond what was already approved for in the TASP. The No Project Alternative would eliminate the additional demand for utilities, public services, and recreation that would be required to meet the growth associated with the Metro Plan. For example, the Metro Plan identifies that a new police station would be built to meet the demands associated with the Metro Plan. As such, the No Project Alternative would eliminate the need for this police station and any of the potential impacts associated with the construction and operation of the police station. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of Metro Plan and 2040 General Plan policies.

### 5.4.1.16 Transportation

The No Project Alternative is expected to have a similar impact on hazards due to a geometric design feature and emergency access as the proposed Metro Plan. However, because the No Project Alternative would not build any of the housing and land uses that would generate employment around transit, and would not include the pedestrian and bicycle facilities identified as part of the Metro Plan, the No Project Alternative would not provide the benefits to transportation associated with the Metro Plan. As described in Impact TR-1 in Section 3.7, *Transportation*, the Metro Plan would help achieve the goals identified in several regional and local plans to create a multimodal transportation system that promotes walking, bicycling, and use of transit. The No Project Alternative would not conflict with the goals identified in these regional and local plans and would, thus, result in a less than significant impact. However, the Metro Plan would be more consistent with the vision of these plans.

The No Project Alternative would result in a greater VMT per service population, per capita, and per employee in the Metro Plan area than if the Metro Plan is implemented. Under the No Project Alternative, only the dwelling units and commercial development identified in the TASP would be

constructed, while the additional 7,000 residential units and the additional commercial development identified in the Metro Plan would not be constructed. Since the No Project alternative would have fewer dwelling units, less commercial development, and less density than the Metro Plan, trip distances would be longer; the Metro Plan Area under the No Project Alternative would therefore have a VMT per service population, per capita, and per employee that would be 13 percent, 9 percent, and 10 percent above the Metro Plan rates, respectively. Additionally, the No Project Alternative would require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. Other locations within the City would not be located near the BART station and are thus unlikely to have the same transit-oriented development benefits as the proposed Metro Plan. Therefore, the No Project Alternative may have worse impacts than the proposed Metro Plan.

#### 5.4.1.17 Tribal Cultural Resources

Under the No Project Alternative, no additional development would occur within the TASP Area beyond what was included in the TASP. The No Project Alternative would have no impact on tribal cultural resources, the same as the Metro Plan.

#### 5.4.1.18 Utilities and Service Systems

Under the No Project Alternative, there would be no demolition or construction activities in the Metro Plan Area, beyond what was already approved for in the TASP. No new land uses would be introduced that could generate population or employment and would not increase the demand for utilities and service systems beyond what was already approved for in the TASP. The No Project Alternative would eliminate the additional demand for utilities and service systems that would be required to meet the growth associated with the Metro Plan. No new impact would occur relative to baseline conditions (i.e., full buildout of the TASP), and impacts would be less than those of the Metro Plan, which would be less than significant with application of Metro Plan and 2040 General Plan policies.

#### 5.4.1.19 Wildfire

Under the No Project Alternative, no additional development would occur within the TASP Area beyond what was included in the TASP. The No Project Alternative would have no impact on mineral resources, the same as the Metro Plan.

### 5.4.2 Reduced Height Alternative

#### 5.4.2.1 Aesthetics

The Reduced Height Alternative would be in the same Plan Area as the proposed Metro Plan and have the same types of development as the proposed Metro Plan. Therefore, like the proposed Metro Plan, most of the development under the Reduced Height Alternative would meet the requirements in PRC Section 21099. Some parts of the development, like the police station and open space, would not meet the requirement of PRC Section 21099 but would be the same as for the proposed Metro Plan and would have the same impacts.

### 5.4.2.2 Agricultural and Forestry Resources

The Metro Plan Area is in a developed urban area without agricultural or forestry features. The Reduced Height Alternative would be in the same Plan Area as the proposed Metro Plan and would have the same impacts.

### 5.4.2.3 Air Quality

The Reduced Height Alternative would have similar impacts as the proposed Metro Plan related to conflicting with or obstructing implementation of an applicable air quality plan because it would still include the green building certifications, promote alternative modes of transportation, reduce GHG emissions, and reduce total VMT.

The Reduced Height Alternative would have a lesser impact than the proposed Metro Plan related to a cumulatively considerable net increase in any criteria pollutant for which the region is classified as a nonattainment area during construction. BAAQMD's project-level significance thresholds for ROG, $NO_X$, and $PM_{10}$ and $PM_{2.5}$ are per day emissions thresholds. A reduction in development likely would not change the daily intensity of construction, which means that daily emissions under the Reduced Height Alternative would be similar to the proposed Metro Plan. However, with reduction in the number of projected dwelling units and office space, the overall length of construction would be reduced, reducing the number of days in which there may be an exceedance of project-level significance thresholds. Similar to the proposed Metro Plan, it is anticipated that multiple land use development projects would be constructed intermittently within the Metro Plan Area throughout the course of the buildout period. As the timing and intensity of future development projects are not known at this time, the precise air quality impacts of construction activities associated with buildout of the Reduced Height Alternative cannot be precisely quantified. However, dwelling units would be reduced by 1,000 units, which is roughly 14 percent, while office space area would be reduced by roughly 16 percent, potentially reducing residential and office building construction emissions by a similar degree. This would constitute a substantial reduction in this air quality impact. Because the significance thresholds may still be exceeded, the same mitigation measures would apply to this alternative as to the proposed Metro Plan for this impact.

The Reduced Height Alternative would have a lesser impact than the proposed Metro Plan related to a cumulatively considerable net increase in any criteria pollutant for which the region is classified as a nonattainment area during operation. Buildout of the Reduced Height Alternative has the potential to result in similar air quality impacts from area, energy, and mobile sources as the proposed Metro Plan. However, these impacts would be reduced compared to the proposed Metro Plan because there would be fewer dwelling units, less office space, and fewer associated mobile sources. However, dwelling units would be reduced by 1,000 units, which is roughly 14 percent, while office space area would be reduced by roughly 16 percent, potentially reducing residential and office building operations emissions by a similar degree. This would constitute a substantial reduction in this significant impact. Because the significance thresholds may still be exceeded, the same mitigation measures would apply to this alternative as to the proposed Metro Plan for this impact.

The Reduced Height Alternative has the potential to expose sensitive receptors to substantial pollutant concentrations similar to the proposed Metro Plan. The overall length of construction and duration of construction emissions could be reduced at the Great Mall and the Tango District as well as the Innovation District due to the reduced height allowance. This could reduce the duration of exposure of sensitive receptors to substantial pollutant concentrations, including residential

receptors located north of the Great Mall, south of the Innovation District, and in the Tango District. However, as the timing, intensity, location, and configuration of future development projects are not known at this time, the precise effects of construction activities associated with buildout of the Reduced Height Alternative cannot be accurately quantified. Therefore, impacts may also be similar to those of the proposed Metro Plan, and the same mitigation measure would apply.

The Reduced Height Alternative would have a similar potential to expose receptors to objectionable odor as the proposed Metro Plan. While there would be less construction overall under the Reduced Height Alternative, the geographic extent of the Plan Area is the same, and activities such as grading and excavation would take place in similar locations at similar intensities. As a result, odors generated from heavy equipment use would be about the same. Similarly, the Reduced Height Alternative would not change the need for landscaping equipment and trash pickup, resulting in similar operational odors as the proposed Metro Plan.

#### 5.4.2.4 Biological Resources

The Reduced Height Alternative would have similar impacts on biological resources as the proposed Metro Plan in terms of impacts on burrowing owl; non-listed special-status raptor and other bird species; significant trees protected by the Tree Maintenance and Protection Ordinance; wetlands, creeks, and drainages protected under Clean Water Act Section 404; patches of riparian habitat; movement of fish and wildlife; and conflict with an HCP. Impacts would be similar because the footprint of the Reduced Height Alternative is the same as the proposed Metro Plan footprint. In addition, impacts related to tall buildings and bird strikes were identified for the proposed Metro Plan and this alternative would reduce those impacts due to the building height limitation. Under this alternative, it is expected that bird strikes could still happen, since buildings would still be allowed to reach 75 feet. Under this alternative, Metro Plan Policy SC 5.2, which would include design requirements for buildings to minimize bird strikes, would also apply.

#### 5.4.2.5 Cultural Resources

The Reduced Height Alternative would have similar impacts on cultural resources as the proposed Metro Plan because the footprint of the Reduced Height Alternative is the same as the proposed Metro Plan footprint. Therefore, the Reduced Height Alternative would have the same potential to impact known and unknown historic and cultural resources as the proposed Metro Plan.

#### 5.4.2.6 Energy

The Reduced Height Alternative would consume energy in similar ways to the proposed Metro Plan, including consumption of fuel during construction and use of electricity during operation. However, these impacts would be reduced compared to the proposed Metro Plan because there would be fewer dwelling units, less office space, and fewer associated mobile sources. Dwelling units would be reduced by 1,000 units, which is roughly 14 percent, while office space area would be reduced by roughly 16 percent, potentially reducing residential and office building energy consumption by a similar degree.

### 5.4.2.7 Geology and Soils

The Reduced Height Alternative would have similar impacts on geology and soils to the proposed Metro Plan because the footprint of the Reduced Height Alternative is the same as the proposed Metro Plan footprint.

### 5.4.2.8 Greenhouse Gases

For evaluation of GHG emissions, BAAQMD recommends evaluating whether construction activities would conflict with statewide emission reduction goals and implement feasible BMPs. With reduction in the number of projected housing units and office space, the overall length of construction would be reduced. Dwelling units would be reduced by 1,000 units, which is roughly 14 percent, while office space area would be reduced by roughly 16 percent, potentially reducing residential and office building construction emissions by a similar degree. This would constitute a substantial reduction in emissions. As for the proposed Metro Plan, the precise effects of construction activities associated with buildout of the Reduced Height Alternative cannot be accurately quantified at this time because construction phasing and intensity are as yet unknown. Because the impact may still be significant, the same mitigation measure would apply to this alternative as to the proposed Metro Plan for construction impacts.

Buildout of the Reduced Height Alternative has the potential to result in similar GHG impacts from area, energy, and mobile sources as the proposed Metro Plan. However, these impacts would be reduced compared to the proposed Metro Plan because there would be fewer dwelling units, less office space, and fewer associated mobile sources. Dwelling units would be reduced by 1,000 units, which is roughly 14 percent, while office space area would be reduced by roughly 16 percent, potentially reducing residential and office building operations emissions by a similar degree. This would constitute a substantial reduction in this significant impact. However, the Reduced Height Alternative may still conflict with GHG reduction plans, as described for the proposed Metro Plan, and the same mitigation measures would apply to this alternative as for the proposed Metro Plan for this impact.

### 5.4.2.9 Hazards and Hazardous Materials

The Reduced Height Alternative would have similar impacts related to existing hazards and hazardous materials as the proposed Metro Plan because the footprint of the Reduced Height Alternative is the same as the proposed Metro Plan footprint. The Reduced Height Alternative would reduce the amount of construction needed, which would reduce the overall use of hazardous materials in the Plan Area and reduce the potential for accidents. The reduced size of the development may also slightly reduce the total use of hazardous materials on site, reducing the risk of accidents. Therefore, the Reduced Height Alternative may result in reduced impacts compared to the proposed Metro Plan.

### 5.4.2.10 Hydrology and Water Quality

The Reduced Height Alternative would have similar impacts on hydrology and water quality as the proposed Metro Plan because the footprint of the Reduced Height Alternative is the same as the proposed Metro Plan footprint.

### 5.4.2.11 Land Use

The Reduced Height Alternative would have similar impacts on land use as the proposed Metro Plan because the land use designations would be the same other than incorporating a height limitation through zoning from the TASP. The Reduced Height Alternative, like the proposed Metro Plan, also would not divide an established community. It is possible the Reduced Height Alternative might also have greater impacts on land use than the proposed Metro Plan because it could require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. Other locations within the City would not be located near the BART station and are thus unlikely to have the same transit-oriented development benefits as the proposed Metro Plan.

### 5.4.2.12 Mineral Resources

The Metro Plan Area is in a developed urban area without mapped mineral resources. The Reduced Height Alternative would be in the same Plan Area as the proposed Metro Plan and would have no impact on mineral resources.

### 5.4.2.13 Noise

Construction of future development associated with the Reduced Height Alternative would generate noise, and temporarily increase noise levels at nearby land uses. The noise levels generated during construction would depend on the construction equipment used, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive receptors. A reduction in development likely would not change the daily intensity of construction, which means that typical construction noise levels generated under the Reduced Height Alternative would be the same as or similar to the proposed Metro Plan (see Table 3.4-11 and associated discussion). However, with reduction in the number of projected housing units and office space, the overall length of construction would be reduced, reducing the number of days in which there may be noise levels greater than 65 dBA or greater than 3 dB over the existing ambient levels at nearby sensitive land uses. Because noise levels may still exceed these thresholds and because noise may still occur during nighttime hours, as for the proposed Metro Plan, the same General Plan policies would apply to this alternative.

The kinds of noise generated by the Reduced Height Alternative would be similar to the proposed Metro Plan in nature but may be reduced in some cases. The proposed Metro Plan would result in increases in traffic noise on some roadway segments and decreases on others (see Table 3.4-12). Fewer dwelling units and less office space would likely reduce the amount of traffic noise generated on segments that would experience increased noise under the proposed Metro Plan because the Reduced Height Alternative would have fewer dwelling units and may have fewer businesses. Transit-Oriented Development (TOD)-related noise and siren noise may also be reduced due to the reduced development size.

As for the proposed Metro Plan, the Reduced Height Alternative would also be expected to include installation and operation of stationary sources of noise, such as HVAC equipment and emergency generators, which could expose existing adjacent land uses to excessive noise. Because specific details for future development projects under the Metro Plan are not known at this time, the types of future mechanical equipment and the exact sizes and locations of future mechanical equipment are also unknown. However, with reduction in the number of projected housing units and office space,

the amount of this equipment needed would likely be reduced in comparison to the proposed Metro Plan, which would reduce noise generation during operation. However, based on noise levels generated by singular pieces of some equipment (e.g., emergency generator), equipment operations may result in excessive noise levels at nearby sensitive uses. The same General Plan policies and mitigation measure would apply.

Similar to the proposed Metro Plan, most future projects in the Reduced Height Alternative would not require the use of pile driving equipment, but some projects may. The vibration levels generated would be the same as for the Metro Plan. Reduced building heights may require different foundation types and could affect the need for, or amount of, pile driving, but details like foundation design are not known at this time. Therefore, the Reduced Height Alternative could have similar impacts as the proposed Metro Plan, and the same mitigation measure would apply.

The Reduced Height Alternative would be within the same Plan Area as the proposed Metro Plan. As a result, this alternative would have no impact related to exposure to airport noise, similar to the proposed Metro Plan.

### 5.4.2.14 Population and Housing

The Reduced Height Alternative would have 1,000 fewer dwelling units than the proposed Metro Plan, reducing the total population growth in the Plan Area by approximately 2,000 people. The reduced office space may also reduce the jobs growth in the Metro Plan Area. Therefore, impacts associated with the Reduced Height Alternative would be less than for the proposed Metro Plan for population growth within the Metro Plan Area. The Reduced Height Alternative would be implemented in the same Plan Area as the proposed Metro Plan and would also not displace existing people or housing. However, it should be noted that the Reduced Height Alternative would require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. This would result in population growth either elsewhere in the City or outside the City that might be unaccounted for in other jurisdictions' planning.

### 5.4.2.15 Public Services and Recreation

The Reduced Height Alternative would have 1,000 fewer dwelling units than the proposed Metro Plan, reducing the total population growth in the Plan Area compared to the proposed Metro Plan by approximately 2,000 people. Reduced population growth would likely also reduce demand for additional school capacity, firefighting capacity, police protection, and parks. The reduction in office space may also reduce demand for firefighting and police protection. Therefore, the Reduced Height Alternative would have slightly reduced impacts on public services and recreation compared to the proposed Metro Plan.

### 5.4.2.16 Transportation

The Reduced Height Alternative would have 1,000 fewer dwelling units than the proposed Metro Plan, reducing the total population growth in the Plan Area compared to the proposed Metro Plan by approximately 2,000 people. It would also have less office space development. As a result, the Reduced Height Alternative would result in reduced pedestrian, bicycle, and transit trips compared to the Metro Plan, which would require transit service adjustment and enhanced active transportation facilities. It is also probable the same transportation infrastructure improvements

would be made as for the proposed Metro Plan, such as new trails along Berryessa Creek and proposed minor street connections. Like the proposed Metro Plan, the Reduced Height Alternative would also need to provide adequate emergency access.

The development included in the proposed Metro Plan would result in VMT per service population, per capita, and per employee that are more than 15 percent below countywide averages. Because the Reduced Height Alternative would have fewer dwelling units and less office space, the per unit VMT under the Reduced Height Alternative may be higher than under the Metro Plan. The Reduced Height Alternative would require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. Other locations within the City would not be located near the BART station and are thus unlikely to have the same transit-oriented development benefits as the proposed Metro Plan. Therefore, residents and workers that could have lived in the Metro Plan Area may instead live somewhere where average VMT is higher. Therefore, the Reduced Height Alternative may have a less beneficial impact on VMT than the proposed Metro Plan.

#### 5.4.2.17 Tribal Cultural Resources

No tribal cultural resources have been identified in the Metro Plan Area. The Reduced Height Alternative would be in the same Plan Area as the proposed Metro Plan, and no impacts on tribal cultural resources are anticipated.

#### 5.4.2.18 Utilities and Service Systems

The Reduced Height Alternative would have 1,000 fewer dwelling units than the proposed Metro Plan, reducing the total population growth in the Plan Area compared to the proposed Metro Plan by approximately 2,000 people. It would also have less office space. Therefore, impacts associated with the Reduced Height Alternative would be less than for the proposed Metro Plan for population growth, also reducing impacts related to water use, wastewater treatment, and solid waste disposal. Stormwater impacts would be similar because the Plan Area would be the same.

#### 5.4.2.19 Wildfire

The proposed Metro Plan had no impact related to the risk of wildfire in the Plan Area. The Reduced Height Alternative would be in the same Plan Area as the proposed Metro Plan and would therefore also have no impact on wildfire.

### 5.4.3 Removal of Western Expansion Area Alternative

#### 5.4.3.1 Aesthetics

The Removal of Western Expansion Area Alternative would be in the same Plan Area as the proposed Metro Plan and have the same types of development as the proposed Metro Plan. Therefore, like the proposed Metro Plan, most of the development under the Removal of Western Expansion Area Alternative would meet the requirements in PRC Section 21099. Some parts of the development, like the police station and open space, would not meet the requirement of PRC Section 21099 but would be the same as for the proposed Metro Plan, and would have the same impacts.

### 5.4.3.2 Agricultural and Forestry Resources

The Metro Plan Area is in a developed urban area without agricultural or forestry features. The Removal of Western Expansion Area Alternative would be within the same Plan Area as the proposed Metro Plan, and there would be no impact on agricultural and forestry resources.

### 5.4.3.3 Air Quality

The Removal of Western Expansion Area Alternative would have similar impacts as the proposed Metro Plan related to conflicting with or obstructing implementation of an applicable air quality plan because it would still include the green building certifications, promote alternative modes of transportation, reduce GHG emissions, and reduce total VMT.

The Removal of Western Expansion Area would have a lesser impact than the proposed Metro Plan related to a cumulatively considerable net increase in any criteria pollutant for which the region is classified as a nonattainment area during construction. BAAQMD's project-level significance thresholds for ROG, $NO_{X,}$ and $PM_{10}$ and $PM_{2.5}$ are per day emissions thresholds. A reduction in development likely would not change the daily intensity of construction, which means that daily emissions under the Removal of Western Expansion Area Alternative would be the same as or similar to the proposed Metro Plan. However, with reduction in the number of projected housing units, the overall length of construction would be reduced, reducing the number of days in which there may be an exceedance of project-level significance thresholds. Similar to the proposed Metro Plan, it is anticipated that multiple land use development projects would be constructed intermittently within the Metro Plan Area throughout the course of the buildout period. As the timing and intensity of future development projects are not known at this time, the precise air quality impacts of construction activities associated with buildout of the Removal of Western Expansion Area Alternative cannot be precisely quantified. However, dwelling units would be reduced by 500 units, which is roughly 7 percent, potentially reducing overall building construction emissions to a similar degree. This would constitute a substantial reduction in this air quality impact. Because the significance thresholds may still be exceeded, the same mitigation measures would apply to this alternative as to the proposed Metro Plan for this impact.

The Removal of Western Expansion Area Alternative would have a lesser impact than the proposed Metro Plan related to a cumulatively considerable net increase in any criteria pollutant for which the region is classified as a nonattainment area under an applicable federal or state ambient air quality standard during operation. Buildout of the Removal of Western Expansion Area Alternative has the potential to result in similar air quality impacts from area, energy, and mobile sources as the proposed Metro Plan. However, these impacts would be reduced compared to the proposed Metro Plan because there would be fewer dwelling units, less office space, and fewer associated mobile sources. Dwelling units would be reduced by 500 units, which is roughly 7 percent, potentially reducing overall building operation emissions to a similar degree. This would constitute a substantial reduction in this significant impact. Because the significance thresholds may still be exceeded, the same mitigation measures would apply to this alternative as to the proposed Metro Plan for this impact.

The Removal of Western Expansion Area Alternative has the potential to expose sensitive receptors to substantial pollutant concentrations similar to the proposed Metro Plan. The overall length of construction and duration of construction emissions could be reduced in the McCandless area due to the Removal of Western Expansion Area from the Plan Area. This could reduce the number of

sensitive receptors exposed to substantial pollutant concentrations. However, as the timing, intensity, location and configuration of future development projects are not known at this time, the precise effects of construction activities associated with buildout of the Removal of Western Expansion Area Alternative cannot be accurately quantified. Therefore, impacts may also be similar to those of the proposed Metro Plan, and the same mitigation measure would apply.

The Removal of Western Expansion Area Alternative would have a similar potential to expose receptors to objectionable odors as the proposed Metro Plan, though fewer receptors may be exposed to odors. The geographic extent of the Plan Area would be slightly reduced, so that receptors around the western expansion area would not be exposed to odors from the use of heavy equipment for grading and excavation, use of landscaping equipment, and trash pickup. Therefore, impacts may be slightly reduced.

#### 5.4.3.4 Biological Resources

The Removal of Western Expansion Area may have slightly reduced impacts on biological resources compared to the proposed Metro Plan. Impacts would be similar in nature because the footprint of the Removal of Western Expansion Area Alternative is generally the same as the proposed Metro Plan footprint and therefore would have impacts on the same resources. However, exclusion of the western expansion area could slightly reduce biological resources impacts, depending on resources present in the western expansion area. For example, most of the western expansion area is developed, but there are some trees that could serve as nesting habitat. Therefore, the reduction in the size of the footprint may reduce impacts slightly.

In addition, impacts related to tall buildings and bird strikes were identified for the proposed Metro Plan and this alternative would reduce those impacts due to the building height limitation. Under this alternative, it is expected that bird strikes could still happen but that they would be reduced since there would be fewer buildings with the removal of the Western Expansion Area Alternative. Under this alternative, Metro Plan Policy SC 5.2, which would include design requirements for buildings to minimize bird strikes, would also apply.

#### 5.4.3.5 Cultural Resources

The Removal of Western Expansion Area Alternative would have impacts on cultural resources that are similar in nature to those of the proposed Metro Plan but potentially reduced in magnitude. The reduced size of the Plan Area under the Removal of Western Expansion Area Alternative would mean that there would be a slightly reduced potential to impact known and unknown historic and cultural resources.

#### 5.4.3.6 Energy

The Removal of Western Expansion Area Alternative would consume energy in similar ways to the proposed Metro Plan, including consumption of fuel during construction and use of electricity during operation. However, these impacts would be reduced compared to the proposed Metro Plan because there would be fewer dwelling units, less office space, and fewer associated mobile sources. Dwelling units would be reduced by 500 units, which is roughly 7 percent, potentially reducing overall residential energy use to a similar degree.

### 5.4.3.7 Geology and Soils

The Removal of Western Expansion Area Alternative would have impacts on cultural resources that are similar in nature to those of the proposed Metro Plan but potentially reduced in magnitude. The reduced size of the Plan Area under the Removal of Western Expansion Area Alternative would mean that there would be slightly reduced impacts related to erosion, soil stability, and the potential to impact paleontological resources.

### 5.4.3.8 Greenhouse Gases

For evaluation of GHG emissions, BAAQMD recommends evaluating whether construction activities would conflict with statewide emission reduction goals and implement feasible BMPs. With reduction in the number of projected housing units and office space, the overall length of construction would be reduced, reducing the total GHG emissions of construction. This would constitute a substantial reduction in emissions. As for the proposed Metro Plan, the precise effects of construction activities associated with buildout of the Removal of Western Expansion Area Alternative cannot be accurately quantified at this time because construction phasing and intensity are as yet unknown. Dwelling units would be reduced by 500 units, which is roughly 7 percent, potentially reducing overall building construction emissions to a similar degree. Because the impact may still be significant, the same mitigation measure would apply to this alternative as to the proposed Metro Plan for construction impacts.

Buildout of the Removal of Western Expansion Area Alternative has the potential to result in similar GHG impacts from area, energy, and mobile sources as the proposed Metro Plan. However, these impacts would be reduced compared to the proposed Metro Plan because there would be fewer dwelling units and fewer associated mobile sources. Dwelling units would be reduced by roughly 7 percent, potentially reducing overall residential building operation emissions to a similar degree. This would constitute a substantial reduction in this significant impact. However, the Removal of Western Expansion Area Alternative may still conflict with GHG reduction plans, as described for the proposed Metro Plan, and the same mitigation measures would apply to this alternative as for the proposed Metro Plan for this impact.

### 5.4.3.9 Hazards and Hazardous Materials

The Removal of Western Expansion Area Alternative would have impacts related to hazards and hazardous materials that are similar in nature to those of the proposed Metro Plan but potentially reduced in magnitude. For example, the Hulligan Property at 1446 South Main Street, the Kaiser Experimental Lab at 1600 South Main Street, and the Milpitas Senior Housing Project at 1600 South Main Street are in the western expansion area and would no longer be in the Plan Area under the Removal of Western Expansion Area Alternative. Although two of these sites are listed as closed and one was referred to a local agency, the smaller Plan Area under this alternative also reduces the risk of unearthing other contamination. Therefore, the Removal of Western Expansion Area Alternative would have slightly reduced impacts compared to the proposed Metro Plan.

### 5.4.3.10 Hydrology and Water Quality

The Removal of Western Expansion Area Alternative would have impacts on hydrology and water quality that are similar in nature to those of the proposed Metro Plan but potentially reduced in magnitude. The reduced size of the Plan Area under the Removal of Western Expansion Area

Alternative would mean that there would be less ground disturbance. This would slightly reduce impacts related to erosion, entrainment of sediment in runoff, sedimentation, localized ponding, flooding, potential release of chemicals, increased discharge of pollutants in stormwater due to the new residents, and additional vehicular traffic when compared to the proposed Metro Plan.

### 5.4.3.11 Land Use

The Removal of Western Expansion Area Alternative would have similar impacts on land use as the proposed Metro Plan because the land use designations would be the same other than removing any land use changes in the western expansion area. The Removal of Western Expansion Area Alternative, like the proposed Metro Plan, also would not divide an established community. It is possible the Removal of Western Expansion Area Alternative might also have greater impacts on land use than the proposed Metro Plan because it could require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. Other locations within the City would not be located near the BART station and are thus unlikely to have the same transit-oriented development benefits as the proposed Metro Plan.

### 5.4.3.12 Mineral Resources

The Metro Plan Area is in a developed urban area without mapped mineral resources. The Removal of Western Expansion Area Alternative would be within the same Plan Area as the proposed Metro Plan and would have no impact on mineral resources.

### 5.4.3.13 Noise

Construction of future development associated with the Metro Plan would generate noise, and temporarily increase noise levels at nearby land uses. The noise levels generated during construction would depend on the construction equipment used, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive receptors. A reduction in development likely would not change the daily intensity of construction, which means that typical construction noise levels generated under the Removal of Western Expansion Area Alternative would be the same as or similar to the proposed Metro Plan (see Table 3.4-11 and associated discussion). However, with reduction in the number of projected housing units, the overall length of construction would be reduced, reducing the number of days in which there may be noise levels greater than 65 dBA or greater than 3 dB over the existing ambient levels at nearby sensitive land uses. The Removal of Western Expansion Area Alternative would also reduce the geographic scope of the Plan Area, reducing the number of receptors potentially exposed to this noise. This would be a substantial reduction in this impact. However, noise may still exceed significance thresholds and may still occur during nighttime hours, as for the proposed Metro Plan. The same General Plan policies would apply to this alternative.

The kinds of noise generated by the Removal of Western Expansion Area Alternative would be similar to the proposed Metro Plan in nature but may be reduced in some cases. The proposed Metro Plan would result in increases in traffic noise on some roadway segments and decreases on others (see Table 3.4-12). Fewer dwelling units would likely reduce the amount of traffic noise generated on segments that would experience increased noise under the proposed Metro Plan because the Removal of Western Expansion Area Alternative would have fewer dwelling units. TOD-related noise and siren noise may also be reduced due to the reduced development size.

As for the proposed Metro Plan, the Removal of Western Expansion Area Alternative would also be expected to include installation and operation of stationary sources of noise, such as HVAC equipment and emergency generators, which could expose existing adjacent land uses to excessive noise. Because specific details for future development projects under the Metro Plan are not known at this time, the types of future mechanical equipment and the exact sizes and locations of future mechanical equipment are also unknown. However, with removal of 500 dwelling units, the amount of this equipment needed would likely be reduced in comparison to the proposed Metro Plan, which would reduce noise generation during operation. The Removal of Western Expansion Area Alternative would also reduce the geographic scope of the Plan Area, reducing the number of receptors potentially exposed to this noise. However, based on noise levels generated by singular pieces of some equipment (e.g., emergency generator), equipment operations may result in excessive noise levels at nearby sensitive uses. The same General Plan policies and mitigation measure would apply.

Similar to the proposed Metro Plan, most future projects in the Removal of Western Expansion Area Alternative would not require the use of pile driving equipment, but some projects may. The vibration levels generated would be the same as for the Metro Plan. The removal of the western expansion area would mean that no pile driving would occur in that area, which could reduce the number of people and buildings exposed to pile driving. However, details like foundation design are not known at this time. Therefore, the Removal of Western Expansion Area Alternative could have similar impacts as the proposed Metro Plan, and the same mitigation measure would apply.

The Removal of Western Expansion Area Alternative would be within the same Plan Area as the proposed Metro Plan. As a result, this alternative would have no impact related to exposure to airport noise, similar to the proposed Metro Plan.

### 5.4.3.14 Population and Housing

The Removal of Western Expansion Area Alternative would have 500 fewer dwelling units than the proposed Metro Plan, reducing the ultimate population growth in the Plan Area compared to the proposed Metro Plan by approximately 1,000 people. Therefore, impacts associated with the Removal of Western Expansion Area Alternative would be less than for the proposed Metro Plan for population growth within the Metro Plan Area. The Removal of Western Expansion Area Alternative would be generally implemented in the same Plan Area as the proposed Metro Plan but would exclude the western expansion area. The western expansion area contains an existing residential assisted living facility, as well as industrial and automotive service uses. It is not anticipated that any existing housing would be demolished or cause displacement of people under the Metro Plan. Therefore, like the proposed Metro Plan, the Removal of Western Expansion Area Alternative would also not displace existing people and housing. However, it should be noted that the Removal of Western Expansion Area Alternative would require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. This would result in population growth either elsewhere in the City or outside the City that might be unaccounted for in other jurisdictions' planning.

### 5.4.3.15 Public Services and Recreation

The Removal of Western Expansion Area Alternative would have 500 fewer dwelling units than the proposed Metro Plan, reducing the ultimate population growth in the Plan Area compared to the proposed Metro Plan by approximately 1,000 people. Reduced population growth would likely also

reduce demand for additional school capacity, firefighting capacity, police protection, and parks. Therefore, the Removal of Western Expansion Area Alternative would have slightly reduced impacts on public services and recreation compared to the proposed Metro Plan.

### 5.4.3.16 Transportation

The Removal of Western Expansion Area Alternative would occur in the same Plan Area as the proposed Metro Plan and would therefore have a similar spatial relationship to existing transit, roadway, bicycle, and pedestrian facilities as the proposed Metro Plan. The Removal of Western Expansion Area Alternative would have 500 fewer dwelling units than the proposed Metro Plan, reducing the ultimate population growth in the Plan Area compared to the proposed Metro Plan. As a result, the Removal of Western Expansion Area Alternative would result in reduced pedestrian, bicycle, and transit trips compared to the Metro Plan, which would require transit service adjustment and enhanced active transportation facilities. It is also probable the same transportation infrastructure improvements would be made as for the proposed Metro Plan, such as new trails along Berryessa Creek and proposed minor street connections. Like the proposed Metro Plan, the Removal of Western Expansion Area Alternative would also need to provide adequate emergency access.

The development included in the proposed Metro Plan would result in VMT per service population, per capita, and per employee that are more than 15 percent lower than countywide averages. Because the Removal of Western Expansion Area Alternative would have fewer dwelling units, the per unit VMT may be higher under the Removal of Western Expansion Area Alternative than under the Metro Plan. The Removal of Western Expansion Area Alternative would require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. Other locations within the City would not be located near the BART station and are thus unlikely to have the same transit-oriented development benefits as the proposed Metro Plan. Therefore, residents and workers that could have lived in the Metro Plan Area may instead live somewhere where average VMT is higher. Therefore, the Removal of Western Expansion Area Alternative may have a less beneficial impact on VMT than the proposed Metro Plan.

### 5.4.3.17 Tribal Cultural Resources

No tribal cultural resources have been identified in the Metro Plan Area. The Removal of Western Expansion Area Alternative would be in the same Plan Area as the proposed Metro Plan, and there would be no impact on tribal cultural resources.

### 5.4.3.18 Utilities and Service Systems

The Removal of Western Expansion Area Alternative would have 500 fewer dwelling units than the proposed Metro Plan, reducing the ultimate population growth in the Plan Area compared to the proposed Metro Plan by approximately 1,000 people. Therefore, impacts associated with the Removal of Western Expansion Area Alternative would be less than for the proposed Metro Plan for population growth, also reducing impacts related to water use, wastewater treatment, and solid waste disposal. The Plan Area would be reduced with removal of the western expansion area. However, stormwater is still currently generated on the site, and removal of the area from the Plan Area might not reduce stormwater generation in the western expansion area. Regardless, impacts related to utilities and service systems would ultimately be less than for the Metro Plan.

### 5.4.3.19 Wildfire

The proposed Metro Plan had no impact related to wildfire. The Removal of Western Expansion Area Alternative would be within the same Plan Area as the proposed Metro Plan and would therefore also have no impact related to wildfire.

## 5.5 Comparison of Impacts

Table 5-1 compares the significant impacts of the Project Change, No Project Alternative, Reduced Height Alternative, and Removal of Western Expansion Area Alternative in two ways. First, for each impact studied, it identifies the level of impact for the Project Change and each alternative (e.g., no impact, less-than-significant impact, less-than-significant impact with mitigation, or significant and unavoidable impact). Second, for each alternative and each impact, it indicates whether the resulting degree of impact would be similar to, less than, or greater than the Project Change impact. In some cases, although both the Project Change and alternative would result in the same level of impact, the degree of that impact might differ.

**Table 5-1. Comparison of Impacts**

| Impact | Project Change | Reduced Height Alternative | Removal of Western Expansion Area Alternative | No Project Alternative |
|---|---|---|---|---|
| Aesthetics | LTS | LTS (similar) | LTS (similar) | NI (less) |
| Agricultural and Forestry Resources | NI | NI (similar) | NI (similar) | NI (similar) |
| Air Quality | SU | SU (less) | SU (less) | NI (less) |
| Biological Resources | LTS | LTS (less) | LTS (less) | NI (less) |
| Cultural Resources | LTS | LTS (similar) | LTS (less) | NI (less) |
| Energy | LTS | LTS (less) | LTS (less) | NI (less) |
| Geology and Soils | LTS | LTS (similar) | LTS (less) | NI (less) |
| Greenhouse Gases | SU | SU (less) | SU (less) | NI (less) |
| Hazards and Hazardous Materials | LTS | LTS (less) | LTS (less) | NI (less) |
| Hydrology and Water Quality | LTS | LTS (similar) | LTS (less) | NI (less) |
| Land Use and Planning | LTS | LTS (similar) | LTS (similar) | LTS (greater) |
| Mineral Resources | NI | NI (similar) | NI (similar) | NI (similar) |
| Noise | SU | SU (less) | SU (less) | NI (less) |
| Population and Housing | LTS | LTS (less) | LTS (less) | LTS (greater) |
| Public Services and Recreation | LTS | LTS (less) | LTS (less) | NI (less) |
| Transportation | LTS | LTS (greater) | LTS (greater) | LTS (greater) |
| Tribal Cultural Resources | NI | NI (similar) | NI (similar) | NI (less) |
| Utilities and Service Systems | LTS | LTS (less) | LTS (less) | NI (less) |
| Wildfire | NI | NI (similar) | NI (similar) | NI (similar) |

NI (no impact); LS (less than significant); LSM (less than significant with mitigation); SU (significant and unavoidable); PSU (potentially significant and unavoidable); similar (similar impact as the Project Change); less (less impact than the Project Change); greater (greater impact than the Project Change).

# 5.6 Environmentally Superior Alternative

Section 21002 of the State CEQA Guidelines requires lead agencies to adopt feasible mitigation measures or feasible environmentally superior alternatives in order to substantially lessen or avoid otherwise significant adverse environmental effects, unless specific social or other conditions make such mitigation measures or alternatives infeasible. CEQA also requires that an environmentally superior alternative be identified among the alternatives analyzed. In general, the environmentally superior alternative is the project that avoids or substantially lessens some or all of the significant and unavoidable impacts of the proposed project (State CEQA Guidelines Section 15126.6).

First, as described above, the reduction in housing units under the No Project Alternative, Reduced Height Alternative, and Removal of Western Expansion Area Alternative would likely result in planning and construction of housing elsewhere. However, it cannot currently be known where those housing units may be located or what the characteristics of those units (e.g., density, height, etc.) would be, such that specific impacts cannot be evaluated. However, generally speaking, it is possible that the No Project Alternative, Reduced Height Alternative, and Removal of Western Expansion Area Alternative might also have greater impacts on land use than the proposed Metro Plan because these alternatives could require planning for housing units elsewhere in the City to meet RHNA obligations and could exacerbate existing housing shortages more generally, resulting in development of housing elsewhere. Other locations within the City would not be located near the BART station and are thus unlikely to have the same transit-oriented development benefits as the proposed Metro Plan. Residents and workers that could have lived in the Metro Plan Area may instead live somewhere where average VMT is higher. Therefore, the alternatives may have a less beneficial impact on VMT than the proposed Metro Plan. These alternatives could also result in population growth either elsewhere in the City or outside the City that might be unaccounted for in other jurisdictions' planning.

The No Project Alternative would not achieve some of the environmental benefits associated with the Metro Plan. Because the No Project Alternative would not build any of the housing uses near transit, the No Project Alternative is expected to have less of a reduction in VMT than the proposed Metro Plan. Nonetheless, the No Project Alternative would also avoid some of the significant and unavoidable impacts identified in the Metro Plan, including significant and unavoidable noise, vibration, air quality, and greenhouse gas emissions impacts. Because the No Project Alternative avoids these significant and unavoidable impacts, the No Project Alternative would be considered the environmentally superior alternative.

In accordance with State CEQA Guidelines Section 15126.6, because the No Project Alternative is the environmentally superior alternative, this SEIR must also specify which of the other alternatives would be environmentally superior. The degree in reduction of impacts of the Reduced Height Alternative and the Removal of Western Area Alternative largely depends on two characteristics: reduction in development intensity and reduction in development area. For both alternatives, the reduction in dwelling units reduces many impacts compared to the proposed Metro Plan.

For the Reduced Height Alternative, the reduction in office space area also reduces some impacts. The decrease in Plan Area size under the Removal of Western Area Alternative also reduces certain impacts. The reduction in impacts is not consistent in degree for each impact. To illustrate, the Removal of Western Area Alternative reduces impacts on geology and soils when the Reduced Height Alternative does not. However, the Reduced Height Alternative has a greater reduction in impacts for air quality because it has a greater reduction in dwelling units and reduces office space development compared to the Removal of Western Area Alternative. Therefore, the exercise of identifying the environmentally superior alternative requires making judgements about the balance of the reductions in impacts and deciding the weight of each impact.

It is uncertain which alternative would have a greater reduction in impacts for biological resources and hazards and hazardous materials. The Reduced Height Alternative would reduce bird strike impacts, but the Removal of Western Expansion Area Alternative could also reduce bird strikes by reducing the number of buildings and could also reduce impacts on nesting birds and any other biological resources located in the western expansion area. The Reduced Height Alternative would have a greater reduction in hazardous materials used for construction due to less construction

overall, but the Removal of Western Expansion Area Alternative could reduce the potential to unearth previously unknown contamination in the western expansion area, and would also reduce hazardous materials used for construction. Therefore, these environmental impacts do not influence the determination of the environmentally superior alternative.

Because of its greater reduction in development size, the Reduced Height Alternative has the greater reduction in impacts for air quality, energy, greenhouse gases, noise, population and housing, public services and recreation, and utilities and service systems. Because of its smaller Plan Area size, the Removal of Western Expansion Area Alternative has the greatest reduction in impacts for cultural resources, geology and soils, and hydrology and water quality. Finally, it appears that the Reduced Height Alternative would result in a greater VMT reduction than the Removal of Western Expansion Area Alternative. Because both alternatives reduce a number of impacts, the balance of impact reductions must be weighed and considered.

In total, the Reduced Height Alternative is expected to have a greater reduction on the impacts of eight environmental topics (air quality, energy, greenhouse gases, noise, population and housing, public services and recreation, and utilities and service systems), compared to the Removal of Western Expansion Area Alternative. In addition, impacts on three of these environmental topics (air quality, greenhouse gases, noise) would be reductions in the magnitude of significant and unavoidable impacts, although the impact conclusion of significant and unavoidable is expected to be the same for the Metro Plan, Reduced Height Alternative, and the Removal of Western Expansion Area Alternative. In total, the Removal of Western Expansion Area Alternative is expected to have a greater reduction on the impacts of three environmental topics (cultural resources, geology and soils, and hydrology and water quality), compared to the Reduced Height Alternative. In addition, impacts on these environmental topics (cultural resources, geology and soils, and hydrology and water quality) would be reductions in the magnitude of less-than-significant impacts (after implementation of policies and regulations). Considering this information, the Reduced Height Alternative is considered environmentally superior.

Chapter 6
# List of Preparers

## 6.1 Lead Agency

### 6.1.1 City of Milpitas

Ned Thomas, Planning Director

Kevin L. Riley, Project Manager

Jay Lee, Principal Planner

Steve Chan, City Traffic Engineer

Harris Siddiqui, Principal Civil Engineer

## 6.2 EIR Preparers—ICF

| Name | Job Title | Technical Contribution | Years of Experience | Education |
|---|---|---|---|---|
| Heidi Mekkelson | Project Director | Senior Review | 15 | B.S., Environmental Studies/ Biology |
| Leo Mena | Project Manager | Project Management<br>Senior Technical Review<br>Initial Study | 8 | B.A., Ecology and Evolutionary Biology |
| Ross Wilming | Wildlife Biologist | Biological Resources | 14 | B.S., Biology |
| Jonathon Rusch | Architectural Historian | Cultural Resources | 5 | M.A. Historical Preservation Planning<br>B.A. Geography |
| Stephen Pappas | Archaeologist | Cultural, Tribal Cultural QA/QC | 21 | M.A., Anthropology<br>B.A., Anthropology, |
| Megan Watson | Archaeologist | Cultural Resources, Tribal Cultural Resources | 10 | B.A., Anthropology |
| Cory Matsui | Manager, Air Quality and Climate Change | Air Quality and Greenhouse Gas Emissions | 11 | B.A., Atmospheric Science |
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| Name | Job Title | Technical Contribution | Years of Experience | Education |
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| Noah Schumaker | Noise Specialist | Noise | 1 | B.S Audio Production and Technology<br>M.S. Mechanical Engineering |
| Lisetta Quick | Senior Planner | Land Use, Population and Housing | 12 | B.A. Environmental Studies/Politics; Certificate in Landscape Architecture |
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## 6.3.4 M-Group

Christina Paul, AICP, Principal Policy Planner

Erin Tou, Associate Planner

Chapter 7
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### 7.3.1 Air Quality

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Appendix A

# Notice of Preparation and Scoping Comments Received

# CITY OF MILPITAS

455 EAST CALAVERAS BOULEVARD, MILPITAS, CALIFORNIA 95035-5479
GENERAL INFORMATION: 408-586-3000, TDD: 586-3013, www.ci.milpitas.ca.gov


## Notice of Preparation and Scoping Meeting
## Milpitas Metro Specific Plan Subsequent Environmental Impact Report
## State Clearinghouse #2006032091

| | |
|---|---|
| **Date:** | September 16, 2021 |
| **To:** | State Clearinghouse, Agencies, Organizations and Interested Parties |
| **Subject:** | Notice of Preparation and Scoping Meeting for the Milpitas Metro Specific Plan Subsequent Environmental Impact Report |
| **Scoping Meeting:** | **September 30, 2021 at 3:00 P.M. – 4:00 P.M.** |
| **Comment Period:** | **September 16, 2021 to October 18, 2021** |

The City of Milpitas (City) will serve as the Lead Agency in the preparation of a Subsequent Environmental Impact Report (SEIR) for the Milpitas Metro Specific Plan (Metro Plan or project) and would like your views regarding the scope and content of the environmental information to be addressed in the SEIR.

The purpose of this notice is (1) to serve as a Notice of Preparation (NOP) of a SEIR pursuant to the State CEQA Guidelines Section 15082; (2) to advise and solicit comments and suggestions regarding the scope and content of the SEIR to be prepared for the Metro Plan; and (3) to notice the public scoping meeting. The project description, location, and a summary of potential environmental effects are included in this NOP further below.

The project is a long-term planning document that updates the original 2008 Milpitas Transit Area Specific Plan (TASP) and vision for the area. As explained in further detail below, the Metro Plan would expand the TASP area by 73 acres and would accommodate additional future growth in Milpitas, in addition to the growth identified in the TASP. No specific development projects are proposed as part of the Metro Plan. Information regarding the project description, project location, and topics to be addressed in the Draft SEIR is provided below. Additional project documents and information are available at the City of Milpitas, Planning Department located at City Hall 455 E. Calaveras Boulevard, Milpitas, CA 95035, and on-line using the following weblinks:

- https://www.ci.milpitas.ca.gov/milpitas/departments/environmentaldocuments/
- https://www.ci.milpitas.ca.gov/metro/

For questions regarding this notice, please contact Kevin Riley at 1-408-586-3292, or by email: kriley@ci.milpitas.ca.gov.

**Notice of Preparation 30-Day Comment Period**
The City, as the Lead Agency, requests that responsible and trustee agencies, and the Office of Planning and Research, respond in a manner consistent with Section 15082(b) of the CEQA Guidelines. Pursuant to Public Resources Code Section 21080.4, responsible agencies, trustee agencies and the Office of Planning and Research must submit any comments in response to this notice no later than 30 days after receipt.

Consistent with Section 15082(b) of the CEQA Guidelines, comments should provide specific detail about the scope and content of the environmental information related to the responsible or trustee agency's area of statutory responsibility and should identify significant environmental issues, reasonable alternatives, mitigation measures, and whether an agency will be a responsible or trustee agency. In accordance with the time limits established by CEQA, the NOP public review period will begin on September 16, 2021 and end on October 18, 2021.

In the event that the City does not receive a response from any Responsible or Trustee Agency by the end of the review period, the City may presume that the Responsible Agency or Trustee Agency has no response to make (State CEQA Guidelines Section 15082(b)(2)).

**How to Comment**

All comments in response to this notice must be submitted in writing at the address below, or via email, by the close of the 30-day NOP review period, which is 5:00 PM on October 18, 2021:

Kevin Riley, Metro Plan Project Manager | City of Milpitas
455 East Calaveras Boulevard, Milpitas, CA 95035
Email: kriley@ci.milpitas.ca.gov

**It is noted that additional opportunities for public comment on the Metro Plan and pending Draft SEIR will be provided. These documents are anticipated to be available for public review in the fall of 2021.*

**Scoping Meeting**

The City will hold a virtual online scoping meeting to provide an opportunity for agency representatives and the public to assist the City in determining the scope and content of the SEIR. The scoping meeting is not intended to be a substitute for comments submitted in response to the NOP, but rather to supplement or expand the understanding of the project, its potential effects and possible mitigation measures, as well as to offer an opportunity for other interested parties to weigh in on the scope and content of the forthcoming SEIR. Any comments on the NOP should be submitted in writing, per the directions listed above in the "How To Comment" section.

The scoping meeting will be held on Thursday, September 30, 2021, at 3:00 P.M. – 4:00 P.M. The scoping meeting can be accessed at:

Facebook: https://www.facebook.com/CityofMilpitas/
YouTube: https://www.ci.milpitas.ca.gov/youtube
Web Streaming: https://www.ci.milpitas.ca.gov/webstreaming

Please submit comments during the meeting by email to kriley@ci.milpitas.ca.gov. For comments before or after the meeting or additional information, please contact Kevin Riley at 1-408-586-3292, or by email: kriley@ci.milpitas.ca.gov.

**Project Location and Setting**

The City of Milpitas is located at the southern tip of the San Francisco Bay, in Santa Clara County, California. With San Jose situated to its south, Milpitas sits in the northeast section of the South Bay, bordering the East Bay and Fremont. Milpitas is often called the "Crossroads of Silicon Valley" with most of its 13.63 square miles of land situated between two major freeways (I-880 and I-680), and traversed by State Route 237, and County-managed Montague Expressway.

The planning area for the 2008 TASP (TASP Area) comprises an approximately 437-acre area in the southeastern portion of the City, just north of San Jose. The TASP Area is centered on a roughly 0.5-mile radius around the Milpitas Bay Area Rapid Transit (BART) Station (Milpitas Transit Center) located near

the intersection of Montague Expressway and East Capitol Avenue. The boundaries of the TASP Area are the Great Mall to the north, South Main Street to the west, Trade Zone Boulevard and the city limits to the south, Milpitas Boulevard to the southeast, and the industrial lands to the northeast.

As explained in more detail in the following section, the planning area for the Metro Plan (Metro Plan Area) comprises the TASP Area plus an additional 73-acres. As part of the Metro Plan, the Metro Plan Area has been expanded to include additional parcels on the east side of Main Street and the industrial area between Berryessa Creek and Highway 680, which the General Plan establishes as an Innovation District. Similar to the TASP Area, the Metro Plan Area is generally bound by and includes the Great Mall and industrial lands to the north, South Main Street to the west, Trade Zone Boulevard and the city's limits to the south, and I-680 and the San Jose border to the east. The Metro Plan Area is organized into five subdistricts, which are generally separated by major street corridors including Great Mall Parkway/Capitol Avenue, Montague Expressway, Milpitas Boulevard, and the BART rail tracks. The parcels along Main Street are part of the McCandless subdistrict, a primarily residential neighborhood with some services, across Great Mall Parkway from Great Mall. The expansion area to the east of the Transit Center is part of the new Innovation District. The location of the Metro Plan Area is shown in Figure 1 (Project Location).

**Project Description**

The Metro Plan will replace the 2008 TASP in its entirety. The Metro Plan aims to update the original TASP vision and complete existing and emerging neighborhoods by expanding access to neighborhood services and retail, creating exciting new opportunities for business and jobs near transit and housing, providing additional affordable and market-rate housing, enhancing multimodal connections and non-vehicular mobility throughout the area, providing a greater variety of shared public spaces, and strengthening the identity and sense of place of the Metro Plan Area.

The Metro Plan Area covers a significant portion of the southern area of the City, and the Metro Plan provides policies to guide development in this district in terms of land use, circulation, community design, and utilities and services. The Milpitas General Plan calls for the maintenance and implementation of the Milpitas Metro Specific Plan to guide development around the Milpitas Transit Center and light rail stations into a transit-oriented urban neighborhood with a mix of land uses (General Plan Land Use Goal LU-2, Policy LU 2-1, and Action LU-2a). The Metro Plan will fulfill that requirement.

The Metro Plan expands the original 437-acre TASP area by approximately 73 acres, annexing approximately 60 acres of an industrial area on the east side near I-680 and approximately 13 acres on the west side along a portion of South Main Street, resulting in a Metro Plan area of 510 acres. In addition, the Metro Plan Area would be divided into five subdistricts. To balance the high-density development in the plan area, each subdistrict includes or will include at least one park or open space amenity, as well as linear parks and trails, which will provide residents and workers with outdoor recreational space. In addition, a series of area-wide infrastructure improvements will take place to accommodate residential and mixed-use development; make it more accessible to and comfortable for pedestrians; improve vehicle navigability; and reduce obstructions to development. The proposed land use map for the Metro Plan is shown in Figure 2 (Proposed Milpitas Metro Specific Plan Land Use Map).[1]

[1] The City of Milpitas is considering annexing a 3.7-acre site from the City of San Jose. This site is located on the east side of the I-680, south of the Montague Expressway; is located adjacent to the proposed Innovation District; and is shown in Figure 1. The certainty of this annexation is not known at this time; therefore, this SEIR will not consider this annexation site in its environmental analysis. If this site is annexed by the City of Milpitas, then additional environmental review would be prepared at that time.

The following objectives have been identified for the Metro Plan:

1. Accommodate a maximum of 7,000 additional housing units to help the City to meet its regional housing needs requirements and support transit ridership.
2. Support the evolution of the Great Mall site from a purely retail-based mall site into a mixed-use, retail and amenity-rich area that is well integrated into the Milpitas Metro Plan Area.
3. Create additional neighborhood-serving retail to serve demand from Plan Area residents, community members, and the local workforce, including up to 300,000 additional square feet of retail and restaurant space.
4. Attract business investments and generate employment opportunities through commercial development near transit, with a maximum of 3,000,000 square feet of new office/R&D/light manufacturing space.
5. Ensure adequate public open space to serve residential development. In compliance with the General Plan, the goal for open space development is 3.5 acres per 1,000 residents or the equivalent in terms of recreational value. Some recreational opportunities may be provided outside the plan area, and intensively-programmed and high quality spaces may be counted as equivalent to larger spaces in meeting open space goals.
6. Support the development of an Innovation District in the industrial area east of the Transit Station and west of Highway 680, which will become a hub of employment and research and development, better integrating Milpitas into Silicon Valley.
7. Enhance the street network to create a multi-modal network that includes pedestrian and bikeways to reinforce a pedestrian scale and grid where appropriate.
8. Expand the plan boundaries to encourage the development of an Innovation District east of the Transit Center, and provide opportunities for housing development along Main Street.
9. Redefine the five subdistricts, which are bound by major streets and other impediments, each with its own character based on the allocated mix of land uses and development densities, parks placement, street grid, pedestrian connections, and proximity to the Milpitas Transit Center. Particular visions include:
    1. High to very high-density housing and/or high intensity office and employment uses along arterials, the light rail and the BART stations;
    2. Vibrant mix of lifestyle retail and amenities, high density housing and/or offices within the Great Mall District, along Great Mall Parkway and Montague Expressway; and
    3. Innovation District redeveloped with high-density office, research, light manufacturing uses and services primarily to the east of Berryessa Creek.
10. Encourage higher density and intensity on the sites closest to the BART and light rail transit nodes in order to support transit ridership and to respond to strong market interest in high-density development. High density is particularly appropriate on wide streets where taller buildings fit with the scale of the street, such as Montague Expressway, Capitol Avenue/Great Mall Parkway, and the Milpitas Boulevard Extension.
11. Ensure the active transportation-oriented character of the Plan Area by creating streetscapes that are richly detailed, fine-grained, and provide good connectivity between desired destinations.
12. Develop parks that provide active and passive recreation opportunities and pedestrian connectivity in each subdistrict, as per the Parks and Recreation Master Plan. Encourage the development of creative, usable outdoor space on building rooftops and balconies.

13. Require local-serving retail on particular sites where it is feasible and appropriate, and permit it in otherwise residential and commercial-only structures.
14. Promote the development of hotels where appropriate to meet demand, and support commercial activity to provide an important revenue source for the City.
15. Improve the City transportation network and contribute to the County transportation network and transportation demand management over the next 20 years by improving the multimodal network and implementing the Active Transportation Plan. Key enhancements include creating safer connections for pedestrians and bicyclists and establishing a plan-wide transportation demand management (TDM) program.

**Additional Growth Under the Metro Plan**

While no specific development projects are proposed as part of the Metro Plan, the Metro Plan will accommodate future growth in Milpitas, including new businesses, expansion of existing businesses, and new residential uses. The buildout analysis assumes a 20-year horizon, and 2040 is assumed to be the buildout year of the Metro Plan.

Anticipated growth accommodated by the Metro Plan within the Metro Plan Area includes new and expanded businesses, new and expanded retail uses, and new hotel and residential uses. Table 1 below summarizes the range of net growth, including residential units, and non-residential square footage that could occur.

Consistent with the Metro Plan Land Use Map (see Figure 2), future growth would largely be focused into the five subdistricts or neighborhoods; each of which would have different characteristics and support different land uses. As shown in Table 1, buildout of the Metro Plan could yield an additional 7,000 dwelling units and 14,000 new residents; and 700 hotel rooms, as well as 300,000 square feet (sf) of retail uses, and 3 million sf of office uses, including 500,000 sf of industrial uses, resulting in approximately 9,500 new jobs; in addition to the buildout that was envisioned under the 2008 TASP.

**Table 1: Comparison of Existing Growth under the 2008 TASP and Additional Growth under the Metro Plan**

| Land Use | Existing Development in 2008 | TASP Planned New Development | Total TASP Planned Development | Entitled by 2019[a] | Additional Projected Development for Metro Plan by 2040 | Total Planned Development (TASP plus Metro Plan) |
|---|---|---|---|---|---|---|
| Dwelling Units | 468 | 7,109 | 7,577 | 6,955 | 7,000 | 14,5777 |
| Office (sf) | 52,780 | 993,843 | 1,050,000 | 10,630 | 3,000,000[b] | 4,050,000 |
| Retail (sf) | 1,970,000 | 287,075 | 2,240,000 | 186,500 | 300,000 | 2,540,000 |
| Hotel (rooms) | 292 | 350 | 642 | 0[c] | 700 | 1,342 |

Notes:

[a.] Entitled, under construction, or constructed/occupied.

[a.] Includes 500,000 sf of industrial uses

[c.] Currently there are concept plans for a high-rise hotel.

**Subsequent EIR Analysis**
The City, as the Lead Agency under CEQA, will prepare a SEIR for the Metro Plan. The purpose of a SEIR is to inform decision makers and the general public of the environmental effects associated with major changes to a previously certified EIR. The SEIR process is intended to provide environmental information sufficient to evaluate major changes and to identify the potential for new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

In May 2008, the City certified a Final Environmental Impact Report (Certified EIR) for the TASP, which evaluated the buildout of approximately 7,100 residential units resulting in 18,000 new residents; and 1,000,000 sf of office space, 285,000 sf of retail space, and 175,000 sf of hotel space resulting in 4,200 new jobs under the TASP. As described above, the Metro Plan would allow for additional growth and expand the boundaries of the TASP Area. In accordance with CEQA and the CEQA Guidelines, the SEIR analysis will focus on the potential impacts of the changes to the project and will not reevaluate the project as a whole. Accordingly, the SEIR will examine the revised project in the context of the 2008 Milpitas TASP EIR, focusing on the changes to environmental impacts and mitigation that would result from the revisions to the project.

The SEIR will be prepared in accordance with CEQA and will include:

- A description of the project;
- A description of the current environmental setting as compared to the environmental setting from the Certified EIR, new or increased potential environmental impacts, and new or revised mitigation measures;
- Alternatives to the project as currently proposed; and
- New environmental consequences or significant changes in environmental consequences as compared to the Certified EIR, including: (a) any significant environmental effects which cannot be avoided if the project is implemented, (b) the growth-inducing impacts of the project, and (c) cumulative impacts.

The City has determined that the Metro Plan has the potential to result in new environmental effects or environmental effects that are increased in severity compared to the 2008 TASP EIR with respect to the following resource topics, which will be addressed in the SEIR:

- Transportation
- Air Quality and Greenhouse Gas Emissions
- Noise
- Population and Housing
- Public Services
- Utilities
- Land Use

**Hazardous Waste Sites**
Portions of the project are located on or in close proximity to areas with hazardous materials contamination compiled pursuant to Government Code Section 65962.5 (Cortese List).

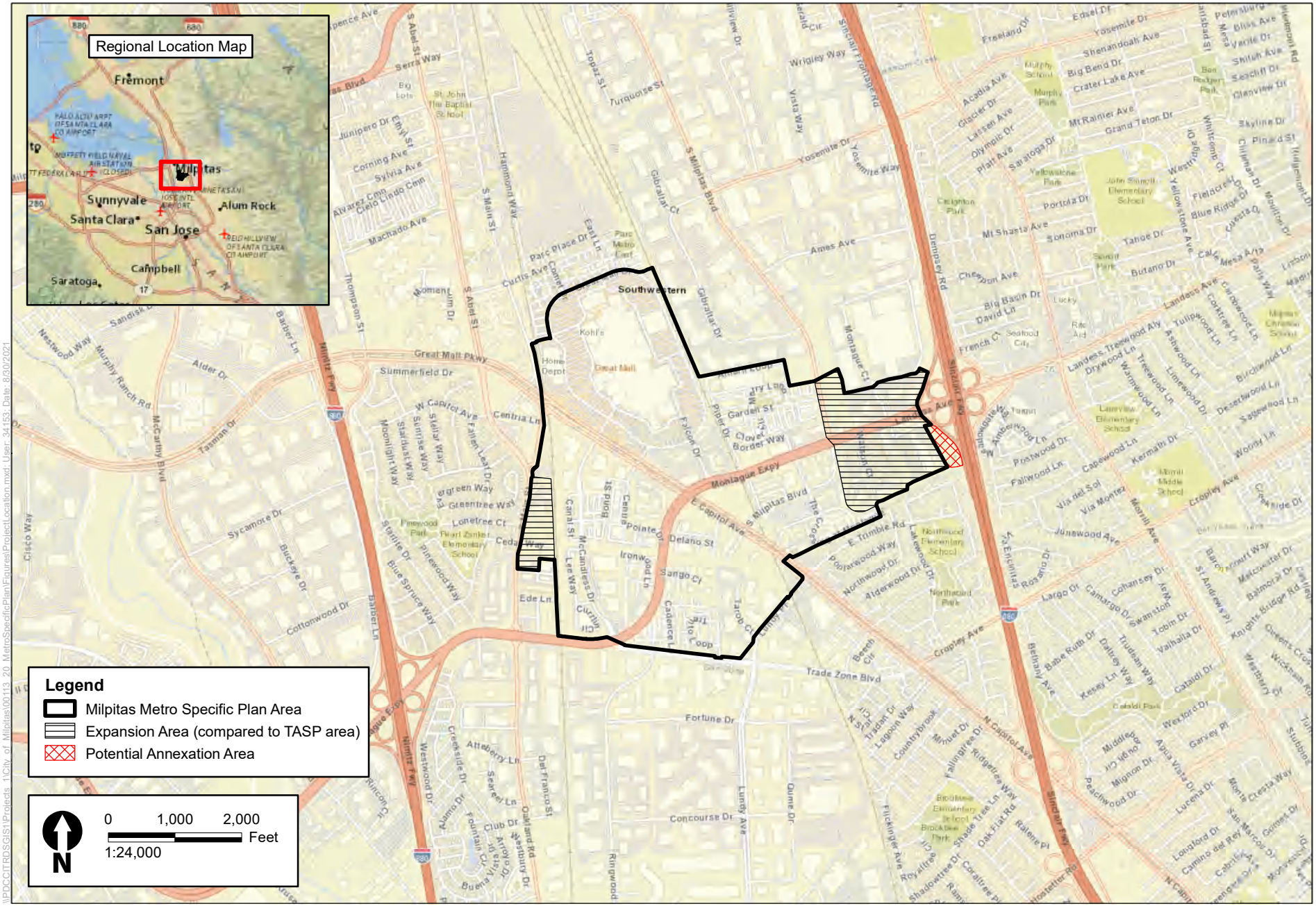


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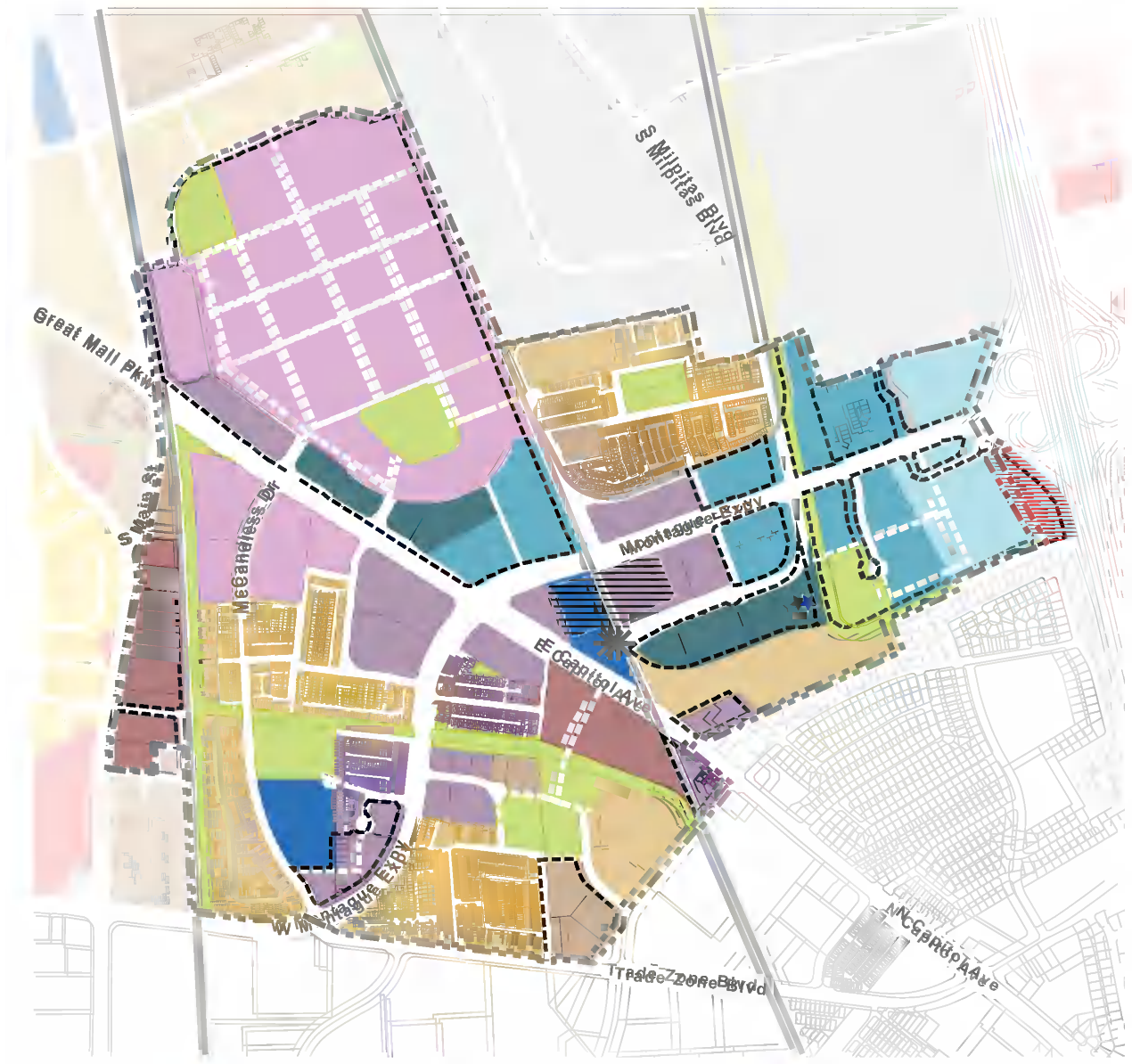
**Figure 1**
**Project Location Map**

MILPITAS METRO




Source: Urban Planning Partners, Inc. 2021.

Graphics ...00113.20 (9/10/21) AB

## Legend

- Milpitas Metro
- BART Station
- Police Substation*
- Railway
- Transit Center
- Potential Annexation Area
- Public Facilities (PF)
- Permanent Open Space (POS)
- Residential Retail High Density Mixed Use (RRMU) 40-85 units/acre; max 2.5 FAR
- Boulevard Very High Density Mixed Use (BVMU) 85-250 units/acre; 2.5-5.0 FAR
- Business Park Research & Development, Lower Density (BPRD-L); 1.0-2.5 FAR
- Business Park Research & Development, Higher Density (BPRD-H); 1.0-2.5 FAR
- Business Park Research & Development, Residential (BPRD-R); 1.0-5.0 FAR
- Multi-Family Residential High Density (MFH) 30-40 units/acre
- Multi-Family Residential Very High Density (VHD) 40-85 units/acre
- Urban Residential (URR) 70-120 units/acre

*Location of police substation is approximate and shall be determined through the implementation of the MMSP.

Milpitas Metro
BART Station
Police Substation*
Railway
Transit Center
Annexation Areas
Public Facilities (PF)
Permanent Open Space (POS)
Residential Retail High Density Mixed Use (RRMU) 40-85 units/acre; max 2.5 FAR
Boulevard Very High Density Mixed Use (BVMU) 85-250 units/acre; 2.5-5.0 FAR
Business Park Research & Development, Lower Density (BPRD-L); 1.0-2.5 FAR
Business Park Research & Development, Higher Density (BPRD-H); 1.0-2.5 FAR
Business Park Research & Development, Residential (BPRD-R); 1.0-5.0 FAR
Multi-Family Residential High Density (MFH) 30-40 units/acre
Multi-Family Residential Very High Density (VHD) 40-85 units/acre
Urban Residential (URR) 70-120 units/acre
*Location of police substation is approximate and shall be determined

**Figure 2**
**Proposed Milpitas Metro Specific Plan Land Use Map**

**From:** "Ayon, Llisel@DOT" <Llisel.Ayon@dot.ca.gov>
**Date:** October 15, 2021 at 10:16:53 AM PDT
**To:** Kevin Riley <kriley@ci.milpitas.ca.gov>
**Cc:** OPR State Clearinghouse <State.Clearinghouse@opr.ca.gov>
**Subject: Milpitas Metro NOP - Caltrans Comments**

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hello Kevin,

Thank you for including Caltrans in the review process for this project. The following comments are based on our review of the NOP. If you have any questions regarding these comments or require any additional information, please feel free to contact me at this email address or the phone number listed below.

Thank you,

**Llisel Ayon**
Associate Transportation Planner
Local Development - Intergovernmental Review
California Department of Transportation – District 4
Cell: (510) 506-6184

**California Department of Transportation**

DISTRICT 4
OFFICE OF TRANSIT AND COMMUNITY PLANNING
P.O. BOX 23660, MS–10D | OAKLAND, CA 94623-0660
www.dot.ca.gov

October 15, 2021

SCH #: 2006032091
GTS #: 04-SCL-2021-00952
GTS ID: 24224
Co/Rt/Pm: SCL/680/6.4

Kevin Riley, Project Manager
City of Milpitas
455 East Calaveras Blvd
Milpitas, CA 95035

**Re: Milpitas Metro Specific Plan Notice of Preparation (NOP) for Draft Environmental Impact Report (DEIR)**

Dear Kevin Riley:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Milpitas Metro Specific Plan. We are committed to ensuring that impacts to the State's multimodal transportation system and to our natural environment are identified and mitigated to support a safe, sustainable, integrated and efficient transportation system. The following comments are based on our review of the September 2021 NOP.

**Project Understanding**
The Milpitas Metro Specific Plan Project will update the 2008 Milpitas Transit Area Specific Plan. The updated plan will expand the original planning area by 73 additional acres, change land use classifications and policies, and allow for additional population and employment growth.

**Travel Demand Analysis**
With the enactment of Senate Bill (SB) 743, Caltrans is focused on maximizing efficient development patterns, innovative travel demand reduction strategies, and multimodal improvements. For more information on how Caltrans assesses Transportation Impact Studies, please review Caltrans' Transportation Impact Study Guide (*link*).

If the project meets the screening criteria established in the City's adopted Vehicle Miles Traveled (VMT) policy to be presumed to have a less-than-significant VMT impact and exempt from detailed VMT analysis, please provide justification to support the

exempt status in align with the City's VMT policy. Projects that do not meet the screening criteria should include a detailed VMT analysis in the DEIR, which should include the following:

- VMT analysis pursuant to the City's guidelines. Projects that result in automobile VMT per capita above the threshold of significance for existing (i.e. baseline) city-wide or regional values for similar land use types may indicate a significant impact. If necessary, mitigation for increasing VMT should be identified. Mitigation should support the use of transit and active transportation modes. Potential mitigation measures that include the requirements of other agencies such as Caltrans are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the City.

- A schematic illustration of walking, biking and auto conditions at the project site and study area roadways. Potential traffic safety issues to the State Transportation Network (STN) may be assessed by Caltrans via the Interim Safety Guidance.

- The project's primary and secondary effects on pedestrians, bicycles, travelers with disabilities and transit performance should be evaluated, including countermeasures and trade-offs resulting from mitigating VMT increases. Access to pedestrians, bicycle, and transit facilities must be maintained.

**Transportation Impact Fees and Fair Share Contributions**
We encourage a sufficient allocation of fair share contributions toward multimodal and regional transit improvements to fully mitigate cumulative impacts to regional transportation. We also strongly support measures to increase sustainable mode shares, thereby reducing VMT. Caltrans welcomes the opportunity to work with the City and local partners to secure the funding for needed mitigation. Traffic mitigation- or cooperative agreements are examples of such measures.

Please identify in text and graphics existing and proposed improvements for the pedestrian, bicycle, and transit networks. The City should estimate the cost of needed improvements, expansion, and maintenance for the Plan area, as well as identify viable sources of funding, correlated with the pace of improvements, and a scheduled plan for implementation along with the DEIR.

Please consider the following projects for fair share contributions:

- Plan Bay Area 2040 - Transit Efficiency & Service Improvement Project
- Plan Bay Area 2040 - Envisions Expressway Program (Montague Expressway)
- Plan Bay Area 2050 - I-680/Montague Expressway Interchange Improvement
- Plan Bay Area 2050 - I-880/Montague Expressway Interchange Improvement

**Lead Agency**
As the Lead Agency, the City of Milpitas is responsible for all project mitigation, including any needed improvements to the State Transportation Network (STN). The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter, please contact Llisel Ayon at Llisel.Ayon@dot.ca.gov. Additionally, for future notifications and requests for review of new projects, please email LDIGR-D4@dot.ca.gov.

Sincerely,

Mark Leong

MARK LEONG
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

**From:** Reena Brilliot <RBrilliot@santaclaraca.gov>
**Date:** October 15, 2021 at 1:42:23 PM PDT
**To:** Kevin Riley <kriley@ci.milpitas.ca.gov>
**Cc:** Andrew Crabtree <acrabtree@santaclaraca.gov>, Michael Liw <MLiw@santaclaraca.gov>
**Subject: City of Santa Clara comments on Milpitas Metro Specific Plan SEIR NOP**

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hi Kevin!
Thank you for providing the City of Santa Clara an opportunity to comment on the NOP for the Milpitas Metro Specific Plan EIR.
Please reference the attached comment letter and list of pending projects in the City of Santa Clara for use in the transportation analysis.

Have a great weekend!
**Reena Brilliot**
Assistant Director| Community Development Department
RBrilliot@SantaClaraCA.gov
www.santaclaraca.gov

City of Santa Clara
The Center of What's Possible

**Community Development**

October 15, 2021

Kevin Riley

**Subject: City of Santa Clara comments on Milpitas Metro Specific Plan SEIR NOP**

Dear Kevin Riley:
Thank you for sharing the Notice of Preparation for the Milpitas Metro Specific Plan Subsequent EIR NOP. The City of Santa Clara has the following comments related to the transportation analysis.

- While the City of Santa Clara has adopted Vehicle Miles Travelled (VMT) as the CEQA metric to measure transportation environmental impacts, the City still also conducts operational traffic analysis at intersections. As this project can add up to 300 peak hour trips within the City of Santa Clara, the City is requesting a local transportation analysis to be conducted at signalized intersections. The City uses the methodology and procedures contained within the VTA TIA Guidelines to conduct the local transportation analysis. Level of service and delay should be determined for intersections that meet the "10-trip rule" along the corridors of Tasman Drive, Agnew Road, Lick Mill Boulevard, and Lafayette Street as project trips most likely will utilize these routes.

- The local transportation analysis must also include an analysis of bicycle and pedestrian facilities in terms of their availability, project effects on future bike/pedestrian plans, and improvements proposed by the project. Maps and information on existing and planned bicycle facilities within Santa Clara can be found on the City's website at https://www.santaclaraca.gov/our-city/departments-g-z/public-works/engineering/committees/bicycle-and-pedestrian-advisory-committee.

- The project site is located near the eastern boundary of the City of Santa Clara. Relevant approved projects within Santa Clara need to be included in the study estimates of the Background traffic volumes. This is consistent with the CMP TIA Guidelines. A list of approved projects within the City of Santa Clara is attached.

- Similarly, pending projects within Santa Clara need to be incorporated in the Cumulative traffic volume estimates, in order to reflect the growth in both the local and regional traffic. A list of pending projects within the City of Santa Clara is attached.

- Any physical improvements required or planned at study intersections need to evaluate secondary impacts to alternative modes of transportation.

- Fair share contributions should be made for adverse effects found along roadways and/or intersections, including along Agnew Road, Tasman Drive, Lick Mill Boulevard, and Lafayette Street.

The City of Santa Clara looks forward to meeting with the City of Milpitas. Please contact Michael Liw, Assistant Director of Public Works to discuss the findings of the local transportation analysis.

Sincerely,

Andrew Crabtree
Director of Community Development

cc: Michael Liw, Assistant Director of Public Works
Jonathan Yee, Transportation Manager
Carol Shariat, Principal Transportation Planner
Reena Brilliot, Assistant Director of Community Development

| | | | | Approved Approved | | | |

Approved
Approved

| | | | | | | | | | | | | | | | | Dwelling Units | | | | Commercial Space | | | | Office Space | | | | Industrial Space | | | | Retail Space | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date Updated | Street Number & Street Name | APN | Submittal Date | Status of Entitlement | Approval Date | Applicant | Tidemark Description | SFD Units (Detached) For Sale | SF Units (Detached) For Rent | MF Units For Sale | MF Units For Rent | Total Dwelling Units | Affordable units? | Senior Units | Proposed Number of Dwelling Units | Existing Dwellings | Existing Dwellings to be Removed | Net Amount of Dwelling Units | Proposed Commercial (non-office) SQ Ft | Existing Commercial (non-office) SQ FT | Existing Commercial (non-office) to be removed SQ FT | Net Commercial (non-office) SQ. FT. | Proposed Office SQ. FT. | Existing Office SQ. FT. | Existing Office to be Removed SQ. FT. | Net Office SQ. FT. | Proposed Industrial SQ. FT. | Existing Industrial SQ. FT. | Existing Industrial to be Removed SQ. FT. | Net Industrial SQ. FT. | Proposed Retail SQ. FT. | Existing Retail SQ. FT. | Existing Retail to be Removed SQ. FT. | Net Retail SQ. FT. | Current Zoning | Current GP | Proposed Entitlements | CEQA Review |
| 11/2/2016 | 3033 Scott Blvd and 3080 Alfred | 224-09-159, 224-09-113, 224-09-140 | 2/2/2018 | Pending | | MCA | Expansion of activities at Muslim Community Association to include new high school student base, administrative offices. Director of Planning and Inspection administrative approval an increase of 500 students including up to 150 high school students. Use Permit for futher expansion. Initial Study/MND/MMRP prepared. | | | | | 0 | N/A | | 0 | | | 0 | - | | | - | | | | - | | | | - | | | | - | | | | | | |
| 11/2/2016 | 1627 Monroe St | 224-26-062 | | Approved | 8/1/2016 | Samir Sharma | Architectural Review to construct 3 new two-story residences; Rezone from R1-6L to PD; Tentative Parcel Map to subdivide one lot into 3 lots; construction completed-for sale now | 3 | | | | 3 | NA | | 3 | | | 3 | | | | - | | | | - | | | | - | | | | | | | | | NOE |
| 11/2/2016 | 5155<br>5120 Stars And Stripes Dr | 104-03-036 & 037, 104-01-102, 097-01-039 & 097-01-073<br>----------<br>104-03-036, 038 and 039 | | Approved | 7/1/2016 | Related | City Place -Related Co project for redevelopment of five parcels that include Santa Clara Golf & Tennis Club, BMX track, Fire Station #10, and former City landfill and two parcels on other side of Stars and Stripes (formerly for Montana Lowe project) directly across from Levi's Stadium. Master Development totals of 9.2M square feet and proposes 5.7M sq ft office; 1.1M sq ft retail; 1,360 mixed density residential units; 700 hotel rooms; 250K restaurant uses; 190K entertainment space | | | 360 | 1000 | 1360 | TBD | | 1,360 | | | 1360 | 990,000 | | | 990,000 | 5,700,000 | - | | 5,700,000 | | | | - | 1,100,000 | - | | 1,100,000 | P | Public Quasi Public | EIR, General Plan Amendment, Rezone to PD or PD-MC, Tentative Map and/or Vesting Tentative Map, Development Agreement and/or Disposition Development Agreement | |
| 11/2/2016 | 3226 Scott Blvd | 224-46-006 | | Approved | 11/15/2016 | Courtney Bauer | Architectural Review and ZA Modification to allow the demolition of the existing industrial building and development of a new 230,500 square foot office building with 93,640 parking structure and other onsite improvements.; Under construction/nearing completion | | | | | 0 | NA | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| 11/2/2016 | 1890 El Camino Real | 269-01-081, 82 | | Approved | 9/27/2016 | Pinn Bros | 56 for sale units condo units (no commercial removed from project by CC and reduced project by 4 units). Construction fire in 2019- rebuilt underway | | | 56 | | 56 | 3 to 4 | | 56 | | | 56 | - | 4,250 | 4,250 | - | | | | - | | | | - | | | | | | | - | CT | Community Mixed Use | Rezone, ARC review, TSM | EIR |
| 11/2/2016 | 1 Great America Pkwy | 104-42-008, 014, 019 | 12/1/2014 | Approved | 1/1/2017 | Cedar Fair | PD rezone to allow 140,000 new retail for open access to general public and year round operation of park | | | | | 0 | NA | | 0 | | | 0 | 140,000 | | | 140,000 | | | | - | | | | - | | | | - | | | Rezone from CT to PD for California's Great America Park Master Plan | |
| 11/2/2016 | 651, 725, and 825 Mathew St | APNs) 224-40-011 (0.26 acre), 224-40-002 (4.36 acres), and 224-40-001 (4.35 acres). | 10/1/2016 | Approved | 3/29/2017 | Vantage | New Data Center campus- Vantage 420,000 sq. ft. Total in up to 4 buildings with electrical substation; under construction | | | | | 0 | NA | | 0 | | | 0 | | | | - | | | | - | 420,000 | 107,600 | 107,600 | 420,000 | | | | - | | | | |
| 11/2/2016 | 3375 Scott Blvd | | 5/1/2016 | Approved | 4/19/2017 and 3/20/2019 (two year extension) | John Duquette | New six story office buildin 237,104 sf, 4 story parking structure with 14,000 sq.ft. amenity building (2 story building attached to garage for employee cafe and/or fitness center, etc.) | | | | | 0 | 0 | | 0 | | | 0 | | 37,600 | 37,600 | | 250,000 | | | 212,400 | | | | - | | | | - | | | | | |
| 11/2/2016 | 1205 Coleman Ave | 230-46-069 | 1/1/2016 | Approved | 7/9/2019 | Hunter Storm Properties | New multi-family residential project on former BAE site, 1,600 residentyial units, 15,000 sq.ft. retail, a 182,00 sq.ft. 225 room hotel, 2.1 acre dedicated park | | | | 1360 | 1360 | TBD | | 1360 | | | 1360 | | | | - | | | | - | 287,000 | 287,000 | - | 25,000 | - | - | 25,000 | | Station area plan | Rezone, tentative map | |
| 11/2/2016 | 3001 Tasman Dr | 104-49-030 | 12/1/2015 | Approved | Extension approved on 1/16/2019 for two additional years | Mike Hodges/Bixby Land Co | New 4-story core and shell building and two new parking structures and associated site improvements. 2-year extension granted for AC approval in 2018. New permit expires in 2020. | | | | | 0 | NA | | 0 | | | 0 | | | | - | 150,000 | 408,753 | - | 558,753 | | | | - | | | | - | | | | | AC approval | EIR |
| 11/2/2016 | 3305 Kifer Rd | 216-33-001 | 11/1/2016 | Approved | 11/29/2017 | Toll Brothers | Development of 45 attached townhomes and stacked flats with 109 parking spaces and open space as part of the Lawrence Station Area Plan . 7.5 acre site project. The environmental review for this project will be covered under the LSAP EIR; Under Construction/sales office open | | | 45 | | 45 | 10% of units | | 45 | 0 | 0 | 45 | | | | - | | 30,000 | 30,000 | - | | | | - | | | | - | | | | | Rezone | TBD |
| 11/2/2016 | 3069 Lawrence Expy | 216-34-052 | 9/1/2015 | Approved | | Westlake Urban/Gaye Quinn | Proposal for up to 328 unit multi-family development; Tentative Subdivision Map 3.82 acres | | | 333 | | 333 | TBD | | 333 | | | 333 | | | | - | | | | - | - | 70,000 | 70,000 | - | | | | - | | | Architectural Review, Rezone (for sale units) Tentative subdivision map | TBD |
| 11/2/2016 | 3505 and 3485 Kifer Road; 2985, 2951, 2901, 2900 and 2960 Gordon Avenue; 3060, 2960, 3045 and 3049 Copper Road; and 3570 Ryder Street | 29.4 acre site located at the northeast corner of Kifer Road and Lawrence Expressway. APNs: 216-34-041, -072, -066, -073, -051, -070, -045, -046, -047 | 11/1/2016 | Approved | 11/29/2017 | Summerhill Homes | Development of 996 residential units with 37,000 square foot retail and associated open space, landscaping, parking and other improvements as part of the Lawrence Station Area Plan. Under construction | 41 | | 298 | 657 | 996 | 10% | $ - | 996 | $ - | | 996 | | | | - | | | | - | 839,884 | | 839,884 | 37,000 | - | | 37,000 | ML | Light Industrial | Rezone, Possible DA, Specific plan approval, ARC review | EIR |
| 11/2/2016 | 2891 Homestead Rd | 290-39-080 | 9/14/2014 | Pending | | Anthony Ho | Pre-zone a 0.39 acre site to PD pending annexation, for the construction of 8 townhouses on a podium over subterranean parking area | | | 11 | 0 | 11 | 1 | | 11 | | 1 | 10 | | | | - | | | | - | | | | - | | | | | | | |

Approved
Approved

| | | | | | | | | | | | | | | | Dwelling Units | | | | Commercial Space | | | | Office Space | | | | Industrial Space | | | | Retail Space | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date Updated** | **Street Number & Street Name** | **APN** | **Submittal Date** | **Status of Entitlement** | **Approval Date** | **Applicant** | **Tidemark Description** | **SFD Units (Detached) For Sale** | **SF Units (Detached) For Rent** | **MF Units For Sale** | **MF Units For Rent** | **Total Dwelling Units** | **Affordable units?** | **Senior Units** | **Proposed Number of Dwelling Units** | **Existing Dwellings** | **Existing Dwellings to be Removed** | **Net Amount of Dwelling Units** | **Proposed Commercial (non-office) SQ Ft** | **Existing Commercial (non-office) SQ FT** | **Existing Commercial (non-office) to be removed SQ FT** | **Net Commercial (non-office) SQ. FT.** | **Proposed Office SQ. FT.** | **Existing Office SQ. FT.** | **Existing Office to be Removed SQ. FT.** | **Net Office SQ. FT.** | **Proposed Industrial SQ. FT.** | **Existing Industrial SQ. FT.** | **Existing Industrial to be Removed SQ. FT.** | **Net Industrial SQ. FT.** | **Proposed Retail SQ. FT.** | **Existing Retail SQ. FT.** | **Existing Retail to be Removed SQ. FT.** | **Net Retail SQ. FT.** | **Current Zoning** | **Current GP** | **Proposed Entitlements** | **CEQA Review** |
| 11/2/2016 | 2490, 2500 El Camino Real | 290-46-001,002,003,015, 016,17 and 316-17-024 | 7/1/2015 | Pending | | Lou Mariani | Proposal for 262 multi-family residential units and senior residential units and a 311-room hotel (full service and extended stay) with a total 215,074 square feet of commercial space consisting of commercial/hotel, retail, restaurants, bars, and meeting rooms on a 7.14 acre site. (Project on hold; restructuring proposal or it may be withdrawn due to partnership issues). | | | 398 | | 398 | 39 | 66 | 398 | 0 | 0 | 398 | 206,000 | 161,358 | 161,358 | 206,000 | | | | - | | | | - | | | | - | | | | - | | | General Plan Amendment from Community Mixed Use to Regional Mixed Use for the development and PD rezoning/ AC approval | |
| | 90 North Winchester Boulevard (1834 Worthington Circle) | 303-17-053 | 16-Dec | Approved | 1/29/2019 | CORE | Portion of former BAREC site (approx 6 acres). Amendment to Existing PD allowing 165 senior affordable units; 419 mixed income apts.' up to 584 housing units with 50% of units affordable, and up tp 25,000 site serving commercial. Up to 1.5 acre open space | | 0 | 34 | 325 | 359 | 181 | 165 | 359 | 0 | 0 | 359 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | 2904 Corvin | 216-33-034 | Feb-17 | Approved | 1/16/2019 | Concentric | 145 residential units 5-story multi-family affordable housing w/supportive services; under construction | | | 121 | | 121 | 60 | | 121 | 0 | | 121 | | | | - | | | | - | | | | - | | | | - | | | lsap | lsap | | |
| | 3905 Freedom Circle | 104-40-046 APNs 104-40-036 and 104-40-021 | Feb-17 | Pending | | Greystar | A new mixed-use development w/following uses: Office (606,968 square feet; Residential 1018 units; Commercial 18,653 square feet Publicly Accessible Open Space (2.5 acres). 16.58 acres of land bounded by Freedom Circle, Mission College Boulevard, Highway 101, and the San Thomas Aquino Creek. The existing site consists of 17,000 square feet Pedro's restaurant and a surface parking lot (APN 104-40-020), and 13.5 acres of vacant land . | | | | 1018 | 1018 | | | | 1018 | | | 1018 | 18,653 | | | 18,653 | **606,968** | - | | 606,968 | | | | - | | | | - | | | | | | GPA #89, Vesting Tentative Parcel Map, Rezoning to PD for Planned Mixed Use Development, Architectural Review, EIR: | |
| | 2305 Mission College | 104-13-096 | 21-Nov | Approved | 8/20/2020 | Oppidon | Architectural Review of a complete demolition of an existing two-story 358,000 square foot office/R&D and construction of a new substation, equipment yard, and two 3-story data center buildings totally 489,951 square feet. | | | | | 0 | | | 0 | | | 0 | | | | - | | | | | | | 485,951 | | 358,000 | 127,951 | | | | - | | | | |
| | 3625 Peterson Way | 216-30-040 | 18-Mar | Approved | 9/16/2020 | Boston Properties | Architectural review of (2) 8-story office buildings connected by bridges at 2 levels; a 4-level paking structure w/ attached amenity building that includes a roof deck; and surface parking and site landscaping; & Variance to increase maximum building height from 70' to 129' at tiop of parapet wall (w/ top of roof screen at 138.5') | | | | | 0 | | | 0 | | | 0 | | | | - | 672,000 | | 53,069 | 618,931 | | 206,000 | 206,000 | - | | | | - | | | | | | |
| | 3402 El Camino Real | 290-01-136 | Mar-17 | Approved | 5/15/2018 | John Vidovich | Rezoning of a 2.27 acre site that was recently burned down, and redevelop a mixed-use project with 66 apartment units, 9,440 square feet of retail, amenities on the third floor, surface parking, and two-level garage parking. Under Construction | | | | 66 | 66 | | | 66 | 0 | | 66 | 9,900 | | | | | | | - | | | | - | 9,900 | 24,050 | 24,050 | 9,900 | | | | |
| | 575 Benton | 230-07-002, 004, 009, 010, 013, 029, 031, 034, 038, 053, 059, 060 | 17-Apr | Approved | 7/17/2018 | Prometheus | (New MTC project proposal) GPA, Rezoning to PD to construct a mixed-use residential development project that consist of 355 apartment units, and approx. 26,000 square feet of retail with 697 parking spaces. (under construction) | | | | 355 | 355 | | | 355 | | | 355 | 14,000 | | | 14,000 | | | | - | | | | - | | | | - | | | | | | |
| 11/2/2016 | 2780 El Camino Real | 290-16-018 | 17-Apr | Approved | 5/22/2018 | KB Home | General Plan Amendment from Regional Commercial to Medium Density Residential; Rezone from CC to PD & Architectural Review for 58- 3 story townhomes; Under Construction | | | 58 | | 58 | 6 | | 58 | 0 | | 58 | - | 36,000 | 36,000 | - | | | | - | | | | - | | | | - | | | | | | MND |
| | 1375 El Camino Real | 224-48-002, 224-48-012, & 224-48-013 | Apr-17 | Approved | 5/22/2018 | Land Sea | 56 townhomes inclusive of 8 live work units (under construction) | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | |
| 11/2/2016 | 2232 El Camino Real | 290-10-0913 | 6/30/2017 | Approved | 10/24/2017 | Summerhill | Rezoning a 2.74 acre project site to PD for a four-story mixed-use project with 151 senior apartment homes, 17,909 square foot of commercial space, and 277 parking spaces provided in a wrapped parking structure and parking lot. (under construction) | | | | 151 | 151 | 0 | 151 | 151 | | 0 | 151 | | 23,200 | 23,200 | - | | | | - | | | | - | 10,000 | | | 10,000 | | | | | Rezoning, General Plan Amendment, and Vesting Tentative Parcel Map | |
| | 1575 Pomeroy | 290-03-089 | | Pending | | Warmington Residential | AC approval for a 33 condominiums using AB 3194 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3045 Stender | 216-29-084 | 6/15/2017 | Approved | 6/6/2018 | Tiemo Mehner | Arch review for new 4-story 175,670 s.f. data center building with rooftop mechanical equipment. The project includes demolition of the existing single-story building. | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | |
| | 1150 Walsh | 224-58-003 | 8/11/2017 | Approved | 8/28/2019 | Raging Wire/NTT | Proposed 248,000 square foot data center and substation | | | | | | | | | | | | | | | | | | | | 248,000 | | 37,500 | | | | | | ML | LI | | |
| | 2788 San Tomas Expressway | 224-11-068 | 9/25/2017 | Completed/Occupied | 7/16/2013 | Saris Regis for NVIDIA | Architectural review for a new 754,100 square-foot office building and a trellis; PHASE 2 of DA and allowed area additional 300K added to to Phase II originally planned for Phase III on other parcel. Two structures built, one additional structure availalbe to build. | | | | | 0 | | | 0 | | | 0 | | | | - | 754,100 | - | | 754,100 | | | | - | | | | - | | | | |

| | | | | Approved | Approved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | Dwelling Units | | | | | Commercial Space | | | | Office Space | | | | Industrial Space | | | | | Retail Space | | | | | | | | |
| Date Updated | Street Number & Street Name | APN | Submittal Date | Status of Entitlement | Approval Date | Applicant | Tidemark Description | SFD Units (Detached) For Sale | SF Units (Detached) For Rent | MF Units For Sale | MF Units For Rent | Total Dwelling Units | Affordable units? | Senior Units | Proposed Number of Dwelling Units | Existing Dwellings | Existing Dwellings to be Removed | Net Amount of Dwelling Units | Proposed Commercial (non-office) SQ Ft | Existing Commercial (non-office) SQ FT | Existing Commercial (non-office) to be removed SQ FT | Net Commercial (non-office) SQ. FT. | Proposed Office SQ. FT. | Existing Office SQ. FT. | Existing Office to be Removed SQ. FT. | Net Office SQ. FT. | Proposed Industrial SQ. FT. | Existing Industrial SQ. FT. | Existing Industrial to be Removed SQ. FT. | Net Industrial SQ. FT. | Proposed Retail SQ. FT. | Existing Retail SQ. FT. | Existing Retail to be Removed SQ. FT. | Net Retail SQ. FT. | Current Zoning | Current GP | Proposed Entitlements | CEQA Review |
| | 2961 Corvin | 216-33-040 | Sep-17 | Approved | 4/24/2018 | Summerhill | Development application for 38 townhomes on .27 acre site consistent with LSAP. Tentative Subdivision Map filed. Under construction | | | 38 | | 38 | 3.8 | | 38 | | | 38 | | | | - | | | | - | | 4,503 | 4,503 | - | | | | - | LSAP | | AC | |
| | 3005 Democracy | 104-04-064, 65, 111, 112, 113, 142, 143, 150, 151 | Oct-17 | Pending | | Kylii | General Plan Amendment from the High-Intensity Office/Research and Development (R&D) to a new designation allowing high-intensity mixed use development, including residential and office. 48.6 acre site. Former Yahoo office campus approval. Potential for 2-4,000 housing units. Due to FAA and community feedback, proposal will be revised to reduce size of project. New submittal still pending as of 12/20 | | | | | 0 | | | 6,000 | | | 6000 | | | | - | | | | - | | | | - | | | | - | | | | | | | |
| | 1900 Warburton | 224-20-027 | 11/14/2017 | Approved | 7/10/2018 | Samir Sharma | Rezone from General Office (OG) to Planned Development (PD) to construct 13 attached condo units in two buildings with a shared driveway on a 0.55 acre site | | | 13 | | 13 | 1 | | 13 | 0 | | 13 | | | | - | | | | - | | 2,000 | 2,000 | - | | | | - | | | | |
| 10/12/2018 | 3035 El Camino Real | 220-32-059 | 5/11/2018 | Approved | 12/17/2019 | Haden Land Company | Rezoning from CT to Planned Development (PD) and Architectural Review for the demolition of existing building and site improvements, and the new mixed use construction of 42 residential condominiums and 6 live work condominiums | | | | | 48 | | | 48 | | | 48 | | | | - | | | | - | | | | - | | | | - | CT | Community Mixed Use | Tentative Subdivision Map, Rezoning from CT to PD and AC approval | IS |
| 10/12/2018 | 2200 Calle De Luna | 097-05-098 | 7/27/2018 | Approved | 10/24/2019 | Holland Partner Group | Architectural review for three 12 residential towers over three-level parking garage with 600 residential units. | | | | | 601 | | | 601 | | | 601 | | | | - | | | | - | | | | - | | | | - | B | Light Industrial | | Addendum to EIR |
| 10/12/2018 | 2101 Tasman Drive | 097-05-056 | 7/30/2018 | Pending | | Related California | Architectural review of 950 multi-family units,associated amenity spaces, open space & 1.25 acre park (Addendum to EIR CEQ2018-01055). Tasman East Specific Plan. | | | | | 950 | | | 950 | | | 950 | | | | - | | | | - | | | | - | | | | - | ML | Light Industrial | | Addendum to EIR |
| 10/12/2018 | 2300 Calle De Luna | 097-46-016 | 7/30/2018 | Approved | 12/4/2019 | Related California | Architectural review of 575 multi-family dwelling units, 25,000 sq.ft. retail, & associated amenity space (Addendum to EIR CEQ2018-01056). Tasman East Specific Plan | | | | | 575 | | | 575 | | | 575 | 25,000 | | | 25,000 | | | | - | | | | - | | | | - | ML | Light Industrial | | Addendum to EIR |
| 10/12/2018 | 5185 Lafayette St. | 097-46-011 | 7/31/2018 | Approved | | Ensemble Investments | Architectural review for a new mixed-use building consisting of 147 residential units and 3,650 square feet of retail space | | | | | 147 | | | 147 | | | 147 | 3,650 | | | 3,650 | | | | - | | | | - | | | | - | | | | |
| 10/12/2018 | 5123 Calle Del Sol | 097-46-019 | 7/31/2018 | Approved | 7/17/2019 | Ensemble Investments | Architectural Review of a 504 residential units and 23,170 square feet of retail space. In the first phase a single story industrial building will be demolished on parcel 19 to redevelop the property into a 85' tall mixed-use mid-rise consisting of 311 residential units with amenity space, 14,210 sf retail space and 462 parking spaces. In phase two a mixed-use high-rise will be built consisting of 193 residential units with amenity space, 8,960 sf of retail space and 149 parking spaces. | | | | | 504 | | | 504 | | | 504 | 23,170 | | | 23,170 | | | | - | | | | - | | | | - | | | | - | | | | |
| 10/12/2018 | 2263 Calle Del Mundo/5185 Lafayette | 097-05-060 | 7/31/2018 | Pending | | | Architectural review for a new 148 unit residential development- no response from application/possibility to withdraw project (note 7/26/21) | | | | | 148 | 0 | | 148 | | | 148 | | | | - | | | | - | | 16,860 | 16,860 | - | | | | - | TESP | | AC | |
| 10/12/2018 | 2233 Calle Del Mundo | 097-05-056 | 7/30/2018 | Approved | 3/15/2019 | Ensemble Investments | Architectural review of for new construction of 182 multi-family dwelling units involving demolition of an existing warehouse (Addendum to EIR CEQ2018-01058 ) . Tasman East Specific Plan | | | | | 182 | | | 182 | | | 182 | | | | - | | | | - | | 16,092 | 16,092 | - | | | | - | | | | |
| 10/12/2018 | 2343 Calle Del Mundo | 097-05-063 | 7/30/2018 | Approved | 3/15/2019 | SummerHill Apartments Communities | Architectural review of 347 unit apartment building & 0.425 acre park (Addendun to EIR CEQ2018-01057 ) & Lot Line Adjustment (Tasman East Specific Plan) | | | | | 347 | | | 347 | | | 347 | | | | - | | | | - | | 16,368 | 16,368 | - | | | | - | | | | |
| 10/12/2018 | 3131 Homestead | 290-24-071 | 6/18/2018 | Approved | | | AC approval for approximately 183 net new apartments | | | | | 0 | 0 | | 183 | | | 183 | | | | - | | | | - | | | | - | | | | - | | | | |
| 10/12/2018 | 3725 El Camino Real | | 5/29/2018 | Approved | 1/9/2019 | | Use Permit to allow a convenience store and potential restaurant in an existing service station | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | |
| 2/8/2019 | 1433 El Camino Real | 224-48-004,005,006 | 11/6/2018 | Approved | 7/9/2019 | SCS Development | Catalina II - 39 townhomes (under construction) | | 1 | | | 1 | | | 0 | 1 | 1 | 0 | | 14,880 | 14,880 | - | | | | - | | | | - | | | | - | PD | | | |
| 4/3/2019 | 2175 Martin | 224-10-115 | 2/15/2019 | Approved | 11/13/2019 | Scott Rynders | New three story data center with 8.5 MW capacity. | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | 80,000 | 31,000 | 31,000 | 49,000 | | | | - | | | | |
| 4/3/2019 | 2200 Lawson Ln | 224-44-025 | 10/15/2018 | Approved | 6/23/2020 | Sobrato | Rezone from PD to PD to allow a 5-story 241,419 sq.ft. office building, 607 sq.ft. expansion to 2-story amenity building and expansion of parking garage - (CEQ2018-01064) | | | | | 0 | | | 0 | | | 0 | | | | - | 241,419 | - | | 241,419 | - | 131,328 | 131,328 | - | | | | - | | | | |

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| Date Updated | Street Number & Street Name | APN | Submittal Date | Status of Entitlement | Approval Date | Applicant | Tidemark Description | SFD Units (Detached) For Sale | SF Units (Detached) For Rent | MF Units For Sale | MF Units For Rent | Total Dwelling Units | Affordable units? | Senior Units | Proposed Number of Dwelling Units | Existing Dwellings | Existing Dwellings to be Removed | Net Amount of Dwelling Units | Proposed Commercial (non-office) SQ Ft | Existing Commercial (non-office) SQ FT | Existing Commercial (non-office) to be removed SQ FT | Net Commercial (non-office) SQ. FT. | Proposed Office SQ. FT. | Existing Office SQ. FT. | Existing Office to be Removed SQ. FT. | Net Office SQ. FT. | Proposed Industrial SQ. FT. | Existing Industrial SQ. FT. | Existing Industrial to be Removed SQ. FT. | Net Industrial SQ. FT. | Proposed Retail SQ. FT. | Existing Retail SQ. FT. | Existing Retail to be Removed SQ. FT. | Net Retail SQ. FT. | Current Zoning | Current GP | Proposed Entitlements | CEQA Review |
| 4/3/2019 | 2330 Monroe | 224-37-068 | 2/1/2019 | Approved | 1/28/2020 | Freebird | Rezoning of a 2.47 acre City-owned vacant site from Single Family residential (R1-6L) to Planned Development (PD) to support the construction of a single building ranging in height from two to three stories and containing 65 residential affordable units in a mix of studios and one-, two- and three bedroom units. The project intends to provide housing for a broad range of family sizes and incomes, including 20% set aside for people with developmental disabilities. | | | | 65 | 65 | 65 | | 65 | 0 | | 65 | | | | - | | | - | | | | - | | | - | | | | - | | | | | | | | | | |
| 4/3/2019 | 2201 Laurelwood | 104-39-023 | 2/15/2019 | Approved | 9/23/2020 | MEP1 | Proposed for two 4 story 737,093----- square foot data center and substation and demolition of 201,529 square feet and three buildings | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | 737,093 | 201,529 | 201,529 | 535,564 | | | | - | | | | | | | |
| 5/29/2019 | 651 Walsh | 224-04-059 | 6/11/2018 | Approved | 9/16/2020 | Jacobs | New 435,050 sq.ft. 4-story data center with the demolition of the existing industrial structures on-site totaling 171,259 sq.ft. of building area | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | 435,050 | 171,259 | 171,259 | 263,791 | | | | - | | | | | | | |
| 5/29/2019 | 2302 Calle Del Mundo | 097-46-024 | 4/24/2019 | Approved | 1/17/2020 | ZAEN Partners | 150 unit - 8 story residential project with 5,000 sq. ft of retail | 0 | | | | 0 | TBD | | 150 | | | 150 | 5,000 | | | 5,000 | | | | - | - | 16,600 | 16,600 | - | | | | - | | | | | | | |
| 5/22/2019 | 4249 Cheeney | 104-12-025 | 3/20/2019 | Pending | | Puja Gupta/Bani Holdings | 8 unit townhome project | | | 8 | | 8 | 0 | | 8 | 2 | | 6 | | | | - | | | | - | | | | - | | | | - | | | | | | | |
| 6/26/2019 | 1530 and 1540 Pomeroy | 290-03-089 | | Pending | | Omid Shakeri | AC review to construct eisix (6)attached townhomes and two Small lot SF homes . Project utilizing AB 3194 no rezoning required (consistency with GP only). 1540 Pomeroy (A), 1530 Pomeroy (R3-18D) | | | | | 0 | | | 8 | 2 | | 10 | | | | - | | | | - | | | | - | | | | - | | | | - | | | | | | | |
| 7/12/2019 | 1111 Comstock | 224-08-092 | 6/17/2019 | Approved | | CAC Architects | Architectural Review of the proposed demolition of an existing one-story industrial building, and the construction of a new three-story 70,170 square foot data center building, and a Zoning Administrator Modification to allow increased 87'-6" building height. | 0 | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | 70, 170 | 26,000 | 26,000 | 44,170 | | | | - | | | | | | | |
| | 2550 Scott | 224-10-122 | 6/6/2019 | Approved | 1/17/2020 | Ray Hashimoto for HMH | Architectural Review to allow a new 52,508 square-foot building at an existing 108,960 square-foot self-storage facility on 3.17 acres; Under Construction | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | 52,508 | | | 52,508 | | | | - | | | | | | | |
| | 80 Saratoga | 294-38-016 | 4/8/2021 | Pending | | | Pre-application for a six-story, 209 unit affordable housing project with a podium level courtyard and a structured parking garage with about 90 parking stalls and 15 exterior parking stalls. The proposal will request for SB35 ministerial review and unlimited density under state density bonus law, due to proximity less than a mile of a major transit stop. | | | | | 0 | | | 25 | 0 | 0 | 25 | 5,000 | | 5,000 | - | | | | - | | | | - | | | | - | | | | | | | |
| | 2905 Stender Way | 216-29-108 | 9/18/2019 | Approved | 6/8/2021 | Coresite | Rezoning and Architectural Review for a new four-styory CoreSite Data Center, approximately 250,0000 sf. | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | | |
| | 2600 De La Cruz | 230-03-105 | 9/24/2019 | Approved | 7/28/2021 | CyrusOne | Four-story data center, 702,114 sf of gross area,Total maximum building load would be 96.5 megawatts (MW). A 100-megavolt amps electrical substation would be located in the western portion of the site. | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | 702,114 | 107,560 | 107,560 | 702,114 | | | | - | | | | | | | |
| | 1290 Coleman (312 Brokaw Road, 1240 Coleman) | 230-05-050 | 2/11/2020 | Pending | | Hilton Assoc. | Use Permit to construct a 396 room, 6-story hotel (5 stories over 1 level of parking w/ 284 stacked parking stalls totaling 204,444 sq.ft. Application includes sale & service of distilled spirits (Type 47) & live entrertainment. | | | | | 0 | | | 0 | | | 0 | 204,444 | | 3,100 | 201,344 | | | | - | | | | - | | | | - | | | | | | | |
| | 1290 Memorex | 224-66--66 | 8/8/2019 | Pending | | 1200 Santa Clara Property Co. | Architectural review of a new 4-story 561,340 sq.ft. data center & substation in an ML zoning district & Modificatioin to increase maximum building height to 85' where 70' is the maximum & reduce minimum parking requirement to 113 spaces where 140 required | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | | |
| | 2825 Lafayette | 2224-04-093 | 11/19/2019 | Pending | | | 3 story data Center totaling 148,442 square feet | | | | | 0 | | | 0 | | | 0 | | | | - | | | 277,597 | (277,597) | 148,442 | | | 148,442 | | | | - | | | | | | | |
| | 4949 GAP | 104-44-039 | 2/27/2020 | Pending | | Eri Smith/Hilton | 4949 Great America: General Plan Amendment and Rezoning to PD to develop a 22-story mixed-use high-rise hotel. | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | | |
| 3/25/2020 | 2901 Tasman | 104-24-025,26 | 3/4/2020 | Pending | | Jane Vaughn/Menlo Equities | General Plan Amendment to High Density R & D for 10.4 acre site | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | | |
| | 171 and 175 Monroe | 269-47-017, 18 | 12/24/2018 | Pending | | LPMD Architects | Rezoning and Architectural Review for a 8 new townhomes | | | 8 | | 8 | 0 | 0 | 8 | 2 | 2 | 8 | | | | - | | | | - | | | | - | | | | - | | | | | | | |

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| **Date Updated** | **Street Number & Street Name** | **APN** | **Submittal Date** | **Status of Entitlement** | **Approval Date** | **Applicant** | **Tidemark Description** | **SFD Units (Detached) For Sale** | **SF Units (Detached) For Rent** | **MF Units For Sale** | **MF Units For Rent** | **Total Dwelling Units** | **Affordable units?** | **Senior Units** | **Proposed Number of Dwelling Units** | **Existing Dwellings** | **Existing Dwellings to be Removed** | **Net Amount of Dwelling Units** | **Proposed Commercial (non-office) SQ Ft** | **Existing Commercial (non-office) SQ FT** | **Existing Commercial (non-office) to be removed SQ FT** | **Net Commercial (non-office) SQ. FT.** | **Proposed Office SQ. FT.** | **Existing Office SQ. FT.** | **Existing Office to be Removed SQ. FT.** | **Net Office SQ. FT.** | **Proposed Industrial SQ. FT.** | **Existing Industrial SQ. FT.** | **Existing Industrial to be Removed SQ. FT.** | **Net Industrial SQ. FT.** | **Proposed Retail SQ. FT.** | **Existing Retail SQ. FT.** | **Existing Retail to be Removed SQ. FT.** | **Net Retail SQ. FT.** | **Current Zoning** | **Current GP** | **Proposed Entitlements** | **CEQA Review** |
| | 3000 Bowers | 216-48-033 | 11/25/2019 | Pending | | Sobrato Organization | Architectural review of (2) new 5-story office buildings (330K total 165K each building) & 5-story parking garage on a vacant ML zoned property and Modifican to increase height from 70' to 876" (Supplemental EIR); demolish 102,600 square foot industrial building | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | 330,000 | 102,600 | 102,600 | 330,000 | | | | - | | | | | | |
| | 2225 Calle De Luna and 2232 Calle del Mundo | 097-46-020 | 7/20/2020 | Approved | 2/3/2021 | Greystar | Arch review of propsoed 8 story high density residential building on each parcel (388 units) 2225 Calle de Luna & 2232 Calle del Mundo. (Arch Review fee paid under PLN2020-14407); Demo 44,100 sq. ft. industrial building | | | | 388 | 388 | TBD | | 388 | 0 | 0 | 388 | | | | - | | | | - | | 44,100 | 44,100 | - | | | | - | | | | | | |
| | 3335 Kifer Rd | 216-33-035 | 6/25/2020 | Approved | 2021 | Allied Housing, Inc. | Architectural review of 80 units affordable senior rental apartments (supportive housing development, 56% restricted to homeless persons) in a six-story building within the Lawrence Station Are Plan (LSAP) - SB 330-Lawrence Station Area Plan | | | 80 | | 80 | 80 | 80 | 80 | 0 | 0 | 80 | | | | - | | | | - | - | 29,196 | 29,196 | - | | | | - | | | | | | |
| | 2354 Calle Del Mundo | 097-46-002 | 7/30/2020 | Approved | 5/12/2021 | Ensemble Investments | Architectural review for a new 89 unit residential project within the Tasman East Specific Plan area; 7,060 sq. ft industrial bldg to be removed | | | | 89 | 89 | yes/TBD | | 89 | 0 | 0 | 89 | | | | - | | | | - | - | 7,060 | 7,060 | - | | | | - | | | | | | |
| | 3155 El Camino Real | 220-32-058 | 10/27/2020 | Pending | | Edward McMahon/Oak Investment Group | Rezoning to create a for-sale 60 unit residential development infill project; 8 buildings total | | | 60 | | 60 | yes/TBD | | 60 | 0 | 0 | 60 | | 2K/TBD | | #VALUE! | | | | - | | | | - | | | | - | | | | | | |
| | 4565 Stevens Creek | 296-21-030 | 12/17/2020 | pending | | Lisa Wong | Architectural Review of the demolition of the remaining 6,190 square foot retail building destroyed by fire and a separate 2,660 square foot commercial office building on a 1.029 acre property, for the replacement construction of a new 9,745 square foot, single-story retail commercial building including 12 outdoor seats for China Delight Restaurant and other sitework including landscaping and 57 on site parking stalls. All new contruction to be Type IIA. | | | | | 0 | | | 0 | 0 | 0 | | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | 2855 El Camino Real | 221-31-082 | 12/10/2020 | Pending | | Leo Texiera/ | Pre-app with PCC review for Rezoning to construct 26 new townhomes units and 62 affordable senior apartments | | | | | 0 | | | 0 | 0 | 0 | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | 1601 Civic Center Drive | 229-49-006 | | Pending | | Charities Housing | Pre-application for 119 Affordable housing units | | | | | 0 | | | 0 | 0 | 0 | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | 906, 930 Monroe | 289-20-95 | 6/16/2020 | Pending | | Sal Caruso | Rezoning to PD. Architectural review of the Relocation of two single family homes at 906 and 930 Monroe and build a new 61 unit housing with 8K approx of retail and restaurant at the gound floor | | | | | 0 | | | 0 | 0 | 0 | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | 275 Saratoga | 303-46-051 | 6/7/2021 | Pending | | Swenson Builderes | Rezone from PD to PD to allow redevelopment of the site with a 4-story building with 121 units and 146 beds as a memory care facility over below grade parking with 73 parking spaces; in conjunction with demolition of existing 30,050 sq.ft. commercial office building and site improvements (CEQA to be determined) | | | | | 0 | | | 0 | 0 | 0 | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | | | | | | | | | | | | 0 | | | 0 | | | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | 3155 Stevens Creek | 303-14-036 | 7/12/2021 | Pending | | Lincoln Dealership | Remodel existing two-story auto sale showroom building, construction of a new one-story auto service building, and site work. | | | | | 0 | | | 0 | 0 | 0 | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | 2590 Walsh | 218-28-112 | 5/10/2021 | Pending | | Vantage | Arch review of the demoliton of a 115,000 sf single-story office and warehouse and the new construction of a 469,467 sf four-story data center project consisting of 8 data center halls | | | | | 0 | | | 0 | 0 | 0 | 0 | 469,464 | | | 469,464 | | | | - | | 115,000 | 115,000 | - | | | | - | | | | | | |
| | 3550 ECR | 290-01-113 | | Pending | | Rhoades Planning Group and RCD Housing | Proposed renovation of an existing motel into long-term affordable housing and the construction a new 7-story mixed-use building with 115,861 sf of gross residential floor area and 1,172 sf of gross commercial floor area fronting El Camino Real. The new building will have 77 rental apartments and the existing motel will be converted into 43 rental apartments for a total of 120 apartments. The proposed | | | | | 0 | | | 0 | 0 | 0 | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |
| | 3060 Raymond | 224-08-099 | 8/2/2021 | Pending | | Dean Rubinson | The proposed project includes conversion to a modern data center facility with 4.5 MW upgradel Tis and seismic upgrade 30K building area; site and ADA improvements; Exterior minor remodel | | | | | 0 | | | 0 | 0 | 0 | 0 | | | | - | | | | - | | | | - | | | | - | | | | | | |

**From:** "Hultman, Debbie@Wildlife" <Debbie.Hultman@wildlife.ca.gov>
**Date:** October 18, 2021 at 3:20:21 PM PDT
**To:** Kevin Riley <kriley@ci.milpitas.ca.gov>
**Cc:** OPR State Clearinghouse <State.Clearinghouse@opr.ca.gov>, "Garrison, Kristin@Wildlife" <Kristin.Garrison@wildlife.ca.gov>, "Blinn, Brenda@Wildlife" <Brenda.Blinn@wildlife.ca.gov>, "Weightman, Craig@Wildlife" <Craig.Weightman@wildlife.ca.gov>
**Subject: Milpitas Metro Specific Plan-SCH2006032091**

Good Afternoon Kevin Riley,

Please see the attached letter for your records. If you have any questions, contact Kristin Garrison, cc'd above.

Thank you,

Debbie Hultman | Assistant to the Regional Manager
California Department of Fish and Wildlife – Bay Delta Region
2825 Cordelia Road, Ste. 100, Fairfield, CA 94534
707.428.2037 | debbie.hultman@wildlife.ca.gov

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
2825 Cordelia Road, Suite 100
Fairfield, CA 94534
(707) 428-2002
www.wildlife.ca.gov

***GAVIN NEWSOM, Governor***
***CHARLTON H. BONHAM, Director***

October 18, 2021

Kevin Riley
City of Milpitas
455 East Calaveras Boulevard
Milpitas, CA 95035
kriley@ci.milpitas.ca.gov

Subject: Milpitas Metro Specific Plan, Notice of Preparation of a Subsequent Draft Environmental Impact Report, SCH No. 2006032091, Santa Clara County

Dear Kevin Riley:

The California Department of Fish and Wildlife (CDFW) received the Notice of Preparation (NOP) of a Subsequent Draft Environmental Impact Report (SDEIR) from the City of Milpitas (City) for the Milpitas Metro Specific Plan (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife resources. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

**CDFW ROLE**

CDFW is a Trustee Agency with responsibility under CEQA §15386 for commenting on projects that could impact fish, plant and wildlife resources. CDFW is also considered a Responsible Agency if a project would require discretionary approval, such as the California Endangered Species Act (CESA) Permit, the Native Plant Protection Act Permit, the Lake and Streambed Alteration (LSA) Agreement and other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife trust resources. Pursuant to our jurisdiction, CDFW has the following concerns, comments, and recommendations regarding the Project.

**PROJECT DESCRIPTION SUMMARY**

**Proponent:** City of Milpitas

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

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**Objective:** City of Milpitas certified the Milpitas Transit Area Specific Plan (TASP) Environmental Impact Report in 2008. The SDEIR will expand the TASP area by approximately 73 additional acres for a total area of 510 acres and change land use classifications (e.g., increased allowable densities, new land use classifications, and change in location of land use classifications).

**Location:** The Project area is located in the southernmost portion of the City of Milpitas. The Project area is generally bounded by the Great Mall to the north, South Main Street to the west, Trade Zone Boulevard and the City limits to the south, Milpitas Boulevard to the southeast, and Highway 680 to the east.

## COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist the City in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources.

In order to avoid significant impacts to avian species potentially nesting within or near the Project area, CDFW recommends that the following protective measures be included in the SDEIR.

### Potential Impacts to Habitat and Avian Species

#### *Habitat Assessment*

In review of the NOP, Figure 1 Project Location Map, and Google Earth aerials, Berryessa Creek and two unnamed drainage channels are located within the Project area. Berryessa Creek and the unnamed drainage channels appear to include wetland plant species, riparian habitat and grass and herbaceous vegetation.

The NOP does not discuss if the proposed Project may result in impacts to Berryessa Creek, drainage channels, or associated habitats such as tree removal. The NOP, page 5, describes objective #15 to improve the City transportation network, and NOP, page 3, discusses that area-wide infrastructure improvements will take place to accommodate residential and mixed-use development. Several bridges or culvert crossings also appear to currently exist over Berryessa Creek and drainage channels. Implementation of projects such as bridge widening or replacement, replacing or installing new utility lines, and expansion of or new installation of stormwater outfalls within the Berryessa Creek or the drainage channels could result in impacts to riparian habitat, and fish and wildlife species.

If the Project may result in impacts to riparian areas and other habitat types, CDFW recommends the measures below be included in the DEIR to potentially offset some of the foreseeable impacts.

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1. Habitat Assessment: A qualified biologist will conduct a habitat assessment to determine if the Project area or its immediate vicinity supports freshwater marsh, wetland, and/or riparian communities. This survey should include, but not be limited to the drainage channels located within the Project area (as listed above).

2. Wetland Delineation: A formal wetland delineation will be conducted by a qualified biologist prior to Project construction to determine the location and extent of wetlands and riparian habitat present. [Please note that, while there is overlap, State and federal definitions of wetlands, as well as which activities require Notification pursuant to Fish and Game Code § 1602 differ; therefore, the delineation should identify both State and federal wetlands, as well as which activities may require Notification to comply with Fish and Game Code (§ 1602 and §2081(b)).]

3. Nesting Bird Surveys: If Project-related work is scheduled during the nesting season (typically February 15 to August 30 for small bird species such as passerines; January 15 to September 15 for owls; and February 15 to September 15 for other raptors), a qualified biologist will conduct two surveys for active nests of such birds within 14 days prior to the beginning of Project construction, with a final survey conducted within 48 hours prior to construction. Appropriate minimum survey radii surrounding the work area are typically the following: i) 250 feet for passerines; ii) 500 feet for small raptors such as accipiters; and iii) 1,000 feet for larger raptors such as buteos. Surveys will be conducted at the appropriate times of day and during appropriate nesting times.

4. Active Nest Buffers: If the qualified biologist documents active nests within the Project area or in nearby surrounding areas, an appropriate buffer between the nest and active construction will be established. The buffer will be clearly marked and maintained until the young have fledged and are foraging independently. Prior to construction, the qualified biologist will conduct baseline monitoring of the nest to characterize “normal” bird behavior and establish a buffer distance which allows the birds to exhibit normal behavior. The qualified biologist will monitor the nesting birds daily during construction activities and increase the buffer if the birds show signs of unusual or distressed behavior (e.g., defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, the qualified biologist or construction foreman will have the authority to cease all construction work in the area until the young have fledged and the nest is no longer active.

5. Qualified Biologist: A qualified biologist is an individual who has a degree in biological sciences or related resource management with a minimum of two seasonal years post-degree experience conducting bird nest surveys. During or following academic training, a qualified biologist will have achieved a high level of

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professional experience and knowledge in biological sciences and special-status species identification, ecology and habitat requirements.

6. Notification of Lake or Streambed Alteration: Fish and Game Code §1602 requires an entity to notify CDFW prior to commencing any activity that may (a) substantially divert or obstruct the natural flow of any river, stream, or lake; (b) substantially change or use any material from the bed, bank, or channel of any river, stream, or lake: (c) deposit debris, waste or other materials that could pass into any river, stream, or lake. Project activities in or around drainage channels and other waterbodies within the Project may require that the project proponent submit an LSA Notification to CDFW. CDFW is required to comply with CEQA in the issuance of an LSA Agreement. Additional information can be found at https://www.wildlife.ca.gov/Conservation/LSA.

***Avian Collision with Buildings***

The NOP describes, in comparison to the TASP, an additional 7,000 dwelling units, 700 hotel rooms, 300,000 square feet of retail, and 3 million square feet of office uses, including 500,000 square feet of industrial uses. The NOP does not discuss if this expansion will occur with a change of use of the current building height levels, or with other design or planning changes.

If the proposed Project will include an increase in building height over existing conditions, this could potentially result in an increase in the number or frequency of avian collisions with buildings, especially tall buildings located adjacent to riparian areas. CDFW therefore recommends that the SDEIR include building height and land use location alternatives that reduce environmental impacts such as locating tall buildings at a biologically appropriate distance away from wetlands or riparian areas. The SDEIR should analyze all potential impacts of increases in building height, types of materials used on the exterior façade of buildings, and changes in other design features on volant wildlife species, and include avoidance and minimization measures that reduce those impacts to a less-than-significant levels.

**ENVIRONMENTAL DATA**

CEQA requires that information developed in draft environmental impact reports be incorporated into a data base which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special-status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form, online field survey form, and contact information for CNDDB staff can be found at the following link: https://wildlife.ca.gov/data/CNDDB/submitting-data. The

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types of information reported to CNDDB can be found at the following link: https://wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

**FILING FEES**

CDFW anticipates that the Project will have an impact on fish and/or wildlife, and assessment of filing fees is necessary (Fish & G. Code, § 711.4; Pub. Resources Code, § 21089). Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW.

**CONCLUSION**

CDFW appreciates the opportunity to comment on the NOP to assist the City in identifying and mitigating Project impacts on biological resources.

Questions regarding this letter or further coordination should be directed to Kristin Garrison, Environmental Scientist, at (707) 944-5534 or by email at Kristin.Garrison@wildlife.ca.gov; or Brenda Blinn, Senior Environmental Scientist (Supervisory), at (707) 944-5541 or by email at Brenda.Blinn@widlife.ca.gov.

Sincerely,

DocuSigned by:
Stephanie Fong
CF047D7F8D234E1...

Stephanie Fong
Acting Regional Manager
Bay Delta Region

ec: Office of Planning and Research, State Clearinghouse, Sacramento

**From:** "Torney, Lola" <lola.torney@vta.org>
**Date:** October 18, 2021 at 4:22:25 PM PDT
**To:** Kevin Riley <kriley@ci.milpitas.ca.gov>
**Cc:** "plan.review" <plan.review@vta.org>
**Subject: VTA comments on Milpitas Metro Specific Plan NOP**

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hi Kevin,
Attached are VTA's comments on the NOP for the Milpitas Metro Specific Plan. Thank you!

~Lola Torney

**Lola Torney** | She/Her
Transportation Planner III
Bicycle and Pedestrian Program

Santa Clara Valley Transportation Authority
3331 North First Street, Building B
San José, CA 95134-1927
Phone **408-321-5830**

Santa Clara Valley Transportation Authority

October 18, 2021

City of Milpitas
455 East Calaveras Boulevard
Milpitas, CA 95035

Attn: Kevin Riley
By Email: kriley@ci.milpitas.ca.gov

Dear Kevin,

VTA appreciates the opportunity to comment on the Notice of Preparation for the Milpitas Metro Specific Plan Subsequent Environmental Impact Report (SEIR) project. VTA has reviewed the document and has the following comments:

Land Use and Densification

VTA supports the addition of the Innovation District to the Metro Plan area east of the Milpitas Bay Area Rapid Transit (BART) station. VTA also supports the Boulevard Very High-Density Mixed Use and Business Park Research and Development Land Uses on VTA parcels next Great Mall and Parking lot. Also, VTA supports the future changes of Great Mall's evolution from purely retail to mixed-use site. This is a transit-supportive change that can increase transit ridership in Milpitas and therefore may lead to lower greenhouse gas emissions in Santa Clara County.

Once transit facilities are no longer needed as public facilities, VTA would like Boulevard Very High-Density Mixed use as the underlayer. VTA does not want any blue for public facilities to be on our land that can be used for transit-oriented development.

Transportation Impact Analysis (TIA)

The City should perform operations analysis of key intersections near the plan area and CMP intersections that may be affected the project. This will likely include the following intersections:

1. Montague Expressway / South Milpitas Boulevard
2. Montague Expressway / East Capitol Avenue
3. Montague Expressway / Trade Zone Boulevard
4. Montague Expressway / South Main Street

The Local Transportation Analysis (LTA) performed should examine if any localized improvements can be done to these intersections to address these operational issues without any widening if possible and instead focus on multi-modal improvements to bikes, pedestrians and transit.

Mitigations to Address CMP Standards

The City is still required to conform to the requirements of the VTA CMP, which is governed by state CMP legislation. While VTA is supportive of the City's use of Vehicle Miles Traveled as CEQA

methodology for transportation impacts in conformance with SB 743, the CMP guidelines currently refer to an LOS standard for CMP purposes. The TIA shall include a discussion of mitigation measures to address any impacts per CMP standards identified in the analysis.

Transportation Demand Management

VTA recommends that the SEIR analyze the potential for the project to reduce its VMT and intersection operational effects through a comprehensive Transportation Demand Management (TDM) program, including setting a target, third-party monitoring, and an enforcement framework. Chapter 8 of VTA's TIA Guidelines includes recommendations for such Target-Based Trip Reduction programs. VTA supports trip caps and aggressive parking management strategies to help reach these TDM goals.

Safety, Security, and Access

VTA engages with its partners at BART, the Federal Transit Administration (FTA), the Department of Homeland Security (DHS), and the California Public Utilities Commission (CPUC) concerning existing and future access underneath VTA Light Rail guideway. New access points or modification near the guideway may trigger regulatory requirements or review of the FTA, DHS, and the CPUC. If any proposals, including art, access for autos, bicycles, or pedestrians is shown in the Metro Plan, VTA strongly recommends documenting proposal as "Conceptual" to set public expectations. Any proposed modifications would require close VTA collaboration and coordination.

VTA notes the possible location for a police substation near the Milpitas BART station shown in some maps. VTA recommends coordinating with VTA's County Sheriff Transit Patrol for this effort. The County Sherriff handles the police activities for VTA and would appreciate coordination when determining needs and location. Please contact me through email to begin coordination.

Noise and Vibration

The SEIR should analyze the impacts of noise and vibration on any future projects or uses. The SEIR should identify any impacts and propose mitigations for the project based on current and future conditions. BART currently operates trains throughout the day as part of VTA's BART Silicon Valley Phase I project within the Metro Plan area.

Thank you again for the opportunity to review this project. If you have any questions, please do not hesitate to contact me at 408-321-5830 or lola.torney@vta.org.

Sincerely,

Lola Torney
Transportation Planner III

ML0601

**From:** "Talbo, Ellen" <Ellen.Talbo@rda.sccgov.org>
**Date:** October 19, 2021 at 11:14:13 PDT
**To:** Kevin Riley <kriley@ci.milpitas.ca.gov>
**Cc:** "Aghegnehu, Ben" <ben.aghegnehu@rda.sccgov.org>, "Camacho, Leo" <Leo.Camacho@rda.sccgov.org>, "Pham, Thien" <Thien.Pham@rda.sccgov.org>
**Subject: Public Comment for Milpitas Metro NOP SEIR**

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hi Kevin,
Unfortunately our network experienced a difficulty last night that didn't allow this letter to go through. Please accept the attached letter for the NOP SEIR.

Thank you greatly,
**Ellen Talbo, AICP**

*County Transportation Planner | Dept. of Roads and Airports*
*Santa Clara County | 101 Skyport Drive | San Jose CA 95127*
*www.countyroads.org*
*(408) 573-2484 office | (408) 234-6533 cell*

**County of Santa Clara**

Roads and Airports Department

101 Skyport Drive
San Jose, CA 95110-1302
(408) 573-2460 FAX 441-0276

**October 18, 2021**

**Kevin Riley**
City of Milpitas
455 East Calaveras Boulevard
Milpitas, CA 95035

**SUBJECT:** Response to Notice of Preparation for the Milpitas Metro Specific Plan Subsequent EIR (SEIR)

**Dear Mr. Riley,**

The Department of Roads and Airports appreciates the opportunity to review the Notice of Preparation of a SEIR for the Metro Specific Plan. We submit the following comments pertaining to the SEIR:

- We understand that the SEIR is intended to be programmatic and prepared so that the Metro Specific Plan can be characterized as one large project. We also understand that Level of Service is no longer a consideration for the purposes of CEQA mitigation. Due to the signal operations and coordination needed to move expressway traffic flows at a reasonable level, the County still evaluates level of service for the purposes of analyzing operational and safety impacts from individual developments along and surrounding the expressway. Therefore, we prefer an approach to continue to require traffic impact analysis studies for individual development projects within the Metro subarea on the basis of analyzing local operational and safety impacts as a means of demonstrating that an individual project and its impacts are consistent with the findings in the programmatic SEIR. We are open and available to meet mutually with City staff and applicants at a pre-application stage to coordinate an adequate scope of work in the preparation of any local traffic studies. Please contact Leo Camacho, Senior Land Development Engineer, at leo.camacho@rda.sccgov.org as the main point of contact for any questions related to this.
- Should impacts from an individual project within the subarea trigger any future fair share contribution(s), the County would prefer to utilize the fair share contribution toward the cost of the Montague Expressway widening project and/or any future planned active transportation or intersection improvements on Montague Expressway.

We also submit the following comments related to the development aspects of implementing the Metro Plan:

- We observed the patterns of high density mixed use among both retail and residential uses in Figure 2 of the scoping notice and acknowledge the environment this creates for higher pedestrian circulation surrounding or along Montague Expressway. Due to the higher volumes and higher traffic speeds of Montague Expressway, we believe that pedestrian safety would be best served, at a minimum, through the provision of sidewalks in a consistent manner free of gaps in the network.

**Board of Supervisors:** Mike Wasserman, Otto Lee, Susan Ellenberg, S. Joseph Simitian, Cindy Chavez
**County Executive:** Jeffrey V. Smith

Therefore, the County will require sidewalk frontage improvements upon development application for encroachment permitting.

- Maintenance of non-standard improvements in the County right of way will be subject to a maintenance indemnification agreement between the encroachment permit applicant and the County unless otherwise coordinated between the City and County.
- The implementation of a bicycle network on Montague Expressway would require mutual planning, design, and coordination between the City and County due to the unique geometric features of the roadway related to sight distance, speed, curvature, intersection configuration, driveway conflicts, and other technical design issues that impact users safety. Please contact Ellen Talbo, County Transportation Planner, at ellen.talbo@rda.sccgov.org for any questions or to discuss implementation of the bicycle infrastructure within the subarea.

For the reasons listed above we invite the City to dually engage with our Land Development and Transportation Planning units on a frequent enough basis to sufficiently check in about any development activity that requires City/County coordination. We thank you for engaging the department in this effort. Further we recognize the City's efforts and goals in addressing regional housing development challenges and support the City's goals of reducing congestion through increases in transit use. If you have any questions or concerns about these comments, please feel free to contact me at 408-573-2482.

Thank you,

Ellen Talbo, AICP
County Transportation Planner

STATE OF CALIFORNIA — Gavin Newsom, Governor

# NATIVE AMERICAN HERITAGE COMMISSION

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**Laura Miranda**
*Luiseño*

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EXECUTIVE SECRETARY
**Christina Snider**
*Pomo*

**NAHC HEADQUARTERS**
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

September 20, 2021

RECEIVED
10/7/2021
LM

Kevin Riley
City of Milpitas
455 East Calaveras Boulevard
Milpitas, CA 95035

**Re: 2006032091, Milpitas Metro Specific Plan Project, Santa Clara County**

Dear Mr. Riley:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

**Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

**1.** Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

**2.** Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

**3.** Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

**4.** Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

**5.** Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

**6.** Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

**7.** Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

**a.** The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

**b.** A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

**8.** Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

**9.** Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

**10.** Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

**a.** Avoidance and preservation of the resources in place, including, but not limited to:

**i.** Planning and construction to avoid the resources and protect the cultural and natural context.

**ii.** Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

**b.** Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

**i.** Protecting the cultural character and integrity of the resource.

**ii.** Protecting the traditional use of the resource.

**iii.** Protecting the confidentiality of the resource.

**c.** Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

**d.** Protecting the resource. (Pub. Resource Code §21084.3 (b)).

**e.** Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

**f.** Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

**11.** Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

**a.** The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

**b.** The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

**c.** The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Katy.Sanchez@nahc.ca.gov.

Sincerely,

Katy Sanchez

Katy Sanchez
Associate Environmental Planner

cc: State Clearinghouse

Appendix B

# Initial Study Milpitas Metro Specific Plan

# INITIAL STUDY
# MILPITAS METRO SPECIFIC PLAN

**PREPARED FOR:**

City of Milpitas
455 East Calaveras Boulevard
Milpitas, CA 95035
Contact: Kevin Riley

**PREPARED BY:**

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**April 2022**

ICF. 2022. *Initial Study—Milpitas Metro Specific Plan*. Draft. April.
(ICF 103830.0.001) Sacramento, CA. Prepared for the City of Milpitas, Milpitas, CA.

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# Acronyms and Abbreviations

| | |
|---|---|
| AB | Assembly Bill |
| BMP | best management practice |
| Cal OSHA | California Division of Occupational Safety and Health |
| CCA | Community Choice Aggregation |
| CCE | Community Choice Energy |
| CDFW | California Department of Fish and Wildlife |
| CEQA | California Environmental Quality Act |
| City | City of Milpitas |
| DTSC | California Department of Toxic Substances Control |
| EIR | environmental impact report |
| GHG | greenhouse gas emissions |
| HCP | habitat conservation plan |
| I- | Interstate |
| IS | Initial Study |
| LOP | Local Oversight Program |
| LOS | level of service |
| Metro Plan or Project | Milpitas Metro Specific Plan |
| MLD | Most Likely Descendant |
| NAHC | Native American Heritage Commission |
| National Register | National Register of Historic Places |
| NCCP | natural community conservation plan |
| NPDES | National Pollutant Discharge Elimination System |
| NWIC | Northwest Information Center |
| PCBs | polychlorinated biphenyls |
| PG&E | Pacific Gas & Electric |
| RWQCB | Regional Water Quality Control Board |
| SB | Senate Bill |
| SCCDEH | Santa Clara County Department of Environmental Health |
| SVCE | Silicon Valley Clean Energy |
| SCVURPP | Santa Clara Valley Urban Runoff Prevention Program |
| SCVWD | Santa Clara Valley Water District |
| SEIR | subsequent EIR |
| SRA | State Responsibility Area |
| SWRCB | State Water Resources Control Board |
| TASP | Transit Area Specific Plan |
| VMT | vehicles miles traveled |

# Chapter 1
# Introduction

This Initial Study (IS) has been prepared by the City of Milpitas, the lead agency under the California Environmental Quality Act (CEQA), to examine the potential environmental impacts of the Milpitas Metro Specific Plan (Metro Plan or Project), which is an update to the 2008 Transit Area Specific Plan (TASP). Compared to the TASP, the Metro Plan is expected to result in four basic changes (referred to as "Project Changes"). First, the Metro Plan would expand the geographic area of the plan area (Metro Plan Area) to include two additional areas that were not previously included in the plan area under the TASP (see Figure 1). Second, the Metro Plan would include changes to land use classifications and policies compared to the TASP. Third, compared to the TASP, the Metro Plan would yield an additional 7,000 dwelling units; 700 hotel rooms; 300,000 square feet of retail uses; 2.5 million square feet of office uses; and 500,000 square feet of industrial uses (as summarized in Table 1-1). Fourth, the Metro Plan would extend the planning horizon year by 10 years (from 2030 to 2040), compared to the TASP.

**Table 1 Comparison of Existing Growth Under the TASP and Additional Growth Under the Metro Plan**

| Land Use | 2008 Existing Development | TASP Planned New Development | Total TASP Planned Development | Entitled by 2019[1] | Additional Projected Development for Metro Plan by 2040 | Total Planned Development (TASP plus Metro Plan) |
|---|---|---|---|---|---|---|
| Dwelling Units | 468 | 7,109 | 7,577 | 6,955 | 7,000 | 14,577 |
| Office (sf) | 52,780 | 993,843 | 1,050,000 | 10,630 | 3,000,000[2] | 4,050,000 |
| Retail (sf) | 1,970,000 | 287,075 | 2,240,000 | 186,500 | 300,000 | 2,540,000 |
| Hotel (rooms) | 292 | 350 | 642 | 0[3] | 700 | 1,342 |

[1] Entitled, under construction, or constructed/occupied.
[2] Includes 500,000 sf of industrial uses
[3] Currently there are concept plans for a high-rise hotel.
Note: The Metro Plan would also allow for a police station to be developed in the Innovation Subdistrict, with a potential location shown on Figure 2-4. The potential police station use is discussed in this Draft SEIR where relevant to the impact analysis.
sf = square feet

# CEQA Background

The City of Milpitas (City) adopted the TASP and certified the TASP Program Environmental Impact Report (Certified EIR) in 2008. Section 15162 of the State CEQA Guidelines provides that when an environmental impact report (EIR) has been certified for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

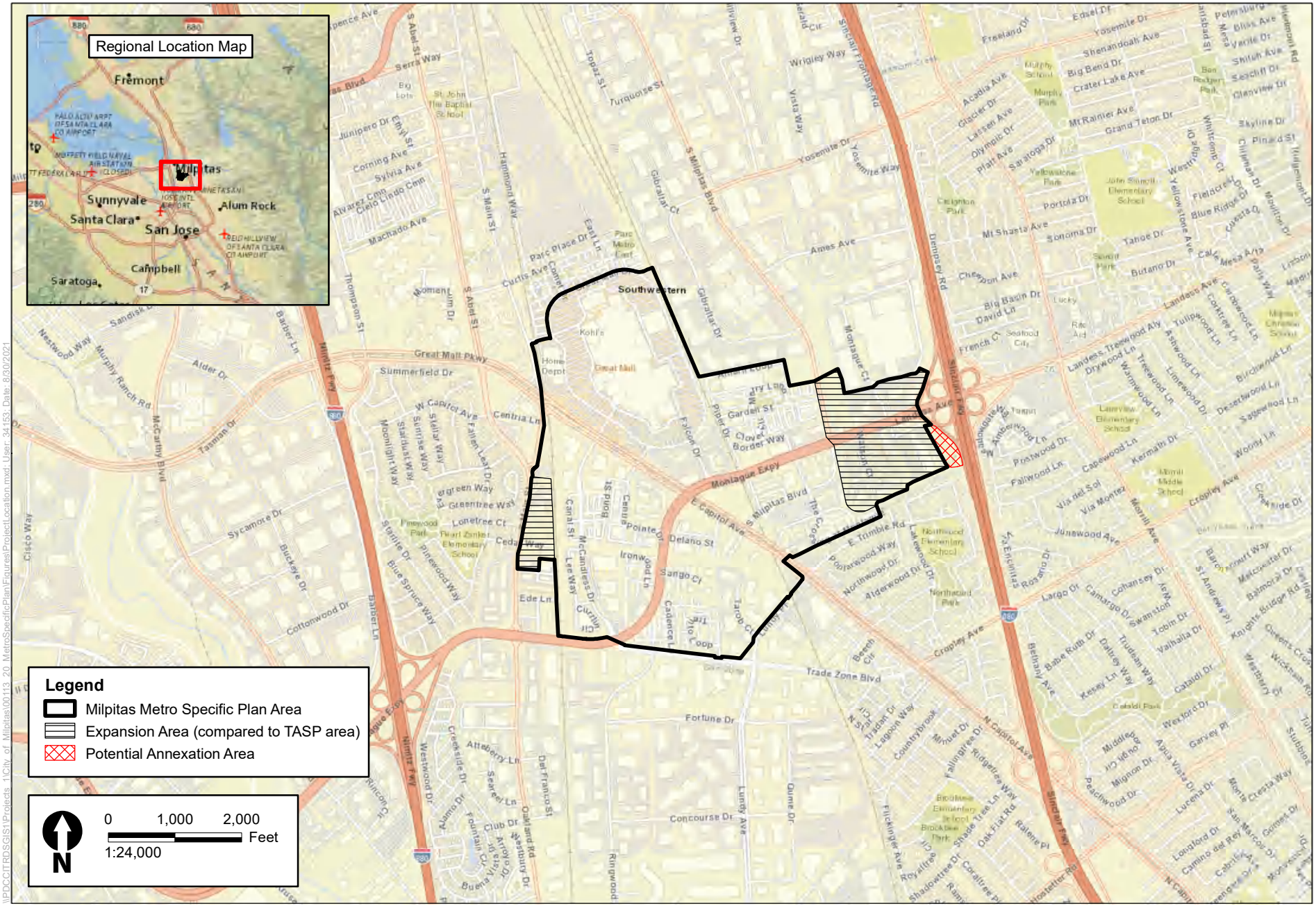


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**Figure 1**
**Project Location Map**

When the lead agency determines that one or more of the above criteria has been met, a subsequent EIR (SEIR) can be prepared. The purpose of a SEIR is to inform decision makers and the general public of the environmental effects associated with major changes to a previously certified EIR. The SEIR process is intended to provide environmental information sufficient to evaluate major changes and to identify the potential for new significant environmental effects or a substantial increase in the severity of previously identified significant effects. A SEIR analysis focusses on the potential impacts of the changes to the project and does not reevaluate the project as a whole. A SEIR is subject to the same public notice and review requirements as any EIR. That includes submittal to the State Clearinghouse for state agency review.

The lead agency has determined that the Project Changes could result in new or substantially more severe effects that were not analyzed in the Certified EIR, and that substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, a SEIR has been prepared. This IS evaluates the potential impacts of the Project Changes and identifies the topics that are analyzed further in the SEIR.

# Impacts Identified by the Certified EIR

The TASP is a long-range planning document that envisioned the transformation of a light industrial area near the Milpitas Transit Center, totaling 437-acre, into a mixed-use, transit oriented, attractive and livable neighborhood with housing, offices, and shopping. The Certified EIR examined the potential impacts of future development from implementation of the TASP compared to then-existing conditions, including the potential impacts from additional residential units; additional office space, retail space, and hotels; and new jobs. Table ES-3 in the Certified EIR's Executive Summary contains a concise summary of all of the impacts of the TASP, including those found to be less than significant. The Certified EIR identified significant and unavoidable impacts from development under the TASP on the following resources.

- *Air Quality.* The Certified EIR found that new development under the TASP could increase population and vehicle miles traveled in the area at a rate greater than that assumed in regional air quality planning and therefore conflict with the implementation of the Bay Area Ozone Strategy.
- *Air Quality.* The Certified EIR found that implementation of the TASP would further contribute to the exceedance of regional air pollutant emissions for state and federal ambient air quality standards.

In addition to the significant and unavoidable impacts identified above, the Certified EIR identified significant and unavoidable impacts related to traffic level-of-service (LOS). Since the preparation of the Certified EIR, the Governor's Office of Planning and Research (OPR) implemented changes to the CEQA Guidelines pursuant to Senate Bill (SB) 743, including the addition of Guidelines Section 15064.3, which establishes that a project's effect on automobile delay shall not constitute a significant environmental impact, and that a project's transportation impacts shall instead be measured by the amount and distance of automobile travel attributable to the project, or vehicles miles traveled (VMT). As such, the Certified EIR's conclusions about LOS impacts are not addressed further in this document.

All other impacts in the Certified EIR were found to be less than significant and no mitigation measures were required. Although no mitigation measures were required, the Certified EIR did identify policies from the TASP, Midtown Specific Plan, and 1994 General Plan that would minimize impacts. Because the policies from the 1994 General Plan have been updated and the TASP policies will be updated in the Metro Plan, this IS considers whether these changes would be substantial and would result in a substantial increase in the severity of previously identified significant effects.

## Environmental Setting and Baseline

Project development characteristics are typically compared to the existing physical environment to isolate impacts caused by the project on its surroundings. In other words, the existing condition (also referred to as the environmental setting) is normally the baseline against which the project's impacts are measured to determine whether impacts are significant. However, because the focus of this IS is on changes relative to a certified EIR, the baseline used for this IS is the conditions associated with buildout of the Project in the Certified EIR. In other words, the environmental baseline for this IS is the full buildout of the TASP as identified in the Certified EIR.

# Project Setting

The Project setting for the Metro Plan in included in Chapter 3, *Setting, Impacts, & Mitigation Measures*, of the SEIR for the Metro Plan, to which this IS is appended.

# Project Description

The Project description for the Metro Plan is included in Chapter 2, *Project Description*, of the SEIR for the Metro Plan, to which this IS is appended.

Chapter 2
# Environmental Checklist

## Environmental Topics Further Evaluated in the SEIR

As detailed in the checklist analysis on the following pages, the Project Changes could result in new or substantially more severe effects that were not analyzed in the Certified EIR, or substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR, with respect to the topics that are checked below (i.e., the Project Changes could result in at least one impact that is a "Potentially Significant Impact"). Accordingly, these topics are further evaluated in the SEIR.

| | | |
|---|---|---|
| ☐ Aesthetics | ☐ Agricultural and Forestry Resources | ☒ Air Quality |
| ☐ Biological Resources | ☐ Cultural Resources | ☐ Energy |
| ☐ Geology/Soils | ☒ Greenhouse Gas Emissions | ☐ Hazards and Hazardous Materials |
| ☐ Hydrology/Water Quality | ☒ Land Use/Planning | ☐ Mineral Resources |
| ☒ Noise | ☒ Population/Housing | ☒ Public Services |
| ☒ Recreation | ☒ Transportation | ☐ Tribal Cultural Resources |
| ☒ Utilities/Service Systems | ☐ Wildfire | ☒ Mandatory Findings of Significance |

# I. Aesthetics

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Except as provided in Public Resources Code Section 21099, would the project: | | | |
| a. Have a substantial adverse effect on a scenic vista? | ☐ | ☒ | ☐ |
| b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway? | ☐ | ☒ | ☐ |
| c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | ☐ | ☒ | ☐ |
| d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area? | ☐ | ☒ | ☐ |

## Setting

### Environmental Setting

The environmental setting for the TASP Area is described on pages 3.2-1 and 3.2-2 of the Certified EIR. This discussion includes an overview of visual resources within the TASP Area; an overview of the visual features within the TASP Area, including street trees (mature trees along McCandless Drive and younger trees along Centre Point Drive and Great Mall Parkway); and an overview of view corridors (scenic foothills). The environmental setting of the TASP concluded that visual resources are well outside of the TASP Area. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review. Since the Certified EIR was prepared, many of the envisioned changes from the TASP have been implemented, including the opening of the Milpitas Bay Area Rapid Transit Station, the development of new residences, office space, retail spaces, a school, and parks. Nonetheless, the setting with regard to aesthetics within the TASP Area has not changed substantially since the Certified EIR was prepared. No new scenic resources or views have been introduced to the Metro Plan Area and the urban character of the Metro Plan Area is generally the same as what was identified in the Certified EIR.

The two expanded areas in the Metro Plan would have a similar environmental setting for aesthetics as described in the Certified EIR. The western expanded area along South Main Street includes businesses, predominantly automobile businesses, with driveways and parking lots, and very little landscaping, except for some street trees along Main Street. The eastern expanded area near

Interstate (I-) 680 includes businesses, predominantly storage units, with driveways, parking lots, and very few landscaped areas. Overall, consistent with the description in the Certified EIR, there are no visual resources within these expanded areas, and there are views of scenic foothills from locations throughout the Metro Plan Area, including from these two expanded areas.

### Regulatory Setting

The regulatory setting for aesthetics is described on page 3.2-3 of the Certified EIR. These regulations include goals from the Midtown Milpitas Specific Plan and the Tree Maintenance and Protection Ordinance of the City of Milpitas.[1] In addition, pertinent policies from the Midtown Specific Plan are described on page 3.2-5. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

On March 9, 2021, the City adopted an update to the 1994 General Plan, which is referred to as the 2040 General Plan. The Certified EIR identified that the Open Space and Conservation Element of the 1994 General Plan provides guiding principles and policies for their preservation and enhancement. Because the 2040 General Plan supersedes and replaces the 1994 General Plan, the policies from the 2040 General Plan would apply to the Metro Plan. Policies that would apply to the Metro Plan from the 2040 General Plan include the following:

- Policy CD 1-10. Minimize the visual impacts of public and private communication, service, and utility facilities by requiring the provider to incorporate sensitive site design techniques, including, but not limited to the placement of facilities in less conspicuous locations, the undergrounding of facilities wherever possible, and the screening of facilities.
- Policy UCS 6-3. Require that all new power and gas lines and transformers are installed underground where feasible and promote the undergrounding of existing overhead facilities.
- Policy UCS 7-7. Require that all new telecommunication lines are installed underground where feasible and promote the undergrounding of existing overhead facilities.

## Certified EIR Findings

The Certified EIR found that:

- The TASP could result in 24-story buildings along Great Mall Parkway and Montague Expressway, and 12-story buildings in the Piper/Montague subdistrict. These buildings could block views but that with implementation of the TASP policies identified in Table 2-2 (see Chapter 2, *Project Description* of the SEIR to which this IS is appended), ample views of the hills should be available and view corridors should remain. Compliance with standards and policies from the TASP (i.e., new parks, new trails, landscaped buffers, amenities, and other development standards) would ensure that less-than-significant impacts occur on the City's scenic views of the foothills, and visual character.
- Light and glare would be caused by new buildings, street lighting, and nighttime lighting. These light and glare impacts would be less than significant with implementation of the TASP Development Standards identified in Table 2-2 (see Chapter 2, *Project Description* of the SEIR to which this IS is appended).

[1] The Certified EIR identified the "Tree Maintenance and Protection Ordinance of the City of Milpitas" as the "City's Tree and Planting Ordinance."

- No scenic resources are within the TASP Area except for the street trees on McCandless Drive. Although the majority of mature trees would remain in place with the TASP, some would likely be removed. The removal of mature trees would be compensated by the street trees and parks added through the TASP Area. In addition, the TASP includes policies calling for the retention of trees along McCandless Drive, Great Mall Parkway, and Centre Point Drive. Furthermore, mature trees are protected by the Tree Maintenance and Protection Ordinance of the City of Milpitas.

# Discussion

## Changes in Land Use Classifications and Policies

Table 2-2 in Chapter 2, *Project Description*, of the SEIR to which this IS is appended, provides a summary of the policies in the TASP related to aesthetics, as well as the policies in the Metro Plan related to aesthetics. In summary, Table 2-2 identifies the following updates that have been made in the Metro Plan:

- The Metro Plan does not include a policy related to placing utilities underground (TASP Development Standard). However, this requirement would still be fulfilled under the Metro Plan because developers would be required to comply with 2040 General Plan Policies CD 1-10, UCS 6-3, and UCS 7-7, which have similar requirements to place utilities underground.
- The Metro Plan includes policies related to constructing a network of trails, implementing landscaped setbacks, orienting façades, and planting trees and, although some of the text has been updated compared to TASP polices, there would be no substantial change in the requirements as identified in the TASP (TASP policies 6.41, 4.4, 4.6, 4.7, 4.13, 4.36, 4.37, 4.46, 4.51, 4.53)
- The Metro Plan does not include a policy related to the preservation of certain trees (TASP policies 4.59 and 4.67) because those trees on McCandless Drive and Great Mall Parkway have been removed. These TASP policies would not apply. However, future development would still be required to adhere to the Tree Maintenance and Protection Ordinance of the City of Milpitas.
- The Metro Plan does not include development standards related to lighting (the TASP included development standards, summarized in Table 2-2 in Chapter 2, *Project Description*, of the SEIR). However, future development in the Metro Plan Area would be required to adhere to Citywide Objective Development Standards that would have similar requirements regulating lightings, as the TASP (see Table 2-2).

Therefore, although there have been changes and deletions to the policies in the TASP, similar measures would still be required by the existing 2040 General Plan, the Metro Plan, and through compliance with existing regulations. As summarized in Table 2-2 of the SEIR to which this IS is appended, the changes made to the TASP policies by the Metro Plan would not substantially change the overall requirements to minimize impacts on aesthetics. Therefore, these changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

## Public Resources Code Section 21099

According to California Public Resources Code Section 21099, which was amended in 2013 pursuant to SB 743, visual resource impacts of residential, mixed-use residential, or employment center[2] projects on an infill site[3] within a Transit Priority Area[4] shall not be considered significant impacts on the environment. Most of the future development that would be constructed as a part of the Project Changes would meet the requirements in Public Resources Code Section 21099. First, except for the police station, and open space (discussed further below), the land uses identified in the Project Changes of the Metro Plan would be considered residential, mixed-use residential, or employment centers. Second, except for a few areas, the Metro Plan Area would be in a Transit Priority Area. Overall, development associated with the Metro Plan would be in proximity to transit, including light rail, buses, and Bay Area Rapid Transit. Figure 2 identifies the areas within the Metro Plan Area that are within a Transit Priority Area. Third, because the Metro Plan Area is a highly urbanized area that is predominantly built out, it is expected that most of the development would occur in infill sites. In summary, most of the future development that would be constructed as a result of the Project Changes would not result in significant aesthetic impacts pursuant to Public Resources Code Section 21099.

[2] An "employment center project" is a project located on property zoned for commercial uses with a floor area ratio of no less than 0.75 and that is located within a TPA. (Public Resources Code Section (a)(1)).

[3] An "infill site" is a lot located within an urban area that has been previously developed, or on a vacant site where at least 75 percent of the perimeter of the site adjoins, or is separated only by an improved public right-of-way from, parcels that are developed with qualified urban uses. (Public Resources Code Section 20199(a)(4)).

[4] A Transit Priority Area is an area within 0.5 mile of a major transit stop that is existing or planned. (Public Resources Code Section (a)(7)).

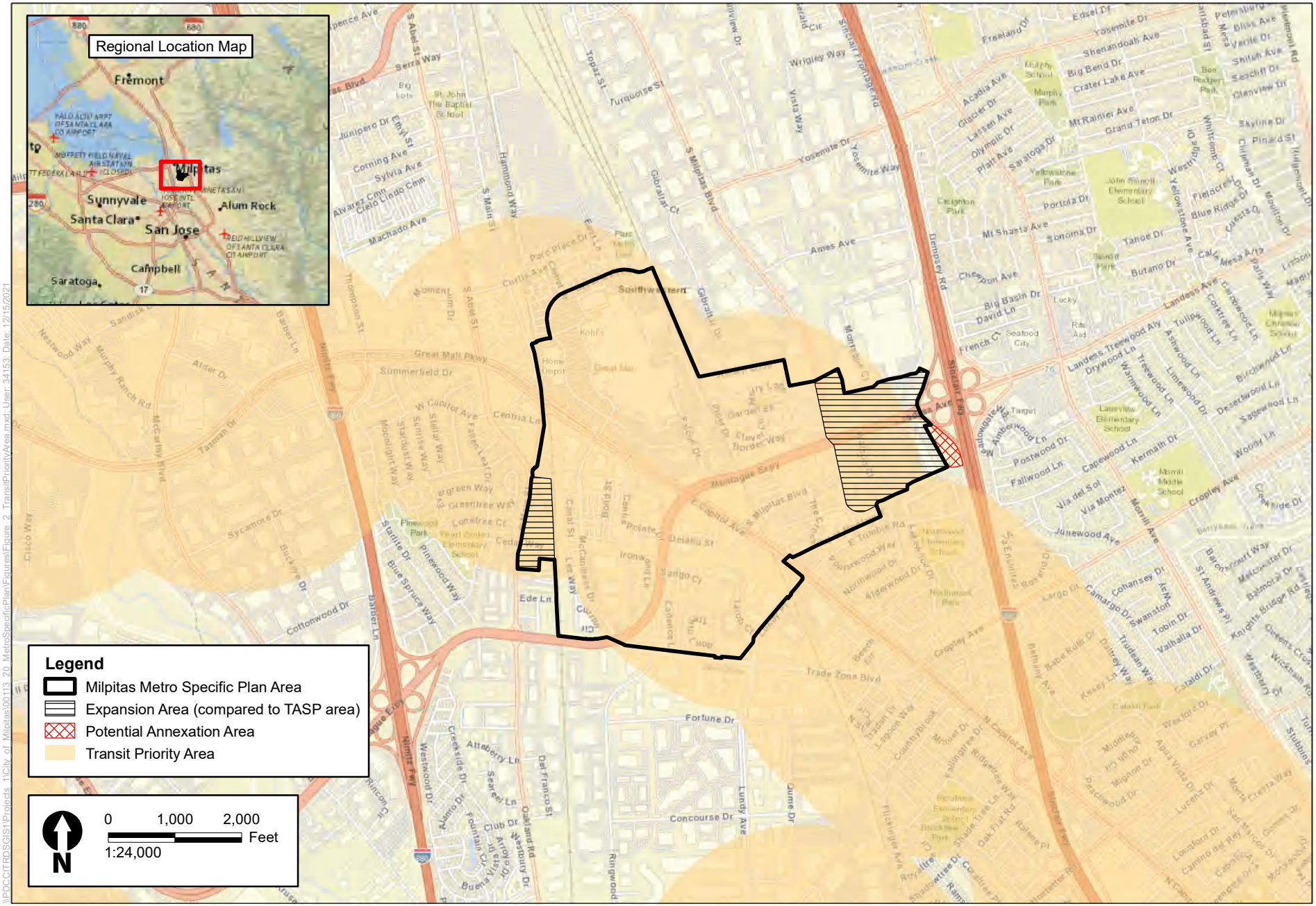


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**Figure 2**
**Transit Priority Area Map**

In addition, the Metro Plan includes updated land use designations that would allow for greater building heights than what was identified in the TASP, including the following:

- *Residential Retail High Density Mixed Use (RRMU)*. The Metro Plan identifies a maximum height of 85 feet for this land use, which is 10 feet higher than the height allowed by right under the TASP. The Metro Plan requires additional height step-downs if the development is near existing residentially zoned parcels.
- *Boulevard Very High Density Mixed Use (BVMU).* The Metro Plan identifies a maximum height of 275 feet for this land use. The TASP identified a maximum height of 150 feet, with an additional 20 stories allowed with a conditional use permit. In summary, the Metro Plan increases the maximum height for this land use by 105 feet.
- *Multi-Family Very High Density Residential (VHD)*. The Metro Plan allows a maximum height of 85 feet for this land use, which is 10 feet higher than the maximum height of 75 feet allowed by right under the TASP.
- *Urban Residential (URR).* This is a new land use designation under the Metro Plan that allows a maximum height of 75 feet.
- *Business Park Research & Development, Residential (BPRD-R)*. This is a new land use designation under the Metro Plan that allows a maximum height of 275 feet.

Although these land use designations would allow for taller buildings than what was identified in the TASP, as discussed above, most future buildings would not result in significant aesthetic impacts pursuant to California Public Resources Code Section 21099. These buildings, although taller than what was identified in the TASP, would have no impact on aesthetics.

## Exceptions to Public Resources Code Section 21099

There are some exceptions where Public Resources Code Section 21099 would not apply to the improvements and development proposed in the Project Changes. As such, this discussion focuses on the potential aesthetics impacts from the following features of the Metro Plan:

- Development of a police station
- Development of open space
- Development of infrastructure associated with the Metro Plan
- Development of the eastern portion of the eastern expanded (Innovation Subdistrict), which is next to I-680, is designated for Business Park Research & Development, Lower Density; and is just outside of a Transit Priority Area
- Development of the southwestern corner of the Metro Plan Area, which is designated for Permanent Open Space and Multi-Family Residential High Density and is just outside of a Transit Priority Area. It should be noted that the area designated for Multi-Family Residential High Density is not likely to be redeveloped because townhomes were recently constructed in that area consistent with the TASP.
- Development of a hotel if the hotel is located outside of a TPA. If the hotel is located within a TPA, the development of the hotel would not result in significant aesthetic impacts pursuant to Public Resources Code Section 21099.

Overall, the Metro Plan, like the TASP, is expected to improve the aesthetics of the area by adding open space with landscaping in an area with few green spaces. The Metro Plan would add open space compared to what was included in the TASP. The addition of open space due to the Metro Plan would improve the aesthetics of the area. There are no scenic vistas or scenic resources located within the Metro Plan Area. As such, the Metro Plan would have no impact on scenic vistas or scenic resources.

The infrastructure associated with the Metro Plan would primarily be underground, which would have no impact on aesthetics. The Metro Plan would, however, include at-grade features such as new roads and at-grade bridges. Because these at-grade features would not block any views, these at-grade features are not expected to have an impact on aesthetics. Overall, underground infrastructure and at-grade infrastructure would have no impact on aesthetics. The development associated with the hotel and police station and a portion of the development within the Innovation Subdistrict would add buildings within the Metro Plan Area. Furthermore, the Metro Plan would include an additional overhead pedestrian bridge. Like similar projects identified in the TASP, this development could result in limited blocking views of the scenic hills east of the Metro Plan Area. Nonetheless, the policies in the Metro Plan include requirements for setbacks that would allow views of hills, as well as development standards that would minimize visual impacts from development. Overall, with implementation of policies in the Metro Plan, impacts on scenic views of hills would be less than significant. Furthermore, the Metro Plan would adhere to the policies in the Metro Plan and 2040 General Plan that govern scenic quality. As such, the Metro Plan would have a less than significant impact related to conflicting with applicable zoning and regulations governing scenic quality.

Furthermore, like with the TASP, light and glare impacts caused by new buildings, street lighting, and nighttime lighting due to the Metro Plan would be less than significant with implementation of Citywide Objective Design Standards.

## Conclusion

The Certified EIR determined that the TASP would have a less-than-significant impact with regard to aesthetics. Based on the analysis above, with incorporation of the Project Changes, the Metro Plan would have a less-than-significant impact with regard to aesthetics. Therefore, the Project Changes would not result in a change to the Certified EIR's impact determination for impacts on aesthetics. Specifically, the Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. **Therefore, this topic is not discussed further in the SEIR**.

# II. Agricultural and Forestry Resources

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts on forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project, and forest carbon measurement methodology provided in the Forest Protocols adopted by the California Air Resources Board. Would the project: | | | |
| a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | ☐ | ☐ | ☒ |
| b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract? | ☐ | ☐ | ☒ |
| c. Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? | ☐ | ☐ | ☒ |
| d. Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☒ |
| e. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use? | ☐ | ☐ | ☒ |

## Setting

The Metro Plan Area is in a developed urban area without agricultural or forestry features. The California Department of Conservation 2016 map of important farmland identifies the Metro Plan

Area as Urban and Built-up Land.[5] In addition, there are no areas that are zoned for agricultural or forestry resources in the Metro Plan Area.

## Certified EIR Findings

The Certified EIR did not include an impact analysis or significance determination related to agricultural resources.

## Conclusion

Because there are no agricultural or forestry resources in the Metro Plan Area or areas zoned for agricultural or forestry resources, the Metro Plan would result in no impact on agricultural or forestry resources. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. **Therefore, this topic is not discussed further in the SEIR**.

[5] California Department of Conservation. 2021. Santa Clara County Important Farmland 2018. Available: https://filerequest.conservation.ca.gov/RequestFile/2834917. Accessed: August 27, 2021.

# III. Air Quality

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project: | | | |
| a. Conflict with or obstruct implementation of the applicable air quality plan? | ☒ | ☐ | ☐ |
| b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard? | ☒ | ☐ | ☐ |
| c. Expose sensitive receptors to substantial pollutant concentrations? | ☒ | ☐ | ☐ |
| d. Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)? | ☒ | ☐ | ☐ |

The Project Changes, which include additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on air quality that were not analyzed in the Certified EIR. As such, **air quality impacts due to the Project Changes are further evaluated in the SEIR**.

# IV. Biological Resources

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| Would the project: | | | | |
| a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☒ | ☐ | ☐ |
| b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☒ | ☐ | ☐ |
| c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means? | ☐ | ☒ | ☐ | ☐ |
| d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | ☐ | ☐ | ☒ | ☐ |
| e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☒ | ☐ | ☐ |
| f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan? | ☐ | ☐ | ☐ | ☒ |

# Setting

## Environmental Setting

The environmental setting for the TASP Area is described on pages 3.8-1 and 3.8-2 of the Certified EIR. This discussion includes an overview of the climate, vegetation communities, wildlife habitats, and occurrences and potential for special-status species within the TASP Area. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review. The setting with regard to biological resources within the TASP Area has not changed substantially since the Certified EIR was prepared.

The two expanded areas in the Metro Plan have similar habitat and a similar potential for special-status species as the TASP Area. Within these expanded areas, there are high levels of disturbance and no natural vegetation communities. The western expanded area along South Main Street is predominantly composed of developed habitat with ruderal habitat. A drainage channel directing water to Penitencia Creek is east of this expanded area and was discussed in the Certified EIR. The eastern expanded area near I-680 is predominantly composed of developed habitat. The developed habitat in the northeast corner of this expanded area, adjacent to the I-680 southbound off-ramp to Montague Expressway, is composed of trees and bushes including native species (e.g., coast-live and valley oaks, Fremont cottonwoods) and nonnative species (e.g., pepper trees, olive trees, glossy privets, Jacaranda trees, iceplant, sugar bush) that have been planted for ornamental value. Additionally, a drainage channel that diverts Berryessa Creek is along the entire western boundary and in the southwest corner of the expanded area.

On October 6, 2021, a desktop review and reconnaissance survey were conducted by an ICF biologist to determine whether areas of potential biological sensitivity are present in the two expanded areas. It was determined that the expanded areas contain trees and vegetation that could provide habitat for nesting raptors and other birds. Additionally, the western expanded area along South Main Street has ruderal habitat (i.e., vegetation in disturbed areas). Both areas with ruderal habitat are small and are surrounded by development. Buildings and trees in proximity to the ruderal areas provide predator perches, which reduce the potential for burrowing owl. Regardless, if small mammal burrows (e.g., California ground squirrel) or other refugia (e.g., small pipes or culverts) exist on the property, burrowing owls could be present.

In addition, as a result of expansions to the Metro Plan Area and the time elapsed since the preparation of the Certified EIR, ICF performed a record search in January 2022 using the California Natural Diversity Database (CNDDB), to identify whether any new special-status species have been identified near the Metro Plan Area, since the Certified EIR was prepared. CNDDB compiles recorded occurrences of special-status species within a given radius, which in this case was set to 1.5 miles from the center of the Metro Plan Area. Occurrences recorded within the Metro Plan Area were compared to previous recordings listed in the Certified EIR to measure the potential for special status species to occur in the Metro Plan Area.

According to the 2022 CNDDB search, the following 3 special-status plant species and 11 special-status wildlife species were previously recorded in the Metro Plan Area:

- Plant Species
    - alkali milk-vetch

  - robust spineflower
  - Congdon's tarplant
- Wildlife Species
  - burrowing owl
  - California tiger salamander - central California distinct population segment (DPS)
  - great blue heron
  - western yellow-billed cuckoo
  - obscure bumble bee
  - Crotch bumble bee
  - western bumble bee
  - yellow rail
  - western ridged mussel
  - Northern California legless lizard
  - tricolored blackbird

Of the 14 total special-status species, six species were previously discussed in the Certified EIR. All three special-status plant species (alkali milk-vetch, robust spineflower, and Congdon's tarplant) were results of the previous CNDDB search performed for the Certified EIR. Two wildlife species (burrowing owl and California tiger salamander) were also identified in the previous CNDDB search in the Certified EIR. The great blue heron species was not identified in the CNDDB search in the Certified EIR but was observed during the Certified EIR's reconnaissance survey.

## Regulatory Setting

The regulatory setting for biological resources is described on page 3.8-3 of the Certified EIR. These regulations include regulations protecting special-status species, including the federal Migratory Bird Treaty Act, California Fish and Game Code, and State CEQA Guidelines Section 15380; regulations protecting waters and wetlands, including regulations from the U.S. Army Corps of Engineers, regulations from the U.S. Environmental Protection Agency, and state policies and regulations on streams and wetlands; and regulations protecting trees, per the Tree Maintenance and Protection Ordinance of the City of Milpitas. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

The Certified EIR identified 1994 General Plan policies relating to the protection of burrowing owl, non-listed nesting birds and raptors, and wetlands and other waters including:

- Policy 4.b-I-4: Require a biological assessment of any project site where sensitive species are present, or where habitats that support known sensitive species are present.
- Policy 4.b-I-5: Utilize sensitive species information acquired through biological assessments, project land use, planning and design.

On March 9, 2021, the City adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan supersedes and replaces the 1994 General Plan and the policies

from the 2040 General Plan would apply to the Metro Plan. The following actions from the 2040 General Plan that would apply to the Metro Plan are similar to the policies from the 1994 General Plan identified in the Certified EIR.

- Action CON-3b: Where sensitive biological habitats have been identified on or immediately adjacent to a project site, the project shall include appropriate mitigation measures identified by a qualified biologist, which may include, but are not limited to the following:
    - Pre-construction surveys for species listed under the State or Federal Endangered Species Acts, or species identified as special-status by the resource agencies, shall be conducted by a qualified biologist;
    - Construction barrier fencing shall be installed around sensitive resources and areas identified for avoidance or protection, and to reduce potential soil compaction in sensitive areas; and
    - Pre-Construction training of contractors and sub-contractors shall be conducted by a qualified biologist to identify and avoid protected species and habitat.
- Action CON-3c: Cooperate with State, federal and local agencies to ensure that development does not cause significant adverse impacts to existing riparian corridors; this includes continued compliance with the "Guidelines and Standards for Land Use Near Streams" from the Santa Clara Valley Water District and Title XI, Chapter 15 (Floodplain Management Regulations) of the Milpitas Municipal Code.

# Certified EIR Findings

The Certified EIR found that:

- Development of ruderal or barren vacant lots within the TASP Area or disturbance to adjacent suitable habitat could result in the direct loss of burrowing owls (designated a California Species of Special Concern) or active nests that are protected under California Fish and Game Code Section 3503.5. Loss of burrowing owl individuals or nests would result in a significant impact on biological resources. These impacts on burrowing owls would be less than significant with compliance with CDFW survey protocols and the implementation of the 1994 General Plan Policies 4.b-I-4 and 4.b-I-5, and TASP Policy 5.26.
- Non-listed special-status raptor and other bird species protected by California Fish and Game Code Sections 3503 and 3503.5 may nest on and near the TASP Area. It was found that construction activities associated with buildout of the TASP could cause direct mortality of nesting birds and their young or cause nest abandonment resulting in indirect loss of avian species. Impacts on non-listed special-status raptor and other bird species would result in a significant impact on biological resources. These impacts on birds would be less than significant with implementation of the 1994 General Plan Policies 4.b-I-4 and 4.b-I-5 and TASP Policies 5.27 and 5.28.
- Significant trees, including heritage trees, protected by the Tree Maintenance and Protection Ordinance of the City of Milpitas occur in the TASP Area. Loss of significant trees could result in significant impacts on biological resources. These impacts on significant trees would be less than significant with compliance with the Tree Maintenance and Protection Ordinance of the City of Milpitas and with implementation of TASP Policy 5.28.
- Wetland, creeks, and drainages, including Penitencia Creek, Berryessa Creek, and their tributaries protected under Section 404 of the Clean Water Act, occur in the TASP Area.

Temporary or permanent loss due to filling of wetlands or other waters and indirect impacts as a result of water quality degradation, lighting, introduction and spread of invasive exotic species, and increased activity of humans and pets could result in significant impacts. These impacts on wetlands and other waters would be less than significant by following design measures including requiring that setbacks from creeks are to be a minimum of 25 feet from top of bank; by coordinating with the U.S. Army Corps of Engineers, CDFW, the Regional Water Quality Control Board (RWQCB), and SCVWD (depending on the jurisdiction potentially affected) prior to new development in areas with potential federally or state-protected wetlands or waters; and with implementation of the 1994 General Plan Policies 4.b-I-4 and 4.b-I-5, and TASP Policy 5.32.

- Patches of riparian habitat associated with creeks, particularly along stretches of Penitencia and Berryessa Creeks, occur in the TASP Area. Construction of new development from the TASP could result in loss or degradation of this riparian habitat. These impacts on riparian habitat would be less than significant by coordinating with CDFW and SCVWD prior to new development in areas with potential riparian habitat as required by law, and with implementation of the 1994 General Plan Policies 4.b-I-4 and 4.b-I-5, and TASP Policy 5.30.

# Discussion

## Changes in Land Use Classifications and Policies

Table 2-2 in Chapter 2, *Project Description*, of the SEIR to which this IS is appended, provides a summary of the policies in the TASP related to biological resources. In summary, Table 2-2 identifies the following updates that have been made in the Metro Plan:

- The Metro Plan does not include a policy for protecting burrowing owl, unlike the TASP (Policy 5.26). However, Action CON-3b from the 2040 General Plan requires mitigation when sensitive biological habitat has been identified on or immediately adjacent to a project site, providing protection for special-status species including burrowing owl. If pre-construction surveys are required for burrowing owl, per Action CON-3b, California Department of Fish and Wildlife (CDFW) protocols would be followed, as required.
- The Metro Plan includes a revised but comparable policy (Policy SC 9.1) as the TASP (Policy 5.27) to protect nesting birds and raptors.
- The Metro Plan does not include a comparable policy as the TASP (Policy 5.28) to protect trees along McCandless Drive and in the vicinity because those trees have been removed since preparation of the Certified EIR and because significant trees would be protected by following the Tree Maintenance and Protection Ordinance of the City of Milpitas.
- The Metro Plan does not include a policy for protecting creeks and riparian habitat from development near creeks, unlike the TASP (Policy 5.30). However, Action CON-3C from the 2040 General Plan requires cooperation with state, federal, and local agencies and compliance with the "Guidelines and Standards for Land Use Near Streams" from the Santa Clara Valley Water District (SCVWD) and Title XI, Chapter 15 (Floodplain Management Regulations) of the Milpitas Municipal Code to ensure development does not cause significant adverse impacts on existing riparian corridors.
- The Metro Plan includes the same policy (Policy SC 8.1) as the TASP (Policy 5.31) related to coordination with SCVWD.

- The Metro Plan includes the same policy (Policy SC 8.2) as the TASP (Policy 5.32) related to obtaining permits from SCVWD.
- The Metro Plan includes the same development standard SC 8.3) as the TASP (Policy 5.32) related to setbacks adjacent to creeks and drainage channels.

Therefore, although there have been changes and deletions to the policies in the TASP, similar measures would still be required by the 2040 General Plan, the Metro Plan, and through compliance with existing regulations. As summarized in Table 2-2 of the SEIR to which this IS is appended, the changes made to the TASP policies by the Metro Plan would not substantially change the overall requirements to minimize impacts on biological resources. Therefore, these changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

## Geographic Expansion and Metro Plan Buildout: Population Growth and Employment

Implementation of the Project Changes, including the geographic expansion of the Metro Plan Area and the additional population growth and employment from the Metro Plan buildout, would result in the construction of new development and associated infrastructure.

As described above, policies and regulations related to the protection of biological resource, that would apply to development under the Metro Plan include the following:

- 2040 General Plan Actions CON-3b and CON-3c
- Metro Plan Policies SC 8.1, SC 8.2, SC 8.3, SC 9.1
- Tree Maintenance and Protection Ordinance of the City of Milpitas

Because the environmental setting for biological resources has not changed substantially within the TASP Area (as described above), any new development or infrastructure associated with the Metro Plan located in that TASP Area would have the same impacts on biological resources as identified in the Certified EIR. There would be no new or substantially more severe impacts on biological resources from additional development or infrastructure located within that TASP Area.

The potential impacts from the geographic expansion were not considered in the Certified EIR. Because the environmental setting for the geographic expansion is the same as the TASP, the potential impacts from the geographic expansion are the same as described in the Certified EIR and would include impacts on burrowing owls, nesting raptors and other birds, riparian habitat, wetlands and other waters, and significant trees including heritage trees. As such, the potential impacts on special-status species (burrowing owls), nesting raptors and other birds, riparian habitat, wetland and other water, and significant trees due to the geographic expansion in the Metro Plan would be the same as what was identified in the Certified EIR and would not result in a change to the Certified EIR's impact determination.

Although additional special-status species were identified in the CNDDB search, implementation of the Metro Plan is not expected to significantly impact these species because these species are unlikely to occur in the Metro Plan Area due to lack of suitable habitat. The great blue heron species was not identified in the CNDDB search in the Certified EIR but was observed during the Certified EIR's reconnaissance survey. Ultimately, the recent occurrence of great blue heron was recorded west of I-880, far from the Metro Plan Area. Thus, the likelihood that the species is impacted by the

Metro Plan is low. Regarding the seven wildlife species not mentioned in the previous CNDDB search for the Certified EIR, the likelihood of these species occurring within the Metro Plan Area is very low. The western yellow-billed cuckoo nests in dense riparian habitat and is no longer found in the Bay Area. The various bee species would not occur in the Metro Plan Area since all the land is disturbed and developed. As for the yellow rail, western ridged mussel, northern California legless lizard, and tricolored blackbird, there is no habitat in the Metro Plan Area for these species. As such, the Metro Plan is not expected to impact these species.

In addition, the Metro Plan includes a new policy (relative to the TASP) to protect bats, including any special-status bats. New development that would be constructed as a part of the Metro Plan is expected to require the removal of some existing trees and the demolition of buildings. The Metro Plan includes Policy SC 9.3, which would require any future construction within the Metro Plan Area to implement measures to protect roosting bats during construction. The Metro Plan also includes two new policies (relative to the TASP) to protect birds after the buildout of new development associated with the Metro Plan. The Metro Plan would result in the buildout of tall buildings, including buildings that could reach 275 feet in height (in the Boulevard Very High Density Mixed Use and Business Park Research & Development, Residential land use designations). The Metro Plan includes Policy SC 9.2, which would include design requirements for buildings to minimize bird strikes. With the implementation of these policies, the Metro Plan would result in a less-than-significant impact on special-status bats and birds.

In addition, regarding impacts to wetlands and other waters, construction of the Metro Plan may occur in areas surrounding Berryessa Creek, drainage channels, and associated habitats. However, construction for the Metro Plan is not expected to impact the creek zone because the Metro Plan would include requirements for a minimum setback of 25 feet from top of bank for creeks and drainage channels (Metro Plan Policy SC 8.3) and would also be required to comply with the requirements from the Santa Clara Valley Water District (Metro Plan Policy SC 8.2). In addition, pedestrian/bicycle bridge footings over Berryessa Creek would meet Santa Clara Valley Water District requirements to avoid impacts within the creek channel. As such, the Metro Plan's impacts on wetlands and waters would be less than significant.

The Certified EIR did not include an impact analysis or significance conclusion regarding the potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The Metro Plan Area is mostly developed with no natural vegetation communities. Any common urban-adapted species that currently move through the Metro Plan Area would continue to be able to do so following construction. Although the area is mostly developed, there are protected wetlands and waters in addition to patches of riparian habitat that occur in the Metro Plan Area that are associated with creeks. Wetland and riparian vegetation provide habitat for fish and wildlife, and drainages provide resources utilized by wildlife. Such habitats can be used by fish and wildlife species for movement or nursery sites. Nonetheless, implementation of Action CON-3b in the 2040 General Plan and Policy SC 9.1 in the Metro Plan would protect burrowing owls and nesting birds that use that habitat. In addition, Action CON-3a and from the 2040 General Plan policies from the Metro Plan (Policies SC 8.1, SC 8.2, SC 8.3) require coordination with jurisdictional agencies and the implementation of development standards to minimize impacts on riparian areas and creeks. Therefore, the Metro Plan would result in a less-than-significant impact on the movement of fish and wildlife species or native wildlife nursery sites.

The Certified EIR did not include an impact analysis or significance conclusion regarding the potential to conflict with the provisions of an adopted habitat conservation plan (HCP), natural community conservation plan (NCCP), or other approved local, regional, or state HCP. Although the Certified EIR did not make a conclusion regarding this potential conflict, both the TASP Area and the Metro Plan Area are not within an adopted HCP, NCCP, or other approved local, regional, or state HCP area. Therefore, implementation of the Metro Plan would result in no new significant effect related to conflicts with an HCP, NCCP, or other conservation plan. Therefore, the Metro Plan would result in no impact related to conflicts with an HCP, NCCP, or other conservation plan.

## Conclusion

The Certified EIR determined that the TASP would have a less-than-significant impact with regard to biological resources. Based on the analysis above, with incorporation of the Project Changes, the Metro Plan would have a less-than-significant impact with regard to biological resources. Therefore, the Project Changes would not result in a change to the Certified EIR's impact determination for impacts on biological resources. Specifically, the Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**.

# V. Cultural Resources

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5? | ☐ | ☒ | ☐ |
| b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5? | ☐ | ☒ | ☐ |
| c. Disturb any human remains, including those interred outside of dedicated cemeteries? | ☐ | ☒ | ☐ |

## Setting

### Environmental Setting

The environmental setting for the TASP Area relative to cultural resources (inclusive of built-environment[6] and archaeological resources) is described on pages 3.13-1 through 3.13-5 of the Certified EIR. This discussion includes a description of the TASP Area's prehistoric and historic-era contexts; a description of previously recorded archaeological sites and built-environment resources within the vicinity of the TASP Area, including the Berryessa Creek Site (CA-SCL-593), based on a records search at the Northwest Information Center (NWIC) at Sonoma State University (which is part of the California Historical Resources Information System); the results of past historical resource inventories in Milpitas and additional investigations that evaluated built-environment resources in the TASP Area, including the Great Mall of the Bay Area at 459 Great Mall Drive; and a discussion of the National Register of Historic Places (National Register) and California Historical Landmarks programs, which confirmed that no built-environment resources within the TASP Area were formally designated under either program. The cultural resources section of the Certified EIR also addressed paleontological resources, which are discussed in Section VII, *Geology and Soils*, of this IS. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

The environmental setting with regard to cultural resources within the TASP Area has changed since the Certified EIR was prepared. The Metro Plan Area is larger than the TASP Area and includes parcels west of Penitencia Creek, as well as parcels east of South Milpitas Boulevard. The Metro Plan

[6] "Built-environment resources" refer to buildings, structures, objects, and districts that support an understanding of human history through their historical, social, cultural, aesthetic/design, or construction value. The Certified EIR refers to this resource category as "historic resources." For the purposes of this analysis, "built-environment historical resources" refers to the significant examples of built-environment resources that require special consideration and analysis during CEQA review.

Area thus includes potential archaeological and built-environment resources that were not within the TASP Area when the Certified EIR was prepared. Additionally, the Certified EIR reported on previously completed built-environment and archaeological investigations but did not include a comprehensive inventory of historic-aged built-environment resources in the TASP Area (i.e., built-environment resources over 50 years old, the age at which such resources typically have the potential to qualify as CEQA historical resources). Furthermore, because more than 10 years have passed since the completion of the Certified EIR, buildings previously within the TASP Area that were not yet of historic age when the Certified EIR was prepared may have reached the age that warrants evaluation as potential CEQA historical resources.

As a result of expansions to the Metro Plan Area and the time elapsed since the preparation of the Certified EIR, ICF conducted an updated NWIC records search to identify whether any cultural resources investigations have been conducted in the Metro Plan Area since the Certified EIR was prepared. Based on the results of the NWIC records search, no new built-environment or archaeological resource investigations or evaluations appear to have been conducted in the Metro Plan Area. However, one known archaeological resource, described in the Certified EIR as adjacent to the TASP Area, would be within the Metro Plan Area as a result of the expansion. ICF also reviewed the properties included in the City of Milpitas Cultural Resources Register and the Historic Sites Inventory, which are the City's local register of historical resources and historical resource inventory, respectively. Inclusion in either the register or the inventory may qualify a building, structure, object, or district as a significant CEQA historical resource.

## Built-Resources

Although the Metro Plan Area contains a substantial volume of residential and commercial buildings constructed after 2000, it also retains several older industrial buildings constructed in the 1950s, 1960s, and 1970s. Some of the earliest of these buildings are along South Main Street at the western edge of the Metro Plan Area. The expansive Great Mall of the Bay Area, which occupies the northern portion of the Metro Plan Area, was built in 1953 as an assembly plant for the Ford Motor Company. ICF conducted a desktop survey to identify those buildings in the Metro Plan Area that are currently over 50 years of age and reviewed past inventories and evaluations of those resources available from the City and the NWIC. The historic-aged buildings in the Metro Plan Area are presented in Table 2.

**Table 2. Historic-Aged Built-Environment Resources in the Metro Plan Area**

| Property Address (Assessor's Parcel Number) | Property Name | Date Constructed | Past Evaluations | In TASP Area or Expansion Areas? |
|---|---|---|---|---|
| 459 Great Mall Drive (086-24-063) | Great Mall of the Bay Area (formerly Ford Motor Company Assembly Plant) | 1953 | Included in local Historic Sites Inventory (1990); evaluated as not eligible for inclusion in the National Register (2006) and assigned status code 6Y (Determined ineligible for the National Register by consensus through Section 106 process) | In TASP Area |

| Property Address (Assessor's Parcel Number) | Property Name | Date Constructed | Past Evaluations | In TASP Area or Expansion Areas? |
|---|---|---|---|---|
| 777 N. Capitol Avenue (092-06-027; 092-06-033) | N/A | 1966 | N/A | In TASP Area |
| 1316 S. Main Street (083-36-003) | N/A | 1962 | N/A | In TASP Area |
| 1362 S. Main Street (083-36-005) | N/A | 1964 | N/A | In TASP Area |
| 1400 S. Main Street (083-36-009) | N/A | Prior to 1968 | N/A | In Expansion Area |
| 901 Montague Expressway (086-32-091) | N/A | 1962 | N/A | In TASP Area |

Sources: City of Milpitas 2004,[7] 2018[8]; National Environmental Title Research, LLC 1968[9]; ParcelQuest 2021[10]; Supernowicz 2006.[11]

Based on the results of the desktop survey and review of past evaluations, the only building in the Metro Plan Area that has received evaluation in the past is the Great Mall of the Bay Area at 459 Great Mall Drive, which was originally included in the local Historic Sites Inventory when it was compiled in 1990. Although Section 15064.5(a)(2) of the State CEQA Guidelines provides that built-environment resources identified as significant in certain local surveys qualify as historical resources, the 1990 Historic Sites Inventory does not appear to meet the necessary requirements established in Public Resources Code Section 5024.1(g). Specifically, the Historic Sites Inventory does not meet the requirements that a survey be included in the State Historic Resources Inventory and be updated within the past 5 years. Furthermore, even if the Historic Sites Inventory were to meet these requirements, the former Ford Motor Company Assembly Plant was rehabilitated as a retail mall subsequent to the preparation of the Historic Sites Inventory in 1990. The EIR prepared for the rehabilitation project noted the building's change in use "would eliminate the 1950s plant setting, which is an important element in the City's 1950-to-1970 period of incorporation,

[7] City of Milpitas. 2004. Cultural Resources Register. Available: https://www.ci.milpitas.ca.gov/_pdfs/plan_cultural_resources.pdf. Accessed November 18, 2021.

[8] City of Milpitas. 2018. City of Milpitas Historical Inventory. MilpitasGIS. Updated November 2021. Available: https://milpitas-gis-milpitas.hub.arcgis.com/datasets/16ba365fcc3848f5837fc19114e607e3_0/about. Accessed November 18, 2021.

[9] National Environmental Title Research, LLC. 1968. Historic Aerials. 1400 S. Main Street, Milpitas, CA. Available: https://www.historicaerials.com/. Accessed November 18, 2021.

[10] ParcelQuest. 2021. Property reports. 777 N. Capitol Avenue, 1316 S. Main Street, 1362 S. Main Street, 901 Montague Expressway, Milpitas, CA. Available: www. https://www.parcelquest.com/. Accessed November 18, 2021.

[11] Supernowicz, Dana E. 2006. Great Mall of the Bay Area Building. P-43-001816. Historic Resource Associates. Department of Parks and Recreation forms 523A, 523B, 523J.

transformation, industrial growth, and social change."[12] The building's altered physical characteristics informed a later evaluation, prepared in 2006, that found the Great Mall of the Bay Area not eligible for listing in the National Register due to a loss of historical and architectural integrity. Given the analysis provided in the 1992 EIR and the negative finding of the 2006 evaluation, a preponderance of evidence demonstrates that the building would not qualify as a historical resource for CEQA on the basis of its evaluation for the 1990 Historic Sites Inventory.[13,14,15,16]

Apart from the Great Mall of the Bay Area, none of the historic-aged built-environment resources in the Metro Plan Area have previously been evaluated to determine whether they qualify as CEQA historical resources. Furthermore, during the lifespan of the Metro Plan, individual projects may be proposed for sites that contain additional buildings that reached 50 years of age subsequent to the completion of this IS and are not listed in Table 2, above.

## Archaeological Resources

The Certified EIR described two previously recorded archaeological resources adjacent to the TASP Area: CA-SCL-38 and CA-SCL-593 (the Berryessa Creek Site). As a result of the geographic expansion of the Metro Plan, CA-SCL-593 would be within the Metro Plan Area.

ICF conducted a desktop survey to identify potential archaeological resources and areas of heightened sensitivity. To this end, ICF archaeologists reviewed the earliest historical quadrangle maps available from the U.S. Geological Survey's online topoView program.[17] ICF reviewed 7.5-minute and 15-minute quadrangle maps covering the Metro Plan Area, including maps ranging in dates from 1889 to 1966. Quadrangle map names and dates are listed in Table 3, along with the corresponding current map name.

**Table 3. Historical Quadrangle Maps Reviewed**

| Historical Map Name | Date | Series | Current Map Name |
|---|---|---|---|
| San Jose | 1889 | 15-minute | MILPITAS |
| San Jose | 1897 | 15-minute | MILPITAS |
| San Jose | 1899 | 15-minute | MILPITAS |
| San Jose | 1943 | 15-minute | MILPITAS |
| San Jose | 1947 | 7.5-minute | MILPITAS |
| Milpitas | 1953 | 7.5-minute | MILPITAS |
| San Jose | 1953 | 15-minute | MILPITAS |

[12] City of Milpitas. 1992. *The Great Mall of the Bay Area Draft Environmental Impact Report*. December 21. Page 313.

[13] City of Milpitas. 1992. *The Great Mall of the Bay Area Draft Environmental Impact Report*. December 21.

[14] City of Milpitas. 2018. City of Milpitas Historical Inventory. MilpitasGIS. Updated November 2021. Available: https://milpitas-gis-milpitas.hub.arcgis.com/datasets/16ba365fcc3848f5837fc19114e607e3_0/about. Accessed November 18, 2021.

[15] City of Milpitas and Architectural Resources Group. 2011. *Conceptual Historic Resources Masterplan for the City of Milpitas*. Adopted March 16, 1993. Available: http://www.ci.milpitas.ca.gov/_pdfs/commissions/prcrc/2011/120511/item_01.pdf. Accessed November 18, 2021. Page 31.

[16] Supernowicz, Dana E. 2006. Great Mall of the Bay Area Building. P-43-001816. Historic Resource Associates. Department of Parks and Recreation forms 523A, 523B, 523J.

[17] ngmdb.usgs.gov/topoview

| Historical Map Name | Date | Series | Current Map Name |
|---|---|---|---|
| San Jose | 1956 | 7.5-minute | MILPITAS |
| Milpitas | 1961 | 7.5-minute | MILPITAS |
| San Jose | 1961 | 15-minute | MILPITAS |
| San Jose | 1962 | 7.5-minute | MILPITAS |
| San Jose | 1966 | 7.5-minute | MILPITAS |

ICF archaeologists reviewed historical aerial photos available from University of California, Santa Barbara's online FrameFinder library.[18] Based on the desktop survey, the Metro Plan Area used to be farmland with a few scattered structures until the Ford Motor Plant was built. Although the structures depicted on the historical maps are no longer extant, undiscovered archaeological resources associated with these structures may exist within the Metro Plan Area.

As described in the Certified EIR, the TASP Area is within an alluvial fan between Lower Penitencia and Berryessa Creeks. Although the Metro Plan Area is expanded from the TASP Area, the underlying sediment is consistent, based on a review of soil survey maps available from University of California, Davis's online soil survey browser, SoilWeb.[19] Alluvial fans are areas of active disposition and, as such, a site that has been subject to human use could be buried by an episode of deposition. Therefore, the presence of Holocene-aged alluvial sediment indicates a potential for buried archaeological deposits across the Metro Plan Area.[20]

The Certified EIR indicated the potential for buried archaeological deposits due to the TASP Area's proximity to Penitencia and Berryessa Creeks. Numerous researchers have studied the spatial relationship between archaeological resources and fresh water sources.[21,22,23,24] These studies have observed that as distance to fresh water decreases, the frequency of archaeological sites and range of archaeological site types increases. The Metro Plan Area is close to both Penitencia and Berryessa Creeks; therefore, there is increased potential for buried archaeological deposits. The desktop survey conducted for this IS supports the Certified EIR's findings that there is a moderate to high potential for encountering undiscovered archaeological resources.

[18] mil.library.ucsb.edu/ap_indexes/FrameFinder

[19] casoilresource.lawr.ucdavis.edu/gmap

[20] Dibblee, T. W. and J. A. Minch. 2005. Geologic Map of the Milpitas Quadrangle, Alameda & Santa Clara Counties, California. Department of the Interior, United States Geological Survey, Washington, D.C.

[21] Christenson, L. E. 1990. *The Late Prehistoric Yuman People of San Diego County California: Their Settlement and Subsistence System*. Unpublished PhD Dissertation, Department of Anthropology, Arizona State University.

[22] Robbins-Wade, M. 1990. *Prehistoric Settlement Pattern of Otay Mesa, San Diego County, California*. Unpublished Masters thesis, Department of Anthropology, San Diego State University.

[23] Lothrop, J. C., J. F. Custer and C. De Santis. 1987. *Phase I & II Archaeological Investigations of the Route 896 Corridor, Route 4 – West Chestnut Hill Road to Summit Bridge Approach, NW Castle County, Delaware*. Prepared for the Delaware Department of Transportation.

[24] Ingbar, E., and J. Hall. 2014. *A Western Oregon Cultural Resource Forecast Model for USDI Bureau of Land Management*. Prepared for Bureau of Land Management.

## Sacred Lands File & Senate Bill 18

As a result of expansions to the Metro Plan Area and the time elapsed since the preparation of the Certified EIR, ICF conducted an updated Sacred Lands File search and additional outreach under SB 18.

On October 11, 2021, ICF reached out to the Native American Heritage Commission (NAHC), to request a Sacred Lands File search and again on November 29, 2021, to request a list of Tribes under SB 18. The results of the Sacred Lands File search were negative. ICF followed up with the NAHC to obtain the SB 18 list but a response was not received until February 2, 2022. As such, in order to begin the consultation process, the City of Milpitas provided ICF with an SB 18 contact list for a Master Plan that the NAHC had provided to the City on December 28, 2021. The list included the following ten Native American contacts:

- Valentin Lopez, Amah Mutsun Tribal Band
- Irenne Zwierlein, Amah Mutsun Tribal Band of Mission San Juan Bautista
- Ann Marie Sayers, Indian Canyon Mutsun Band of Costanoan
- Charlene Nijmeh, Muwekma Ohlone Indian Tribe of the SF Bay Area
- Katherine Perez, North Valley Yokuts Tribe
- Dee Dee Manzanares Ybarra, Rumsen Am:a Tur:ataj Ohlone
- Andrew Galvan, The Ohlone Indian Tribe
- Kenneth Woodrow, Wuksache Indian Tribe/Eshom
- Corrina Gould, The Confederated Villages of Lisjan
- Quirina Luna Geary, Tamien Nation

On February 2, 2022, letters were sent via certified mail to each of the ten contacts on the list provided by the City informing them of the Metro Plan and inviting them to consultation under SB 18. On February 18, 2022, the NAHC responded to ICF's request and returned a SB 18 list that included three additional Native American contacts:

- Kanyon Sayers-Roods, Indian Canyon Mutsun Band of Costanoan
- Monica Arellano, Muwekma Ohlone Indian Tribe of the SF Bay Area
- Timothy Perez, North Valley Yokuts Tribe

On February 18, 2022, letters were sent via certified mail to the three contacts (Kanyon Sayers-Roods, Monica Arellano, and Timothy Perez) that had not received letters previously.

On February 25, 2022, since no responses had yet been received, ICF reached out to each of the contacts via email and included the original letter as an attachment. The email sent to Monica Arellano was returned with a message stating the email was undeliverable as the recipient's mailbox was full and could not accept messages.

On March 1, 2022, Katherine Perez (North Valley Yokuts Tribe) responded via email. Ms. Perez, on behalf of the North Valley Yokuts Tribe, stated that the Metro Plan Area was sensitive and recommended that projects within the Metro Plan Area be monitored by both a Native American Monitor and a qualified archaeologist. No additional information was requested. ICF forwarded Ms.

Perez's response to the City of Milpitas. The City reviewed Ms. Perez's recommendations and incorporated them as a policy in the Metro Plan (Policy SC 7).

On March 7, 2022, ICF on behalf of the City, responded to Ms. Perez to inform her that the City would be incorporating her recommendations as policies in the Metro Plan. No other responses were received, so on March 9, 2022, ICF reached out via phone call to the contacts that had not yet responded. On March 9, 2022, ICF archaeologist Megan Watson spoke with Dee Dee Manzanares Ybarra (Rumsen Am:a Tur:ataj Ohlone) on the phone. Ms. Ybarra stated she would need to review the original letter and would reach out once she had an opportunity to do so. Later in the day, Ms. Ybarra sent an email to ICF stating that the Rumsen Am:a Tur:ataj would be declining the opportunity to consult on the Metro Plan as the location of the Metro Plan Area was outside of the Rumsen Ohlone territory.

On March 9, 2022, ICF archaeologist Megan Watson spoke with Valentin Lopez (Amah Mutsun Tribal Band) on the phone. Mr. Lopez stated that the Amah Mutsun Tribal Band would be declining the opportunity to consult on the Metro Plan as the City of Milpitas was outside of the Tribe's territory.

ICF archaeologist Megan Watson left voicemail messages for the other Native American contacts (except for Monica Arellano, as her voicemail was full) providing them with information regarding the Metro Plan and encouraging them to reach out with questions, comments, and concerns.

On March 17, 2022, Kanyon Sayers-Roods (Indian Canyon Mutsun Band of Costanoan) responded via email. ICF forwarded Ms. Sayers-Roods' response to the City of Milpitas. Ms. Sayers-Roods, on behalf of the Indian Canyon Mutsun Band of Costanoan Ohlone People, accepted the City of Milpitas' invitation to consult on the Metro Plan. Ms. Sayers-Roods stated that the Metro Plan Area "overlaps or is near the management boundary of potentially eligible cultural sites." She also provided preliminary recommendations including:

1. A Native monitor and archaeologist should be present on-site at all times during any/all ground disturbing activities.
2. A Cultural Sensitivity Training should be conducted at the beginning of each project.
3. A specialized consultation provided by their company, Kanyon Konsulting, LLC should be conducted as the project commences.
4. An approach to Indigenous Cultural Awareness/History should be developed. Such an approach may include:

    a. Signs or messages with information about the history, ecology, and resources of the land. Examples include a commemorative plaque, a page on the website, a mural, a display, or an educational/cultural center.

    b. A commitment to consultation with the Native Peoples of the territory. Examples include a Land Acknowledgment on the website, or cultural displays about Indigenous Science and Technology, such as cultural resources, botanical knowledge, and cultural sharing of Traditional Ecological Knowledge.

    c. Advocation and support for indigenous lead movements and efforts, which may be achieved by informing the community about local present Indigenous communities.

The City is consulting with the Indian Canyon Mutsun Band of Costanoan Ohlone under SB 18. To date, no other responses have been received.

## Regulatory Setting

The regulatory setting for cultural resources is described on pages 3.13-6 through 3.13-9 of the Certified EIR. This discussion includes the following: an overview of the National Historic Preservation Act; state-level regulations and cultural resources programs, including the California Register of Historical Resources, State CEQA Guidelines, California Health and Safety Code, NAHC, and California Historical Resources Information System; the results of the Sacred Lands File search, which were negative; a description of the outreach conducted under SB 18 in support of the Certified EIR; and descriptions of the Cultural Resources Register, as established by the City of Milpitas General Plan, and the City of Milpitas Cultural Resources Preservation Program. In addition, pertinent policies from the General Plan, Midtown Plan, and TASP are described on pages 3.13-11 and 3.13-13. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

The Certified EIR identified that the 1994 General Plan provides guiding principles and policies for the preservation and enhancement of cultural resources.

On March 9, 2021, the City adopted an update to the 1994 General Plan, which is referred to as the 2040 General Plan. Because the 2040 General Plan supersedes and replaces the 1994 General Plan, the policies from the 2040 General Plan would apply to the Metro Plan. The following 2040 General Plan policies relate to built-environment and archaeological resources.

- Goal CD-1: Strengthen Milpitas's identity and sense of place by reinforcing the community's distinctive, high-quality community form, natural landscape, and character.
- Policy CD 1-4: Recognize, enhance, celebrate and preserve, where possible, natural features and ecosystems, and protect cultural and historic resources.
- Goal CON-4: Preserve and protect prehistoric, historic, archaeological, and paleontological resources in Milpitas.
- Policy CON 4-1: Review proposed developments and work in conjunction with the California Historical Resources Information System, Northwest Information Center at Sonoma State University, to determine whether project areas contain known archaeological resources, either prehistoric and/or historic-era, or have the potential for such resources.
- Policy CON 4-2: If found during construction, ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.
- Policy CON 4-3: Work with Native American representatives to identify and appropriately address, through avoidance or mitigation, impacts to Native American cultural resources and sacred sites during the development review process.
- Policy CON 4-4: Consistent with State, local, and tribal intergovernmental consultation requirements such as SB 18 and AB 52, the City shall consult as necessary with Native American tribes that may be interested in proposed new development and land use policy changes.
- Action CON-4a: Require a cultural and archaeological survey prior to approval of any project which would require excavation in an area that is sensitive for cultural or archaeological resources. If significant cultural or archaeological resources, including historic and prehistoric resources, are identified, appropriate measures shall be implemented, such as documentation and conservation, to reduce adverse impacts to the resource.

- Action CON-4b: Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:
    - If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.
    - If human remains are discovered during any ground-disturbing activity, work shall stop until the Planning Department and the County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Planning Department.
- Goal CON-5: Protect and enhance historic resources- including places, buildings, or landmarks with historic, architectural, cultural, and/or aesthetic significance.
- Policy CON 5-1: Protect significant historic resources and use these resources to promote a sense of place and history in Milpitas through implementation of the Milpitas Cultural Resources Preservation Program (Municipal Code, Title XI, Chapter 4), the Conceptual Historic Resources Master Plan, the conservation and preservation of the City's historical collection at the Milpitas Community Museum, and other applicable codes, regulations, and area plans.
- Policy CON 5-2: Evaluate the condition of historical buildings, the costs of rehabilitation, and the feasibility of preservation or conservation alternatives when considering the demolition or movement of historic structures; when possible, encourage the adaptive re-use of the historic structure.
- Policy CON 5-3: Provide readily available public information on the Mills Act and encourage people to renovate historic homes in disrepair using property tax savings available through the Mills Act.

# Certified EIR Findings

The Certified EIR found that:

- The TASP could result in new development on parcels within the TASP Area, which may involve the demolition of existing built-environment resources. None of the built-environment resources within the TASP Area, however, were previously evaluated as significant CEQA historical resources. The TASP furthermore did not propose redevelopment on the site of the Great Mall of the Bay Area, which had previously been listed in the City of Milpitas's Historic Sites Inventory. The Certified EIR concluded that federal, state, and local laws—as well as policies contained in the Milpitas General Plan, Midtown Plan, and TASP—would adequately protect significant built-environment resources from demolition or insensitive alteration, thus ensuring the TASP would have a less-than-significant impact on built-environment historical resources.
- The Certified EIR describes two previously documented archaeological resources adjacent to the TASP Area. These resources are not within the TASP Area; however, the Certified EIR identified that new development within the TASP Area may affect undiscovered archaeological resources and human remains during ground-disturbing activities. The Certified EIR concluded that federal, state, and local laws—as well as policies contained in the TASP—would adequately

protect significant archaeological resources and would ensure that the TASP would have a less-than-significant impact on archaeological resources.

# Discussion

## Changes in Land Use Classifications and Policies

Table 2-2 in Chapter 2, *Project Description*, of the SEIR to which this IS is appended, provides a summary of the policies in the TASP related to cultural resources, as well as the policies in the Metro Plan related to cultural resources. In summary, Table 2-2 identifies the following updates that have been made in the Metro Plan:

- The Metro Plan includes a policy for comprehensively evaluating built-environment resources on a project-level basis, which includes determining CEQA historical resource status via recordation on Department of Parks and Recreation inventory forms and, if required, assessing potential project impacts (Metro Plan Policy SC 1). This policy has similarities to TASP Policy 5.33, which requires project-level review of impacts that may be caused by proposed alteration or demolition projects on the property containing the Great Mall of the Bay Area building. However, the Metro Plan policy applies to all historic-aged built-environment resources within the entire Metro Plan Area rather than being limited to the Great Mall of the Bay Area property.
- The Metro Plan includes a similar policy to TASP Policy 5.34 requiring archaeological monitoring (Metro Plan Policy SC 7).

Therefore, although there have been changes to the policies in the TASP, similar measures would still be required by the 2040 General Plan, the Metro Plan, and through compliance with existing regulations. As summarized in Table 2-2 of the SEIR to which this IS is appended, the changes made to the TASP policies by the Metro Plan would not substantially change the overall requirements to minimize impacts on cultural resources. Therefore, these changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

## Geographic Expansion and Metro Plan Buildout: Population Growth and Employment

Implementation of the Project Changes, including the geographic expansion of the Metro Plan Area and the additional population growth and employment from the Metro Plan buildout, would result in the construction of new development and associated infrastructure. The discussion below focuses on the impacts from this additional buildout.

As described above, policies and regulations related to the protection of cultural resources, that would apply to development under the Metro Plan include the following:

- 2040 General Plan Actions CON-4a and CON-4b
- Metro Plan Policies SC 1 and SC 7
- Section 7050.5 of the California Health and Safety Code
- Section 5097.98 of the California Public Resources Code

## Built Resources

Implementation of the Project Changes is anticipated to result in new construction that produces additional housing units, commercial office and retail space, and hotel rooms. New construction and ground disturbance could occur throughout the Metro Plan Area, including in the two expansion areas.

However, as described previously, the environmental setting for the Metro Plan is not the same as for the TASP relative to cultural resources. Potential impacts on cultural resources resulting from future development in the expansion areas were not considered in the Certified EIR. In addition, the Certified EIR did not consider new development's potential to cause impacts on previously unevaluated historic-aged (more than 50 years old) built-environment resources throughout the TASP Area, which could be identified as significant historical resources in the future. The majority of historic-aged built-environment resources do not appear to have previously received evaluation as historical resources under CEQA, such that their historical resource status remains unknown.

Future development occurring as a consequence of the Metro Plan would involve changes in the built environment to accommodate future population and employment growth within the Metro Plan Area. Future projects associated with the Metro Plan may include demolition of existing buildings, as well as additions and/or rehabilitations of existing buildings, to construct new residential units, commercial space, or hotel rooms. According to Section 15064.5(b)(1)-(2) of the State CEQA Guidelines, projects would cause significant effects on the environment if they demolish or adversely alter the physical characteristics that qualify built-environment historical resources for inclusion in applicable historical registers. Section 15064.5(b)(3) of the State CEQA Guidelines specifically notes that projects complying with the Secretary of the Interior's Standards, a set of federal-level guidance for sensitive preservation and rehabilitation work, do not materially impair the significance of the resource and thus have a less-than-significant impact.

It is possible that projects in the Metro Plan Area could be proposed for sites containing significant built-environment resources that are identified in future investigations. To facilitate the identification of significant historical resources, Metro Plan Policy SC 1 establishes a review process that evaluates the historical significance of historic-aged built-environment resources in the Metro Plan Area at the time a future project is proposed. In the event that any such resource is determined eligible for listing in a historical resource register and therefore qualifies for special consideration under CEQA, Metro Plan Policy BD SC 1 requires that the project design be assessed for its conformance with the Secretary of the Interior's Standards. The documentation of conformance with the Secretary of the Interior's Standards would ensure that future projects occurring as a result of the Metro Plan would have a less-than-significant impact on built-environment historical resources, which is consistent with the impact determination made by the Certified EIR. Any project that does not adhere to the Secretary of the Interior's Standards would be required to undergo separate, project-level CEQA review that may involve preparation of an EIR. For the purposes of the current analysis, the policies of the Metro Plan would ensure that impacts of the Metro Plan would be the same as those identified in the Certified EIR and would not result in a change to the Certified EIR's impact determination.

## Archaeological Resources

### Known Archaeological Resources

Future projects associated with the Metro Plan would include ground-disturbing activities within an area already analyzed in the Certified EIR (i.e., TASP Area), as well as within two areas that were not previously considered in the Certified EIR (i.e., the western expansion area and the eastern expansion area). Based on the results of the desktop survey, one known archaeological resource (CA-SCL-593), described in the Certified EIR as adjacent to the TASP Area, would be within the Metro Plan Area as a result of the expansion. Ground-disturbing activities in the expansion areas could potentially affect this resource, along with any associated human remains.

The policies found in the 2040 General Plan provide measures to reduce adverse impacts on cultural resources. Action CON-4a requires surveys prior to approval of any project that would require excavation in an area that is sensitive for cultural or archaeological resources. The 2040 General Plan also calls for appropriate measures to be implemented in the event that significant cultural or archaeological resources are encountered. Conformance with Action CON-4a of the 2040 General Plan would mitigate impacts on significant resources, including on CA-SCL-593, through conservation and documentation. Conservation would require either avoidance or preservation in place; however, if the resource cannot be avoided or preserved, the project archaeologist would perform documentation. Standards for archaeological documentation are provided by the Secretary of the Interior. In compliance with Action CON-4b of the 2040 General Plan, these protection measures must be approved by the Planning Department prior to construction or grading. In addition, similar to the TASP, the Metro Plan includes a policy (Metro Plan Policy SC 7) requiring archaeological monitoring. Given the presence of one known archaeological resource within the Metro Plan Area, monitoring would be appropriate in order to reduce impacts on archaeological resources to less-than-significant levels.

The Certified EIR concluded that federal, state, and local laws and policies in the TASP would adequately protect significant archaeological resources, ensuring that the TASP would have a less-than-significant impact on archaeological resources. As discussed, the setting with regard to cultural resources in the TASP Area has changed since the Certified EIR was prepared, and one known archaeological resource has been identified within the Metro Plan Area. Nonetheless, implementation of the 2040 General Plan (Actions CON-4a and CON-4b) and Metro Plan Policy SC 7 would ensure that impacts on known archaeological resources due to ground-disturbance from the Metro Plan would be reduced to less-than-significant levels. Therefore, the Metro Plan would have a similar impact on archaeological resources as what was identified in the Certified EIR.

### Unknown Archaeological Resources

The Certified EIR identified that “there is a moderate to high likelihood that unrecorded Native American cultural resources exist in the [TASP] Area.” Likewise, based on the results of the desktop survey, there is a moderate to high potential for encountering as-yet undiscovered archaeological resources within the Metro Plan Area. As such, the Metro Plan would have a similar potential to affect as-yet undiscovered archaeological resources as the TASP.

Action CON-4a of the 2040 General Plan requires surveys prior to approval of any project that would require excavation in an area that is sensitive for cultural or archaeological resources. Monitoring would also be required by Metro Plan Policy SC 7 and would reduce impacts on unknown

archaeological resources. Action CON-4b from the 2040 General Plan provides guidance for the inadvertent discovery of previously unknown archaeological resources. In compliance with Action CON-4b, should an unknown resource be encountered, all work within 100 feet of the discovery shall cease, and the Planning Department will be notified. The resource shall be examined by a qualified archaeologist, and the archaeologist will work with the Planning Department to implement the appropriate protection measures (either conservation or documentation) before work is resumed. Implementation of the 2040 General Plan (Action CON-4a and CON-4b) and Metro Plan Policy SC 7 would ensure that impacts on unknown archaeological resources (due to ground disturbance from implementation of the Metro Plan) would be reduced to less-than-significant-levels.

The Certified EIR concluded that federal, state, and local laws and policies in the TASP would adequately protect significant unknown archaeological resources, ensuring that the TASP would have a less-than-significant impact on archaeological resources. The Metro Plan would also be required to adhere to federal, state, and local laws, as well as actions in the 2040 General Plan (Actions CON-4a and CON-4b) and Metro Plan Policy SC 7, which would have similar requirements as the TASP to protect significant unknown archaeological resources. Therefore, the Metro Plan would have a similar impact on unknown archaeological resources as what was identified in the Certified EIR.

**Human Remains**

Similar to the TASP, future projects associated with the Metro Plan would include ground-disturbing activities that could potentially affect human remains. Based on the results of the desktop survey, human remains were identified in association with CA-SCL-593, which would be within the Metro Plan Area (as a result of the expansion). In addition, the desktop survey indicated there was a moderate to high potential for encountering as-yet undiscovered archaeological resources containing human remains within the Metro Plan Area.

Monitoring would be required by Metro Plan Policy SC 7 and would reduce impacts related to encountering human remains. In the event that human remains are discovered, Action CON-4b of the 2040 General Plan states that work shall stop until the Planning Department and the County Coroner have been contacted and the appropriate measures have been taken and approved by the Planning Department. In compliance with Action CON-4b, if the human remains are determined to be of Native American origin, the NAHC and MLDs must be consulted. Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the California Public Resources Code (if the remains are Native American) also provide guidance for the treatment of human remains. Compliance with state laws (Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the California Public Resources Code), the 2040 General Plan (Action CON-4b in support of Goal CON-4), and Metro Plan Policy SC 7 would ensure that impacts on human remains due to ground disturbance from the Metro Plan would be reduced to less-than-significant levels.

The Certified EIR concluded that federal, state, and local laws and policies in the TASP would adequately protect human remains, ensuring that the TASP would have a less-than-significant impact on archaeological resources. The Metro Plan would also be required to adhere to federal, state, and local laws, as well as actions in the 2040 General Plan (Action CON-4b) and Metro Plan Policy SC 7, which would have similar requirements as the TASP to protect human remains. Therefore, the Metro Plan would have a similar impact on unknown archaeological resources as what was identified in the Certified EIR.

## Conclusion

The Certified EIR determined that the TASP would have a less-than-significant impact with regard to cultural resources. Based on the analysis above, with incorporation of the Project Changes, the Metro Plan would have a less-than-significant impact with regard to cultural resources. Therefore, the Project Changes would not result in a change to the Certified EIR's impact determination for impacts on cultural resources. Specifically, the Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**.

# VI. Energy

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| Would the project: | | | | |
| a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | ☐ | ☐ | ☒ | ☐ |
| b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | ☐ | ☐ | ☒ | ☐ |

## Setting

### Environmental Setting

Energy was not a topic analyzed in the Certified EIR. The Office of Planning and Research (OPR) did not incorporate energy as a resource area in the CEQA Appendix G checklist until December 2018 during a comprehensive update to the CEQA Guidelines. Thus, a complete environmental setting for energy consumption within the TASP Area was not prepared previously. Nonetheless, energy consumption was discussed in both the Utilities and Service Systems and Greenhouse Gases and Climate Change sections of the Certified EIR. The Greenhouse Gasses and Climate Change section describes "Emissions from Use of Electricity" on page 3.12-3. The Utilities and Service Systems section describes electricity and natural gas providers on pages 3.11-11 and 3.11-12. As expressed in these sections, the majority of the homes and businesses in the TASP Area use energy from Pacific Gas & Electric (PG&E). PG&E obtains energy from power plants and natural gas fields in northern California and from energy it purchases from outside its service area. These energy sources comprise utility companies in other western states, including northwest hydroelectric power sources, and Mexico. This information is incorporated by reference pursuant to Section 15150 of the State CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

California's per capita rate of energy usage has remained relatively constant since the 1970s, with an annual growth rate of 0.9 percent between 1997 and 2010.[25] However, since publication of the Certified EIR, energy efficient and renewable energy technology has, and continues to, develop rapidly in order to achieve local, State, and federal energy goals. According to the 2040 General Plan EIR, electricity and natural gas is still provided to the City by PG&E. PG&E is now expected to achieve at least 60 percent renewables by 2030, and 100 percent zero-carbon electricity by 2045 (in compliance with SB 100). Therefore, PG&E has started supplementing their electricity with power

[25] City of Milpitas. 2020. Draft Environmental Impact Report for the Milpitas General Plan Update. November 2.

from Silicon Valley Clean Energy (SVCE). SVCE is known as Community Choice Aggregation (CCA) or Community Choice Energy (CCE) and is a community-owned electricity provider that provides municipal, residential, and commercial electricity customers with clean, carbon free electricity options from sources like solar, wind and hydropower. Anyone that lives or owns a business in the City may participate in SVCE and PG&E delivers the electricity over existing utility lines. As of 2020, Milpitas customers have a 97 percent participation rate in the SVCE Program, which further reduces emissions associated with energy consumption.[26]

## Regulatory Setting

As mentioned above, energy was not a resource area analyzed in the Certified EIR but was a topic mentioned in the Utilities and Service Systems and Greenhouse Gases and Climate Change sections. Nevertheless, no energy-related regulations are listed within these sections of the Certified EIR.

Federal regulations relevant to energy include the Energy Policy and Conservation Act; the Energy Policy Act of 1992 (EPAct); and the Energy Policy Act of 2005. State regulations relevant to energy include the Warren-Alquist Act; the Energy Action Plan: the State of California Energy Action Plan; Assembly Bill 1493; Assembly Bill 1007; the Bioenergy Action Plan – Executive Order #S-06-06; EO S-13-08; Senate Bill 743; Executive Order B-48-18: Zero-Emission Vehicles; Assembly Bill 2076; Executive Order #S-01-07; Senate Bill 97; Senate Bill 375; Executive Order B-30-15; Advanced Clean Cars Program; Executive Order N-79-20; and the California Building Energy Efficiency Standards.[27]

Locally, the City adopted a Climate Action Plan (CAP) in 2013 to make Milpitas a more sustainable community and provide guidance for adapting to anticipated effects of climate change. The 2013 CAP looks at five key sectors— energy use, vehicle miles, waste production, water usage, and off-road activities offering best practices to achieve greenhouse gas (GHG) emissions reduction in Milpitas. The City is currently working on updating the 2013 CAP with a planned draft release in spring of 2022. This CAP update will focus on the City's goal to achieve carbon neutrality by 2040 and will discuss the different pathways of doing so. However, this CAP update has not been publicly adopted as of the writing of this Draft SEIR.

On March 9, 2021, the City also adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan supersedes and replaces the 1994 General Plan; therefore, the following actions and policies from the 2040 General Plan would apply to the Metro Plan:

- Policy CON 1-1: Ensure that new development is consistent with the energy objectives and targets identified by the City's Climate Action Plan (CAP).
- Policy CON 1-2: Ensure all development projects comply with the mandatory energy efficiency requirements of the California Green Building Standards Code (CALGreen).
- Policy CON 1-3: Support innovative green building best management practices including, but not limited to, LEED certification, and encourage project applicants to exceed the most current "green" development standards in the California Code of Regulations (CCR), Title 24, as feasible.

[26] City of Milpitas. 2020. Draft Environmental Impact Report for the Milpitas General Plan Update. November 2.
[27] Ibid.

- Policy CON 1-4: Require large-scale industrial and manufacturing energy users to implement an energy conservation plan as part of the project review and approval process.
- Policy CON 1-9: Encourage site planning and building techniques that promote energy conservation. Where feasible, encourage projects to take advantage of shade, prevailing winds, landscaping, sunscreens, building orientations, and material choices that reduce energy use.
- Action CON-1e: Continue to review all new public and private development projects to ensure compliance with the California Code of Regulations (CCR), Title 24 standards as well as the energy efficiency standards established by California Green Building Standards Code (CALGreen), the General Plan, and the Milpitas Municipal Code Chapter 20 Green Building Regulations.
- Action CON-1f: Continue to require all development project applications for new buildings to include a completed LEED or CalGreen Mandatory Measures Checklist.

# Certified EIR Findings

Energy was not a resource area analyzed in the Certified EIR, but was a topic analyzed as part of the Greenhouse Gases and Climate Change section. Impact 3.12-2 states that "development under the proposed Transit Area Specific Plan will result in a substantial increase in the total amount of energy consumed by residential and non-residential users in [the] Transit Area." This section of the Certified EIR found that:

- Buildout under the TASP would increase the total demand for electrical energy in the TASP Area. Total consumption of electrical energy was anticipated to increase from 10 million to 169 million kWh, an increase of 159 million kWh of electrical power.
- Implementation of TASP policies which encourage and support energy efficiency and green building techniques would reduce this impact to a level that is less than significant.

Nonetheless, the Certified EIR did not include a conclusion of the TASP's impact related to wasteful, inefficient, or unnecessary consumption of energy resources or conflicts with state or local plan for renewable energy or energy efficiency.

# Discussion

## Changes in Land Use Classifications and Policies

Overall, the Metro Plan has updated the policies related to energy to promote sustainability. The Metro Plan requires building design features that reduce energy consumption and increase renewable energy generation. This includes the electrification of all new developments by prohibiting natural gas infrastructure (Policies CB 7.2.2 and CB 7.2.3), installation of photovoltaic solar systems and implementing solar management plans (Policies CB 7.2.1 and Policy CB 7.3.1), onsite renewable energy generation (Policy CB 7.3), and overall energy reduction uses (Policy CB 7.2). Although there have been changes and deletions to the policies in the TASP, as explained further below, implementation of these policies would help ensure that impacts on energy are less than significant. Therefore, changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

## Geographic Expansion and Metro Plan Buildout: Population Growth and Employment

Implementation of the Project Changes, including the geographic expansion of the Metro Plan Area and the additional population growth and employment from the Metro Plan buildout, would result in the construction of new development and associated infrastructure. The discussion below focuses on the impacts from this additional buildout.

As described above, policies and regulations related to energy that would apply to development under the Metro Plan, include the following:

- Policies CON 1-1, CON 1-2, CON 1-3, CON 1-4, and CON 1-9; and actions CON-1e and CON-1f from the 2040 General Plan
- Metro Plan Policies CB 7.1, CB 7.2, CB 7.2.1, CB 7.2.2., CB 7.2.3, CB 7.3, CB 7.3.1, CB 7.3.2, and CB 7.4.
- California Green Building Standards Code (CALGreen)
- Milpitas Municipal Code Chapter 20 Green Building Regulations
- Titles 24 of the California Code of Regulations

### Energy Resources

As with the TASP, energy (e.g., fuels and electricity) would be required during construction of the Metro Plan for operation of construction equipment, employee and haul truck trips, lighting, and heat. The specific size, location, construction techniques, and scheduling that would be utilized for each individual development project occurring in the Metro Plan Area is not currently known. With an anticipated buildout year of 2040, development of the various land uses associated with the Metro Plan would occur over an extended period of time and would depend on factors such as local economic conditions, market demand, and other financing considerations. As such, without specific project-level details it is not possible to develop a refined inventory of energy resources.[28]

Nonetheless, the Metro Plan is in compliance with applicable federal, state, and local regulations regulating energy usage. Future projects would be required to comply with California's latest Title 24 building energy efficiency standards, as well as the City's Municipal Code Chapter 20 Green Building Regulations. In addition, the Metro Plan incorporates more stringent policies to further prevent wasteful, inefficient, or unnecessary consumption of energy. During construction, the Metro Plan requires that all off-road heavy-duty construction equipment use high-performance renewable diesel (Metro Plan Policy CB 7.4). Additionally, Metro Plan Policies CB 7.2.2 and CB 7.2.3 requires complete electrification of residential and nonresidential buildings (unless other uses are essential to the key functions of an internal business).

The City has also taken steps to improve the availability of clean, carbon free electricity options from sources like solar, wind and hydropower. SVCE, the local CCA, in conjunction with PG&E, would maintain sufficient capacity to serve residential and commercial electricity customers within the Metro Plan Area. Since 2017, SVCE has committed over 1 billion dollars to build new renewable

[28] Project-level information includes details such as the size and scale of the project to be constructed, construction schedule, equipment fleet, construction worker crew estimates, and demolition and grading quantities.

energy plants (City 2020). The Metro Plan requires new buildings to include the most impactful methods for reducing energy uses and greenhouse gas emissions (Metro Plan Policy CB 7.2); thus, energy usage within the Metro Plan Area may even reduce over time.

Therefore, although the Metro Plan would include geographic expansions and population/employment increases, the Metro Plan would not result in the wasteful, inefficient, or unnecessary consumption of energy resources and impacts would be less than significant.

### State or Local Plans for Renewable Energy or Energy Efficiency

The Metro Plan has been designed in compliance with the 2040 General Plan. In addition, the Metro Plan has been prepared to be consistent with the updated CAP that the City is planning to release in spring 2022. The Metro Plan acknowledges that the Metro Plan "implements the Climate Action Plan by ensuring that new development is not only aligned with citywide energy efficiency and emission reduction goals, but also serves as an early example of the implementation of critical policies." Polices required by the Metro Plan would ensure compliance with the CAP that the City is planning to release in spring 2022 and the 2040 General Plan goals and policies. The overall objective of the Metro Plan is to promote higher density and intensity development to provide an opportunity for advancing sustainability measures related to accessibility, energy use, and resource management. This objective aligns with many State and local plans designed to lead a state-wide reduction in energy consumption. For example, CARB's 2017 Scoping Plan Update calls for walkable communities and transit-oriented development.[29] The Association of Bay Area Governments/ Metropolitan Transportation Commission's Final Plan Bay Area 2050 also focuses on promoting more compact, mixed-use residential and commercial neighborhoods situated near transit.[30] Buildout of the Metro Plan would not result in new significant impacts or significant impacts of increased severity with respect to state or local plans for renewable energy or energy efficiency. This is a less than significant impact.

## Conclusion

As described above, implementation of policies in the Metro Plan and existing regulations would ensure that impacts related to the wasteful, inefficient, or unnecessary consumption of energy resources and conflicting with plans for renewable energy or energy efficiency would be less than significant. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**

[29] California Air Resources Board. 2017. California's 2017 Climate Change Scoping Plan. November. Available: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed: February 2022

[30] Association of Bay Area Governments and Metropolitan Transportation Commission. 2021. Plan Bay Area 2050. Available: https://www.planbayarea.org/digital-library/plan-bay-area-2050. Accessed: February 9, 2022.

# VII. Geology and Soils

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | |
| 1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | ☐ | ☒ | ☐ |
| 2. Strong seismic ground shaking? | ☐ | ☒ | ☐ |
| 3. Seismic-related ground failure, including liquefaction? | ☐ | ☒ | ☐ |
| 4. Landslides? | ☐ | ☒ | ☐ |
| b. Result in substantial soil erosion or the loss of topsoil? | ☐ | ☒ | ☐ |
| c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse? | ☐ | ☒ | ☐ |
| d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | ☐ | ☒ | ☐ |
| e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater? | ☐ | ☒ | ☐ |
| f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☒ | ☐ |

## Setting

### Environmental Setting

The environmental setting for the TASP Area for geology and soils is described on pages 3.5-1 through 3.5-8 of the Certified EIR. This discussion includes an overview of the following: geology and soils in the Bay Area and in the TASP Area; seismic activity in the Bay Area, including active

faults close to the TASP Area; liquefaction hazards; surface fault rupture; earthquake-induced settlement; soil erosion and soil loss; slope instability and landslides; expansive soils; the Milpitas Fire Department Office of Emergency Services; the Strategic Action for Emergencies Program; and the Earthquake Preparedness Program. In addition, the environmental setting for paleontological resources is described on pages 3.13-5 and 3.13-6 of the Certified EIR. This discussion includes an overview of the fossils found in Santa Clara County and the City of Milpitas. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

The setting with regard to geology and soils within the TASP Area has not changed substantially since the Certified EIR was prepared. The two expanded areas in the Metro Plan have the same physical setting for geology and soils, including paleontological resources, as what was identified for the TASP in the Certified EIR.

## Regulatory Setting

The regulatory setting for geology and soils is described on pages 3.5-8 to 3.5-9 of the Certified EIR. These regulations include the Alquist-Priolo Earthquake Fault Zoning Act; the Seismic Hazards Mapping Act, which requires a geotechnical investigation be conducted and appropriate mitigation be applied before a development permit is granted for a site within a seismic hazard zone[31]; the California Building Code; Title II, Chapter 13 of the City Municipal Code (Grading, Excavation, Paving, and Erosion Control Ordinance), which regulates grading, excavation, paving, and earthwork through grading plans, erosion control plans, and implementation of best management practices (BMPs); Title I, Chapter 1, Section 8 of the City Municipal Code, which requires that a preliminary soils report accompany a building permit; and policies in the 1994 General Plan related to seismic and geologic hazards and emergency services. The regulatory setting for paleontological resources is described on pages 3.13-6 to 3.13-9. These regulations include state and local regulations that protect cultural resources, including paleontological resources. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

The Certified EIR identified 1994 General Plan policies relating to geology and soils, including:

- Policy 5.a-I-3: Require projects to comply with the guidelines prescribed in the City's Geotechnical Hazards Evaluation manual.
- Policy 5.d-I-2: Design critical public facilities to remain operational during emergencies.

On March 9, 2021, the City adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan supersedes and replaces the 1994 General Plan and the policies from the 2040 General Plan would apply to the Metro Plan. The following actions from the 2040 General Plan that would apply to the Metro Plan are similar to the policies from the 1994 General Plan identified in the Certified EIR.

- Policy SA 3.2: Ensure that critical facilities are properly supplied and equipped to provide emergency services.

[31] The entirety of the TASP and the Metro Plan are within a Liquefaction Zone, which is considered a Seismic Hazard Zone. As such, all future development would be required to prepare a geotechnical report.

- Policy SA 3.3: Ensure that critical facilities are designed and constructed to withstand the "maximum probable" seismic events and still remain capable of service use to provide emergency assistance after a major disaster.
- Action CON 4b: Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:
    - If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.
    - If human remains are discovered during any ground disturbing activity, work shall stop until the Planning Department and the County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Planning Department.

# Certified EIR Findings

The Certified EIR found that:

- Future development and infrastructure associated with the TASP could be susceptible to ground shaking generated during an earthquake and secondary seismic hazards, such as liquefaction. The following requirements would ensure potential impacts related to ground shaking and liquefaction are less than significant: the California Building Code; building permit applications, which require a preliminary soils report, per the City's Municipal Code; a geotechnical investigation and incorporation of appropriate mitigation measures for development within a seismic hazard zone, consistent with the Seismic Hazards Mapping Act; and General Plan Policy 5.a-I-3.
- Future development could be subject to soil expansion, settlement, and erosion during construction. The following requirements that would ensure potential impacts related to impacts on geologic hazards, such as expansive soils, differential settlement, and erosion are less than significant: building permit applications, which require a preliminary soils report; and National Pollutant Discharge Elimination System (NPDES) General Construction Permit requirements, including preparing a Stormwater Pollution Prevention Plan.
- A large earthquake would place serious demands on the emergency services provided by the City. Compliance with the California Building Code, Seismic Hazards Mapping Act, and the General Plan (Policy 5.d-I-2) would reduce impacts from ground shaking on future structures and infrastructure in the TASP Area. Compliance with those regulations, as well as policies in the TASP (Policies 6.50, 6.52, 6.53, and 6.54) would reduce potential impacts on emergency services during emergencies to a less-than-significant level.
- Fossils have been found in the City and, as such, there is the potential to encounter paleontological resources during construction of new development that could result in the destruction of fossil remains. Nonetheless, impacts on paleontological resources would be less than significant with implementation of TASP Policy 5.35, which requires monitoring by a

qualified paleontologist, halting construction in the event fossils are encountered, notifying the City's Planning Department, evaluating fossils for scientific significance, and recovering fossils.

# Discussion

## Changes in Land Use Classifications and Policies

Table 2-2 in Chapter 2, *Project Description*, of the SEIR to which this IS is appended, provides a summary of the policies in the TASP related to geology and soils. In summary, Table 2-2 identifies the following updates that have been made in the Metro Plan:

- The Metro Plan includes policies related to conducting a "standards of cover" analysis to determine the Metro Plan's precise impact on the Fire Department's staffing, hiring of additional fire department staff and equipment, siting requirements for a new fire station, updates to the City's emergency and disaster response plans, and hiring of additional police staff. Although some of the text has been updated compared to TASP polices, there would be no substantial change in the requirements related to the fire and police services as identified in the TASP (TASP Policies 6.50, 6.51, 6.52, 6.53, and 6.54).
- The Metro Plan does not include a policy related to the protection of paleontological resources (TASP Policy 5.35). However, this requirement would still be fulfilled under the Metro Plan because developers would be required to comply with 2040 General Plan Action CON 4b, which has similar requirements to minimize impacts on paleontological resources.

Therefore, although there have been changes and deletions to the policies in the TASP, similar measures would still be required by the existing 2040 General Plan, the Metro Plan, and through compliance with existing regulations. As summarized in Table 2-2 of the SEIR to which this IS is appended, the changes made to the TASP policies by the Metro Plan would not substantially change the overall requirements to minimize impacts on geology and soils, including paleontological resources. Therefore, these changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

## Geographic Expansion and Metro Plan Buildout: Population Growth and Employment

Implementation of the Project Changes, including the geographic expansion of the Metro Plan Area and the additional population growth and employment from the Metro Plan buildout, would result in the construction of new development and associated infrastructure. The discussion below focuses on the impacts from this additional buildout.

As described above, policies and regulations related to the protection of geology and soils, including paleontological resources, that would apply to development under the Metro Plan include the following:

- California Building Code requirements
- The City's Municipal Code (Title I, Chapter 1, Section 8), which requires a preliminary soils report
- The Seismic Hazards Mapping Act, which requires a geotechnical investigation and incorporation of appropriate mitigation measures

- Metro Plan Policies ICS 8.1, 8.2, ICS 8.3, ICS 8.4, ICS 8.5, and ICS 9.1
- 2040 General Plan Action CON 4b

As described in the *Setting* section above, the Metro Plan Area, including the two expanded areas, would have the same physical setting for geology, soils, and paleontological resources as the TASP. As such, the new development and infrastructure associated with the Metro Plan would be subject to the same geological hazards as the TASP (ground shaking from earthquakes, liquefaction, earthquake-induced settlement, and erosion) and could potentially disturb paleontological resources. The Metro Plan would also be subject to the regulatory requirements listed above, including requirements in the California Building Code; preparation of a preliminary soils report per the City's Municipal Code; preparation of a geotechnical investigation and incorporation of appropriate mitigation measures, per the Seismic Hazards Mapping Act; and policies in the 2040 General Plan and Metro Plan.

Because the setting for the Metro Plan is the same as the setting in the TASP, the Metro Plan would include similar kinds of development and infrastructure as the TASP, and the Metro Plan would be subject to the same or comparable regulatory requirements as the TASP, the impacts identified in the Certified EIR for geology, soils, and paleontological resources would be the same for the Metro Plan.

Overall, through adherence to existing regulations and policies in the 2040 General Plan and the Metro Plan, the Project Changes are expected to result in a less-than-significant impact on geology, soils, and paleontological resources. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to geology, soils, and paleontological resources.

# Conclusion

The Certified EIR determined that the TASP would have a less-than-significant impact with regard to geology and soils, including paleontological resources. Based on the analysis above, with incorporation of the Project Changes, the Metro Plan would have a less-than-significant impact with regard to geology and soils, including paleontological resources. Therefore, the Project Changes would not result in a change to the Certified EIR's impact determination for impacts on geology and soils, including paleontological resources. Specifically, the Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**.

# VIII. Greenhouse Gas Emissions

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ☒ | ☐ | ☐ |
| b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | ☒ | ☐ | ☐ |

The Project Changes, which include the additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on greenhouse gas emissions that were not analyzed in the Certified EIR. As such, **greenhouse gas emission impacts due to the Project Changes are further evaluated in the SEIR**.

# IX. Hazards and Hazardous Materials

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | Less than Significant | No Impact |
|---|---|---|---|---|
| Would the project: | | | | |
| a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☐ | ☒ | ☐ | ☐ |
| b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☐ | ☒ | ☐ | ☐ |
| c. Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | ☐ | ☒ | ☐ | ☐ |
| d. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | ☐ | ☒ | ☐ | ☐ |
| e. Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard or excessive noise for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |
| f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☒ | ☐ | ☐ |
| g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires? | ☐ | ☐ | ☒ | ☐ |

# Setting

## Environmental Setting

The environmental setting for the TASP Area is described on pages 3.4-1 through 3.4-6 of the Certified EIR. The environmental setting discussion is centered around historical land uses within the TASP Area and the activities associated with these land uses, specifically historical activities that could pose potential environmental, health, and safety risks. An electronic environmental database search was used to identify any reported hazardous materials spills and releases within the TASP Area. Environmental databases reviewed included the California Department of Toxic Substances Control's (DTSC) EnviroStor and Cal-Sites, State Water Resources Control Board's (SWRCB) GeoTracker, and the Santa Clara County Department of Environmental Health's (SCCDEH) Local Oversight Program (LOP) and Cortese databases. The environmental database review identified 28 sites with known hazardous material releases within the TASP Area. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review. Updates to the environmental setting for the Metro Plan, including the setting for the expanded areas for the Metro Plan, are identified below.

There is potential for additional hazardous materials listings associated with hazardous material spills and releases to be within the two new expanded areas in the Metro Plan. A supplemental environmental database search was conducted within these areas via DTSC's EnviroStor and Cal-Sites, SWRCB's GeoTracker, and the SCCDEH LOP databases (all cleanup sites under SCCDEH oversight are required to submit their information to the SWRCB's GeoTracker website). The following six sites were identified during the supplemental environmental database search as being within the two new expanded areas in the Metro Plan:

- Cordova Printed Circuits, Inc., 1648 Watson Court – DTSC EnviroStor Tiered Permit site. The site status is listed as *Inactive - Needs Evaluation*. The *Inactive - Needs Evaluation* status identifies non-active sites where DTSC has determined a Preliminary Endangerment Assessment, or other evaluation is required. Impacted media and contaminants of concern were not disclosed.
- South Valley Circuits, Inc., 1603 Watson Court – DTSC EnviroStor Tiered Permit site. The site status is listed as *Inactive - Needs Evaluation*. Impacted media and contaminants of concern were not disclosed.
- Jones Chemical, 985 Montague Expressway – SWRCB GeoTracker Cleanup Program Site. The site status is listed as *Open - Site Assessment as of 6/1/2018*. Contaminants are listed as volatile organic compounds in aquifer used for drinking water, groundwater, and soil vapor.
- Hulligan Property, 1446 South Main Street – SWRCB GeoTracker Leaking Underground Storage Tank Cleanup Site. The site status is listed as *Completed - Case Closed as of 10/13/1995*. The site was listed as exhibiting gasoline impacted soil.
- Kaiser Experimental Lab, 1600 South Main Street - DTSC EnviroStor Evaluation site. The site status is listed as *Refer: 1248 Local Agency as of 8/27/2009*. The *Refer: 1248 Local Agency* site status identifies sites that were referred to a local agency (through the SB 1248 determination process) to supervise the cleanup of a simple waste release. Impacted media includes both soil and groundwater. Contaminants include chromium, copper, lead, magnesium, mercury, nickel, and zinc.

- Milpitas Senior Housing Project, 1600 South Main Street - SWRCB GeoTracker Cleanup Program Site. The site status is listed as *Completed - Case Closed as of 11/20/2009*. The contaminant of concern was listed as lead, found in onsite soils only.

The Certified EIR identified that the potential for a school being located within the TASP Area; however, no existing schools were identified within the TASP Area in the Certified EIR. Since the preparation of the Certified EIR, Mabel Mattos Elementary School, which is located within the Metro Plan Area has opened and is operational.

## Regulatory Setting

The regulatory setting for hazards and hazardous materials is described in pages 3.4-6 through 3.4-10 of the Certified EIR. These regulations include the federal Resource Conservation and Recovery Act, which regulates recycling and recovery, spills, generation, and disposal of hazardous materials; California's Hazardous Materials Release Response Plans and Inventory Law, which regulates storage of hazardous materials and emergency response; the Milpitas Toxic Gas Ordinance, which regulates hazardous materials in aboveground storage tanks and underground storage tanks, and the handling, dispensing, and potential release of toxic gases; the Multi-Hazard Emergency Plan, which is maintained by the Milpitas Fire Department; the Santa Clara Countywide Household Hazardous Waste program, which provides designated collection items for various household hazardous wastes; the California Environmental Protection Agency and DTSC, which regulate the generation, transportation, treatment, storage, and disposal of hazardous waste; local enforcement of hazardous waste laws by the Milpitas Fire Department and SCCDEH; regulations related to remediation of contaminated sites under the oversight of SCCDEH with the cooperation of the RWQCB; federal and state laws, which regulate occupational safety and are enforced by the California Division of Occupational Safety and Health (Cal OSHA) and the federal Occupational Safety and Health Administration; Bay Area Air Quality Management District and Cal OSHA regulations related to asbestos as a hazardous air pollutant and as a potential worker safety hazard; DTSC regulations related to polychlorinated biphenyls (PCBs); Cal OSHA and U.S. Department of Housing and Urban Development standards and guidelines related to lead; federal regulations pertaining to the transport of hazardous materials and hazardous wastes by all modes of transportation; and policies from the Midtown Milpitas Specific Plan. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

The Certified EIR identified that the Safety Element of the 1994 General Plan provides guiding principles and policies for the protection from and handling of hazardous materials, in addition to protections from exposure to contaminated media associated with historical hazardous materials releases. The guiding principles and policies identified in the Certified EIR are included below.

- Guiding Principle 5.d-G-1: Use the City's Emergency Management Plan as the guide for emergency management in the Planning Area.
- Policy 5.d-I-2: Design critical public facilities to remain operational during emergencies.
- Guiding Principle 5.c-G-1: Provide high quality, effective and efficient fire protection services for the Milpitas area residents.
- Policy 5.c-I-1: Maintain a response time of four minutes or less for all urban service areas.
- Policy 5.c-I-2: Maintain mutual aid agreements with other agencies in the County.

- Policy 5.c-I-3: Require automatic fire sprinklers for all new development in the Hillside Area that is not within 1.5 miles of an existing or planned fire station, and fire-resistive construction and compliance with California high-rise building requirements for buildings over three stories in height.
- Policy 5.d-I-1: Maintain and upgrade the Emergency Management Plan as necessary.

On March 9, 2021, the City adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan supersedes and replaces the 1994 General Plan and the policies from the 2040 General Plan would apply to the Metro Plan. The following actions and policies from the 2040 General Plan that would apply to the Metro Plan are similar to the policies from the 1994 General Plan identified in the Certified EIR.

- Policy SA 3.1: Ensure that new critical facilities in Milpitas are located in areas that minimize exposure to potential natural hazards.
- Policy SA 3.2: Ensure that critical facilities are properly supplied and equipped to provide emergency services.
- Policy SA 3.3: Ensure that critical facilities are designed and constructed to withstand the "maximum probable" seismic events and still remain capable of service use to provide emergency assistance after a major disaster.
- Policy SA 3.6: Maintain effective mutual aid agreements for fire, medical response, and other functions as appropriate.
- Policy SA 4.1: Provide adequate funding for police and fire facilities and personnel to accommodate existing and future citizens' needs to ensure a safe and secure environment for people and property throughout the city.
- Policy SA 4.9: Ensure that fire and emergency medical services meet existing and future demand by maintaining a response time of four minutes or less for all urban service areas.
- Goal SA-5: Protect citizens from hazardous materials.
- Policy SA 5-1: Require hazardous waste generated within Milpitas to be disposed of in a safe manner, consistent with all applicable local, state, and federal laws.
- Policy SA 5-2: Hazardous materials shall be stored in a safe manner, consistent with all applicable local, state, and federal laws.
- Policy SA 5-3: Ensure that businesses in Milpitas that handle hazardous materials prepare and file a Hazardous Materials Business Plan (HMBP), and Hazardous Materials Inventories. The HMMP and Inventory shall consist of general business information, basic information on the location, type, quantity, and health risks of hazardous materials, and emergency response and training plans.
- Policy SA 5-4: Use the environmental review process to comment on Hazardous Waste Transportation, Storage and Disposal (TSD) Facilities proposed in the Milpitas Planning Area and throughout the County to request a risk assessment and ensure that potentially significant, widespread, and long-term impacts on public health and safety of these facilities are identified and mitigated, as such impacts do not respect jurisdictional boundaries.
- Policy SA 5-5: As feasible, minimize the use of toxic cleaning supplies and products in civic facilities, and minimize the City's use of pesticides, herbicides and fertilizers during landscaping and outdoor municipal operations.
- Policy SA 5-6: Encourage residents and businesses to minimize the use of toxic materials and products including the application of pesticides, herbicides and fertilizers.
- Action SA-5a: Require that applications for discretionary development projects provide detailed information regarding the potential for the historical use of hazardous materials on the site,

including information regarding the potential for past soil and/or groundwater contaminations. If warranted, identify and require mitigation measures to ensure the exposure to hazardous materials from historical uses has been mitigated to acceptable levels consistent with U.S. Environmental Protection Agency (EPA) and/or DTSC standards.

- Action SA-5d: Require that Business License applications for businesses that use, store, or sell hazardous materials be reviewed by the County Department of Environmental Health to ensure operations comply with all applicable local, state, and federal laws and do not pose a risk to the public.

# Certified EIR Findings

The Certified EIR found that:

- At the time of the TASP preparation, an environmental database review conducted via DTSC's EnviroStor and Cal-Sites, SWRCB's GeoTracker, and the SCCDEH LOP and Cortese databases identified 28 sites with known hazardous material releases within the TASP Area. Of the 28 sites identified, 21 sites were listed as *no further action* or *case closed*, did not require additional remediation, and were not considered a threat to proposed future land uses in the Project area. The seven remaining cases were *open cases* indicating that remediation activities have not been completed and/or the concentrations of contaminants currently exist above regulatory thresholds. Implementation of TASP policies including Policy 5.20 to address potential hazardous materials impacts affecting human health and to require remediation of contaminated sites, along with Policy 5.22 requiring Risk Management Plans at sites with known contamination, would reduce potential impacts to less-than-significant levels.
- The Certified EIR determined that existing structures to be demolished in the TASP Area could potentially include hazardous building materials such as asbestos, PCBs, or lead-based paint. Implementation of Policy 5.21 to address hazardous building materials such as asbestos, PCBs or lead; adherence to Section 19827.5 of the California Health and Safety Code requiring compliance with notification requirements under federal regulations; and compliance with Titles 8 and 17 of the California Code of Regulations, which include work practice standards related to lead exposure and the evaluation and abatement of lead in public and residential buildings, would reduce potential impacts to less-than-significant levels.
- Future commercial, residential, and light industrial land uses associated with the TASP would involve the use, transport, and disposal of hazardous substances including paints, polishes, petroleum-based products, household cleaning agents, solvents, gardening chemicals, pool chemicals, and ammonia. Installation of aboveground storage tanks and underground storage tanks could also occur as part of TASP development. The Certified EIR concluded that due to mandatory compliance with federal, state, and local regulations, potential impacts associated with future hazardous material use, transport, and disposal would be less than significant.
- Under the TASP, an elementary or K-8 school would be potentially constructed within the TASP Area. A 2006 preliminary environmental assessment of the potential school site indicated that existing hazardous material conditions within the site and the surrounding area do not pose a threat of hazardous material contamination to the site. Although onsite contamination was unlikely, the Certified EIR stated that implementation of TASP policies, such as Policy 5.20 and Policy 5.22, would address potential hazardous materials impacts related to existing site contamination within the Project area, including the school site in question. As such, the

Certified EIR concluded that potential impacts on future school sites would be less than significant.

- The TASP is not expected to impair the implementation of or interfere with the City's Multi-Hazard Emergency Plan.

# Discussion

## Changes in Land Use Classifications and Policies

Table 2-2 in Chapter 2, *Project Description*, of the SEIR to which this IS is appended, provides a summary of the policies in the TASP related to hazardous materials. The Metro Plan does not include policies related to hazardous materials. However, as shown in Table 2-2, requirements from the 2040 General Plan and existing regulations would still include similar requirements as those identified in the TASP.

Therefore, although there have been changes and deletions to the policies in the TASP, similar measures would still be required by the existing 2040 General Plan and through compliance with existing regulations. The changes made to the TASP policies by the Metro Plan would not substantially change the overall requirements to minimize impacts on hazards and hazardous materials. Therefore, these changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

## Geographic Expansion and Metro Plan Buildout: Population Growth and Employment

Implementation of the Project Changes, including the geographic expansion of the Metro Plan Area and the additional population growth and employment from the Metro Plan buildout, would result in the construction of new development and associated infrastructure. The discussion below focuses on the impacts from this additional buildout.

As described above, policies and regulations related to the hazards and hazardous materials, that would apply to development under the Metro Plan include the following:

- Policies SA 3.6, SA 4.1, SA 4.9, and SA 5-1 through SA 5-6, and Actions SA-5a and SA-5d from the 2040 General Plan
- Section 19827.5 of the California Health and Safety Code
- Titles 8 and 17 of the California Code of Regulations

### Hazardous Materials

Future development associated with the Metro Plan would involve the use, transport, and disposal of hazardous substances similar to what is described in the Certified EIR for the TASP Area. General Plan goals, policies, and actions such as Policy SA 5-1 through Policy SA 5-6 and Action SA-5d would apply to the use, handling, and disposal of hazardous materials. Consistent with the conclusions in the Certified EIR, the Project Changes would have a less-than-significant impact on hazards related to the routine transport, use, or disposal of hazardous materials.

Population growth could result in the increased use of and exposure to hazardous materials; however, the types and use of hazardous materials would be the same as what was previously described in the Certified EIR for the TASP Area. General Plan goals, policies, and actions such as Policy SA 5-1 through Policy SA 5-6 and Action SA-5d would apply to the use, handling, and disposal of hazardous materials and would reduce potential impacts to less-than-significant levels. Consistent with the conclusions in the Certified EIR, operation of development associated with the Project Changes would have a less-than-significant impact on hazards related to the routine transport, use, or disposal of hazardous materials.

As described above under *Setting*, six sites were identified during the supplemental database review in the Metro Plan expansion areas; these sites were not evaluated in the Certified EIR. Out of the six sites, two have received closure from the applicable oversight agency, and two others are inactive and in need of an evaluation. The remaining two sites include an active site exhibiting volatile organic compound-impacted groundwater and soil vapor, and a site exhibiting metal impacts on both soil and groundwater. As such, construction activities occurring within the Metro Plan expansion areas could occur in areas exhibiting impacted soils or groundwater. However, future development in the Metro Plan Area would adhere to applicable General Plan goals, policies, and actions (presented above), such as Action SA-5a, which requires development projects to provide detailed information regarding historical onsite use of hazardous materials and information regarding historical releases associated with the site. It also requires the identification and implementation (as necessary) of mitigation measures to ensure the exposure to hazardous materials from historical uses has been mitigated to acceptable levels consistent with U.S. Environmental Protection Agency and/or DTSC standards. Implementation of Policy SA 5-1 would require hazardous waste generated as a result of the remediation of a contaminated site to be disposed of appropriately, and consistent with all applicable local, state, and federal laws. Policy SA 5-1 along with Section 19827.5 of the California Health and Safety Code and Titles 8 and 17 of the California Code of Regulations would also apply to the demolition of buildings within the expansion areas and would address hazardous building material waste such as asbestos, PCBs, or lead. Potential impacts on construction personnel and the surrounding environment would be less than significant. Consistent with the conclusions in the Certified EIR, the Project Changes would have a less-than-significant impact on hazards related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, as well as from being located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

Since the preparation of the Certified EIR, Mabel Mattos Elementary School has opened and is operational. As such, any future construction near Mabel Mattos Elementary School associated with the Metro Plan could result in the emission or handling of hazardous materials near a school. Nonetheless, adherence to the same policies and regulations identified above that regulate the use, transport, disposal, and handling of hazardous materials would ensure that impacts on schools would be less than significant. Therefore, implementation of the Metro Plan would not result in new significant impacts or significant impacts of increased severity with respect to impacts on schools.

## Emergency Response Plan

The Certified EIR identified that the TASP is not expected to impair the implementation of or interfere with the City's Multi-Hazard Emergency Plan. Implementation of the Project Changes would result in additional development and infrastructure in the Metro Plan Area. Nonetheless, the

2040 General Plan EIR identifies that the 2040 General Plan would ensure "that the City's emergency access routes, emergency contact lists, and public information regarding designated facilities and routes are regularly reviewed to ensure that up to date information is available to the City and the public in the event of an emergency."[32] Consistent with the conclusions in the Certified EIR, implementation of the Project Changes would have a less-than-significant impact on emergency planning.

### Airport Land Use Plan

The Certified EIR did not include an impact analysis or significance conclusion regarding safety hazards or excessive noise impacts related to being within an airport land use plan area or within 2 miles of a public airport or public use airport. Nonetheless, the closest airport to the TASP Area or the Metro Plan Area (including the two expanded areas) is the San Jose International Airport, which is more than 2 miles away from the TASP Area or Metro Plan Area. In addition, no lands in the City are within an airport land use plan area.[33] As such, the Metro Plan would have no impact on safety hazards or excessive noise related to being within an airport land use plan area or within 2 miles of a public airport or public use airport. Therefore, implementation of the Metro Plan would not result in new significant impacts or significant impacts of increased severity with respect to being located in an airport land use plan or near an airport.

### Wildland Fires

The Certified EIR did not include an impact analysis or significance conclusion regarding exposing people or structures to a significant risk of loss, injury, or death involving wildland fires. Nonetheless, the area surrounding both the TASP Area or the Metro Plan Area (including the two expanded areas) is generally developed and lacking features that normally elevate wildland fire risks (e.g., dry vegetation, steeply sloped hills). The 2040 General Plan includes several policies that would ensure that the City is prepared to respond to any emergency related to fires, including Policies SA 3.6, SA 4.1, and SA 4.9. Because of the urban setting of the Metro Plan Area and because of the 2040 General Plan policies that would ensure that the City is prepared for emergencies, the impact due to wildland fires would be less than significant for the Metro Plan. Therefore, implementation of the Metro Plan would not result in new significant impacts or significant impacts of increased severity with respect to wildland fires.

## Conclusion

The Certified EIR determined that the TASP would have a less-than-significant impact with regard to hazards and hazardous materials. Based on the analysis above, with incorporation of the Project Changes, the Metro Plan would also have a less-than-significant impact with regard to hazards and hazardous materials. Therefore, the Project Changes would not result in a change to the Certified EIR's impact determination for impacts on hazards and hazardous materials. Specifically, the Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or

[32] City of Milpitas. 2020. *Draft Environmental Impact Report for the Milpitas General Plan Update*. November 2. Page 3.8-35.

[33] City of Milpitas. 2020. *Draft Environmental Impact Report for the Milpitas General Plan Update*. November 2. Page 3.10-22.

substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**.

# X. Hydrology and Water Quality

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| Would the project: | | | | |
| a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? | ☐ | ☒ | ☐ | ☐ |
| b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | ☐ | ☒ | ☐ | ☐ |
| c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would: | ☐ | ☒ | ☐ | ☐ |
| 1. Result in substantial erosion or siltation on- or off-site; | ☐ | ☒ | ☐ | ☐ |
| 2. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; | ☐ | ☒ | ☐ | ☐ |
| 3. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or | ☐ | ☒ | ☐ | ☐ |
| 4. Impede or redirect floodflows? | ☐ | ☒ | ☐ | ☐ |
| d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? | ☐ | ☐ | ☒ | ☐ |
| e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | ☐ | ☐ | ☒ | ☐ |

# Setting

## Environmental Setting

The environmental setting for the TASP Area is described on pages 3.10-1 through 3.10-6 of the Certified EIR. This discussion includes an overview of drainage in the TASP Area, the watershed in the TASP Area, precipitation, the storm drain system, flooding, water quality, and groundwater within and around the TASP Area. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review. The setting with regard to hydrology and water quality within the TASP Area has not changed substantially since the Certified EIR was prepared. The information in the Certified EIR regarding groundwater wells is correct but it should be noted that the City plans to expand its groundwater capabilities by operating two new groundwater wells, the Curtis Well and the McCandless Well. The Design for the Curtis Well began in 2020 and the McCandless Well is expected to be completed in 2020.[34] The two expanded areas in the Metro Plan have the same physical setting for hydrology and water quality as what was identified for the TASP in the Certified EIR.

## Regulatory Setting

The regulatory setting for hydrology and water quality is described on pages 3.10-6 to 3.10-8 of the Certified EIR. These regulations include the National Flood Insurance Act of 1986 and the Flood Disaster Protection Act of 1973, which are implemented through the National Flood Insurance Program and the City's Building Code; the federal Clean Water Act and the state Porter-Colone Water Quality Control Act, which are administered by the San Francisco RWQCB; the NPDES permit administered by the RWQCB; the Santa Clara Valley Urban Runoff Prevention Program (SCVURPP) Stormwater Management Plan; the City's Zoning Ordinance, which implements NPDES requirements; the Milpitas Sanitary Code, which prohibits the discharge of polluted waters; the City's Municipal Code, which requires developers with developments in a floodplain to submit a permit application showing the development plans, in particular the measures that will be taken to prevent flood hazards or elevate buildings out of the floodplain; policies in the 1994 General Plan; policies in the Midtown Specific Plan; policies from the Santa Clara Valley Water Resources Protection Collaborative; and BMPs, which are typically required through the development review process on a case-by-case basis. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

Since the preparation of the Certified EIR, the Sustainable Groundwater Management Act was passed in California. Per the Sustainable Groundwater Management Act, all of California's 515 groundwater basins are classified into one of four categories: High, Medium, Low, or Very Low Priority. The City is within the Santa Clara Valley Subbasin, which is identified as a High-Priority groundwater basin.[35] In 2016, SCVWD prepared the Groundwater Management Plan for the Santa Clara and Llagas Subbasins. This Groundwater Management Plan describes SCVWD's comprehensive groundwater management framework, including existing and potential actions to achieve basin

[34] City of Milpitas. 2021. *Water Master Plan*. March 2021. Prepared by West Yost.

[35] California Department of Water Resources. 2020. SGMA Basin Prioritization Dashboard. Santa Clara Valley. Available: https://gis.water.ca.gov/app/bp-dashboard/final/#. Accessed October 2021.

sustainability goals and ensure continued sustainable groundwater management.[36] This plan satisfies the objectives of the Sustainable Groundwater Management Act.

The Certified EIR identified 1994 General Plan policies relating to hydrology and water quality including:

- Policy 4.d-G-1: Protect and enhance the quality of water resources in the Planning Area.
- Policy 4.d-I-1: Continue implementing the National Pollutant Discharge Elimination System (NPDES) requirements of the Regional Water Quality Control Board – this is implemented through Chapter 16 of the City's Zoning Ordinance.

On March 9, 2021, the City adopted an update to the General Plan, which is referred to as the 2040 General Plan. The 2040 General Plan supersedes and replaces the 1994 General Plan and the policies from the 2040 General Plan would apply to the Metro Plan. The following actions from the 2040 General Plan that would apply to the Metro Plan are similar to the policies from the 1994 General Plan identified in the Certified EIR.

- Policy UCS 4-2: Require all development projects to demonstrate how storm water runoff will be detained or retained on-site and/or conveyed to the nearest drainage facility as part of the development review process and as required by the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit.
- Policy UCS 4-3: Require all future development projects to analyze their drainage and stormwater conveyance impacts and either demonstrate that the City's existing infrastructure can accommodate increased stormwater flows, or make the necessary improvements to mitigate all potential impacts.
- Policy UCS 4-4: Applicable projects shall incorporate BMPs and Low Impact Development (LID) measures to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.
- Policy UCS 4-5: Applicable projects shall control peak flows and duration of runoff to prevent accelerated erosion of downstream watercourses.
- Policy UCS 4-14: Construction sites shall incorporate measures to control erosion, sedimentation, and the generation of runoff pollutants to the maximum extent practicable. The design, scope and location of grading and related activities shall be designed to cause minimum disturbance to terrain and natural features. (Title II, Chapter 13 of the Municipal Code).
- Action SA 2a: As part of the development review process continue to require new developments to prepare hydraulic and storm drainage studies as necessary to define the net increase in storm water run-off resulting from construction and operation, and require mitigation to reduce identified impacts. Drainage and grading plans shall identify BMP protections and include standards established and recommended by the City that shall be incorporated into development.
- Action SA 2c: Continue to review projects in flood hazard areas to ensure compliance with Milpitas Municipal Code Title XI, Chapter 15 – (Floodplain Management Regulations).
- Action SA 2g: Require developers to adequately fund the costs of drainage facilities needed for surface runoff generated as a result of new development.

[36] Santa Clara Valley Water District. 2016. *2016 Groundwater Management Plan Santa Clara and Llagas Subbasins*. November. Available: https://s3.us-west-2.amazonaws.com/assets.valleywater.org/2016%20Groundwater%20Management%20Plan.pdf. Accessed: October 2021.

- Action USC 4e: Continue to implement a comprehensive municipal stormwater pollution-prevention program in compliance with requirements of the Santa Clara Valley Urban Runoff Prevention Program (SCVURPPP) and the C.3 Stormwater Handbook.
- Action USC 4f: Work cooperatively with local, state, and federal agencies to comply with regulations, reduce pollutants in runoff, and protect and enhance water resources in the Santa Clara Basin through implementation of the Santa Clara Valley Urban Runoff Prevention Program (SCVURPPP).

# Certified EIR Findings

The Certified EIR found that:

- The TASP is not expected to substantially affect groundwater levels or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. The City is served by a municipal water system that does not depend on local groundwater. Because of this and because the TASP Area is almost fully developed, the Certified EIR concluded that significant impacts on groundwater systems are not expected to occur.
- The TASP would not substantially alter the course of a stream or river in a manner that would result in substantial erosion or siltation on- or offsite. The TASP would maintain approximately the same drainage pattern, utilizing street gutters and storm drains that would remain in the same place as they are currently. The Certified EIR concluded that this significance criterion is not relevant to the TASP and is therefore not discussed in the Impacts and Mitigations Measures section of the Certified EIR.
- The TASP Area is not subject to inundation by seiche, tsunami, or mudflow. The Certified EIR concluded that this significance criterion is not relevant to the TASP and is therefore not discussed in the Impacts and Mitigations Measures section of the Certified EIR.
- Impacts associated with construction activities (i.e., grading, excavation, soil stockpiling) could result in erosion, entrainment of sediment in runoff, sedimentation, localized ponding, flooding, and potential release of chemicals. Impacts on water quality were found to be less than significant after implementation of General Plan Policies 4.d-G-1 and 4.d-I-1 and TASP Policies 5.36 and 5.37.
- Impacts associated with buildout of the TASP could include increased discharge of pollutants in stormwater due to the new residents and additional vehicular traffic, which would result in pollutants in runoff. The Certified EIR also concluded that the TASP would overall decrease runoff due to addition of more landscaped areas and parks. Impacts on water quality from buildout of the TASP were found to be less than significant after implementation of Storm Drainage Plans by developers; compliance with the NPDES permit; General Plan Policies 4.d-G-1 and 4.d-I-1; TASP Policies 5.36, 6.5, 6.7; and actions from Table 7-1 of the Certified EIR.
- Impacts associated with constructing development within a Federal Emergency Management Agency–designated 100-year floodplain were found to be less than significant after compliance with the requirements in the City's Municipal Code, the City's development standards, and TASP Policies 6.1, 6.2, 6.3, 6.4, 6.6, and 6.7. The Certified EIR also identified that regional flooding mitigation will be conducted by SCVWD and the U.S. Army Corp of Engineers, and that localized flooding mitigations will be handled by individual developers in accordance with a developer-funded and City-approved Storm Drainage Plan for each subdistrict.

# Discussion

Since the preparation of the Certified EIR, the thresholds identified in Appendix G of the State CEQA Guidelines have been updated for hydrology and water quality. The discussion below is based on the updated thresholds in Appendix G of the State CEQA guidelines.

## Changes in Land Use Classifications and Policies

Table 2-2 in Chapter 2, *Project Description*, of the SEIR to which this IS is appended, provides a summary of the policies in the TASP related to hydrology and water quality. In summary, Table 2-2 identifies the following updates that have been made in the Metro Plan:

- The Metro Plan does not include a policy requiring projects that disturb more than 1 acre to prepare a Stormwater Pollution Prevention Plan (TASP Policy 5.36). However, this requirement would still be fulfilled under the Metro Plan because developers would be required to comply with the Construction General Permit.
- The Metro Plan does not include a policy requiring projects that disturb more than 1 acre to prepare a Stormwater Control Plan (TASP Policy 5.37). However, this requirement would still be fulfilled under the Metro Plan because developers would be required to comply with the NPDES Permit that includes this requirement.
- The Metro Plan includes policies related to flooding and storm drains; although some of the text has been updated compared to TASP polices, there would be no substantial change in the requirements related to minimizing impacts from flooding and on storm drains as identified in the TASP (TASP Policies 6.1, 6.2, 6.3, 6.4, and 6.5).

Therefore, although there have been changes and deletions to the policies in the TASP, similar measures would still be required by the existing 2040 General Plan, the Metro Plan, and through compliance with existing regulations. As summarized in Table 2-2 of the SEIR to which this IS is appended, the changes made to the TASP policies by the Metro Plan would not substantially change the overall requirements to minimize impacts on hydrology and water quality. Therefore, these changes in policies would not result in new significant impacts or more severe significant impacts than what was identified in the Certified EIR.

## Geographic Expansion and Metro Plan Buildout: Population Growth and Employment

Implementation of the Project Changes, including the geographic expansion of the Metro Plan Area and the additional population growth and employment from the Metro Plan buildout, would result in the construction of new development and associated infrastructure. The discussion below focuses on the impacts from this additional buildout.

As described above, policies and regulations related to hydrology and water quality, that would apply to development under the Metro Plan include the following:

- NPDES Permit
- Construction General Permit
- National Flood Insurance Program

- Milpitas Municipal Code Title XI, Chapter 15 – (Floodplain Management Regulations).
- SCVURPPP.
- Metro Plan Policies ICS 1.1, ICS 1.2, ICS 1.3, ICS 2.1, ICS 2.2, CB 4.5.8.

## Water Quality

The Certified EIR concluded that impacts on water quality from construction would be minimized to a less-than-significant level by future developments complying with General Plan Policies 4.d-G-1 and 4.d-I-1 and TASP Policies 5.36 and 5.37, which require compliance with existing regulations, including NPDES and the Construction General Permit. The construction associated with the Project Changes would be similar to what was described in the Certified EIR (i.e., grading, excavation, soil stockpiling, use of chemicals) and construction of future development associated with the Project Changes would be required to adhere to the same regulations as described for the TASP in the Certified EIR. As such, construction impacts on water quality due to the Project Changes would be less than significant and the same as identified in the Certified EIR.

The Certified EIR concluded that impacts from the TASP buildout, including discharge of pollutants into stormwater due to new residents and additional vehicular traffic, would be less than significant after implementation of Storm Drainage Plans by developers; compliance with the NPDES permit; compliance with 1994 General Plan Policies 4.d-G-1 and 4.d-I-1 and TASP Policies 5.36, 6.5, 6.7; and actions from Table 7-1 of the Certified EIR. Buildout associated with the Project Changes would be similar to the TASP buildout and would result in the same pollutants potentially discharged into stormwater. Buildout associated with the Project Changes would be required to adhere to the same regulations and similar policies for the TASP in the Certified EIR. Although the Metro Plan does not include a policy requiring the preparation of Storm Drainage Plans, these plans would not be necessary to reduce the impacts related to discharge into stormwater. First, the Metro Plan is expected to overall decrease stormwater runoff due to the addition of open space and parks, which would increase pervious areas and reduce runoff. Second, water quality would be protected by other regulations. As such, impacts on water quality due to buildout of the Project Changes would be less than significant and the same as identified in the Certified EIR.

Overall, through adherence to existing regulations and policies in the Metro Plan, the Project Changes are expected to result in a less-than-significant impact on water quality, would not violate water quality standards or waste discharge requirements, and would not conflict with or obstruct implementation of a water quality control plan. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to water quality.

## Groundwater and Groundwater Quality

The Certified EIR concluded that impacts on groundwater would be less than significant because: (1) the City does not depend on local groundwater, and (2) the TASP Area is almost fully developed and would not affect groundwater recharge.

Since the preparation of the Certified EIR, changes have been made relative to groundwater management. First, the City has identified that two new groundwater wells would be developed to expand the City's water capabilities for the future, and second, the Sustainable Groundwater Management Act was passed. Like the TASP Area, the Metro Plan Area (including the two expanded

areas) is within a highly developed, urbanized areas and the buildout of new development (which is expected to implement more vegetated areas than currently exist) would not affect groundwater recharge. In addition, although the City is expected to use groundwater in the future, implementation of the Metro Plan is not expected to impede implementation of the Groundwater Management Plan by SCVWD. In fact, the Metro Plan would be in line with some programs identified in the Groundwater Management Plan to maintain a reliable groundwater supply, including water conservation and use of recycled water (see Metro Plan Policy ICS 3.4). In addition, the Groundwater Management Plan identifies working with the SCVURPP, of which the City of Milpitas is a member, in order to protect groundwater quality. The 2040 General Plan identifies actions (Actions USC 4e and USC 4f) that require implementation of the SCVURPP. As such, implementation of the Project Changes would result in a less-than-significant impact on groundwater and groundwater quality and would not decrease groundwater supplies, interfere substantially with groundwater recharge, impede sustainable groundwater management of the groundwater basin, or conflict with the Groundwater Management Plan.

Implementation of the Metro Plan would result in no new significant effect on groundwater or groundwater quality, and the impact would not be more severe than the impacts identified in the Certified EIR.

## Alteration to Drainage Patterns

The Certified EIR concluded that the TASP would not substantially alter the course of a stream or river and that it would maintain a similar drainage pattern with street gutters and storm drains. In addition, the Certified EIR concluded that implementation of the TASP would increase the area of pervious surfaces through the addition of parks and vegetated areas.

Similarly, the Project Changes would not alter the course of a stream or river. Although there are creeks in the Metro Plan Area, buildout is not expected to alter the course of a stream or a river. Furthermore, the Project Changes would maintain a similar drainage pattern as the drainage pattern anticipated from buildout of the TASP, including through street gutters and storm drains. In addition, the Project Changes would increase the area of pervious surfaces through the addition of vegetated areas associated with new developments and through the additions of parks and open space. As such, the Project Changes are expected to result in a less-than-significant impact related to the alteration of existing drainage patterns and in less-than-significant impacts from erosion, siltation, flooding due to increased runoff, exceeding the capacity of stormwater drainage systems due to runoff, and impeding or redirecting floodflows.

The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to alteration of existing drainage patterns.

## Flood Hazard

The Certified EIR concluded that impacts from placing development within flood hazards would be less than significant after compliance with the City's Municipal Code, the City's development standards, and TASP Policies 6.1, 6.2, 6.3, 6.4, 6.6, and 6.7.

Under the Metro Plan, development could occur within those areas identified as being within a flood hazard in the Certified EIR. In addition, the Project Changes would result in additional areas where development could occur under the TASP. The western expanded area is adjacent to but not within a

flood hazard area. A small portion of the eastern expanded area is within a flood hazard area. Overall, development under the Metro Plan would be required to adhere to the same requirements to minimize flooding impacts as the TASP, including from existing regulations (City's Municipal Code and City's Development Standards) and from Metro Plan policies. With implementation of these regulations and polices—as well as implementation of the SCVURPP, which would protect water quality—the potential impacts related to the risk of release of pollutants due to flooding in flood hazard areas would be less than significant for the Metro Plan.

Since the preparation of the Certified EIR, the thresholds for flooding impacts have been updated in Appendix G of the State CEQA Guidelines. As such, the Certified EIR did not consider the risk of release of pollutants due to flooding in flood hazard areas. Nonetheless, implementation of the Metro Plan would result in no new significant effect on flooding. Implementation of the Metro Plan would not result in new significant impacts or significant impacts of increased severity with respect to flooding.

### Tsunami and Seiche

Like the TASP Area, the Metro Plan Area, including the expansion areas, would not be within an area subject to flooding by tsunami or seiche. As such, there would be no risk of release of pollutants due to inundation from tsunami or seiche. The Project Changes would not result in any new impacts or more severe impacts, beyond what was identified in the Certified EIR, related to risk of release of pollutants due to inundation from tsunami or seiche.

## Conclusion

The Certified EIR determined that the TASP would have a less-than-significant impact with regard to hydrology and water quality. Based on the analysis above, with incorporation of the Project Changes, the Metro Plan would have a less-than-significant impact with regard to hydrology and water quality. Therefore, the Project Changes would not result in a change to the Certified EIR's impact determination for impacts on hydrology and water quality. Specifically, the Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**.

# XI. Land Use and Planning

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Physically divide an established community? | ☒ | ☐ | ☐ |
| b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | ☒ | ☐ | ☐ |

The Project Changes, which include the additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on land use and planning that were not analyzed in the Certified EIR. As such, **land use and planning impacts due to the Project Changes are further evaluated in the SEIR**.

# XII. Mineral Resources

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☒ |
| b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | ☐ | ☐ | ☒ |

## Setting

The Existing Conditions Report for the Milpitas General Plan identifies four areas that have been identified by the State Geologist as containing Regionally Significant Construction Aggregate Resources.[37] These four areas are in the foothills outside City limits.[38] In addition, the Existing Conditions Report for the Milpitas General Plan identifies five aggregate mines in Santa Clara County.[39] None of these areas or aggregate mines are within the Metro Plan Area.

## Certified EIR Findings

The Certified EIR did not include an impact analysis or significance determination related to mineral resources.

## Conclusion

Because there are no mineral resources in the Metro Plan Area, the Metro Plan would result in no impact on mineral resources. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**.

[37] City of Milpitas. 2018. *Milpitas General Plan Update Existing Conditions Report*. June. Available: https://milpitas.generalplan.org/content/documents-and-maps. Accessed: September 2021.

[38] Ibid.

[39] Ibid.

# XIII. Noise

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in a local general plan or noise ordinance, or applicable standards of other agencies? | ☒ | ☐ | ☐ |
| b. Generate excessive groundborne vibration or groundborne noise levels? | ☒ | ☐ | ☐ |
| c. Be located within the vicinity of a private airstrip or an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels? | ☒ | ☐ | ☐ |

The Project Changes, which include the additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on noise that were not analyzed in the Certified EIR. As such, **noise impacts due to the Project Changes are further evaluated in the SEIR**.

# XIV. Population and Housing

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)? | ☒ | ☐ | ☐ |
| b. Displace a substantial number of existing people or housing units, necessitating the construction of replacement housing elsewhere? | ☒ | ☐ | ☐ |

The Project Changes, which include the additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on population and housing that were not analyzed in the Certified EIR. As such, **population and housing impacts due to the Project Changes are further evaluated in the SEIR**.

# XV. Public Services

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services: | | | |
| Fire protection? | ☒ | ☐ | ☐ |
| Police protection? | ☒ | ☐ | ☐ |
| Schools? | ☒ | ☐ | ☐ |
| Parks? | ☒ | ☐ | ☐ |
| Other public facilities? | ☒ | ☐ | ☐ |

The Project Changes, which include the additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on public services that were not analyzed in the Certified EIR. As such, **public services impacts due to the Project Changes are further evaluated in the SEIR**.

# XVI. Recreation

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☒ | ☐ | ☐ |
| b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment? | ☒ | ☐ | ☐ |

The Project Changes, which include the additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on recreation that were not analyzed in the Certified EIR. As such, **recreation impacts due to the Project Changes are further evaluated in the SEIR**.

# XVII. Transportation

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? | ☒ | ☐ | ☐ |
| b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? | ☒ | ☐ | ☐ |
| c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☒ | ☐ | ☐ |
| d. Result in inadequate emergency access? | ☒ | ☐ | ☐ |

On September 27, 2013, SB 743 was signed into law, supporting previous climate-focused and transportation legislation, including the Sustainable Communities and Climate Protection Act of 2008 (SB 375) and the California Global Warming Solutions Act of 2006 (AB 32). SB 743 introduced fundamental changes in the assessment of transportation impacts through the CEQA process. These changes include the elimination of auto delay (measured as Level of Service, or LOS) as a basis for determining significant transportation impacts. SB 743 included amendments that revised the definition of "infill opportunity zones" to allow cities and counties to opt out of traditional LOS standards established by CMPs and required the California Governor's Office of Planning and Research (OPR) to update the State CEQA Guidelines and establish "criteria for determining the significance of transportation impacts of projects within transit priority areas." As part of the new CEQA guidelines, the new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." SB 743-compliant CEQA analysis became mandatory on July 1, 2020. Since the CEQA transportation analysis in the Certified EIR predated SB 743, potentially significant impacts were defined differently (i.e., in terms of vehicle delay) at that time and vehicle miles traveled (VMT) was not evaluated, as is currently required. CEQA Guidelines section 15064.3 establishes VMT as the most appropriate measure of transportation impacts. CEQA Guidelines section 15064.3(b)(1) states the following:

> *Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.*

It is expected that the Metro Plan would have less than significant VMT impacts because the majority of the Metro Plan Area is located within one-half mile of a major transit stop (Milpitas Transit

Center). Nonetheless, the Project Changes, which include the additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on transportation that were not analyzed in the Certified EIR. As such, **transportation impacts due to the Project Changes are further evaluated in the SEIR**.

# XVIII. Tribal Cultural Resources

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: | | | |
| a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or | ☐ | ☐ | ☒ |
| b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | ☐ | ☐ | ☒ |

## Setting

The environmental and regulatory setting for the TASP Area is described in the Certified EIR on pages 3.13-1 through 3.13-9 of the *Cultural Resources* section. However, the Certified EIR does not include a discussion of Assembly Bill (AB) 52, which defines tribal cultural resources, because AB 52 had not yet been adopted at the time the Certified EIR was prepared. Thus, no tribal cultural resources were formally designated under the TASP. This information is incorporated by reference pursuant to Section 15150 of the CEQA Guidelines. Refer to Chapter 1, *Introduction*, of the SEIR to which this IS is appended for the location where the Certified EIR is available for public review.

The regulatory setting with regard to tribal cultural resources within the TASP Area has changed since the Certified EIR was prepared. In September 2014, tribal cultural resources were identified as a distinct CEQA environmental category with the adoption of AB 52. For all projects subject to CEQA that received a notice of preparation, notice of negative declaration, or mitigated negative declaration on or after July 1, 2015, AB 52 requires the lead agency on a proposed project to consult with the geographically affiliated California Native American tribes. The legislation creates a broad new category of environmental resources, "tribal cultural resources," which must be considered

under CEQA. AB 52 requires a lead agency to not only consider the resource's scientific and historical value but also whether it is culturally important to a California Native American tribe.

AB 52 defines tribal cultural resources as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are included or determined to be eligible for inclusion in the California Register of Historical Resources; included in a local register of historical resources, as defined in Public Resources Code Section 5020.1(k); or determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to the criteria of Public Resources Code Section 5024.1(c) (CEQA Section 21074).

AB 52 also sets up an expanded consultation process. For projects initiated after July 1, 2015, lead agencies are required to provide notice of the proposed projects to any tribe that is traditionally and culturally affiliated with the geographic area that requested to be informed by the lead agency, following Public Resources Code Section 21018.3.1(b). If, within 30 days, a tribe requests consultation, the consultation process must begin before the lead agency can release a draft environmental document. Consultation with the tribe may include discussion of the type of review necessary, the significance of tribal cultural resources, the significance of the project's impacts on the tribal cultural resources, and alternatives and mitigation measures recommended by the tribe. The consultation process will be deemed concluded when either (1) the parties agree to mitigation measures or (2) any party concludes, after a good-faith effort, that an agreement cannot be reached. Any mitigation measures agreed to by the tribe and lead agency must be recommended for inclusion in the environmental document. If a tribe does not request consultation, or to otherwise assist in identifying mitigation measures during the consultation process, a lead agency may still consider mitigation measures if the agency determines that a project will cause a substantial adverse change to a tribal cultural resource.

No tribes have requested to be informed of CEQA projects in the City pursuant to Public Resources Code Section 21018.3.1(b). Therefore, the City is not required to notify tribes of new CEQA projects pursuant to AB 52.

On March 9, 2021, the City adopted an update to the 1994 General Plan, which is referred to as the 2040 General Plan. The 1994 General Plan does not address tribal cultural resources. However, the 2040 General Plan, which supersedes and replaces the 1994 General Plan, does provide guidance for the preservation of tribal cultural resources and the policies from the 2040 General Plan would apply to the Metro Plan. The following 2040 General Plan policies relate to tribal cultural resources.

- Goal CON-4: Preserve and protect prehistoric, historic, archaeological, and paleontological resources in Milpitas.
- Policy CON 4-2: If found during construction, ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.
- Policy CON 4-3: Work with Native American representatives to identify and appropriately address, through avoidance or mitigation, impacts to Native American cultural resources and sacred sites during the development review process.
- Policy CON 4-4: Consistent with State, local, and tribal intergovernmental consultation requirements such as SB 18 and AB 52, the City shall consult as necessary with Native American tribes that may be interested in proposed new development and land use policy changes.

- Action CON-4b: Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:
    - If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.
    - If human remains are discovered during any ground-disturbing activity, work shall stop until the Planning Department and the County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Planning Department.

The TASP did not provide any polices related to tribal cultural resources, as the Certified EIR was prepared prior to the implementation of AB 52 in 2015. Furthermore, the Metro Plan does not include a policy pertaining to tribal cultural resources. However, the 2040 General Plan and State regulations do provide policies and actions to protect tribal cultural resources.

## Certified EIR Findings

The Certified EIR did not address tribal cultural resources, as it was prepared prior to the implementation of AB 52 in 2015. However, in support of the Certified EIR, a Native American contact list was requested from the NAHC in April 2006. A letter describing the TASP was sent to the tribal contacts on this list but no comments or concerns were received.

## Discussion

As described above, the setting with regard to tribal cultural resources has changed since the Certified EIR. For projects initiated after July 1, 2015, lead agencies are required to provide notice of the proposed projects to any tribe that is traditionally and culturally affiliated with the geographic area that requested to be informed by the lead agency. The 2040 General Plan, adopted by the City in 2021, provides policies and actions to protect tribal cultural resources in compliance with AB 52.

Implementation of the Metro Plan is anticipated to result in new construction that produces additional housing units, commercial office and retail space, and hotel rooms. Ground disturbance associated with new construction could result in temporary or permanent construction-related impacts on tribal cultural resources during ground disturbance. Potential impacts on tribal cultural resources resulting from future development in the expansion areas were not considered in the Certified EIR. However, to date, the City has not received any requests from tribes to be notified of projects under AB 52. Accordingly, no tribal cultural resources have been identified within the Metro Plan Area. Accordingly, there would be no impact on tribal cultural resources.

## Conclusion

The Certified EIR did not address tribal cultural resources. However, based on the analysis above, the Metro Plan would have no impact on tribal cultural resources. The Project Changes would not

result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**.

# XIX. Utilities and Service Systems

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| Would the project: | | | |
| a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | ☒ | ☐ | ☐ |
| b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years? | ☒ | ☐ | ☐ |
| c. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? | ☒ | ☐ | ☐ |
| d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | ☒ | ☐ | ☐ |
| e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | ☒ | ☐ | ☐ |

The Project Changes, which include the additional buildout associated with the Metro Plan and the expansion of the geographic area of the Metro Plan, could result in new or substantially more severe effects on utilities and service systems that were not analyzed in the Certified EIR. As such, **utilities and service systems impacts due to the Project Changes are further evaluated in the SEIR**.

# XX. Wildfire

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| If located in or near State Responsibility Areas or lands classified as Very High Fire Hazard Severity Zones, would the Project: | | | |
| a. Substantially impair an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☒ |
| b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | ☐ | ☐ | ☒ |
| c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | ☐ | ☐ | ☒ |
| d Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? | ☐ | ☐ | ☒ |

## Setting

According to maps prepared by the California Department of Forestry and Fire Protection, the Metro Plan is in a local responsibility area that is classified as a Non-Very High Fire Hazard Severity Zone.[40] The closest State Responsibility Area (SRA) is to the east of the City limits in the hilly terrain. The Metro Plan is approximately 2 miles from an SRA that is classified as a High SRA.

## Certified EIR Findings

Since the preparation of the Certified EIR, the thresholds identified in Appendix G of the State CEQA Guidelines have been updated for wildfire. When the Certified EIR was prepared, Appendix G of the State CEQA Guidelines did not include these current thresholds. As such, the Certified EIR did not include an impact analysis or significance determination to the current wildfire CEQA thresholds.

[40] California Department of Forestry and Fire Protection. 2008. Santa Clara County Very High Fire Hazard Severity Zones in LRA. October. Available: https://osfm.fire.ca.gov/media/6764/fhszl_map43.pdf. Accessed September 2021.

## Conclusion

The area surrounding the Metro Plan is generally developed and lacking features that normally elevate wildland fire risks (i.e., dry vegetation, steeply sloped hills). Because the Project site is not within or near an SRA or Very High Fire Hazard Severity Zone, there would be no impact. The Project Changes would not result in new or substantially more severe effects that were not analyzed in the Certified EIR, and no substantial changes in circumstances have occurred that could result in new or substantially more severe effects that were not analyzed in the Certified EIR. Therefore, **this topic is not discussed further in the SEIR**.

# XXI. Mandatory Findings of Significance

| | Potentially New Significant Impact or Substantially More Severe Significant Impact | Impact Adequately Addressed in Certified EIR | No Impact |
|---|---|---|---|
| a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? | ☒ | ☐ | ☐ |
| b. Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.) | ☒ | ☐ | ☐ |
| c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly? | ☒ | ☐ | ☐ |

## Checklist Item A

Section IV, *Biological Resources*, identifies that the Project Changes would have a less-than-significant impact with regard to biological resources and would not result in a change to the Certified EIR's impact determination for impacts on biological resources. There are very few biological resources in the Metro Plan Area and, as such, the Metro Plan would have a less-than-significant impact relative to impacts on the quality of the environment, fish and wildlife habitat and populations, plant and animal communities, and rare or endangered plants or animals. The Project Changes would not result in a change to the Certified EIR's impact determination for impacts on biological resources.

Section V, *Cultural Resources*, identifies that the Project Changes would have a less-than-significant impact on cultural resources, including historical and archaeological resources, and would not result in a change to the Certified EIR's impact determination for impacts on cultural resources. The Metro Plan includes policies to protect cultural resources and would not eliminate important examples of the major periods of California history or prehistory.

Nonetheless, the Metro Plan may have the potential to degrade the quality of the environment in terms of **air quality and greenhouse gas emissions. This will be addressed in the SEIR**.

## Checklist Item B

The Project would not contribute to cumulatively considerable impacts on most resource areas. However, because there are potential impacts on air quality, greenhouse gas emissions, land use and planning, noise, population and housing, public services, recreation, transportation, and utilities and service systems, **cumulative impacts will be addressed in the SEIR**.

## Checklist Item C

There are potential impacts on air quality and noise; as such, there is a potential that human beings could be adversely affected either directly or indirectly by air pollutants or noise. **Potentially adverse effects on human beings will therefore be addressed in the SEIR**.

Appendix C

# Draft Milpitas Metro Specific Plan

CITY OF MILPITAS

# MILPITAS METRO SPECIFIC PLAN

Public Draft April 2022

Milpitas

URBAN FIELD GROUP

W-Trans

EPS

BKF 100 YEARS ENGINEERS . SURVEYORS . PLANNERS

ICF

WEST YOST Water. Engineered.

LEXINGTON PLANNING

The Milpitas VTA Light Rail Station is an elevated station above Great Mall Parkway in the Milpitas Metro Area. There are two stations in the area, one connecting to Milpitas BART and the other to the Great Mall.

# ACKNOWLEDGMENTS


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MILPITAS

This photo taken in 2020 shows housing construction next to the VTA Light Rail Station at the Milpitas Transit Center, which is connected to BART with a pedestrian bridge. The Metro Plan supports the completion of the neighborhood transformation in to a transit oriented community.

# 1. INTRODUCTION

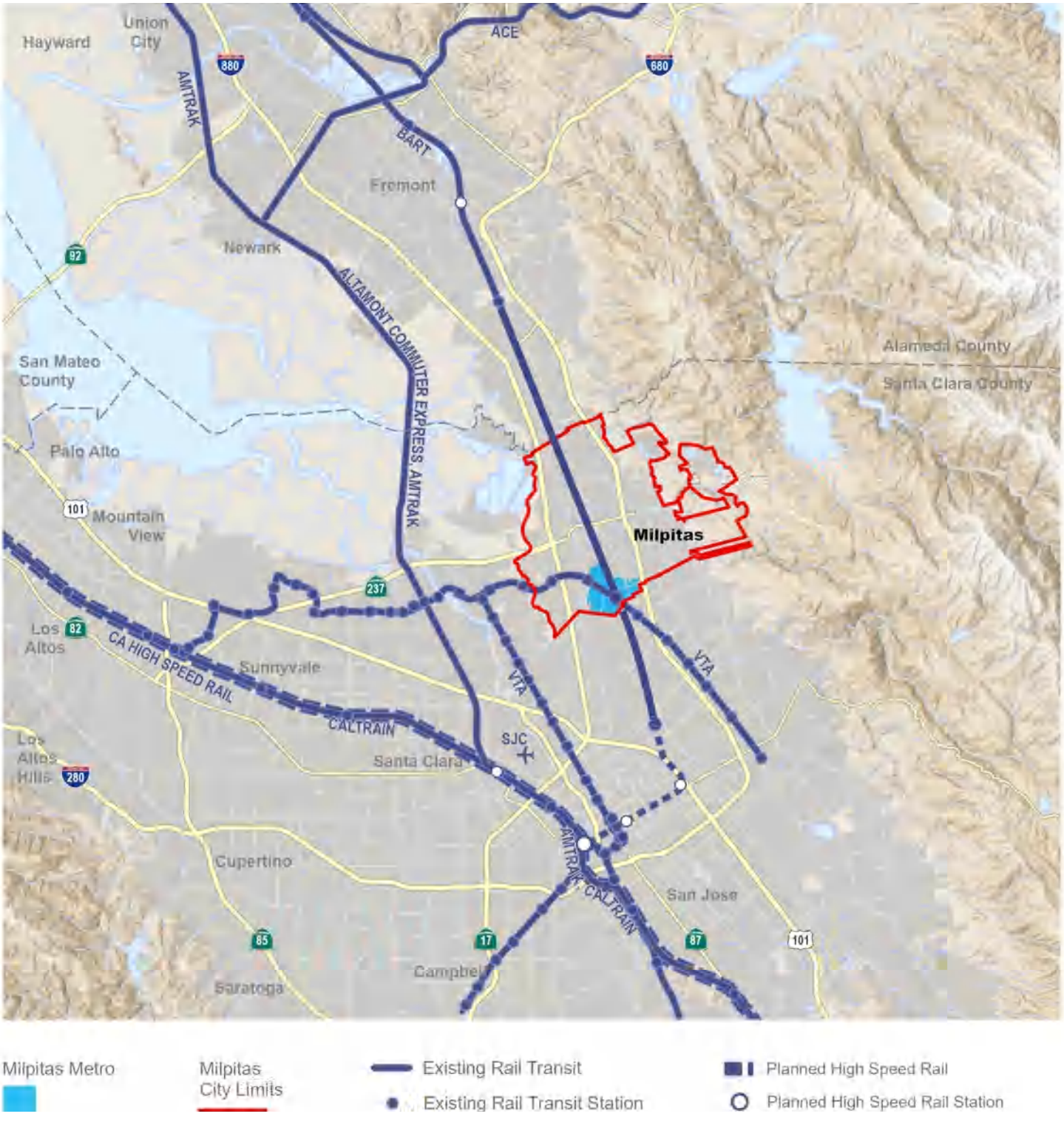

1.1. The Evolution of Milpitas Metro
1.2. Plan Context
1.3. Plan Boundary
1.4. Area Background
1.5. Impacts of the Transit Area Specific Plan
1.6. Relationship to Other Plans/ Programs
1.7. Regulatory Compliance
1.8. Community Engagement
1.9. Plan Vision
1.10. Plan Build Out
1.11. Basic Improvement Program (BIP) and Transit Area Development Impact Fee (TADIF)
1.12. Subsequent Environmental Impact Report (SEIR)
1.13. Milpitas Metro Plan Framework


The Milpitas Metro area is a unique and vital hub in Silicon Valley. It is a major transportation crossroads, including transit stops served by BART, VTA light rail, and bus, and it includes major roadways and highway access. It is also emerging as Milpitas's densest urban center, featuring new multifamily development, a range of shopping opportunities, and a planned Innovation District. This Plan provides a framework for the future evolution of Milpitas Metro. Milpitas Metro will be an urban, future-forward center that supports a balanced mix of housing, retail, and employment uses; provides safe multimodal connections and public spaces; and is distinguished by urban design standards that create a visually memorable environment.

The Milpitas Metro Specific Plan (Metro Plan, MMSP, or the Plan) is an update to the Milpitas Transit Area Specific Plan (TASP), adopted in 2008. The Metro Plan increases the Plan Area from approximately 437 acres to approximately 510 gross acres and includes annexations on the east and west sides of the original Plan Area. The long-term focus of this work is to continue and accelerate the transformation of this area from industrial and auto-oriented to a vibrant, connected, and fully developed transit-oriented neighborhood.

This chapter covers the history and planning context of the Metro Plan Area, the community engagement process, and the anticipated development buildout. This chapter also includes a high-level overview of funding sources for infrastructure and service improvements and the environmental impact of the Metro Plan.

## Figure 1-1. Regional Context



## 1.1 THE EVOLUTION OF MILPITAS METRO

In the late 2000's, the Milpitas Metro Plan Area (Metro Area) was a largely industrial area characterized by wide, fast-moving arterial streets, rail crossings, culverted streams, and the presence of Great Mall, a regional shopping center located in a former Ford Motor Company manufacturing plant.

The City of Milpitas and the Milpitas community saw the opportunity for change in this area, catalyzed by major transit connections along the Santa Clara Valley Transportation Authority (VTA) light rail, the planned Bay Area Rapid Transit (BART) station, and the ongoing growth of Silicon Valley as well as the broader San Francisco Bay Area.

Seizing this opportunity, the City developed a transformative vision for the wider transit area, captured in the Transit Area Specific Plan (TASP), which was adopted in 2008. At the time of adoption, the TASP had 468 existing housing units and anticipated 7,109 new units. The TASP buildout planned for a total of 7,577 residential units, 2,240,000 square feet of retail space, and 1,050,000 square feet of office space to be built by 2020.

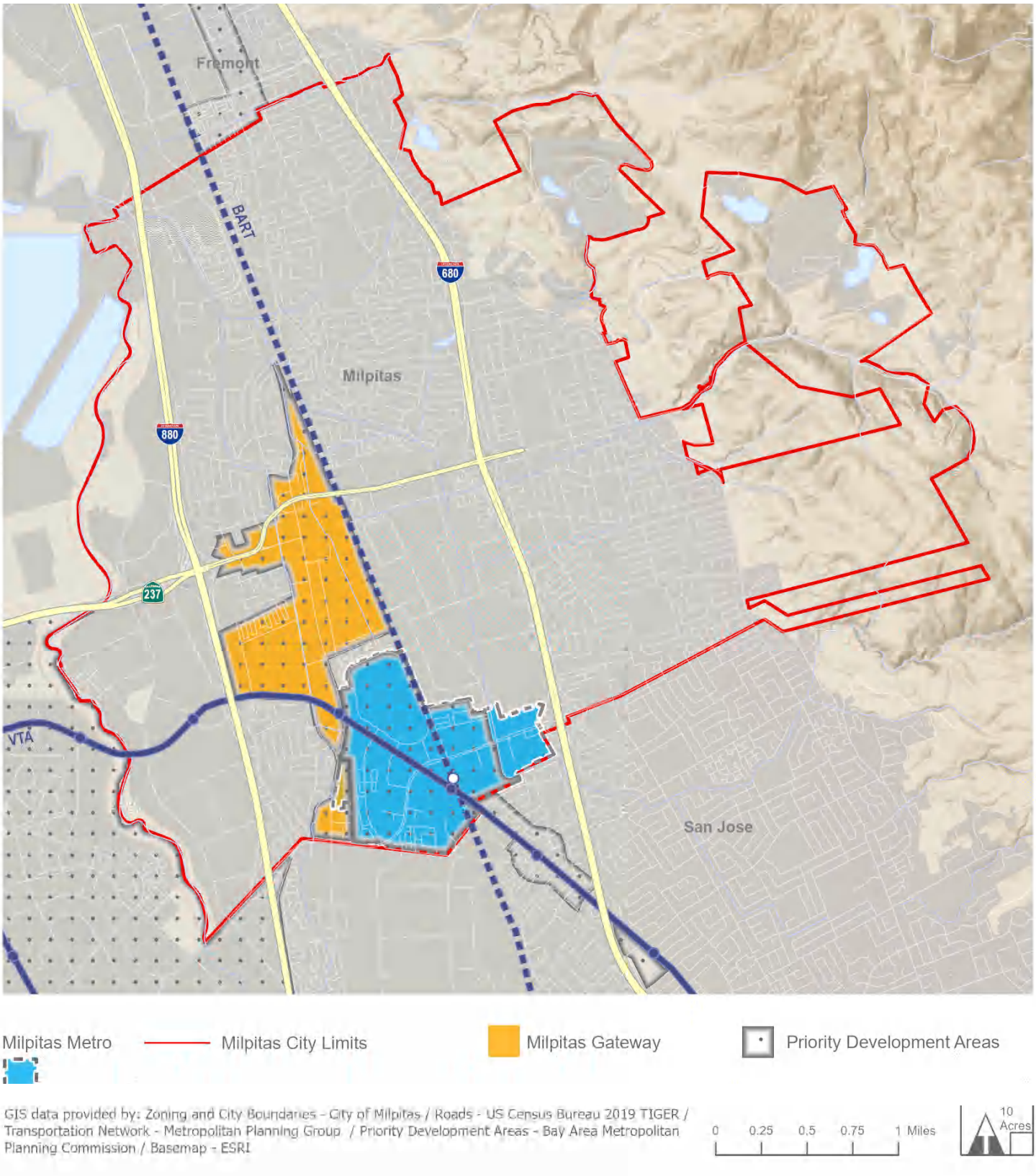
Change came.

Much of the TASP vision became a reality, including the development of the newly opened Milpitas Transit Center, new housing, parks, a grocery store, and other shops. By 2019, 92 percent of the planned residential units were under development. Unfortunately, economic conditions did not support the planned commercial development due to a lack of strong transit access that could support the higher intensity employment development prior to the opening of the BART station. As the area neared its planned residential capacity, the City began a process to update the TASP, now named the Milpitas Metro Specific Plan (Metro Plan or MMSP). This renaming highlights the focus on the Milpitas Transit Center, a regional destination that is also an emerging metropolitan center for the City of Milpitas and the South Bay Area Region.

*Postcard of the Ford assembly plant (now the Great Mall) in 1955.*

The 20-year horizon of the Metro Plan promotes the development of a complete and unique urban neighborhood with a balance of high residential densities, commercial uses, and neighborhood retail. The long-term focus of planning in this area is to support the transformation from an industrial and auto-oriented neighborhood to a vibrant transit-oriented community. The Plan Area has already begun to be a more urban environment with higher densities and larger mixed-use buildings. This plan update sets forth a vision, policies, and

**Figure 1-2. City Context**



implementing framework to further the evolution of the area surrounding the Milpitas Transit Center to make it a complete neighborhood.

The Metro Plan focuses on the Great Mall, the Innovation District, connections and sites that will transform this emerging area into an attractive, vibrant and convenient neighborhood over the next 20 years.

## 1.2 PLAN CONTEXT

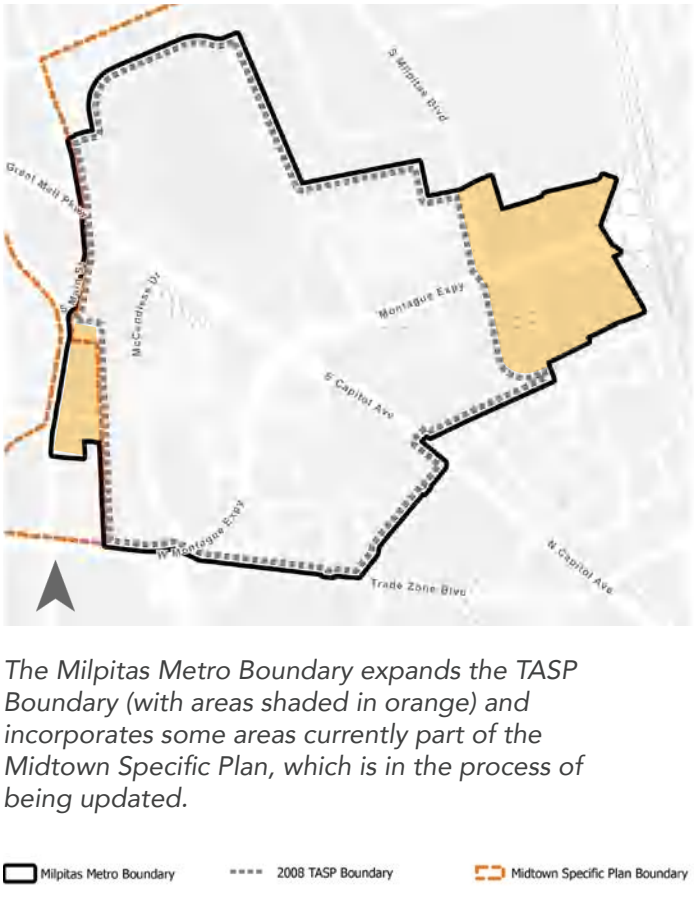
The City of Milpitas is located in northern Santa Clara County with the City of Fremont to the north, the City of San Jose to the west and south, and unincorporated Santa Clara County to the east, as seen in Figure 1-1. The Metro Plan Area encompasses properties within the southern end of the city. Located south of the City's Midtown Plan, the Metro Plan is centered around the Milpitas Transit Center and marks the entrance into the city from the south (Figure 1-2).

## 1.3 PLAN BOUNDARY

The Metro Plan Area expands the original specific plan area to include additional parcels on Main Street and between the Berryessa Creek and Highway 680, which the General Plan establishes as an Innovation District. Refer to Figure 1-3 for a map of the Plan's boundary changes.

The 510-acre Metro Plan Area has been organized into five districts, which are generally separated by major street corridors (Figure 1-4). The location and characteristics of the districts are described in further detail in Chapter 2: Land Use and Public Space.

**Figure 1-3. Plan Area Boundary**




*The Milpitas Metro Boundary expands the TASP Boundary (with areas shaded in orange) and incorporates some areas currently part of the Midtown Specific Plan, which is in the process of being updated.*

**Figure 1-4. Districts**

*The Milpitas Metro districts redefine the subdistricts in the TASP.*

# 1.4 AREA BACKGROUND

For many years, Milpitas has been a major rail hub. This infrastructure is what originally established the community as a key regional shipping point.

## 1.4.1 Industry and Integration

Incorporated as a city in 1954, Milpitas experienced rapid expansion and has grown to become an industrial hub and residential community in Silicon Valley. In 1955, the Ford Motor Company moved its operations from Richmond to Milpitas. In the 1950s, suburban single family homes were built to house the Ford factory workers. The homes in the Sunnyhills neighborhood were the first racially-integrated community in the United States. Milpitas continues to be home for a racially diverse and growing population.

## 1.4.2 Regional Retail

Milpitas' retail core was historically located along Main Street, north of the Metro Plan Area. As the city developed, local and regional shopping centers emerged throughout the city. One of the biggest of these shopping centers is the Great Mall, located in the former Ford assembly plant. After nearly three decades of operation, the Ford plant closed in 1983. The site, including the old assembly buildings, was transformed into the Great Mall of the Bay Area, which opened in 1994. The Great Mall, owned by national retailer and developer Simon Property Group, is a 1.2 million square foot indoor outlet shopping mall, the second largest in northern California. It is a regional shopping destination that includes a

*The Great Mall in the 1990s. (Photo by Dave Cowl)*

variety of factory and outlet retailers from a range of national and international brands, as well as Home Depot, Century Theaters Multiplex, Dave and Busters, and Legoland Discovery Center. It is anticipated that many of these providers will remain in the Great Mall District, even if their locations and physical format formats change.

The Great Mall site will continue to evolve as shopping and lifestyle preferences change and development opportunities arise. While there was little retail in the Plan Area outside the Great Mall for many years, recent development, including at the Milpitas Transit Center and along major arterials, has included more locally-serving retail and dining spaces, including a grocery store on Great Mall Parkway.

Surrounding the Great Mall site are separately-owned parcels that support various commercial uses. Of significance are the two Marriott hotels, Stratford School, the former VTA bus terminal, an office building, and a gas station. These parcels present major development opportunities close to the Transit Center and are discussed in further detail in Chapter 2: Land Use and Public Space.

*Photographs from "The Great Mall holds a great Ford secret". https://www.hemmings.com/stories/2016/11/16/the-great-mall-holds-a-great-ford-secret*

### 1.4.3 Commercial Development at the Crossroads of Silicon Valley

The City of Milpitas is located north of San Jose and east of Santa Clara, Sunnyvale, and Mountain View along Highway 237, and is part of Silicon Valley. Tech companies and related high-skilled manufacturing businesses have been locating in Milpitas since the mid-1980s. Milpitas is often referred to as the "Crossroads of Silicon Valley",

Aerial images of the Metro Area in 2006 and 2019. (Google Earth)

*The Plan Area was predominantly single-story office and industrial development prior to its transformation into a Transit Oriented Neighborhood.*

*The BART extension of the Warm Springs/ South Fremont line through Milpitas began construction in 2015 and opened for service in 2020. (The Mercury News)*

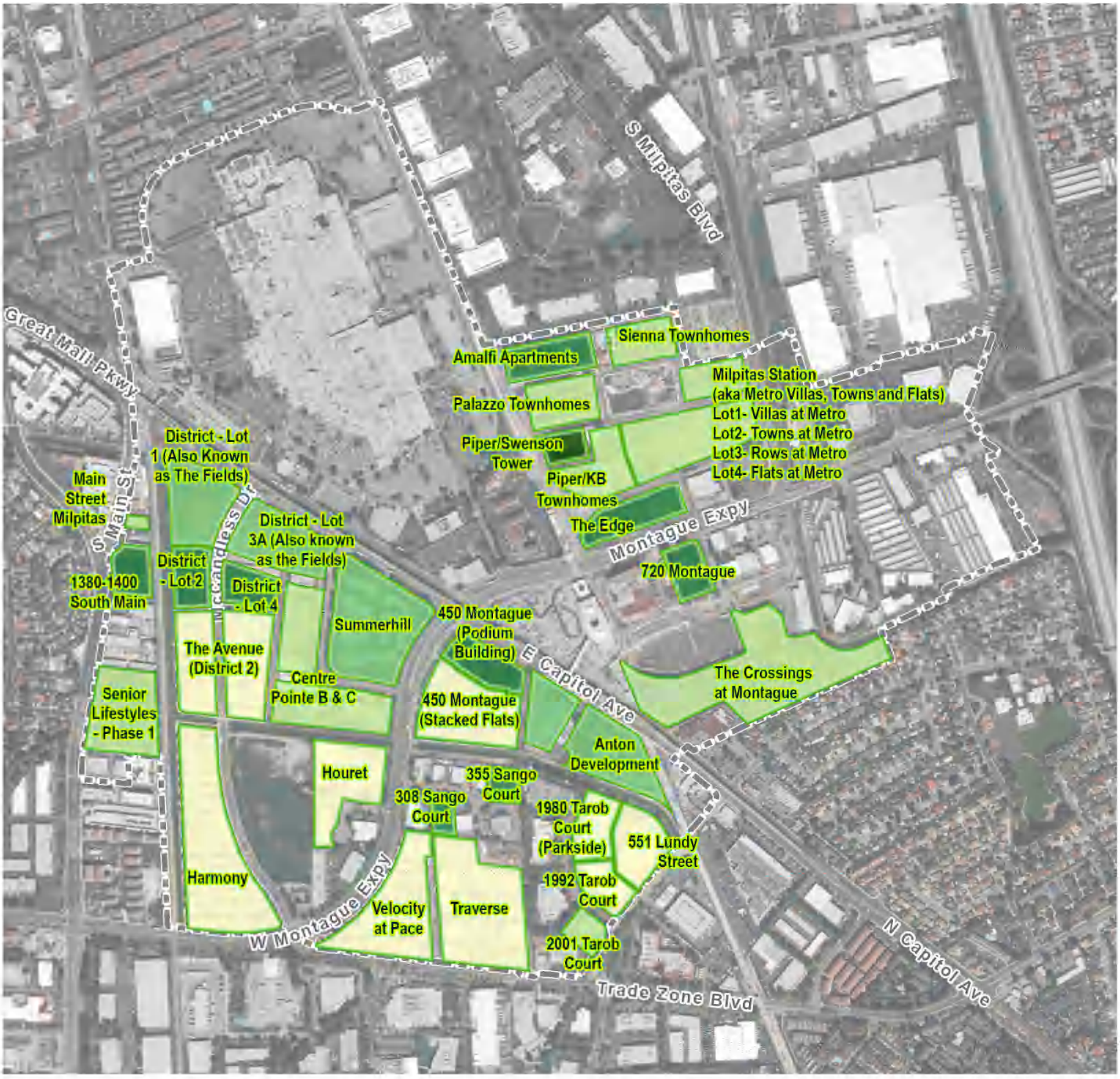
with most of its 13.63 square miles of land situated between two major freeways (I-880 and I-680), State Route 237, and County-managed Montague Expressway.

Single story, light industrial business parks were the predominant land use in the Plan Area prior to the transformation planned with the TASP. To preserve land for future employment uses, the Metro Plan establishes a framework for significant office and research & development (R&D) development in the Innovation District.

### 1.4.4 Regional Transit

While Milpitas has been a major vehicle and freight railroad transportation hub for decades, regional transit planning in the 2000's increased the importance of the Milpitas Metro Area to the City of Milpitas. Cities near Milpitas had the advantages of both Caltrain and BART transit to attract economic development, as well as higher density residential development to support higher intensity employment opportunities. The extension of VTA and BART lines into the Milpitas and East San Jose areas generally, and specifically into the Metro Area, meant that the Plan Area would be more regionally connected than any other part of the City of Milpitas. VTA completed construction of the Tasman East Extension in 2004, extending the regional light rail transit system and adding Great Mall/Main Street and Montague Expressway stations in Milpitas. A new Milpitas BART station, which opened in June 2020, was proposed at the intersection of Montague Expressway and Capitol Avenue. The TASP was originally developed to anticipate new development around the Milpitas Transit Center and respond to the continued growth of Silicon Valley by transforming a low-density industrial area into a mixed-use, transit-friendly area.

## Figure 1-5. Development Since the Transit Area Specific Plan (2008)



## 1.5 IMPACTS OF THE TRANSIT AREA SPECIFIC PLAN

The Transit Area Specific Plan (TASP) was adopted in 2008, shortly before the Great Recession. Redevelopment in the area was slow to arrive, but as market conditions improved, residential projects of increasing intensity were proposed and constructed throughout the Plan Area, resulting in a striking urban transformation. Table 1-1 summarizes the housing, office, retail, and hotel development envisioned under the TASP and the amount of entitled development as of 2019.

### 1.5.1 Residential Development

By 2019, new development on significant tracts of land within the TASP area had reached much of the planned residential capacity (Figure 1-5). Early projects in the TASP Area featured townhouses in the Piper/Montague, McCandless/Centre Pointe, and Trade Zone/Montague Subdistricts (now the Piper, McCandless, and Tango Districts respectively).

The majority of early townhome projects were located away from the major vehicular corridors, such as Great Mall Parkway and Montague Expressway.

Subsequently, dense mid-rise residential and mixed-use projects were built and entitled in the Innovation, McCandless, and Tango Districts along Capitol Avenue, Montague Expressway, and Main Street. New development where significant mixed use was realized includes "The District" (later called "The Fields") across from the Great Mall on McCandless Drive, which includes neighborhood retail, urban scaled

**Table 1-1. Development Following the Transit Area Specific Plan**

| Land Use | Existing Development in 2008 | TASP Planned New Development | Total TASP Planned Development (columns 1+2, Projected for 2020) | Entitled by 2019 |
|---|---|---|---|---|
| Dwelling Units | 468 | 7,109 | 7,577 | 6,955 |
| Office (sf) | 52,780 | 993,843 | 1,050,000 | 10,630 |
| Retail (sf) | 1,970,000 | 287,075 | 2,240,000 | 186,500 |
| Hotel (rooms) | 292 | 350 | 642 | 175 |

residential, and a hotel around a public gathering space. A few 100 percent affordable housing projects have also been approved within the Tango District and along South Main Street.

### 1.5.2 Commercial Development

Commercial development envisioned under the TASP has not been fully realized. Examples of commercial development include retail, office, and hotel land uses. As of 2019, approximately two-thirds of the commercial development planned had been built, as described in Table 1-1. Several notable new commercial developments in the Plan Area include a completed grocery store and ground floor retail on Montague Expressway directly across from the Transit Center; ground floor retail in a mixed use development along Great Mall Parkway and Capitol Avenue; and an entitled hotel at The District.

Commercial retail in the area is well represented at the Great Mall, which is a significant traditional regional retail, dining, and entertainment destination. Neighborhood serving retail spaces are being built at the ground floor level of new mixed-use projects to serve the local population's daily needs.

Although market conditions have favored residential development, proximity to freeways and public transit makes this area ideal for commercial office and other employment uses as part of the Milpitas Innovation District.

*The Edge Apartments: New high-density mixed-use development directly across Montague Expressway from the Milpitas Transit Center.*

*Capitol 650: New high density residential development at Montague and Great Mall Parkway.*

*Townhouses in the McCandless District.*

### 1.5.3 Public Investment

Since the TASP's adoption in 2008, the most significant publicly financed infrastructure built in the Plan Area is the Milpitas Transit Center, which includes a BART station, bus station, and light rail station. The VTA Transit Center was a project that was paid for by Measure A, the State of California Traffic Congestion Relief Program, and the Federal Transit Administration New Starts Program. The BART extension represents a public investment of $2.3 billion including both Milpitas and Berryessa BART Stations.

Recent public investment in the Metro Area also includes new infrastructure and maintenance of existing facilities, such as publicly-owned roads, parks, utility lines, and public services, including fire, police, and school funding. Streetscape improvements were also made as part of new development. These projects are typically funded through impact fees collected from new private development under the TADIF (Transit Area Development Impact Fee) or built on-site.

The TADIF paid by developers of new housing projects also helped to fund three new parks in the Piper, Tango, and McCandless Districts; a pedestrian overcrossing across Montague Expressway; and a new extension of S. Milpitas Boulevard. Additional public investments include improvements to Montague Expressway coordinated by Santa Clara County's Roads and Airports Department and the expansion of Milpitas Unified School District's facilities. In anticipation of the new population planned under the TASP, the School District built Mabel Mattos Elementary School adjacent to the new park in the McCandless District. Phase 1 has been completed, and Phase 2 is being redesigned to allow increased student capacity.

Several additional infrastructure projects are programmed into the original TASP and will be built as resources are available. To facilitate the budgeting process for the Basic Infrastructure Program (BIP) through the Capital Improvement Projects (CIP) Program, the BIP could prioritize key projects that are needed by or benefit the built, under-construction, or near-term development projects within the Metro or other projects in the City that might utilize TADIF funds.

## 1.6 PLAN VISION

The Milpitas Metro Specific Plan sets the stage for vibrant, connected districts with active public spaces, employment centers, and affordable housing surrounding the Milpitas Transit Center. The Milpitas Metro identity as an urban, future-forward, inclusive, and world-class competitive district will distinguish itself from other areas in the city and South Bay Region.

The Metro Plan considers what transit riders and visitors see when they visit the Milpitas Transit Center for the first time, as well as everyday experiences of people commuting and living in the area. The Plan expands neighborhood services and the variety of retail in the area, and creates commercial space for jobs near transit.

The sense of uniqueness in the Metro Area will be strengthened by urban design standards that ensure high quality building design and public places to create visually memorable spaces. The sense of place and identity will also be enhanced by public art and landmark features. Public investment in the public realm will help to strengthen the spatial understanding of the Metro Area and the social and cultural image of the area.

The Metro Area Plan features urban housing and a thriving Innovation District in addition to a range of retail and entertainment options in and around the Great Mall.

Milpitas Metro will be competitive with other major transit nodes in the region when it becomes a place that celebrates a walkable lifestyle with convenient places to live and work

# MILPITAS METRO PLAN VISION

**The core of the Milpitas Metro Plan Vision is:**

## To create a complete and unique urban neighborhood

A complete neighborhood includes neighborhood services, a variety of retail, a balance of jobs and housing, with jobs near transit, affordable and market rate housing, safe and attractive multimodal connections, a variety of shared public spaces, and a strong sense of place with memorable architecture and landmarks.

with a wide range of neighborhood services and transit options just steps away. Milpitas Metro neighborhoods will be multimodal-friendly with safe routes for bicycles and pedestrians that connect housing to activity centers, such as retail services, office uses, and the Milpitas Transit Center.

Pedestrian-friendly streets will support mixed-use development that will house local community-serving retail and restaurants and high-density housing that is affordable for a range of income levels. Commercial buildings (i.e. office, R&D, and light industrial) near the Milpitas Transit Center will create a nexus of activity in the core of the Metro Area.

The Metro Plan calls for shared public spaces to provide a variety of recreational and contemplative environments for residents, workers, and visitors. Large plazas, creek trails, and small parklets will provide a balance of open space opportunities for community members to enjoy outdoor space in this vibrant urban area.

### 1.6.1 Great Mall Parkway

The Great Mall Parkway is a central corridor of the Metro Area and a gateway to Milpitas. Transit riders will be arriving near or on Great Mall Parkway below grade on BART, at grade on bus, and above grade on VTA Light Rail. Great Mall Parkway is a well-traveled and wide road that has the capacity for more transportation modes and a transformation of character.

It is possible to transform this important roadway to provide a more welcoming environment for pedestrians and cyclists without reducing the number of vehicle travel lanes on Great Mall Parkway by narrowing the central median, which is up to 40 feet wide in some areas. Adding protected bike lanes, a generous street side pathway in a linear park, and activity at the base of street-facing buildings will make the Great Mall Parkway look and feel more like a "Great Parkway" and serve the area better. The above grade light-rail tracks are a significant landmark for the area but not yet celebrated as a defining feature. Enhancing the light rail structure with public art would help create an identity for the area. There are options for transforming the street to maximize its multimodal benefits in areas where the City controls the at-grade right-of-way.

### 1.6.2 The Great Mall District

Economic and social forces are evolving the demand for brick-and-mortar retail. In response, the Milpitas Metro Specific Plan envisions that the Great Mall District, which includes Great Mall itself, will transform itself over time from an indoor mall surrounded by parking lots and isolated buildings into a vibrant mixed-use neighborhood with lifestyle retail and entertainment on a walkable street grid. The opening of the Milpitas Transit Center across Montague Expressway from the Great Mall brings new regional access within walking distance of the Great Mall District, which includes multiple ownerships. The Great Mall is an important asset in the area, with regional-serving entertainment, outlet shopping, and a large format retail environment. The Metro Plan provides a variety of options for the future evolution of the district, including reimagining the buildings and parking

areas on this property, by allowing more land uses and more density.

The Metro Plan envisions new jobs and housing, especially in portions of the district nearest transit, a central gathering space, walkable street grid, and development along Great Mall Parkway that reflects the scale of development on the other side of the parkway.

Transformation of the Great Mall to a more urban format could occur quickly or over a multi-phase period, depending on economic and market forces and the objectives of property owners. This Plan establishes broad revitalization goals for the entire district, with implementation taking shape via zoning and/or a Development Agreement process.

### 1.6.3 The Innovation District

The Innovation District is a neighborhood in the Metro Plan that is envisioned as a thriving employment destination featuring modern office, creative flex space, and R&D buildings. Zoning also allows for limited residential uses south of the Transit Center on the south side of South Milpitas Boulevard Extension.

Overlapping with this geographic district is the Milpitas Innovation District which is established in the City's Economic Development Strategy. The Milpitas Innovation District is a 57-acre area that includes land adjacent to the Great Mall in the Great Mall District and parcels on both sides of Montague Expressway in Milpitas Metro's Innovation District. The opening of the Milpitas Transit Center and the extension of regional BART service into the South Bay changes the outlook for the Milpitas Innovation District by

*Public realm improvements near the Milpitas Transit Center include open spaces, streetscape improvements, and new pedestrian overhead bridges.*

*The Edge Apartments: New high-density residential development on Montague Expressway near the Milpitas Transit Center.*

*Anton Aspire Apartments: New high-density residential development in the Tango District.*

*Townhouses: New townhouse development in the McCandless District.*

*The Milpitas BART Station was opened in June 2020. This station is part of the Phase I extension of BART to San Jose and is the second to last station, with Berryessa Station as the end of the line.*

giving it valuable direct transit access to other parts of the Bay Area.

The Metro Plan envisions the construction of new South Milpitas Boulevard extension that creates new access over Berryessa Creek, likely a pedestrian/bicycle bridge, to provide direct connections for workers, residents and visitors between the eastern part of the Milpitas Metro's Innovation District and the Transit Center. A new street grid will maintain connections to the expressway, and retail services will provide a vibrant street environment for people working and visiting there.

### 1.6.4 Public Realm and Streetscape

The public realm includes the spaces shared by everyone in the community, which include open spaces, parks, streets, and public amenities. The successful development of the public realm is the result of public investment and contributions from private developers. Milpitas' public infrastructure program, funded by the Transit Area Development Impact Fee (TADIF) and Citywide funds, will provide many of the public amenities planned for in the Metro Plan.

Private development, both commercial and residential, further contributes to the public realm with the construction of streetscape and amenities that serve the public. Newly developed mixed-use and multifamily projects have enhanced and will continue to improve the public realm with parks, pathways, and generous streetscape improvements that support the pedestrian experience.

The design of the public realm is important because it is integral to a sense of place. The public realm is a place where social interaction can take place and where the neighborhood's vibrancy is on display. New neighborhood parks throughout the Metro Area in the Piper, McCandless, and Tango Districts were built as a result of the TASP. The park in the Tango District will be expanded. New publicly accessible parks in the Innovation and Great Mall Districts, as well as a signature linear park along Great Mall Parkway, are also planned, offering opportunities to gather, relax, and play throughout the Plan Area. The City has been purchasing land to establish the parks in the Metro Area with funds collected from new development in the area. New development has also been providing publicly accessible amenities and on-site improvements that make the area more livable.

The public realm, through a network of pathways and pedestrian and bicycle bridges, helps to connect the area and provide access between districts and to transit. Significant improvements to the Metro Area have been recently completed, including a pedestrian overcrossing over Montague Expressway. Additionally, South Milpitas Boulevard Extension, McCandless Boulevard, Main Street, and internal roads are all streets that the City of Milpitas improved as Complete Streets in the Metro Area. Santa Clara County was responsible for improvements to Montague Expressway in conjunction with its widening, which included landscaping, new street lighting, and sidewalks. These improvements are critical to the connectivity of the neighborhood.

Additional improvements outlined in this plan will complete the connections that surround the Transit Center.

### 1.6.5 Urban Form

The urban character of buildings in the Milpitas Metro Area make it stand out from the rest of Milpitas. Well-designed, tall buildings can help establish a sense of place for the City of Milpitas. Taller buildings signify the City's importance, and their physical form become landmarks to help people orient themselves. More intense development in larger buildings reflects the growing economic value of the lands near the mass transit hub and within the focused Metro Area generally.

The Metro Plan landmarks that define its character will include taller new development, the linear park along Great Mall Parkway, public art on the light rail structure and bridges, and inviting trails and recreation pathways along and over creeks.

A bicycle- and pedestrian-focused urban form will complete the transit connectedness for the Metro Area and to make it easier to travel without a private vehicle.

### 1.6.6 Wayfinding

Wayfinding is the experience of an individual making their way through an unfamiliar environment. The identity of the neighborhood and how to navigate it is most explicitly expressed through wayfinding signage. Clues in the structure of the city itself also implicitly help orient people in the environment.

Consistent signage will help people understand where they are in the Metro Area. The use of consistent terminology and graphics across a range of mediums will build a distinctive sense of place and project a consistent image for the area while encouraging increased rates of active transportation by helping people identify more interesting or alternative routes. The Specific Plan envisions Metro branded signage that is integrated with citywide branding to establish a welcoming, energetic tone for the community. Signage can also help express Milpitas Metro's diverse districts and unique character. The design for signage will be easy to identify and tailored to the needs of pedestrians, bicyclists, transit riders, and low speed electric vehicles as well as automobiles and trucks. Signage in the Milpitas Metro Area will be integrated into the City's branding, signage, and wayfinding program.

### 1.6.7 Urban Destinations and Retail Mix

The attractions in the Metro Plan Area currently include the Great Mall's regional-serving shopping and entertainment, neighborhood parks, and emerging neighborhood retail in the McCandless District. The Metro Plan envisions the Great Mall as a regional destination but with a greater variety of uses; the McCandless District as an emerging destination for residents and visitors, with neighborhood services and gathering places; the Innovation District as a regional employment destination; and the local parks as destinations connected by a trail network for the residents, workers, and visitors in the area, which will include a linear park on Great Mall Parkway. These attractions will strengthen the area and make it more livable.

The Metro Plan further envisions retail concentrated into nodes along Activity Streets within districts, where ground floor retail will be highly visible and economically viable.

### 1.6.8 Leading-Edge Sustainability

Milpitas has a citywide goal of reducing greenhouse gas emissions by nearly 50 percent from 2005 levels by 2030 and reaching carbon neutrality by 2045. To reach these targets, the City has taken a holistic approach to reduce emissions, particularly in the transportation sector and emissions related to energy usage in buildings.

Over the next few decades, the City's General Plan envisions that the majority of new development will continue to occur within the Milpitas Metro Area. Sustainability strategies implemented in the Metro Plan will have a significant impact on the City of Milpitas and greater environment for years to come. The Milpitas Metro Plan is an early adopter of policies in the Climate Action Plan and contains policies that will increase the sustainability of the area through building standards that reduce emissions and increase reliance on renewable energy sources; transportation strategies that manage automobile usage and promote low- and zero-carbon transportation options; targeted strategies to reduce waste; and landscaping requirements to ensure reductions in water use.

## 1.7 COMMUNITY ENGAGEMENT

The development of the Milpitas Metro Specific Plan has been guided by robust community engagement with regional public stakeholders, private developers, residents in the Plan Area and City as a whole, as well as City decision makers. Stakeholders have been engaged throughout the process to ensure that the Plan's development reflects the community's priorities. Community engagement opportunities included:

- **Website.** The Milpitas Metro Specific Plan website was created at the start of the planning process. The website provided updates on the status of the Plan and opportunities for community engagement. Community members were able to join the Milpitas Metro Specific Plan mailing list and leave comments about the Plan.
- **City Council Meetings.** The Milpitas City Council was actively engaged in directing work on the Metro Specific Plan beginning with the early visioning process. In addition to regular check-ins, a series of in-depth study sessions were held with the Council to develop the framework for land use, mobility and circulation, the public realm, and the Innovation District. City Council members responded to policy recommendations and provided detailed feedback on key concepts and strategies to be incorporated into the Metro Specific Plan. The City Council also reviewed the Draft Plan and approved the Final Plan and environmental review documents in accordance with CEQA.

- **City Commission Meetings.** Various City Commissions, including the Planning Commission and the Economic Development and Trade Commission were engaged throughout the process. City Commissions provided feedback on the Innovation District and the wider land use strategy in the Plan.
- **Community Outreach.** Decision makers and members of the public were invited to participate in outreach events to shape the contents of the plan at each phase of plan development. The community outreach is described in more details below.

### 1.7.1 Existing Conditions Phase

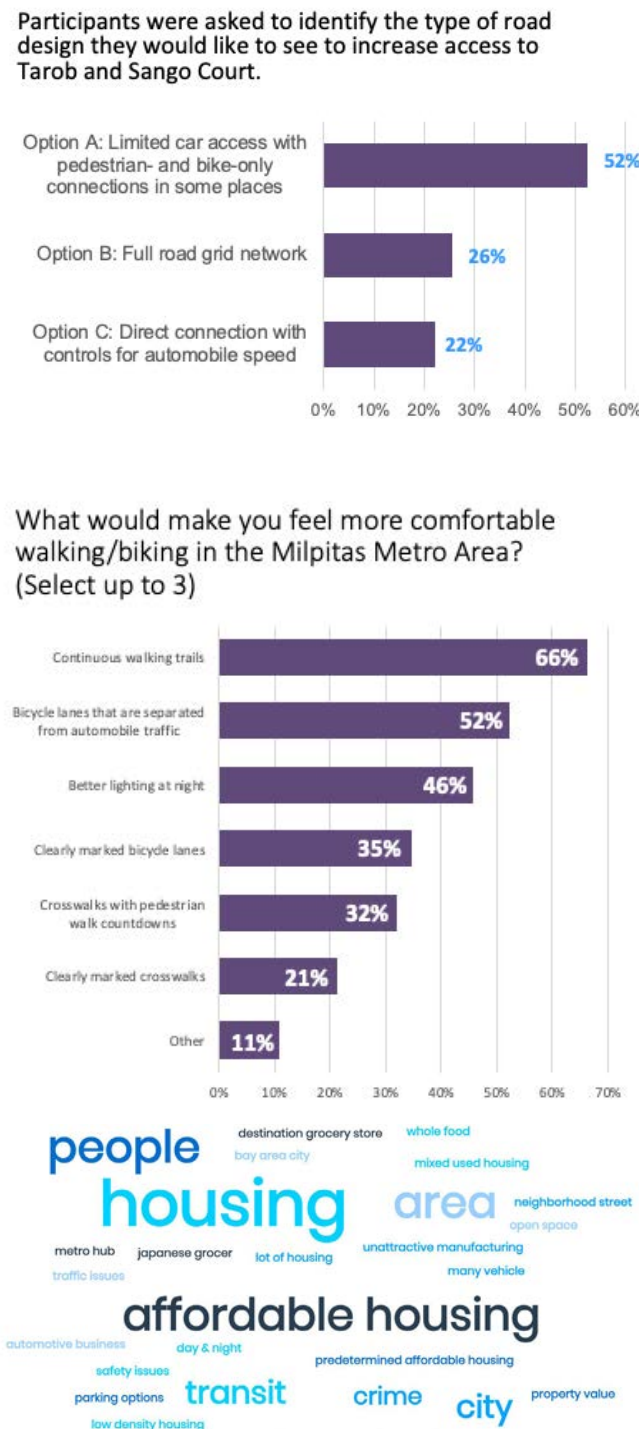
In the existing conditions phase, the planning team solicited community concerns and priorities that were used to guide the preliminary approach to the Plan update.

- **Map-Based Public Survey.** This map-based online survey was released at the beginning of the planning process and collected 316 responses. Respondents were asked to identify destination and service needs in the Plan Area, such as open space and retail, as well as where they would like to see future commercial, office, and housing development. The results from the survey informed conceptual ideas for the Milpitas Metro Specific Plan, which were presented to the City Council.
- **Stakeholder Interviews.** Interviews were conducted with 24 different stakeholder groups, including the Chamber of Commerce, Milpitas Unified School District (MUSD), Santa Clara Valley Transportation Authority (VTA), private commercial and housing developers, and City departments, to identify priorities and concerns for development in the Metro Area.

### 1.7.2 Plan Framework Phase

In the Plan Framework phase, the community provided feedback on conceptual land use and transportation connection ideas.

- **Community Meeting.** An interactive community meeting was held online on September 30, 2020 to assess the community's attitudes towards conceptual ideas on land use and pedestrian and bicycle connections in the Plan Area. Attendees answered polling questions throughout the presentation and were able to give additional comments and have questions answered during the Q&A and open comment period.
- **Online Open House.** An online Open House was available on the project website for 3.5 weeks in October 2020 following the community meeting. This was an opportunity for community members who were unable to attend the community meeting to learn about the Metro Plan and provide input. Materials presented were the same as at the community meeting. A survey that mirrored the polling questions asked during the




*Online Open House results for questions about road design, walking, and biking, and a word cloud of important considerations for the Metro Area.*

community meeting gathered a combined total from the meeting and open house of 101 participants.

### 1.7.3 Draft Plan Phase

In this last phase, community members were invited to review and provide comments on the Public Draft of the Metro Plan and corresponding Environmental Impact Review (EIR) before the Plan was presented to City Council for adoption.

- **Community Meeting: Draft Plan**. A community meeting and an asynchronous online open house were conducted following the completion of the Public Draft of the Milpitas Metro Specific Plan. Community members were given the opportunity to respond to the draft Milpitas Metro Specific Plan and voice any feedback they would like to see incorporated into the Plan.
- **CEQA Review.** The City prepared a Notice of Preparation (NOP), which provided an overview of the Metro Plan. The City held a scoping meeting to inform public agencies and members of the public about the Project and the CEQA process in September 2021. Public comments on the scope of the EIR, per the California Environmental Quality Act (CEQA), were accepted through mid-October. Following the completion of the Draft EIR, public agencies and members of the public were given an additional opportunity to provide comments on the document.

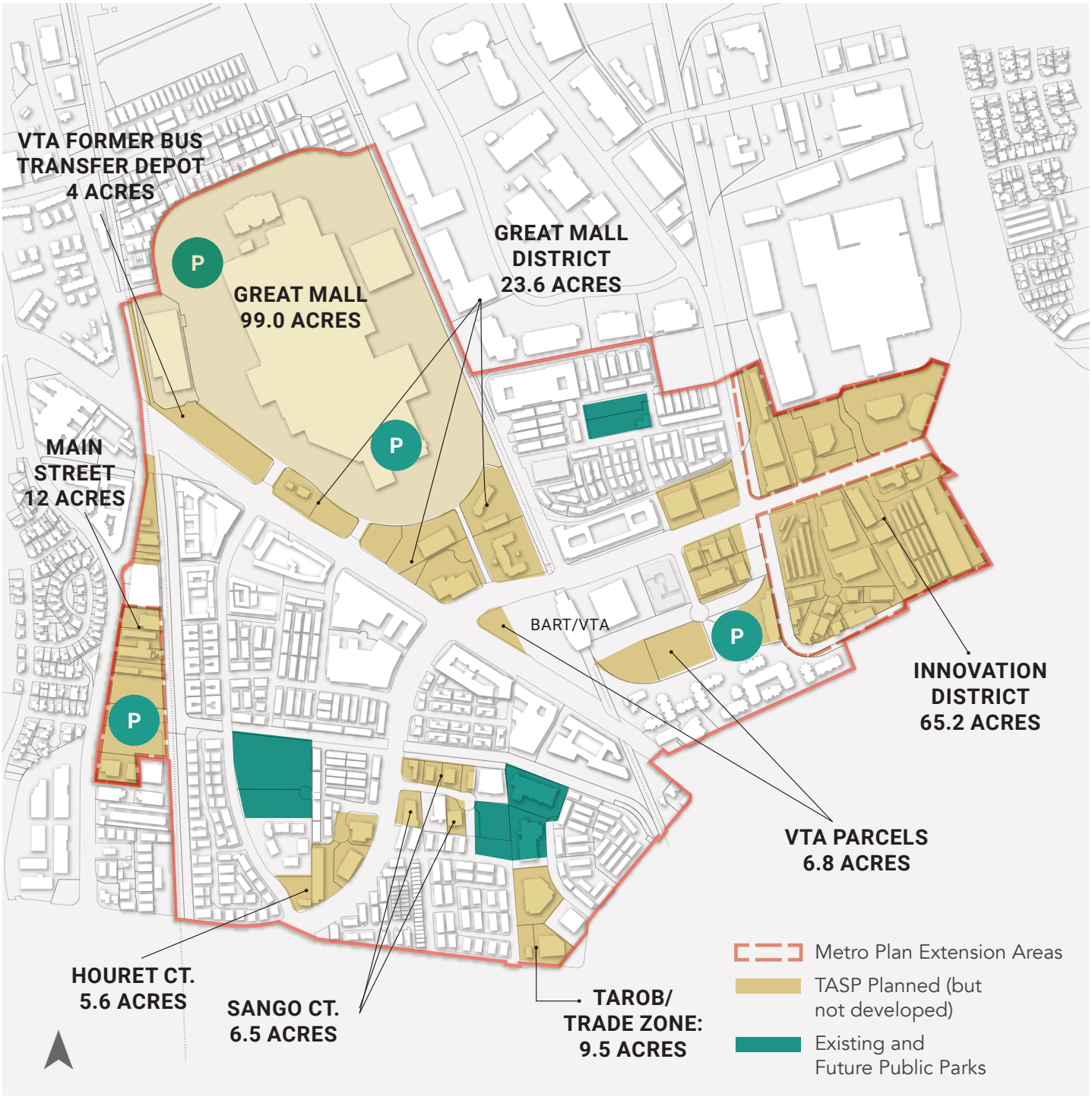
### 1.7.4 Feedback Highlights

Key takeaways from the community engagement efforts included the following:

- Top priorities for the Metro Plan should be providing open space, fun destinations, and safer streets.
- Pedestrian and bicycle connectivity are generally higher priorities than addressing vehicular traffic.
- More retail activity is highly desirable.
- There are concerns about safety/crime issues, too much housing, and increases in traffic congestion.
- The community provided input to address connectivity challenges in the Plan Area. 72 percent of participants at the Community Meeting and Open House expressed that pedestrian and bicycle connections are a higher priority than vehicular traffic speed. There was also an interest in limiting car access by building new pedestrian- and bicycle-only connections in the Tango District. The top three types of open spaces identified by the community included plazas/ courtyards, farmers' markets/ community fairs/ event spaces, and trails.

*The Milpitas Metro Plan started with a City staff and consultant team workshop in March 2020, prior to the COVID-19 pandemic. All subsequent meetings and community outreach were conducted online.*

**Figure 1-6. Properties Not Redeveloped Since 2008**




The remaining parcels include additions to the Plan Area, infill sites throughout the area, and the Great Mall.

## 1.8 PLAN BUILD OUT

Since 2008, the Plan Area has experienced significant change and development. Table 1-2 summarizes the anticipated build out generated by the Milpitas Metro Specific Plan.

Many of the early projects in the Plan Area included townhouses in the Piper District, the McCandless District, and along Trade Zone Boulevard. More recent projects have included higher-density residential and mixed-use projects along Great Mall Parkway, Main Street, and Montague Expressway.

While significant development has occurred in the Plan Area, several large sites have not been redeveloped or intensified and were not identified for development in the TASP, including the Great Mall, three VTA-owned sites, and properties in the Innovation District. Some smaller sites that were identified for redevelopment have not yet changed uses either. Figure 1-7 identifies the properties that have not been developed or redeveloped since the TASP was adopted, and Plan Area expansion areas.

The Metro Plan's anticipated build out is determined by considering a reasonable and supportable portion of the capacity of the remaining undeveloped parcels for more commercial and residential development, as well as necessary open space and amenities. The Innovation District is a largely low-intensity

**Table 1-2. Plan Build Out**

| Land Use | Existing Development in 2008 | TASP Planned New Development | Additional Projected for Milpitas Metro Specific Plan by 2040 | Total |
|---|---|---|---|---|
| Dwelling Units | 468 | 7,109 | 7,000 | 14,577 |
| Office (sf) | 52,780 | 993,843 | 3,000,000 (includes 500,000 sf of industrial) | 4,046,623 |
| Retail (sf) | 1,970,000 | 287,075 | 300,000 | 2,557,075 |
| Hotel (rooms) | 292 | 350 | 700 | 1,342 |

industrial area that will support office, R&D, and industrial growth in the next 20 years. Of the 3,000,000 square feet of new office space projected in the Plan Area, 2,500,000 square feet will be accommodated in the Innovation District.

In collaboration with the property owner, Simon Property Group, the City of Milpitas envisions the Great Mall as another site that is critical to future development. This site is expected to support a significant amount of anticipated office space, a substantial amount of multifamily housing, and the bulk of new commercial retail.

### 1.8.1 Jobs/Housing

Milpitas Metro continues to be a major opportunity site for housing development in Milpitas. Development of the City's next Housing Element is currently underway and will be completed by January 2023. City staff from the Department of Building Safety and Housing have been involved in the preparation of the Milpitas Metro Specific Plan to ensure close alignment with the city's overall housing strategies.

As currently calculated, total capacity for additional residential units in Milpitas Metro is approximately 5,000-7,000 total, with 2,000-4,000 units on the Great Mall site, and 3,000 units scatted on other sites throughout the Metro Area. As the Housing Element is developed, the City will determine which sites to identify in the Housing Element.

The Milpitas Metro Plan envisions the development of not only transit-oriented housing, but also commercial office, creative flex space, and R&D uses that will serve as employment hubs and balance Milpitas' housing provision with local employment. The Metro Plan preserves and expands employment space through zoning changes, primarily in the Industrial District. New commercial office, R&D, retail, and hotel space is anticipated to create over 12,000 new jobs in the Metro Area. Projected job generation by land use is summarized in Table 1-3.

**Table 1-3. Employment Generation**

| Land Use | Employment Density Assumptions | MMSP Development Potential | New Jobs Generated |
|---|---|---|---|
| Retail | 350 square feet per job | 300,000 square feet | 857 |
| Office (sf) | 260 square feet per job | 2,500,000 square feet | 9,615 |
| Hotel | 1 room per job | 700 rooms | 700 |
| Industrial/R&D | 450 square feet per job | 500,000 square feet | 1,111 |

## 1.9 BASIC IMPROVEMENT PROGRAM (BIP) AND TRANSIT AREA DEVELOPMENT IMPACT FEE (TADIF)

The 2008 TASP envisioned a broad range of public infrastructure investments and improvements to serve and support new development. The City identified and estimated costs for the required improvements in its Basic Improvement Program (BIP). The BIP included investments in road improvements and traffic mitigation improvements (33 percent of total net costs), sewer and water facility improvements (20 percent), and parks and community facilities (47 percent).

The City established the Transit Area Development Impact Fee (TADIF) to ensure new development contributed proportionately and appropriately to the BIP costs. Fees were established for residential development on a per-unit basis and for non-residential development on a per building square foot or hotel room basis. As is typical for development impact fee programs, the fee levels have been adjusted through time based both on automatic cost-indexed increases as well as more comprehensive updates. The most recent fee adjustment, which occurred in 2019, was progressively phased in for residential developments with the updated as of November 2020 and provided below:

- Residential - $40,487 per unit
- Retail - $26.49 per square foot
- Office - $42.52 per square foot

Fees were originally established for hotel development at $9,000 per room and were adjusted in 2012 to $10,754 per room, but following a fee study in 2014 when less development was expected, hotel fees were eliminated. Following adoption of the Metro Plan, a new nexus fee study will be prepared, and the City will decide if hotel developments would again be required to pay fees.

The Milpitas Metro Specific Plan is expected to result in some refinements to the BIP, and the TADIF is expected to remain as the primary source of public infrastructure/ improvement funding from new development. The Milpitas Metro Specific Plan recommends that the TADIF be updated to account for the new infrastructure and development planned for and described herein.

The TASP also created a Community Facilities District (CFD) that levies a special property tax on a per-unit basis for all new residential development and utilizes those additional property tax revenues to supply a fund for services and maintenance of certain public improvements, such as certain police and fire protection services, public lighting, storm protection, and hazardous cleanup. In this way, the General Fund is not negatively affected by residential development in the Metro Area, while still benefiting from the new revenues generated by non-residential development.

## 1.10 SUBSEQUENT ENVIRONMENTAL IMPACT REPORT (SEIR)

The Milpitas Metro Specific Plan is accompanied by a Subsequent Environmental Impact Report (SEIR) to assess and mitigate, as feasible, the impacts of the Milpitas Metro Specific Plan project. As noted above, the Milpitas Metro Specific Plan will replace the Milpitas TASP, for which a prior Environmental Impact Report (EIR) was prepared. The 2007 Draft EIR (2007 EIR) was prepared to analyze, at a program level, the environmental impacts of implementation of the TASP. Given the expanded scope of the Milpitas Metro Specific Plan project and changes in circumstances in the project area since certification of the 2007 EIR, the SEIR fully evaluates certain topics, including transportation, air quality/ greenhouse gas emissions, noise, population and housing, land use, public services, and utilities. Other topics included in the CEQA Checklist, such as biological and cultural resources, have been scoped out of the full SEIR analysis, as the Milpitas Metro Specific Plan (i.e., the revised project) would not result in new or more significant impacts related to these resource topics. The SEIR is a self-mitigating evaluation and appropriate policies to mitigate any potential impacts have been identified and incorporated into the Metro Plan.

As supported by recent CEQA case law, the SEIR analysis focuses on the potential impacts of the changes to the project and does not reassess the project as a whole. Accordingly, the SEIR examines the revised project in the context of the 2007 EIR focusing on the changes to environmental impacts and mitigation that would result from the revisions to the project.

## 1.11 RELATIONSHIP TO OTHER PLANS/PROGRAMS

The Milpitas Metro Specific Plan was developed in the context of other citywide plans, Specific Plans, and topic area plans. These plans include the following:

### 1.11.1 General Plan 2040

The General Plan 2040, adopted in 2021, is the City's guiding land use and policy document that provides a framework for future development in the city through 2040. The Milpitas Metro Specific Plan is recognized in the General Plan as an urban transit-oriented development area that provides critical opportunities for regional job growth. The General Plan 2040 provides high-level goals and policies for the Metro Plan Area, which envision the Plan Area as an attractive, walkable, urban area with a mix of land uses that minimizes vehicle trips and facilitates increases in employment densities.

The Milpitas Metro Specific Plan provides more focused visioning for the transit area including a detailed land use and design framework, a zoning framework, and public infrastructure financing tools to guide private development and public investment.

### 1.11.2 Transit Area Specific Plan (TASP)

The 2008 Transit Area Specific Plan (TASP) was adopted to create attractive high-density urban neighborhoods with a mix of land uses around the light rail stations and future Milpitas Transit Center. The 2008 TASP also aimed to create pedestrian connections and design streets and public spaces that supported a lively and attractive street character and a distinctive identity for each subdistrict.

While the TASP's flexible zoning along with market conditions has supported development focused on housing and placemaking, some placemaking work has not yet been implemented and TASP has not yet attracted significant workspace development.

The City now seeks to:

- Complement housing with workspace development;
- Create additional capacity for housing development, particularly dense, affordable, and affordable-by-design housing;
- Attract modern office/ research & development (R&D)/ creative/ co-working and other workspaces to the TASP;
- Develop the General Plan 2040's "Manufacturing South Area" as well as a larger area along Montague Expressway as a focused "Innovation District" for a broad range of new workspaces;
- Encourage landowners/ developers of remaining large sites to consider workspace development; and
- Integrate workspaces into mixed-use residential developments.

The Milpitas Metro Specific Plan updates and replaces the original 2008 TASP and vision for the area. This plan will shape the continued transformation of this area from industrial and auto-oriented to a vibrant transit-oriented community that includes housing, retail, entertainment, commercial and park spaces, and a safe and attractive pedestrian and bicycle network.

In particular, the Milpitas Metro Specific Plan aims to:

- Strengthen connective infrastructure between all uses within the Metro Area;
- Build a sense of place and cohesion for all who live, work, and visit in the Metro Area;
- Incorporate feasible commercial development that provides good job opportunities for residents of Milpitas and the greater region;
- Foster jobs/housing balance with a strong connection between employment and housing developments; and
- Establish a strong policy and land use framework to support future Housing Elements and future housing development.

### 1.11.3 Economic Development Strategy and Implementation Actions

The Milpitas Economic Development Strategy and Implementation Actions (EDS) report guides the City's economic development activities from 2020 to 2025. This report identifies strategies and implementation actions to grow and diversify the City's economy, support businesses and workers, and improve the quality of life in the community.

One of the seven priority areas identified in the EDS is the creation of a new Innovation District that supports the growth of innovation-focused technology businesses. Consistent with the EDS, the Milpitas Metro Plan includes zoning changes to support the growth of office and research & development uses close to the Transit Center.

### 1.11.4 Citywide Objective Design Standards

Citywide Objective Design Standards provide design standards and guidelines for all multifamily development in the City of Milpitas, as well as other development as relevant. Existing standards include setbacks and height limits. These design standards ensure high-quality development that is visually compatible with the surrounding area. The City of Milpitas has developed additional Objective Design Standards for residential development, including residential-only and mixed-use development. When complete, these standards will apply in the Metro Area as they do elsewhere in the City.

In addition to the citywide Objective Standards, the Milpitas Metro Specific Plan sets forth additional Plan Area specific design guidelines and standards that ensure building and site designs enhance the pedestrian realm. Plan-specific standards have been developed to supplement other municipal design documents.

### 1.11.5 Midtown Specific Plan/ Milpitas Gateway-Main Street Specific Plan

The Midtown Specific Plan was adopted in 2002 to guide redevelopment in the Main Street/ Calaveras Boulevard area of Milpitas, which is generally north of the Milpitas Metro Plan Area. A comprehensive update of this plan was initiated in 2021, and the plan was renamed the Milpitas Gateway-Main Street Specific Plan. Similar to the Metro Plan, the Gateway Plan provides revised strategies and policies to enhance and accelerate the redevelopment of the City's historic Main Street and the Calaveras Boulevard commercial corridor adjacent to Interstate 880 into an interconnected series of vibrant, higher-intensity, mixed-use neighborhoods. Several parcels located at the southern end of the plan area along Main Street have been incorporated into the Milpitas Metro Specific Plan Area and will be developed as higher-density housing with some local-serving commercial uses.

### 1.11.6 Parks and Recreation Master Plan

The Parks and Recreation Master Plan adopted in December 2021 is a strategic planning document that provides a long-term vision for citywide parks and recreational facilities. The Park and Recreation Master Plan inventories existing park facilities and establishes a framework for expanding and maintaining the city's park

and recreational network and programming to meet future needs. The Milpitas Metro Specific Plan's open space policies were developed in conjunction with the Parks and Recreation Master Plan's development process to ensure that open space and recreational facilities in the Plan Area meet the needs of residents, workers, and visitors in a manner that is consistent with the City's overarching vision for the park system.

### 1.11.7 Bicycle/ Pedestrian and Trails Plan

The Bicycle, Pedestrian, and Trails Plan provides a vision and action plan for improving the city's bicycle and pedestrian network. The plan seeks to improve bicycle and pedestrian connectivity to destinations, integrate active transportation networks with transit, and improve the safety and accessibility of the network. The Bicycle, Pedestrian, and Trails Plan also identifies priority areas for infrastructure improvements within the Milpitas Metro Specific Plan Area, which are reflected in the Metro Plan's policies and programs. This plan provides conceptual and technical guidance that informs the Milpitas Metro Specific Plan's active transportation network.

### 1.11.8 Urban Water Management Plan

The Urban Water Management Plan is a water supply planning tool that guides long-term water supply decisions to ensure that the City has adequate capacity to meet future water supply needs. Given population growth in Milpitas and heightened drought risks as the result of climate change, sustainable water management planning is critical to ensuring adequate water supply. The Urban Water Management Plan provides water supply and demand projections and establishes a per capita water use goal. The Milpitas Metro Specific Plan has been developed in coordination with the Urban Water Management Plan to ensure that the City's water supply and distribution system has the capacity to support the projected growth in the Plan Area.

### 1.11.9 Climate Action Plan

The Climate Action Plan is periodically updated and was updated in 2022. The Climate Action Plan is the City's strategy for achieving carbon neutrality by 2045.This plan includes greenhouse gas reduction strategies and climate adaptation goals and actions that will build citywide resiliency. The Milpitas Metro Specific Plan implements the Climate Action Plan by ensuring that new development is not only aligned with citywide energy efficiency and emission reduction goals, but also serves as an early example of the implementation of critical policies. Development in the Milpitas Metro Specific Plan will lead the charge on addressing sustainability goals and will set a precedent for development elsewhere in the city.

### 1.11.10 Housing Element

The City is in the process of developing the Housing Element for the 6th Regional Housing Needs Allocation (RHNA) cycle. The Housing Element establishes the framework for accommodating current and future housing needs in the city. Policies and actions in this document will ensure a diverse supply of housing that is affordable to households of all income

levels. The Housing Element is slated to be completed and adopted by the City Council in January 2023. The Housing Element may include a Housing Opportunities Zone program that might include target sites within the Metro Area.

### 1.11.11 Urban Forest Management Plan

The Urban Forest Management Plan presents an inventory of the City's trees and provides guidelines for tree management, including priorities for maintenance and recommendations for new tree plantings to increase the City's urban forest. New park and street tree plantings in the Plan Area will be guided by strategies discussed in the Urban Forest Management Plan.

## 1.12 REGULATORY COMPLIANCE

The Milpitas Metro Specific Plan has been prepared in compliance with California Government Code Section 65450 through 65457 and the requirements of the California Environmental Quality Act (CEQA). The Milpitas Metro Specific Plan guides all development within the Plan Area and will require amendments to the Zoning Ordinance to ensure consistency and to implement the development regulations and land uses established in this Specific Plan. The Milpitas Metro Specific Plan is adopted under the authority of the City's Zoning Ordinance, which designates specific plans as a tool to guide land use and development consistent with the General Plan.

## 1.13 MILPITAS METRO PLAN FRAMEWORK

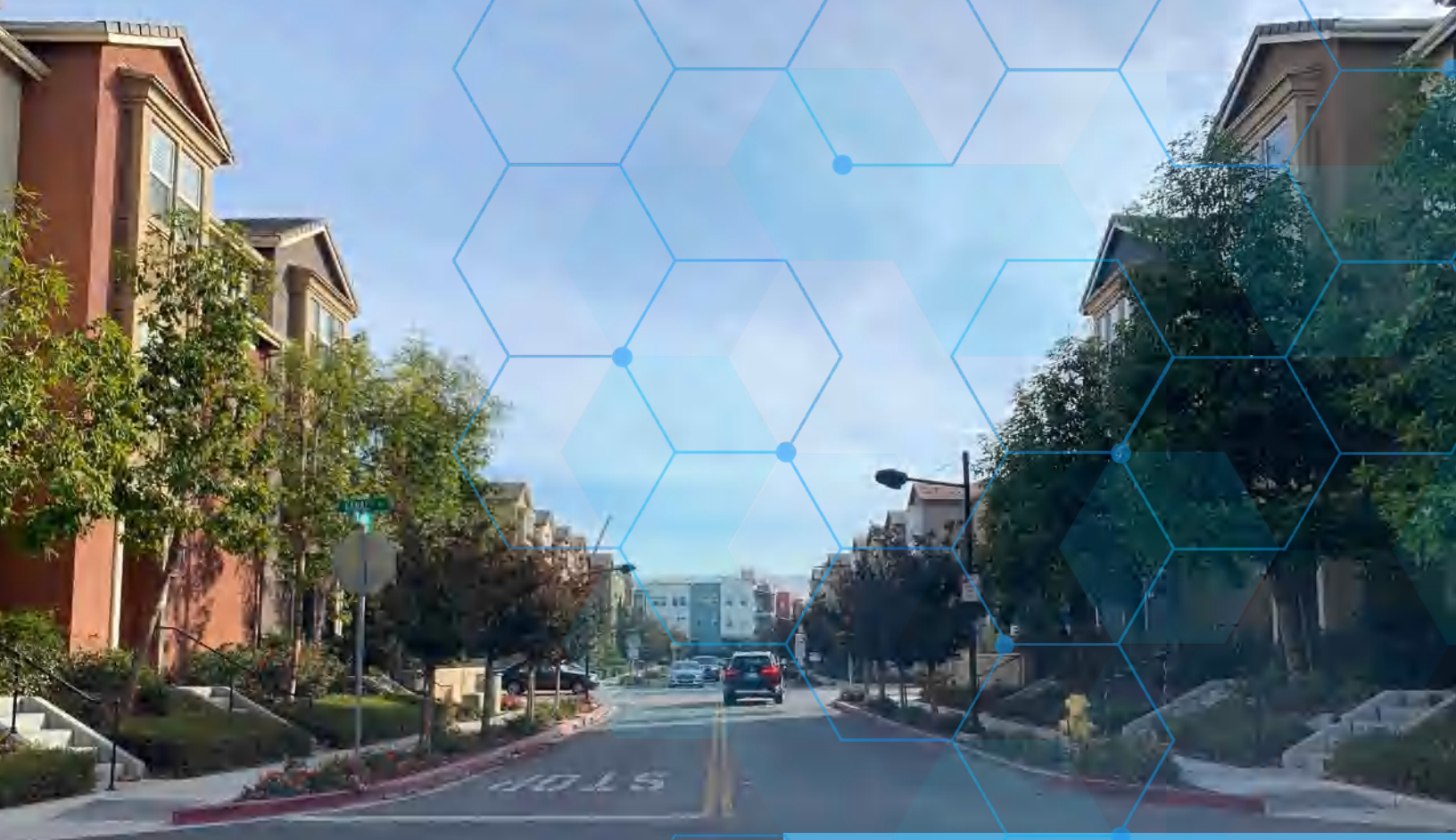
### 1.13.1 Plan Organization

Chapter 1 provides background context on the Metro Plan and includes an overview of the Plan's vision. Chapters 2 through 5 of the Plan contain goals and policies that respond to the Milpitas Metro Specific Plan's overarching vision and direct future development in the Plan Area. Goals in each chapter will be achieved by the subsequent policies which provide concrete actions that guide implementation. Chapter 6 contains the implementation and funding plan to make the plan vision a reality. The Milpitas Metro Specific Plan consists of the following chapters:

- **Chapter 1: Introduction** establishes the Plan Vision and provides background information on the Milpitas Metro Specific Plan, explains the Plan's relationship with other municipal regulatory documents, and projects expected plan build out.
- **Chapter 2: Land Use and Public Space** establishes the land use and open space strategy for the Plan Area.
- **Chapter 3: Site and Building Design Standards and Guidelines** includes the Milpitas Metro Specific Plan's strategy for activating the public realm, including sidewalks and pathways, and provides guidance on building design in the Plan Area.
- **Chapter 4: Mobility and Circulation** describes strategies to create a multimodal network, reduce vehicle miles traveled through transportation demand management policies, and decrease automobile dependency.
- **Chapter 5: Infrastructure** describes the public infrastructure and services needed to support growth in the Plan Area.
- **Chapter 6: Implementation** details the implementation of the Milpitas Metro Specific Plan by the City of Milpitas, including funding sources and time frames for public infrastructure projects.

### 1.13.2 Plan Horizon

The Milpitas Metro Specific Plan is a planning document that embodies the vision for the neighborhoods around the Milpitas Transit Center for the next 20 years. It shall be prepared, adopted, and amended in the same manner as a General Plan. The Metro Plan may be adopted by resolution or by ordinance and may be amended or repealed as often as deemed necessary by the legislative body.



**Residential development completed in 2020 in the McCandless District (top) and the Tango District (bottom).**

# 2. LAND USE AND PUBLIC SPACE


2.1. Land Use Development Framework
2.2. Great Mall District
2.3. Innovation District
2.4. Piper District
2.5. McCandless District
2.6. Tango District
2.7. Land Use Policies
2.8. Parks and Public Spaces Framework
2.9. Existing and Proposed Parks Open Space Strategy
2.10. Public Open Space Policies
2.11. Private And Common Spaces


This chapter establishes the land use framework and public space strategy for the Milpitas Metro Specific Plan (MMSP) to support the emergence of a complete and connected neighborhood. This chapter identifies land use designations, he goals and policies, and zoning regulations for the Plan Area.

This chapter also provides a vision for the districts. The Plan provides universally-applicable policies, and, where necessary, districts are referenced to identify specific policies and improvements in those areas.

This chapter also addresses the need for parks and shared open spaces in Milpitas Metro. The initial residential development in the TASP was generally moderate density townhomes which covered more than 60 percent of the approved housing acreage. That significant consumption of available land along with the limited impact fees available from that development constrained the City's ability to acquire significant parkland acreage. The Parks and Public Spaces policies below address park acreage and establish a framework for a network of high-quality diverse and versatile spaces that will serve the area's population as it grows.

The Milpitas Metro Area is a dense urban environment that supports transit use and balances a mix of uses at higher densities and intensities of development to sustain residential and commercial activity and a vibrant streetscape. The MMSP will expand neighborhood retail and services, generate jobs and attract quality employment uses, support the development and implementation of the City's Housing Elements, expand housing affordability, and increase the quantity and quality of shared public spaces.

## 2.1 LAND USE DEVELOPMENT FRAMEWORK

### 2.1.1 Land Use Strategy

The Milpitas Metro Plan revises current land use designations to respond to current market conditions and the community vision for the area, to better sustain commercial activity and to foster a vibrant streetscape environment. The Milpitas Metro Specific Plan also adds new land uses to better shape development in the Great Mall District, Innovation District, and remaining infill parcels. These updated land uses support the concentration of higher density residential and higher intensity commercial development near the Milpitas Transit Center and larger street arterials, and provide opportunities for denser development throughout the district.

Encouraging a mix of uses is critical to creating a more complete neighborhood and ensuring the vibrancy of the area. Mixed-use buildings create destinations that organically facilitate community interaction and reduce traffic during the workday by providing jobs and essential services within walking and biking distance of homes. A vibrant pedestrian-friendly street environment will be achieved by focusing retail uses along designated Activity Streets.

The land use strategy acknowledges the dynamic character of this rapidly changing area and shifting market conditions by preserving land for employment uses. Building from the direction in the General Plan, the Milpitas Metro Specific Plan establishes the Innovation District as the center of a future employment hub of office campuses and research and development buildings with exceptional access to regional transit and highways. Vibrant street side commercial services will support employment center activity and will offer restaurant and other services to the broader community throughout the day. Limited residential uses will be allowed in this district, primarily west of Berryessa Creek.

### 2.1.2 Land Use Densities

Milpitas Metro is a unique area in Milpitas, intentionally planned for more intense development that takes advantage of transit opportunities and the proximity of housing, jobs, services, and amenities close to each other. While other areas of the city are characterized largely by low-rise development, the Metro District is a dense, transit-oriented hub and provides a limited area of the City where taller buildings may be geographically concentrated and might comprise much of the urban skyline. In order to foster the evolution of the district into a complete neighborhood, the Metro land use framework offers density incentives to residential mixed-use development. The highest permitted commercial intensities are located along major corridors and in the Innovation District. Densities and intensities are reduced on parcels farther from the corridors or closer to existing residential neighborhoods.

Table 2-1 specifies density and floor area ratio (FAR) ranges for each land use classification:

- Residential Development: Intensities are determined on a dwelling unit per acre basis when a project consists of residential uses only.

- Commercial Development: Intensities are calculated based on FAR.
- Mixed-use with Residential Development: FAR is used for all portions for mixed-use projects, including residential and non-residential portions.

Development densities and intensities are calculated per parcel, as opposed to gross acreage that often includes street right-of-way. This methodology is intended to ensure the type of development built more accurately reflects the vision expressed in the Plan.

For mixed-use projects, Floor Area Ratio (FAR) is used and a dwelling unit per acre range is stated to indicate the anticipated density of the project. In the case of mixed-use projects any stated density is advisory only, and indicates provisional City expectations. For certain land use classifications in and adjacent to the Innovation District that allow mixed-use development, a minimum commercial FAR is required to ensure that parcels do not develop as residential-only. These land uses include Boulevard Very High Density Mixed Use and Business Park Research & Development, Limited Residential.

Maximum heights are defined for each district using a potential number of stories and/or maximum feet. Where both stories and feet are provided, the maximum height in feet may not be exceeded.

### 2.1.3 Land Use Classifications

To fulfill the land use vision, the Milpitas Metro Specific Plan establishes seven land use classifications that are specific to the Plan Area, as shown in Table 2-1. Additional moderate density townhomes are not contemplated in the Metro Plan; higher density housing will better meet the City's housing obligations and balance new jobs and new housing. The classifications are illustrated in the Land Use Map in Figure 2-1 and include:

- **Residential Retail High Density Mixed Use (RRMU).** Supports high-density vertically mixed-use development with ground floor retail and active uses and residential or office uses on upper floors.
- **Boulevard Very High Density Mixed Use (BVMU).** Supports very high-density housing, retail, and small-format employment.
- **Multi-Family High Density Residential (MFH).** Supports high-density residential development such as stacked flats and apartments.
- **Multi-Family Very High Density Residential (VHD).** Allows very high-density residential development, such as multi-story apartments and condos.
- **Urban Residential (URR).** Allows urban scale, residential-only development, such as multi-story apartments and condos.

**Table 2-1. Land Use Classification with description, allowed density, maximum height, and allowed zoning districts**

| Land Use Classification | Allowed Density* | Maximum Height | Active Use Requirements | Allowed Zoning Districts |
|---|---|---|---|---|
| **Residential Retail High Density Mixed Use (RRMU)** | Mixed Use[1]: 1-2.5 FAR<br>Residential Only: 40-85 units/ac | 85 feet<br>Within 60 feet of adjacent existing residential zoned parcels, building height shall be stepped down to be the same max height plus 10 feet of the adjacent parcel. | Ground floor retail and active uses are required on 80 percent of the ground floor facade along any Activity Street. | Metro High Density Mixed Use (MXD2-Metro) |
| **Boulevard Very High Density Mixed Use (BVMU)** | Mixed Use[1]: 2.5-5.0 FAR<br>Residential Only: 85-250 units/ac | 275 feet<br>50 percent of base footprint above 85 feet and 25 percent of base footprint to a maximum height of 275 feet tall | Ground floor retail and active uses are required on 80 percent of the ground floor facade along any Activity Street. | Metro Very High Density Mixed Use (MXD3-Metro) |
| **Multi-Family High Density Residential (MFH)** | Residential: 30-40 units/ac | 75 feet | N/A | Metro Multi-Family High Density Residential (R3-Metro) |
| **Multi-Family Very High Density Residential (VHD)** | Residential: 40-85 units/ac | 35-85 feet | N/A | Metro Multi-Family Very High Density Residential (R4-Metro) |
| **Urban Residential (URR)** | Residential: 70-120 units/ac | 8 stories and 110 feet | N/A | Metro Urban Residential (R5-Metro) |

** Additional density may be allowed per the State of California's housing density bonus requirements or the City of Milpitas' density bonus programs.*

*[1] On Housing Element opportunity sites, upper story non-residential uses are prohibited.*

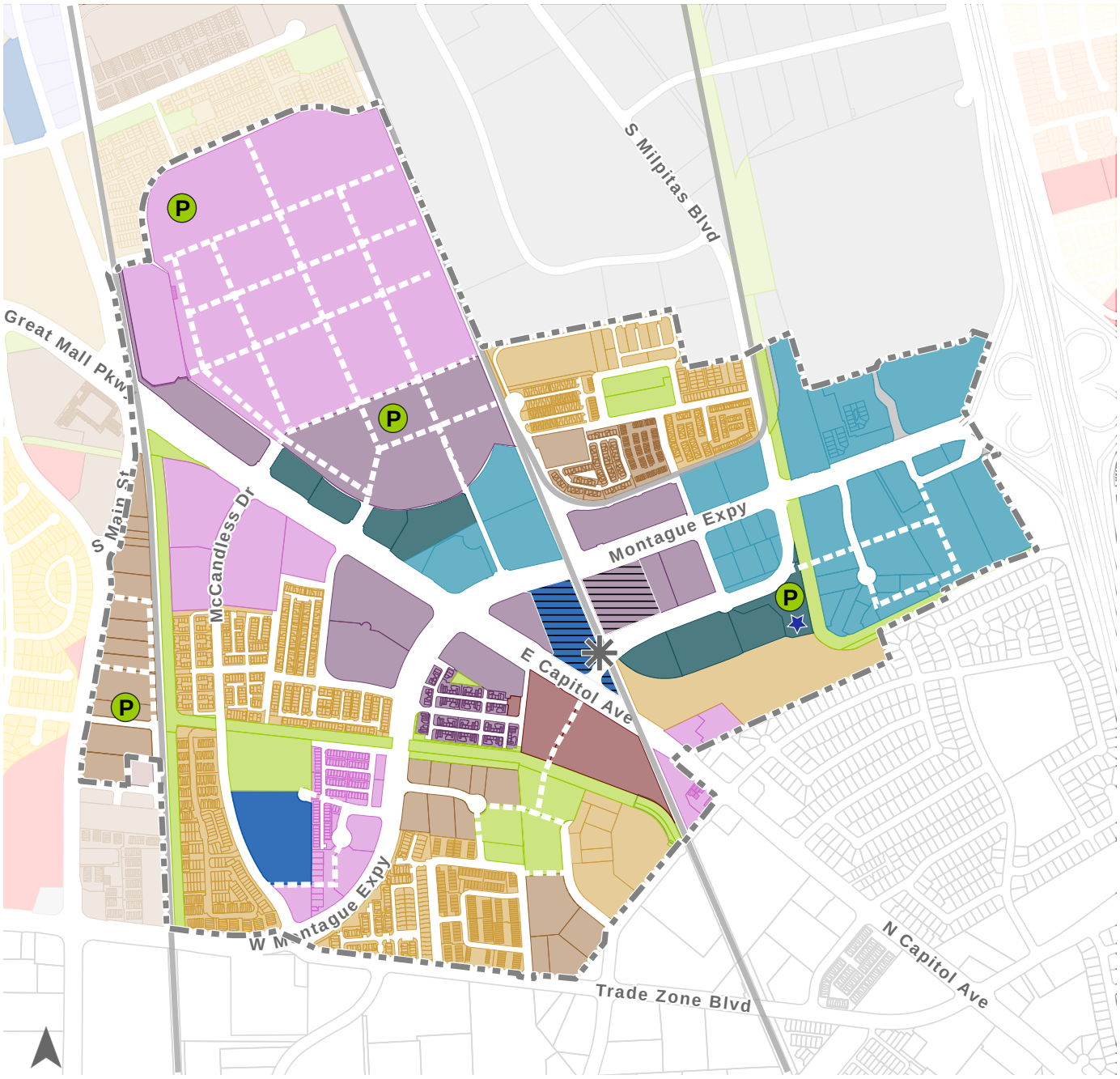
| Land Use Classification | Allowed Density* | Maximum Height | Active Use Requirements | Allowed Zoning Districts |
|---|---|---|---|---|
| **Business Park Research & Development (BPRD)** | Non-residential: 1.0-2.5 FAR | 8 stories | Ground floor retail and active uses are required on 80 percent of the ground floor facade along any Activity Street. | Business Park Research & Development (BPRD) |
| **Business Park Research & Development, Limited Residential (BPRD-R)** | Mixed-use: 1.0-5.0 FAR; minimum of 1.0 FAR of office or R&D | 275 feet or 18 stories | Ground floor retail and active uses are required on 80 percent of the ground floor facade along any Activity Street. | Business Park Research & Development, Limited Residential (BPRD-R) |

- **Business Park Research & Development, (BPRD).** Allows for office, R&D, office-supportive commercial, and hotels.
- **Business Park Research & Development, Limited Residential (BPRD-R).** Supports office, R&D, office-supportive commercial retail, hotels, and limited residential uses.

This framework locates residential mixed-use development with commercial uses at the ground floor along the major corridors. This approach will cluster pedestrian-oriented retail and personal services in proximity to high-density residential populations, as well as making retail uses convenient to employment sites. Mixed-use parcels are permitted to develop with higher densities and taller building heights as incentives to provide commercial uses. Designated "Activity Streets" identify locations where ground-floor commercial uses will be required, as shown in the Circulation Network Map (Figure 4-6). Building frontages on Activity Streets must include retail and/ or active ground-floor uses. Active uses are uses that encourage pedestrian activity, including storefront retail and personal services, ground-floor office, or residential shared amenities, such as a lobby, gym, or conference room.

High- to very high-density residential land use classifications provide opportunities for residential-only buildings within the interior of districts. With a range of height and density standards, these residential classifications allow for transitions to lower density areas outside the plan boundaries.

## Figure 2-1. Land Use




- Milpitas Metro
- Transit Center
- Police Substation*
- Park*
- Railway
- Transit Center Property
- Public Facilities (PF)
- Permanent Open Space (POS)
- Residential Retail High Density Mixed Use (RRMU) 40-85 units/acre; max 2.5 FAR
- Boulevard Very High Density Mixed Use (BVMU) 85-250 units/acre; 2.5-5.0 FAR
- Business Park Research & Development (BPRD); 1.0-2.5 FAR
- Business Park Research & Development, Limited Residential (BPRD-R); 1.0-5.0 FAR
- Multi-Family High Density Residential (MFH) 30-40 units/acre
- Multi-Family Very High Density Residential (VHD) 40-85 units/acre
- Urban Residential (URR) 70-120 units/acre

*Location is approximate and shall be determined through the implementation of the MMSP.

GIS data provided by: General Plan - City of Milpitas / Roads - US Census Bureau 2019 TIGER / Basemap - ESRI

The City is developing Housing Opportunity Zones (HOZ), which will designate opportunity areas for increased housing densities. Proposed development projects in the HOZ will be eligible for additional densities provided that they comply with City requirements including design standards and affordable housing requirements.

Two new land uses have been developed to support the evolution of the Innovation District: Business Park Research & Development (BPRD) and Business Park Research & Development, Limited Residential (BPRD-R). These land use classifications support research and development activities, offices, high tech, hotels, retail services, and education uses. The classifications are applied to the eastern portion of the Innovation District and the southern portion of the Great Mall District. BPRD allows only commercial uses to encourage clustering of shopping and employment uses, provide opportunities for large-footprint buildings, and to prevent encroachment by residential uses. Mixed-use developments can include limited residential uses in BPRD-R if minimum commercial intensity requirements are met. In BPRD-R, residential uses would be expected to be located on the upper levels of a building.

The Metro Plan maintains two General Plan land use designations: Public Facilities (PF) and Permanent Open Space (POS). The Public Facilities designation applies to parcels owned by public agencies and are intended to be accessed by the public, including schools, City services, and transit centers. Areas that are intended for parks, waterways, creek corridors, and trails are designated as Permanent Open Space. Development in these areas is limited to structures that support open space uses, such as park facilities, restrooms, and signage.

While the MMSP updates all land uses in the Plan Area, most development changes are anticipated in areas that are expected to redevelop over the next 20 years (Figure 1-7).

### 2.1.4 Zoning

The Milpitas Metro Specific Plan establishes seven new zoning districts that implement the Metro Area's land uses. The two mixed use zoning districts and three residential-only zoning districts are similar to the existing MXD2, MXD3, R-3, R-4, and R-5 zones contained in the City's zoning code. Density and height regulations for the new zoning designations shall be consistent with the corresponding land use standards established in Table 2-1. Table 2-2 contains additional setback requirements for each zone.

Parking minimums and maximums are also associated with the land uses and are generally lower in the Metro Area compared to other areas of the city due to closer proximity to transit and future jobs. Many of the trips in the Metro Area are anticipated to be made by foot, bike, or transit due to the dense transit-rich environment. Additional parking considerations and transportation demand management strategies to support reduced parking are discussed in Chapter 4: Mobility and Circulation. For off-street parking requirements, refer to Table 4-3.

### 2.1.5 Affordable Housing Approach

The Milpitas Metro Specific Plan aims to increase the amount of affordable housing in the Plan Area through the implementation of both citywide policies and the Milpitas Metro Specific Plan vision and policies, and through support of the Housing Element.

The TASP was successful in generating new market rate housing, including smaller transit-oriented units that were affordable by design. However, with significant land area dedicated to for-sale townhome development, it did not generate the anticipated amount of housing for households earning below the area median income (AMI).

In 2018, the City of Milpitas adopted an inclusionary housing ordinance that requires 15 percent of new housing to be affordable at below-market rates. In general, these units must be built within individual development projects, though a developer can request that the City Council approve off-site development or an in-lieu impact fee payment. Recent developments on Main Street and Tarob Court have both met the 15 percent inclusionary requirement on site. Additionally, the City has approved two 100 percent affordable housing projects on Sango Court, which provide a combined total of 216 units of affordable housing. The citywide policies in the existing General Plan Housing Element and future Housing Elements that aim to expand affordable housing will be the major policy drivers on affordable housing and will apply to the Milpitas Metro Specific Plan Area.

Additionally, the Plan envisions a series of neighborhoods that will be "affordable by design" due to their excellent access to high-quality transit and multimodal access, higher density design, small to moderate unit sizes, and low parking ratios. These units will still need to meet income-level affordability standards to meet RHNA requirements. Through future Housing Elements, the City will define affordable housing sites and establish Housing Opportunity Zones that support the development of affordable housing, which is likely to include sites within the Metro Plan Area.

**Table 2-2. Zoning District Setbacks**

| Zoning District | Front Setback Minimum | Rear Setback Minimum | Side Setback (interior) Minimum | Side Setback (street side), Minimum |
|---|---|---|---|---|
| Metro High Density Mixed Use (MXD2-Metro) | 0 feet min, 20 feet max | 10 feet; 15 feet when abutting residential; 20 feet for portions of buildings over 60 feet or 4 stories tall | 0 feet; 10 feet when abutting residential use and for portions of buildings over 60 feet or four stories tall | 0 feet |
| Metro Very High Density Mixed Use (MXD3-Metro) | 12 feet min, 20 feet max | 15 feet; 20 feet when abutting residential; 30 feet for portions of buildings over 60 feet or 4 stories tall | 10 feet; 15 feet when abutting residential; 20 feet for portions of buildings over 60 feet or 4 stories tall | 12 feet min, 20 feet max |
| Metro Multi-Family High Density Residential (R3-Metro) | 20 feet | Single story: 30 feet; 2-2.5 story: 35 feet; 3-3.5 story: 40 feet | Single story: One side 5 feet min, total of 12 feet; 2-2.5 story: One side 10 feet min, total 25 feet; 3-3.5 story: One side 12 feet min, total 30 feet | 10 feet |
| Metro Multi-Family Very High Density Residential (R4-Metro) | 8 feet min, 20 feet max from the back of the sidewalk | 10 feet | 10 feet | 8 feet min, 15 feet max from the back of the sidewalk |
| Metro Urban Residential (R5-Metro) | 12 feet min, 20 feet max from the back of the sidewalk | 15 feet; 20 feet for building over 3 stories which abut residential uses | 15 feet; 20 feet for building over 3 stories which abut residential uses | 12 feet min, 20 feet max from the back of the sidewalk |

| Zoning District | Front Setback Minimum | Rear Setback Minimum | Side Setback (interior) Minimum | Side Setback (street side), Minimum |
|---|---|---|---|---|
| Business Park Research & Development (BPRD) | 0 feet | 10 feet min | 10 feet min | 0 feet |
| Business Park Research & Development, Limited Residential (BPRD-R) | 10 feet min, 20 feet max | 10 feet min | 10 feet min | 10 feet min, 15 feet max |

### 2.1.6 Districts

The Metro Plan is organized into five districts which have unique characteristics and support different land uses (Figure 1-4).

These districts are reoriented and reorganized from the original TASP subdistricts to better define them as cohesive neighborhoods, typically bounded by major streets and centered around a common open space area or business district. This section qualitatively describes each neighborhood; identifies recent changes; anticipates where new development is expected; and describes circulation, park, and infrastructure improvements that are documented in other chapters of the Milpitas Metro Specific Plan.

### 2.1.7 Annexation

In order to support the development of the Innovation District, the City of Milpitas is discussing a potential annexation of a parcel located between the Innovation District and Highway 680 with the City of San Jose (Figure 2-2). The character of the parcel is more similar to the surrounding uses in Milpitas. If incorporated, this parcel will become part of the Innovation District and support office park and light industrial development.

## 2.2 GREAT MALL DISTRICT

The Milpitas Metro Specific Plan supports the evolution of the Great Mall District, which includes the Great Mall itself, from a brick-and-mortar shopping center with isolated surrounding uses to a new transit-oriented, high-density, mixed-use neighborhood with a finer-grain street grid and signature public open spaces. Given the site's proximity and pedestrian access to the Milpitas Transit Center and the potential of Great Mall site evolution, this district has a high opportunity for growth and the potential to transform into a transit oriented district that is committed to advancing sustainability and equity goals through high performance targets in areas such as access and mobility, community health, and energy usage. The Great Mall District also has the potential to support a performing arts center, which could draw both local and regional visitors, given its location and accessibility from transit.

**Figure 2-2. Annexation Area**

The district was largely unaddressed in the 2008 TASP as it reflected the strength of the traditional retail center economic conditions of that time and was zoned for general commercial use, which prohibits residential uses. The suburban character of the district has low building form and looks underdeveloped in comparison to the transit-oriented neighborhoods that have grown up around it. To provide flexibility and capacity for change, this district now includes land uses that support high-density mixed use throughout the majority of the district while maintaining parcels close to the Milpitas Transit Center as commercial and retail only. The planning concept for the Great Mall District establishes a flexible vision for the area that will respond to market and economic conditions both in the near-term and long-terms.

This district is bound by Great Mall Parkway and Main Street to the west, the BART rail tracks to the east, and Montague Expressway to the south. The district includes the Great Mall, owned by Simon Property Group and the parcels at the edge of the Great Mall site along Great Mall Parkway and Montague Expressway that are owned by a variety of owners. For planning purposes, the Great Mall District is divided into distinct development pads, and each has been assigned development capacity. These pads may be individually identified as opportunity sites in the Housing Element.

*This illustration shows a variety of ways the Great Mall could redevelop. The potential evolution of the Great Mall will be responsive to the local market and property owner needs and expertise.*

### 2.2.1 Great Mall District Priorities

The priorities for the vision of this area are:

- A walkable public street grid that is built with the phases of development that occur within the district. Streets will divide the existing large parking lots and any redeveloped building areas into active, walkable blocks.
- A signature central outdoor gathering space and supporting publicly accessible open spaces that build a sense of place. These spaces will be the new amenities that anchor the entire district and would provide social gathering spaces for residents, workers, and visitors.
- Higher density mixed use development located close to the Great Mall Parkway and across from the Milpitas Transit Center where the urban scape is the most appropriate.
- A mix of ground floor commercial space and housing for a variety of opportunities to live, work, and play near transit. Dedicated Activity Streets with ground floor retail, services, and open space amenities, located parallel to Great Mall Parkway and extending into the Great Mall site that provide a lively and active sidewalk experience.
- New pedestrian and bicycling connections along Great Mall Parkway between both VTA Light Rail Stations. Other priority connections include new streets to adjacent neighboring areas to the north, bridges across barriers to the east, a dedicated cycletrack and linear park to the south, and improved Great Mall Parkway pedestrian safety to the west.

## 2.2.2 Great Mall

The Great Mall stretches from parking lots located near Falcon Drive and close to the Transit Center to neighborhoods north of the site that are associated with Main Street. The structure of the Great Mall, which was originally developed in the 1960s as a major Ford Motor Company auto factory and substantially remodeled to accommodate the Mall in 1994, is 1.4 million square feet and one to two stories tall with one multi-level parking garage on the north side of the mall.

The Great Mall structure's footprint, including the plaza area at the theater entrance, occupies approximately 1.65 million square feet (37.8 acres), or 38 percent of the 99-acre site. That leaves over 61 acres of land devoted to surface parking, including the footprint of the multi-level 2.3-acre parking structure.

Access to the Great Mall is available through private roadways from Main Street, Great Mall Parkway and Montague Expressway, as well as from the townhome development on the north side of the Mall site, though this is currently fenced off. Future redevelopment of the site contemplates retaining these access points and could include dedication of public streets or private streets with public access easements to ensure entry to publicly accessible open space features inside the district. Preservation of access and parking for the Home Depot, as long as it remains, will have to be considered in any site redevelopment plans.

Pedestrian access into and through the site will likely become even more important than it is today as Activity Streets and new development

*These illustrative graphics show the possibilities for the Great Mall District and not what is proposed.*

*Walkable street grid.*

*Open space network with central plaza.*

*Mixed-Use development with higher densities near the Transit Center.*

*Concentration of new development near transit.*

*The vision for the Great Mall District as a transit-oriented high density, mixed-use neighborhood. This view is at Great Mall Parkway and McCandless Drive, looking through new development at the edges of the district to the Great Mall itself.*

*Conceptual illustration of the transformation of the Great Mall Parkway.*

**Figure 2-3. Great Mall District Illustrative Plan**

*This illustrative Plan of the Great Mall District demonstrates the vision for this district with a concept that includes part of the original mall remaining, residential infill at the north of the site, urban scaled buildings along Great Mall Parkway, commercial buildings that are part of the Milpitas Innovation District located closest to the Milpitas Transit Station, a central public gathering place and linear park, and a walkable street grid. Future development will adhere to the concepts illustrated here rather than necessarily follow this precise design.*

will facilitate increased pedestrian activity. Improved access to and through the site for residents, workers, and visitors around Main Street, including those headed to the Transit Center, will enhance the viability and vibrancy of retail and service uses on the site. A master scheme of roads, sidewalks and pathways on the site, as well as the open space areas, should be developed with the initial proposals for site development. Considerations for providing an overhead pedestrian connection to the Piper District from the Great Mall site should be evaluated.

The Great Mall continues to be a major regional attraction and a successful location for brick-and-mortar retail. However, retail is evolving, and there is currently high potential for "lifestyle" retail, fitness, and entertainment uses or a central gathering space to be the anchor for this regional destination. In addition, there is an excellent opportunity to provide housing and establish a strong employment base with direct access to transit within this district.

The evolution of retail will mean that there are complementary and additive changes to the site over time, and that the City might anticipate redevelopment in phases. The City of Milpitas will partner with the owner of this site to establish a development plan for the property that generally aligns with this vision document when appropriate and likely at the outset of any significant site development. This partnership establishes development expectations for both the City and the owner/developer. Tools such as a Development Agreement (DA) may be useful in expressing these needs and expectations for both parties. Refer to Figure 6-1 in Chapter 6: Implementation for development pads (or grid blocks) on the Great Mall site that will support the phased evolution on the parcel. A phasing scheme is suggested below, but development on any part of the site could go forward so long as it is in keeping with the goals, policies, and standards of the Metro Plan generally and the Great Mall District specifically (including land use densities and intensities, design standards, public infrastructure needs, etc.).

- In the first phase, redevelopment at the Mall may include development of the surface parking lots around the site. It may start at the northern end of the site where new development could blend with the existing residential neighborhood that borders the district. Access at the northern end would improve access from Main Street to the Great Mall and Milpitas Transit Center. A master development scheme, with suitable flexibility for later phases, should be laid out with the initial development phase.
- A mid-term phase could involve redeveloping the southern end of the site, closest to the Milpitas Transit Center, the Innovation District and hotels along Montague Expressway. This could involve replacement of any portion of the existing Great Mall structure to continue to transform the site into a more urban walkable area.
- In the long-term the Mall could be replaced with a variety of new structures, including some retaining and reformatting substantial and profitable retail commercial uses.

The MMSP anticipates a substantial amount of housing in the Great Mall District over time, as well as parkland and open space to provide the suitable amenities for new residents and visitors. Implementation of development projects will necessitate reserving areas for this open space. Enhancing the existing small open space on the southwestern side of the Great Mall building would provide an enjoyable pedestrian link between the Main Street light rail station and the internal areas of the Great Mall site.

*The former VTA Bus Station is now an opportunity site.*

*VTA owns another opportunity site (a parking lot) next to the new VTA Bus Transfer Station at the Milpitas Transit Center.*

### 2.2.3 VTA Bus Station

The former VTA Bus Station site located at the edge of the Great Mall District is a key opportunity site for near-term redevelopment. This site is located on Great Mall Parkway, and VTA has indicated that they will likely pursue redevelopment of this site for affordable housing to support their goal of 35 percent affordable housing across their property portfolio. This site is at a critical location in the district and could serve as a figurative bridge between recent mixed-use development at Great Mall Parkway and McCandless Drive and anticipated redevelopment on the Great Mall site. This site can be an important model for demonstrating the importance of interfacing with both the Great Mall Parkway multi-use corridor and the interior grid concept of pedestrian streets within the district. Redevelopment of the VTA site could improve mobility at the intersection of Great Mall Parkway and Main Street and incorporate existing and planned pedestrian overcrossings from the Light Rail Transit (LRT) station. This addition could be key to the success of the Main Street and Great Mall Parkway intersection, which is fraught with long, complicated, and uncomfortable walking and cycling conditions. A concept for improving this intersection and a plaza at the Great Mall District is further illustrated in Chapter 4.

### 2.2.4 Commercial Properties at Montague Expressway and Great Mall Parkway

The southern portion of the Great Mall District includes several parcels that are ideal for higher intensity office, R&D, office-supportive retail, and hotel uses. These parcels extend the Milpitas Innovation District economic development area by preserving and encouraging employment land uses close to the Milpitas Transit Center, while also providing a gateway experience to the arriving commuters and visitors.

Falcon Drive is a key access point between the district and Montague Expressway. Mustang Drive at Great Mall Parkway is signalized and is another important access points into the interior area of the district, and should be maintained and enhanced.

## 2.3 INNOVATION DISTRICT

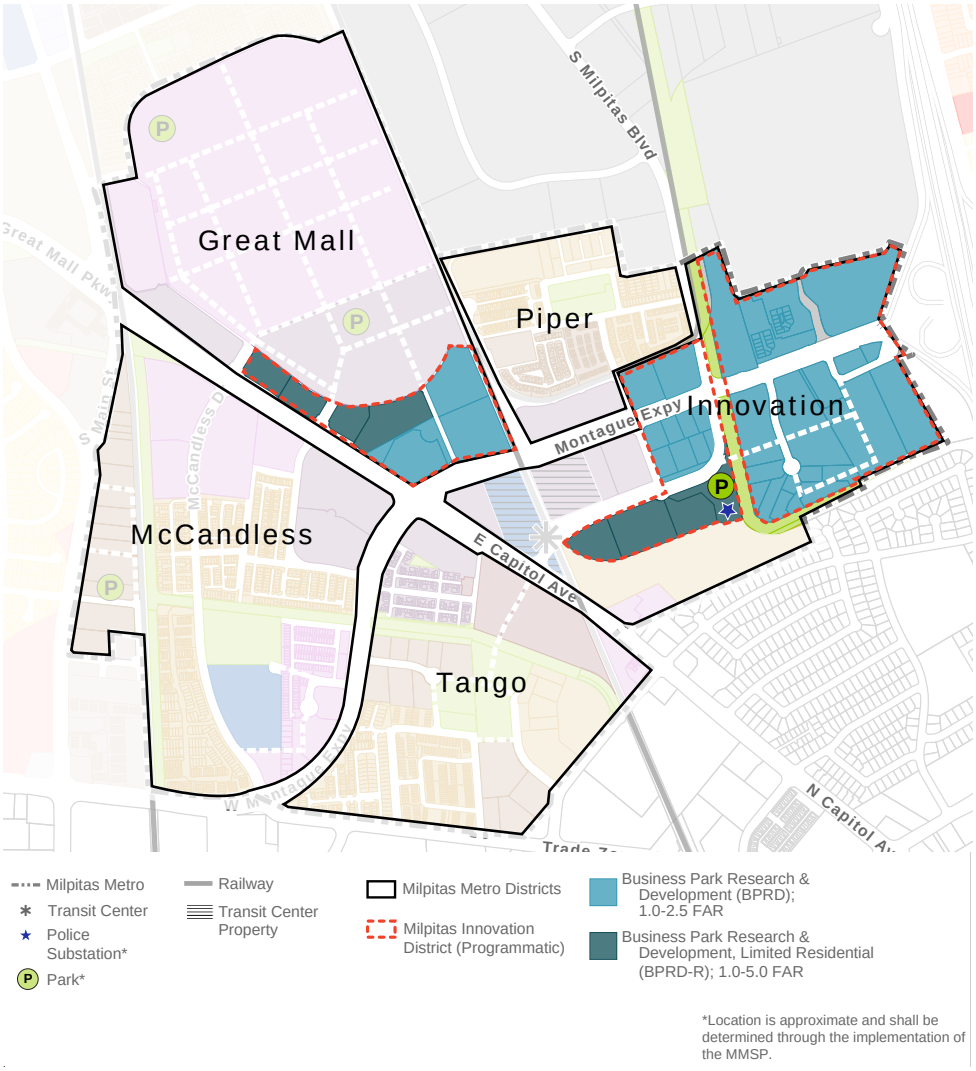
The Innovation District includes the Milpitas Transit Center and the crossroads of Montague Expressway and S. Milpitas Boulevard. It is bound by I-680 to the east and Capitol Avenue to the west. The area currently has two roadway connections to Montague Expressway, including one that is signalized at Pecten Court.

The vision for the Innovation District is a new center for innovation and applied technology in Silicon Valley. The highest-density employment uses will be ideally located closest to transit, services and housing, and the construction of a pedestrian bridge over Berryessa Creek will provide a direct connection to the rest of the Metro Area.

Partially contained within the Metro Plan's Innovation District, is the programmatic Milpitas Innovation District. Silicon Valley's economic driver is technology. Innovation districts are geographic areas where innovation drivers such as small/ medium size businesses, startups, incubators/accelerators, and academic institutions are located in physically compact, transit-accessible, and technically-wired areas that offer a mix of commercial and residential uses. The Milpitas Innovation District is guided by the following principles:

- Protect and preserve employment lands for greater long-term opportunities.
- Promote densification and intensification.
- Explore mixed-use opportunities with commercial development as primary and residential as secondary priorities.

**Figure 2-4. Programmatic Milpitas Innovation District**




- Provide incentives to encourage development and creative alternatives to parking challenges.
- Encourage parcel assembly for highest and best use.
- Promote pedestrian-oriented streets and activate public spaces through connecting elements.
- Explore information technology infrastructure such as broadband and utilities.

The Milpitas Innovation District, allows for the evolution of a traditional manufacturing, warehousing and mini-storage uses to a place designed for emerging technologies in artificial intelligence, machine learning, automotive technology, virtual and augmented reality, robotics, 3-D printing, etc. The programmatic Milpitas Innovation District is largely contained

in the Metro Plan's Innovation District but also extends into the Great Mall District.

The Innovation District helps to fulfill one of the City Council's priorities and City's commitment to economic development and job growth for City and regional residents, as well as affordable housing opportunities as outlined in the City Council adopted Economic Development Strategy (i.e., Innovation District/Real Estate Development Opportunities and Workforce Development). New streets and sidewalks located south of Montague Expressway will connect employment centers to Milpitas Boulevard and the Milpitas Transit Center and to housing nearby. The Plan also envisions a new park and landscaped creek trails along Berryessa Creek to provide workers with outdoor passive and recreational space.

The strategy for the Metro Plan's Innovation District is focused primarily on the employment uses and supportive services that will make the Metro Area a complete neighborhood. In addition to the implementing the Economic Development Strategy, the City's General Plan 2040 also calls for Action ED-3i, which states to "Explore the creation of an Innovation District in the Milpitas Metro Specific Plan area to facilitate increases in employment densities while leveraging the area's proximity to mass transit."

There are three primary areas in the MMSP Innovation District:

- The Milpitas Transit Center, which includes the Milpitas BART station and VTA bus stops, is in the western part of the Innovation District. The sites closest to the Milpitas

*A view from one of the upper levels of commercial office buildings looking upon the street extending over Berryessa Creek into the Innovation District.*

**Figure 2-5. Innovation District Illustrative Plan**

*Illustrative Plan of Innovation District and potential development around the Milpitas Transit Center.*

Transit Center are owned by VTA. VTA has confirmed that these parcels may be used for commercial uses in the future, and could potentially include mixed-use housing. Mixed-use development in this area will provide housing opportunities that complement the employment uses in this district.

- Sites near the intersection of Montague Expressway and S. Milpitas Boulevard are a central part of the Innovation District and are zoned Business Park Research & Development (BPRD).
- Along the easternmost portion of the district are several sites that are both freeway and transit accessible. These areas are anticipated to be R&D or industrial uses and are zoned Business Park Research & Development (BPRD).

Uses that support surrounding businesses, including health and fitness centers, restaurants and cafés, limited convenience retail, and day care facilities will also be encouraged, typically at ground floor level and oriented to the street, to complement the campus-like ecosystem.

*Aerial view of the Piper District.*

Given the high development potential for the Innovation District and its anticipated intensity, the feasibility of integrating high performance sustainability measures will be explored. The Innovation District is conveniently located within walking distance of the Milpitas Transit Center and will support new higher density development which could provide an opportunity for advancing sustainability measures related to accessibility, energy use, and resource management.

## 2.4 PIPER DISTRICT

The Piper District is the most built-out district in the Plan Area at the time of the this Plan's preparation. The Metro Plan modifies the district by changing the land use of properties at the busiest edge of the district near the intersection of S. Milpitas Boulevard and Montague Expressway to BPRD, which does not allow residential uses, and reassigning these properties to the Innovation District. Design sensitivity to the existing residential in the district will be important.

The Piper District is bound by industrial properties to the north, the BART tracks to the west, S. Milpitas Boulevard to the east, and Montague Expressway to the south. The district includes Bob McGuire Park at the center of the district, surrounded by Multi-Family Residential High Density and Multi-Family Residential Very High Density. A pedestrian overcrossing connects the Piper District to the Milpitas Transit Center.

The direct pedestrian bridge connectivity to the Milpitas Transit Center made the Piper District attractive for developers to propose and develop high density residential projects and mixed-use developments.

## 2.5 MCCANDLESS DISTRICT

The McCandless District is mostly built out. This district has been expanded to include several residential parcels on Main Street. The expansion of the district to Main Street will increase the development potential for high-density residential parcels to the Plan Area. These areas are closely connected on Great Mall Parkway and close to the Great Mall VTA Light Rail Station.

The district is characterized by high-density mixed-use development along larger, busier streets in the northern area and lower density townhouse development in the central area. A signature part of the district is a neighborhood serving commercial district at The Fields, which includes a Trader Joe's grocery store, retail, and a public gathering place, a block from the intersection of Great Mall Parkway and McCandless Drive. Construction of a hotel is contemplated as a part of this more intense development at Great Mall Parkway, to serve business visitors and others with easy access to services and amenities.

Farther down McCandless Drive, Mabel Mattos Elementary School has recently been constructed. The second phase of school construction is expanding to accommodate projected new development in the city. McCandless Park, a centerpiece of the McCandless District, is near completion as the largest park in the Metro Area, and will serve the school and public through a joint-use agreement. McCandless Park is bordered on the north by Penitencia Creek East Channel where a trail and pedestrian bridges are planned to connect across the creek and beyond.

Another part of this district yet to redevelop is a stretch along Montague Expressway between McCandless Drive and Houret Court. This Plan establishes the framework for a new street pattern in the southern portion of the district that could ultimately provide access between McCandless Drive and Montague Expressway via Houret Court. Houret Court will be redesigned as a part of that connection to make the adjacent parcels more feasible for mid-rise residential development and to facilitate access for mixed-use retail commercial development at McCandless Drive.

## 2.6 TANGO DISTRICT

The Milpitas Metro Plan's focus in the Tango District is to complete the street network within the district and connect this area to the Milpitas Transit Center via a new bridge over Penitencia Creek that will serve as an extension of South Milpitas Boulevard. The new bridge will provide direct access to the Transit Center for pedestrians and bicyclists and will also serve as an emergency access route for vehicles.

The name of the district is a combination of the names of two cul-de-sacs in the district, Tarob Court and Sango Court, that do not currently connect within the district. Barriers, such as South Penitencia Creek - East Channel divide

**Figure 2-6. McCandless and Tango Districts Illustrative Plan**

*Illustrative Plan of the McCandless and Tango Districts.*

the district. Large arterial streets - Montague Expressway, Capitol Avenue, and Trade Zone Boulevard that surround the district are also barriers to connectivity and circulation within the Metro Area.

Several residential and mixed-use buildings have been developed following the TASP, including the higher density apartments on Capitol Avenue and townhouses in the southern part of the district along Trade Zone Boulevard. While there has been some development, the Tango District is still transitioning from business park and industrial uses to "transit-oriented" uses. The remaining parcels in the district are located south of Penitencia Creek and are envisioned to be higher density housing with some neighborhood-serving commercial services within walking distance to the Milpitas Transit Center.

Development impact fees will help fund new bridges, parks, and streets to connect to the heart of the Tango District. By 2020, the City of Milpitas had acquired key parcels in this district that will be developed as roadways, pathways, and parks, and provide with a connection to the Milpitas Transit Center. A planned pedestrian bridge across Montague Expressway will connect the McCandless District to the Tango District along the Penitencia Creek Trail. When completed, this pedestrian and bicycle network will provide safe connections to the Milpitas Transit Center, employment centers with in the Innovation District, and services and other amenities within the Metro Area. The circulation strategy in this area is described in more detail in the Mobility and Circulation Chapter (Chapter 4).

## 2.7 LAND USE POLICIES

**LU 1. Mix of Uses.** Provide a mix of land uses, including residential; neighborhood-serving, local, and regional retail and entertainment destinations; commercial; office; research and development facilities; parks; and public facilities, to create a complete neighborhood.

LU 1.1. Establish Land Use Classifications (Table 2-1) and the Land Use Map (Figure 2-1) to identify areas appropriate for residential, commercial, mixed use, office, R&D, and industrial development. Retail commercial uses shall be concentrated in a pedestrian-oriented pattern, further described with development standards (Chapter 3).

LU 1.2. Update the General Plan as necessary to establish the Metro Plan's boundaries to include parcels on Main Street and parcels east of Berryessa Creek as identified in the Plan Area Boundary map (Figure 1-3).

LU 1.3. Convert suitable portions of any transit facility sites into high density mixed use where they are not needed for transit.

LU 1.4. Explore the feasibility of creating an EcoDistrict in the Innovation District and/or the Great Mall District: a vibrant, mixed-use neighborhood committed to advancing sustainability, resilience, and equity through targeting a variety of performance areas, such as access and mobility, appropriate development, community health and well-being, energy, water, and materials management.

LU 1.5. Ensure that new development is coordinated with policies and goals in the Climate Action Plan and incorporates sustainable design features.

LU 1.6. Ensure day care facilities, schools, nursing homes, and other similar sensitive receptors are located away from sites that store or use hazardous materials, in accordance with State and City standards. Adequate buffers to protect occupants of these sensitive uses shall be provided, including but not limited to walls, fences, landscaping, large building setbacks, and additional exit routes over and above minimum code requirements.

LU 1.7. In all rental and sale agreements, provide disclosures to future residents about all surrounding industrial uses, including UPRR train tracks and operations, and the permanent rights of such industrial uses to remain. Describe potential impacts including but not limited to: noise, groundborne and airborne vibration, odors, and use of hazardous materials.

**LU 2. Transit Orientation.** Capitalize on the transit orientation of the Plan Area to support transit ridership, reduce traffic congestion and greenhouse gas emissions, and support livability.

LU 2.1. Arrange the highest density areas along major corridors and transit-adjacent areas, and support them with strong pedestrian and bicycle access ways.

LU 2.2. Accommodate hotels in designated locations along major arterials that maximize access and visibility; are close to higher intensity businesses, shopping, entertainment, and dining; and enjoy good access to BART and light rail.

LU 2.3. Establish a strong pedestrian and transit orientation throughout the Plan Area and limit development design that prioritizes automobile access to the detriment of pedestrian and bicycle access. Policies defining development design are found in Chapter 3: Site and Building Design Standards and Guidelines.

LU 2.3.1. Drive-through retail and service formats or other activities that induce vehicle idling are prohibited.

LU 2.4. Concentrate neighborhood retail uses along Activity Streets, as designated in Figure 4-6, to support nearby uses, reduce automobile dependence and support alternative modes of transportation. Refer to LU 6: Retail and Active Ground Floor Uses for guidance on desirable retail uses and design of street frontages.

**LU 3. Housing Diversity and Affordability.** Provide transit-oriented housing that is accessible and affordable for a range of household types and income levels.

LU 3.1. At least 15 percent of the planned 5,000 to 7,000 new housing units in Milpitas Metro should be affordable, as regulated by the City of Milpitas' Inclusionary Housing Ordinance.

LU 3.2. Accommodate housing for a range of housing types, income levels, and rental and ownership models, including the following:

- Live/work units
- Group housing
- Co-living
- Senior housing
- Student housing

LU 3.3. Establish development intensities (Table 2-1) that support transit ridership, home-to-work convenience, neighborhood retail and active open spaces. Set and promote minimum densities to prevent the underutilization of sites.

LU 3.4. Refer to Section 2.11 Private And Common Spaces for requirements regarding the provision of publicly accessible open space.

LU 3.5. Encourage the development of affordable housing using frameworks established by the City, such as a Housing Opportunity Zone designation.

LU 3.6. When determining the density or unit count of non-traditional housing configurations, such as dormitories, co-living, or Single-Room Occupancy buildings, three bedrooms may be counted as the equivalent of one unit.

LU 3.7. Coordinate with the Housing Element Update to ensure that the Metro Area can adequately support housing to meet the City's RHNA goals.

**LU 4. Hotel.** Allow hotels in mixed-use, commercial or research and development areas to encourage vitality and support local businesses.

LU 4.1. Hotels are an allowed use in the Business Park Research & Development (BPRD) and Business Park Research & Development, Limited Residential (BPRD-R) zoning districts.

LU 4.2. Hotels may be designed to be converted into to residential rental properties

**LU 5. Office.** Preserve employment lands that accommodate a range of office and light industrial uses, including small businesses, larger offices, and R&D and technology uses.

LU 5.1. Create a well-connected, dynamic office and R&D employment destination by concentrating office and light industrial uses and limiting housing in the Innovation District.

LU 5.2. Promote the development and appeal of flexible office and research and development uses in the Innovation District by ensuring strong connections to transit and the rest of the Metro Area. For street connection standards and guidelines, refer to Chapter 4: Mobility and Circulation.

LU 5.3. Office and R&D buildings in the Innovation District should be highly adaptable to accommodate the needs of research-oriented sectors such as applied sciences and creative industries with specialized manufacturing.

LU 5.4. Encourage supporting food and beverage and neighborhood convenience retail in the Innovation District and in proximity to other employment facilities. Office-supportive services should be located on the ground floor and in social hubs of the development where they can be directly accessed by the public.

LU 5.5. Office spaces throughout the Metro Area, and particularly in the Innovation District, are encouraged to be designed as incubators, accelerators, maker spaces, shared working spaces, and labs associated with innovation-driven economies. Large format high employee based offices are permitted.

LU 5.6. Support small-format offices (generally less than 5,000 square feet) within residential mixed-use buildings outside of the Innovation District, where retail is not required, and through co-working configurations.

LU 5.7. Commercial office uses and commercial infill development are encouraged in the Innovation District at locations near Great Mall Parkway, Montague Expressway, and the Milpitas Transit Center to create a more mixed and complete neighborhood with the opportunity for employment. Office and R&D uses should be located close to transit and major streets.

LU 5.8. All office buildings and the supporting public spaces around them should be designed to stimulate connectivity, collaboration, and innovation.

**LU 6. Retail and Active Ground Floors**. Support a mix of neighborhood and regional serving retail and active ground floors that are compatible with surrounding land uses and are economically viable, as seen in the Land Use Map, Figure 2-1.

LU 6.1. Refer to 3.3 Commercial and Mixed-Use Buildings Design Guidelines for additional guidance.

LU 6.2. Retail and active ground floors are required on frontages along Activity Streets. Refer to Chapter 4: Mobility and Circulation for additional standards regarding Activity Streets.

LU 6.3. Ground floor retail uses shall encourage activities and foot traffic at the street frontage and may include uses such as restaurants, retail shopping, service-oriented uses, small offices, medical clinics, gyms, and other similar uses.

LU 6.4. Prohibit drive-through establishments and other new automobile prioritized uses such as gas stations or car-oriented convenience stores.

**LU 7. Public Services.** Expand infrastructure and public services in parallel with new development.

LU 7.1. Consider locating a Police Substation in the Innovation District in proximity to the Milpitas Transit Center. Refer to Land Use Map, Figure 2-1 for approximate location.

LU 7.2. Consider developing a reuse facility in the Innovation District, in the

nearby industrial district or elsewhere in the City that makes building materials available to customers, and acts as an outlet for reusable items otherwise destined for landfill.

**LU 8. Community Spaces.** Locate shared public spaces within each district to be easily accessible for residents, employees, and visitors.

LU 8.1. Refer to Section 2.10 Public Open Space Policies for public space policies and guidelines.

## 2.8 PARKS AND PUBLIC SPACES FRAMEWORK

Open space is a critical component in dense urban communities where residents have limited to no private outdoor space and public open spaces become an extension of their homes. These spaces support social gatherings and recreational opportunities and places for quiet contemplation. Well-designed public spaces contribute to placemaking and define the character and aesthetics of a neighborhood. In addition to social and health benefits, open spaces also have environmental benefits. Landscaping, parks, and gardens can help with stormwater management, reduce the heat island effect in urban areas by providing shade, and provide habitats for pollinators and other wildlife.

Open space is both a highly desired amenity and a limited resource in the Metro Area. Parks and other shared public spaces provide residents, workers, and visitors with recreation opportunities and can improve overall community health. The Metro Plan implements the General Plan and the Parks and Recreation Master Plan by using a combination of standards — acreage of open space and quality of open space — to meet recreation demands. A variety of park typologies will be used to create a varied open space experience that will meet the different needs of the diversity of the people who live, work, and play in the Metro Area.

Some of the policies in this section provide guidance for the City, developers, and the public in general. Others identify the specific considerations that developers must take into account when preparing their development plans.

### 2.8.1 Relevance to Other City Plans

Providing open space that is safe, convenient, and is equitably accessible is a key tenet of the General Plan. General Plan Goal PROS-1 sets a citywide goal to "Provide a diversified and high quality public park and trail system that provides recreational opportunities for all residents." The goals and subsequent strategies and actions contained in this chapter are intended to enhance and expand the citywide park and trail systems to maximize the recreational value of public amenities.

The City's Parks and Recreation Master Plan (2021) establishes a long-term vision and strategy for the provision and programming of parkland and other public spaces across the City. The Master Plan evaluates existing park and recreational facilities and provides a policy framework for the City to respond to new opportunities and meet the changing needs of residents, workers, and visitors.

The Milpitas Metro Specific Plan's vision of providing a greater variety of shared public spaces is consistent with the Parks and Recreation Master Plan's overall vision, goals, and policies. The intent of this chapter is to implement the Parks and Recreation Master Plan and provide additional detail and discussion for parks planning within the Milpitas Metro Area. Developers should refer to the Parks and Recreation Master Plan for additional park guidelines not contained in the Milpitas Metro Specific Plan.

### 2.8.2 Determining Park Demand: Acres Ratio vs. Recreation Value System

The General Plan establishes an overall goal of 2 acres of open space per 1,000 residents in the Milpitas Metro Area. The Milpitas Metro Specific Plan maintains this ratio as a standard and provides additional nuance by using the Recreational Value System to quantify a public space's level of service.

Relying solely on a ratio of open space acres to population can create challenges for cities to adequately evaluate the quality of existing park spaces and to identify recreational needs. Additionally, dense urban areas where the need for public open space is higher due to the lack of private open spaces tend to have a shortage of space due to the competition for land.

The City's Parks and Recreation Master Plan establishes a Recreational Value System to maximize recreational opportunities, capacity, and amenities. The Recreational Value System provides a points-based system for evaluating existing and proposed public parks on their capacity to provide the following amenities:

- Active Uses (e.g., sport court, pool, playground, skate parks)
- Contemplative Uses (e.g., nature area, community garden, public art)
- Social Uses (e.g., amphitheater, picnic area, concession, plaza)
- Support Facilities (e.g., restroom, parking lot, power, WiFi)

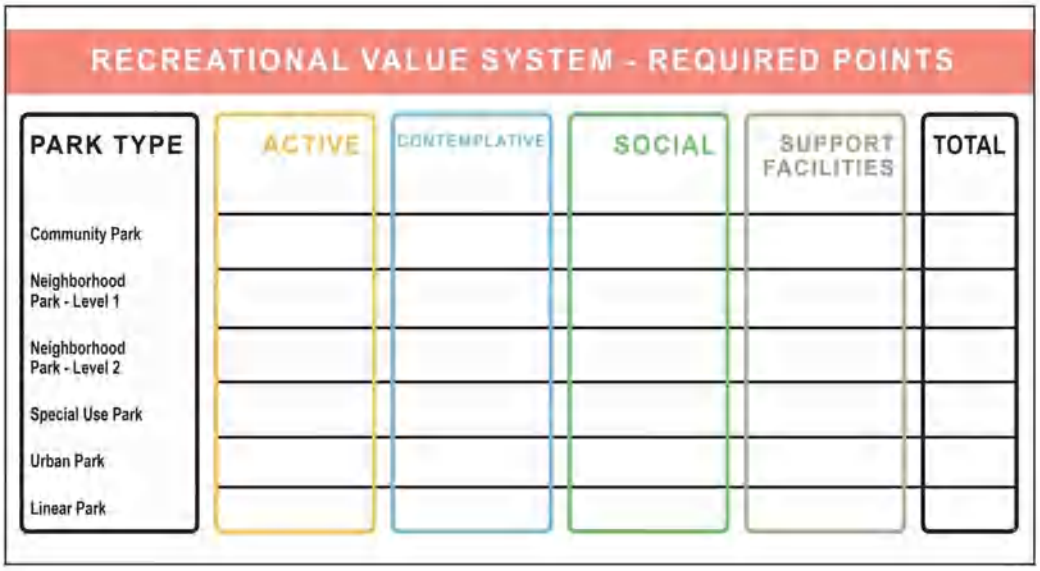
- Required Amenities (e.g., bike racks, drinking fountain, lighting, seating)

This system will ensure that parks are meeting their maximum potential in providing residents and workers with flexible and usable space. This type of value system prioritizes the variety of experiences, access and proximity to experiences, and a comprehensive range of spaces. The Recreational Value System strives to provide a more holistic picture of the City's park systems and illuminate future park opportunities.

### 2.8.3 Existing Park System Park Acreage and Location

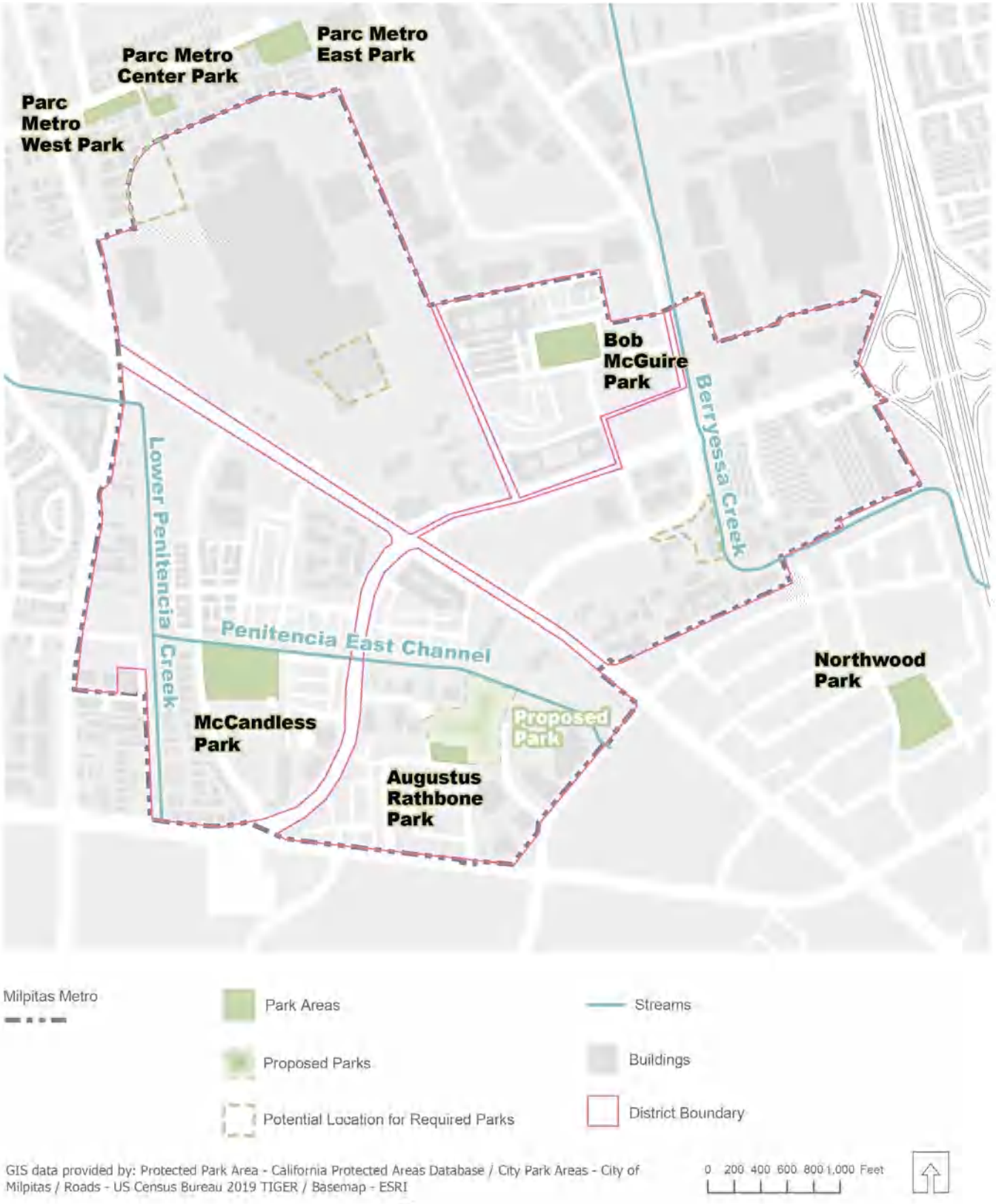
The Milpitas Metro Area is home to the following publicly accessible park amenities:

- **Bob McGuire Park.** Located in the housing development east of the Great Mall, this popular three-acre park includes four tennis courts, an amphitheater, playgrounds, and a field.
- **McCandless Park.** Conveniently located next to Mabel Mattos Elementary School and adjacent to the creek walking trails, this four-acre park is under construction and will be completed in 2022.
- **Augustus Rathbone Park.** This small 0.7-acre neighborhood park is located in the Tango District. It contains playgrounds and grassy




*The Parks & Recreation Master Plan assigned each amenity a maximum point value. As the next step in the Master Plan's implementation, the City will assign each park type with a target range of required points in each amenity category. (Source: City of Milpitas Parks & Recreation Master Plan, 2021: Appendix C.)"*

## Figure 2-7. Existing and Proposed Parks



open space. This park will be enhanced and enlarged in the future.

- **Creek Trails.** The trails that run adjacent to Penitencia Creek are popular outdoor recreational destinations for residents.

### 2.8.4 Park System Needs

The planning process for the Milpitas Metro Specific Plan included multiple outreach efforts which engaged over 400 people. The need for additional public outdoor spaces in the Milpitas Metro Area was identified as a top priority by community participants. The community's top three preferences for types of public space included places to gather, contemplative spaces, and recreational spaces. More specifically, the top three preferences were for plazas and courtyards, farmer's markets and community event spaces, and trails.

There are several opportunities for additional open space in the Milpitas Metro Area, including the following.

- **Tango District Park.** The City has secured land for additional park space in the Tango District north of the existing August Rathbone Park. Once all designated parcels are utilized for parkland, this park will encompass nearly seven acres and will be accessible from several different neighborhoods. This proposed park will be designed to be flexible to meet a diversity of users and will add recreational open space to this growing area.
- **Creek Trails.** Improvements to the Penitencia Creek Trail are being guided by the Bicycle, Pedestrian, and Trails Plan. The existing creek trails will be expanded to connect to a larger citywide trail network to provide residents, workers, and visitors with more recreational access.
- **Great Mall.** The Great Mall and the area around it are anticipated to evolve into vibrant mixed-use areas that are centered around landmark open spaces. The evolution of the Great Mall presents an opportunity for public plazas and flexible spaces that can support community events. With substantial new development, particularly residential projects, the City anticipates parkland development in close proximity.
- **Innovation District.** A publicly accessible park is anticipated in the Innovation District adjacent to Berryessa Creek and the new pedestrian connection to S. Milpitas Boulevard Extension. The proposed park will provide recreational opportunities for workers and provide open space in a district that currently lacks park space.
- **Main Street.** A small park is anticipated on South Main Street. The City may explore the feasibility of connecting this area with the trail system and parks to the east via a pedestrian crossing over the railroad tracks.

*Some examples of Open Space Typologies that are envisioned for the Milpitas Metro Area.*

*An illustration of a creek trail along South Penitencia Creek - East Channel in the Tango District. The pedestrian bridge and Tango District Park can be seen in the background.*

# 2.9 EXISTING AND PROPOSED PARKS OPEN SPACE STRATEGY

## 2.9.1 Open Space Typologies

The Milpitas Metro Specific Plan relies on several different open space typologies to achieve parks and open space goals. In the urban setting that is envisioned for Milpitas Metro, open spaces will look different than much of what exists now in Milpitas. Parkland could include pocket parks, plazas, playgrounds, paseos, squares, performance venues, dog parks, and urban recreational spaces. With people living in smaller units without private yards, these shared open spaces will serve as the backyard for the community.

This Plan maintains the 2 acres of publicly accessible parkland per 1,000 residents standard established in the General Plan but also aims to improve the quality and variety of open spaces. Adequate open space in this more urban setting will be ensured by evaluating public parks and privately-owned public spaces based on the Recreational Value System. This evaluation may result in modifications to amenities within existing parks. Private communal space will be enforced through required minimums per unit.

- **Public Parks:** Public parks and spaces are owned and managed by the City and are freely accessible to the general public. Examples of public parks in the Milpitas Metro Area include Bob McGuire Park and Augustus Rathbone Park, both of which are accessed by dedicated public streets.
- **Privately-Owned Public Spaces**: Privately-owned public spaces are recreational or outdoor spaces that can be accessed by the general public and are owned and managed by a private developer. Privately-owned public spaces must be designed to be easily accessed by the public from sidewalks or pathways. They should be governed by public access easements and be clearly marked as public spaces. These spaces have the same function and access as publicly-owned parks and plazas but are owned and maintained by a private party. These spaces shall be viewed by this Plan as community, neighborhood or urban parks.
- **Private Communal Spaces**: Private communal spaces are recreational or outdoor spaces that are accessible to residents living within a residential community but are not open to the general public. These spaces may include balconies, porches, rooftop gardens, gyms, and other communal spaces that can only be accessed by residents in a particular building complex or community.

## 2.9.2 Open Space Network

Public open space in the Milpitas Metro Area is a critical component to making the neighborhood more complete. The Milpitas Metro Specific Plan will create a connected network of public spaces by integrating new public spaces into the area and enhancing the quality of existing open space. Bike and pedestrian connections, including trails and sidewalks, are part of the open space network and will also increase accessibility to parks and other public space destinations.

Public space can come in a variety of different forms and sizes, including sports fields, plazas, parklets, courtyards, walking trails, and rooftop gardens. The Milpitas Metro Specific Plan utilizes different scaled public spaces and emphasizes partnership with private developers to meet the outdoor needs of residents and workers. The Milpitas Metro Specific Plan will provide high-quality public space that maximizes recreational experiences within the space constraints of this urban environment.

### 2.9.3 Guiding Principles

The policies for public space are guided by the following principles:

- **Large Projects.** "Phased projects" (i.e., Great Mall District and Innovation District) will develop large parks to serve new populations. Policies define acreage and timing requirements.
- **Small to Medium Projects.** Residential and mixed-use infill projects will pay into the TADIF funds dedicated to parkland acquisition and construction and/or provide public open space on site, depending on the size and location of the project. At minimum, standards require that at least 5 percent of the public open space requirement is provided as publicly-accessible open space. As a submittal requirement for entitlement applications, projects must identify how these requirements are being met and demonstrate a commitment to develop and maintain or contribute to public spaces or privately-owned publicly accessible spaces.
- **Quantity & Quality Standards.** Use a hybrid model of an acres per resident ratio and the Recreational Value System to assess public space facilities and identify opportunities for growth.
- **Variety & Distribution.** Ensure that each district will include open space with amenities suitable to serve the uses and activity within or planned for the area.

## 2.10 PUBLIC OPEN SPACE POLICIES

**PPS 1. Access.** Ensure safe, broad, and equitable access to urban public spaces, such as parks, trails, and rooftop gardens.

PPS 1.1. Establish community connections to parks and open spaces from the street and trail network that are easy to access.

PPS 1.2. Ensure that at least three sides of a park be accessible by pedestrians and bicyclists via a sidewalk, pathway, or trail.

PPS 1.3. Design the parks adjacent to Penitencia Creek and Berryessa Creek to provide trailheads for accessing the citywide creek trail system.

PPS 1.4. Distribute public spaces to maximize accessibility from residential neighborhoods, workplaces, and commercial areas.

PPS 1.5. Generally create multiple smaller public urban spaces throughout the plan area rather than a single large park, locating at least one park in each district within walking distance from housing.

PPS 1.6. Locate small neighborhood-serving parks away from major thoroughfares, such as Montague Expressway.

PPS 1.7. Locate parks and outdoor gathering spaces adjacent to higher density residential development to provide a visual and activity amenity for housing, as well as to ensure safety through casual surveillance.

PPS 1.8. Activate parks to the extent feasible, by orienting development entrances to face onto parks and trails to enhance access and safety.

PPS 1.9. Consider including publicly accessible open space as part of the development of City-owned parcels along Main Street.

PPS 1.10. Ensure that parking at parks and community centers are monitored and parking time limits are enforced to ensure the availability of parking for facility users. Refer to M 8.5 for parking requirements for publicly accessible parks.

**PPS 2. Public Space Typologies.** Provide a variety of different sized public spaces, including urban parks, neighborhood parks, community parks, plazas, and pathways that are appropriately scaled for their surroundings and support different activities.

PPS 2.1. Support a range of activities within parks that meet the active and passive recreation needs of Milpitas Metro Area residents, workers, and visitors.

PPS 2.2. Provide for a range of activities within the parks, including walking, jogging, picnicking, bicycling, arts and exercise classes for both children and adults, sports playing fields and courts, and flexible pop-up spaces. Provide:

- Passive recreation parks near housing that provide a visual amenity as well as places to walk dogs, take children to play, etc.;

- Parks with sports fields;
- Urban plazas and courtyards with landscaping, paving, benches and trees;
- A community center where City recreation programs and classes can be offered;
- Staging areas along the trail network where people can access the trail system; and
- Parks along creeks where people can enjoy passive recreation in a creek setting.

PPS 2.3. If a public utility easement (such as the one existing between Capitol Avenue and Penitencia Creek East Channel) is developed as a publicly-accessible pathway or linear park that connects two public streets, it can be counted toward a development's park dedication requirement.

**PPS 3. Recreational Value System.** Enhance and expand public open space facilities based on the Recreation Value System provided by the Parks and Recreation Master Plan. (See Section 2.8.2).

PPS 3.1. Use the Recreational Value System to guide existing and future park improvements to ensure all parks provide a diversity of active, contemplative, and social gathering experiences.

PPS 3.2. Generate publicly-accessible private open space to supplement public open space in meeting the outdoor and recreational needs of residents.

PPS 3.3. Design the citywide trail system as an asset of the Plan Area's open space network in addition to the system's circulation role to connect districts and residential neighborhoods with transit, shopping, and employment.

PPS 3.4. Complete a pedestrian and bicycle network that connects trails and pathways with pedestrian bridges, enhanced pedestrian-friendly environments, and bicycling enhancements to create a loop that connects the entire Milpitas Metro Area.

PPS 3.5. Refer to trail policies in Chapter 3: Site and Building Design Standards and Guidelines for guidance on the design of the trail network.

PPS 3.6. Develop and locate signage along the creek trails to educate trail users on the importance of preserving native vegetation, habitats, and resources. Signage shall be compliant with wayfinding and signage guidelines and standards contained in Chapter 3: Site and Building Design Standards and Guidelines.

**PPS 4. Public/Private Partnership and Requirements for New Development.** Work with property owners to develop public parks and open spaces as a part of the entitlement and/or Development Agreement process for development projects.

PPS 4.1. As a requirement of project submittal during entitlement, project sponsors shall identify how they are meeting parks and open space requirement and demonstrate commitment to the following principles:

- Indicate equitable access as described in PPS 1.
- Describe amenities provided, by category, as described in the Recreation Value System in Section 2.8.2 and PPS 3.
- Identify connection to trails and path network in M 5.
- Identify on-site publicly-accessible park location consistent with PPS 4 requirements below.

PPS 4.2. Activate the Great Mall District with flexible urban public open spaces that support a range of purposes, including social gatherings. Minimum requirements are as follows:

- Development of one large public park, measuring at least two acres.
- Development of one smaller public park, measuring at least one acre.
- Require developer to fund and construct a new public plaza at the Great Mall. Ownership and maintenance of the plaza will be negotiated between the developer and the City.
- Prior to the granting of entitlements for the 1,000th unit, a parkland space of at least 2 acres must be secured for design and construction prior to or concurrent with those entitled units.

PPS 4.3. A large park of at least one acre shall be developed by the City as an amenity in the Innovation District. Smaller paseos, plazas, outdoor dining areas, and/or recreation areas shall be created by project sponsors of commercial projects with at least 10,000 square feet of floor area (excluding retail/restaurant/service area). Commercial project sponsors shall provide at least 25 square feet of contiguous publicly-accessible open space per 10,000 square feet of floor area. Since the Innovation District spans multiple properties with different property owners, park development shall be coordinated and contiguous, to the extent feasible. Individual property owners may collaborate to fulfill the publicly-accessible open space requirements.

PPS 4.4. Consider a range of ownership and maintenance options when developing open spaces within larger developments. Ownership and maintenance of publicly accessible open spaces will be negotiated between the developer and the City on project-by-project basis.

PPS 4.5. Developments that maintain public access to privately owned parks are prohibited from installing private single access gates from a single homeowner's property into the public space.

PPS 4.6. Permit applications for public improvements must identify location of, funding for, and ownership of identified public or publicly-accessible improvements on or adjacent to each site, including roadways, parks, trails, sidewalks, and other similar improvements, as agreed upon with the City.

PPS 4.7. Require developers to submit a soils report for all publicly accessible improvements. The developer shall be responsible for remediating contaminated soils to acceptable standards as defined by the California Department of Toxic Substances Control.

PPS 4.8. Require privately-owned public spaces to be clearly visible and directly connected to the street or pedestrian pathways.

PPS 4.9. Require all existing and planned privately-owned public spaces to include a sign that is adjacent to a major public sidewalk and trail and is easily visible from the street and adjacent trails that states the space is open to the public.

**PPS 5. Programming.** Program parks and public open spaces to provide a variety of both temporal and ongoing experiences and opportunities for community events and education.

PPS 5.1. Coordinate with the Recreation and Community Services Department to activate parks and plazas with community events and allow residents and non-residents to rent out public spaces for events in compliance with citywide policies.

PPS 5.2. Encourage pop-up markets, food trucks, and other temporary events that activate the open space and encourage community gatherings.

PPS 5.3. Renew and develop park facilities to foster education about and engagement in the natural world.

PPS 5.4. Where there is strong public support to manage and maintain them, establish community gardens and edible landscapes within the neighborhood parks that will provide education, access to healthy foods, and economic support for the local food system.

PPS 5.5. The design and programming of new parks must be approved by the City's Parks and Recreation Department.

**PPS 6. Community Gardens.** Include Community Gardens for community wellness and benefit.

PPS 6.1. Make food services available on/at community-level parklands to benefit residents, park visitors, and the environment.

PPS 6.2. Encourage naturally occurring biological pest control.

PPS 6.3. Adopt cultural practices that include cultivating, pruning, fertilizing, maintenance and irrigation practices that reduce pest problems.

PPS 6.4. Encourage use of alternate plant species or varieties that resist pests.

PPS 6.5. Limit monoculture plantings where possible.

PPS 6.6. Require community gardens to be consistent with Community Rules and Regulations, which emphasizes:

- Pedestrian and bicycle access.
- Only flowers, fruits, vegetables, and herbs may be grown in the plots. Beekeeping is allowed. Animal husbandry is not allowed. Only plant species that do not present a danger to others and that produce edible food may be grown. No illegal plants are allowed.

**PPS 7. Plazas.** Plazas should serve as destinations for community members of all ages, income levels, and abilities, and should be safe, inclusive, and welcoming.

PPS 7.1. Refer to PA 5 in Chapter 3: Site and Building Design Standards and Guidelines for guidance on the design of plazas.

**PPS 8. Landscaping.** Provide drought-tolerant landscaping and shade trees that contribute to a comfortable pedestrian experience and maximize environmental benefits.

PPS 8.1. Landscape and maintain all waterway riparian areas where creek trails provide a public presence. All plants and trees located adjacent to public rights of way or in publicly-accessible areas shall be locally-sourced native, drought-tolerant, or water conserving species.

PPS 8.2. Require development projects to include on-site vegetated stormwater treatment and landscaping and shade trees at a rate of one tree per 5,000 square feet of the residential building footprint and one tree for every 10,000 square feet of developed lot area for non-residential or mixed use development to reduce heat island effect.

PPS 8.3. Require native species to be planted within project sponsors' property along creek corridors. In coordination with the Water District, private property owners shall replace invasive and non-native species with native plants and trees when significant re-landscaping or remodeling occurs.

PPS 8.4. Require development projects to rehabilitate areas where vegetation is displaced or disturbed by the development.

PPS 8.5. Daylight existing creeks and waterways, supporting permeable creek beds where practical in collaboration with regional water management agencies.

PPS 8.6. Identify opportunities to expand the use of plants to slow and manage stormwater runoff, including those listed by the Santa Clara Valley Urban Runoff Pollution Prevention Program, in the planning area.

PPS 8.7. Expand shade tree coverage in the Plan Area, particularly in areas underserved by street trees.

**PPS 9. Recreation and Cultural Centers.** Enhance Milpitas Metro as a recreational and cultural destination.

PPS 9.1. Promote the establishment of a community and regionally-focused performing and visual arts center in the Great Mall District.

## 2.11 PRIVATE AND COMMON SPACES

Private and common open spaces are essential elements of residential development. All developments with residential units are required to provide a mix of common and private space on-site. Table 2-3 summarizes the minimum on-site open space that shall be provided. Examples of open space types that can be used to fulfill these requirements are described below.

### 2.11.1 Common Open Space

**Description.** Common open spaces are areas that are intended for common use by residents of the building. Plazas and courtyard areas should have clearly defined visual and physical connections to interior space that promote a comfortable transition from the public to the private realm.

**Requirements.** The provision and design of common open spaces must comply with the following standards.

COS–1. Private development must provide on-site open space at a rate of 100 square feet of private or common space per unit. If developments are unable to provide the required private open space, they may pay an

**Table 2-3. Private On-Site Common Space Requirements for Residential Development**

| | Minimum Requirement | Common Open Space | Accessible to the Public |
|---|---|---|---|
| Required On-Site Open Space | 100 square feet per unit | Minimum of 30% of total open space | Minimum of 5% of total open space |

in-lieu fee as described in Chapter 1 Section 9 of the Municipal Zoning Code on a project-by-project basis, as determined at the time of project entitlements.

COS–2. At least 30 percent of the total on-site open space provided must be common shared spaces.

COS–3. At least 5 percent of the total open space provided should be publicly accessible. Developers may provide at least one of the following types of public open spaces as part of their development project:

- Park
- Plaza
- Garden
- Public sitting area

COS–4. Developments within mixed-use zones that provide at least 50 percent of their units at or below 80 percent AMI are not required to provide public-serving open space.

COS–5. Common open space shall have a minimum dimension of 15 feet.

COS–6. Types of shared spaces that can be used to fulfill this requirement include but are not limited to:

- Courtyards
- Gardens
- Play areas
- Outdoor dining
- Recreation amenities
- Rooftop amenities
- Landscaping

COS–7. Common open space construction, irrigation and planting must be completed before the occupation of a building.

### 2.11.2 Private Open Spaces

**Description.** Private open spaces, such as patios and balconies, are outdoor spaces that are only accessible to the residents of an individual unit. Private open spaces are required not only because they provide access to the outdoor environment but also because they provide visual interest to the design of buildings. Boundaries between private open spaces and shared walkways and communal spaces should be clearly delineated and private open spaces should be designed to ensure privacy and provide a sense of enclosure.

**Requirements.** The design of private open spaces must comply with the following standards.

POS–1. Minimum dimensions for private open spaces shall be consistent with the City's Objective Design Standards.

POS–2. Examples of private open space that can be built include, but are not limited to balconies, private yards, terraces, decks, and porches.

POS–3. Private open space construction, irrigation and planting must be completed before the occupation of a building.

Residential development on Capitol Avenue near the Milpitas Transit Center.

# 3. SITE AND BUILDING DESIGN STANDARDS AND GUIDELINES


3.1. Metro Plan Area Guidelines
3.2. District Guidelines
3.3. Commercial and Mixed-Use Buildings Design Guidelines
3.4. Special Conditions


This chapter implements the Milpitas Metro Specific Plan's vision by establishing policies that relate to the urban design of the area. The design intent of the Specific Plan is to create an exceptional and interesting sense of place, which can be achieved through the streetscape, landscaping, building design, signage, public art, and other design features.

The Metro Plan builds upon the citywide residential objective design standards for the Plan Area. The Milpitas Objective Design Standards address residential development. The residential objective design standards address both smaller and larger sites and multi-family and mixed-use residential building design. This chapter provides design guidelines for the Metro Plan area districts, public projects, and commercial uses.

Guidelines are organized by district. The guidelines focus primarily on the public realm, the majority of which falls within City-owned or publicly held areas. Public investment is addressed first, then private development. These guidelines are intended to provide private development with information about design consistency. Private development will be responsible for some of the design and construction of the amenities within the public realm.

## 3.1 METRO PLAN AREA GUIDELINES

Policies that require public investment are highlighted with color. Policies that are addressed by private investment and apply to private development are highlighted in black.

**PA 1. Connections.** Add streets, trails, and pathways to support multimodal connections to the Milpitas Transit Center and between districts.

**PA 1.1. Complete Connections.** Complete the network of pathways that connect the area by bridging over S. Penitencia Creek East Channel and Berryessa Creek, Montague Expressway, and Great Mall Parkway/Capitol Avenue.

**PA 1.1.1. Improve Trails.** Work with Valley Water to design and improve trails on both sides of Berryessa Creek and South Penitencia Creek East Channel. Trails are envisioned to provide a minimum 8-feet wide multi-weather, permeable pathway that can also accommodate maintenance vehicles. The use of fine gravel materials is discouraged. Further improvements envisioned include more landscaping at the edges of the trails and pedestrian-scaled lighting.

**PA 1.1.2. Multimodal Access.** Prioritize walkability and pedestrian safety as well as vehicular access. Allow bicycles to use pathways.

**PA 1.1.3. Walkable Street Grid.** Enhance the street grid with new streets and mid-block passages to improve walkability within the Metro District.

**PA 1.1.4. Pedestrian-Friendly Ground Floor Experience.** Prioritize and support the pedestrian experience by designing the ground level of buildings to address the pedestrian scale and locating active uses near pathways whenever feasible.

**PA 1.1.5. Direct Routes.** Private development is encouraged to provide direct walking and biking routes to schools and major destinations, such as parks and shopping, through their property.

**PA 2. Complete the Neighborhood.** Complete the Transit-Oriented Neighborhood by encouraging a variety of uses to support a vibrant and varied life within the Metro District. Include neighborhood retail, a balance of jobs and housing, community services, and places to gather, recreate, and relax.

**PA 2.1. Variety of Land Uses and Services.** Provide a variety of land uses and services in the Milpitas Metro District to complement and diversify the mix of uses already present in the neighborhood.

**PA 3. Sense of Place.** Strengthen the identity and sense of place of the Metro Plan Area with new distinguishing features.

**PA 3.1. Gateway Elements.** Develop a gateway experience for transit users and street users to welcome to the Metro Plan Area in concert with signage guidelines. Gateway elements could include public art, landmark buildings, and unique treatment of public spaces.

**PA 3.2. Public Art and VTA.** The City of Milpitas should work with VTA to promote public art on the VTA light-rail infrastructure to make it a landmark for the area. Local artists should be hired to install art that evokes aspirational, geographic, cultural, or striking visual themes.

**PA 3.3. Public Art.** Private development should provide on-site artwork per the City's public art requirements (Chapter 20 of the Municipal Code). Display public art in areas with high levels of pedestrian traffic and ensure that it is easily visible and accessible to the public. Design public art to be interactive and serve all ages. Art should be used to create landmarks and establish a unique local

*Public Art on the underside of the Kellogg Light Rail Bridge, by Andre Caradec and Thom Faulders, titled "Flowzone."*

*Mural on the side of 455 Hyde, San Francisco, by InkDwell.*

*Photo by Allison Fujimoto.*

sense of place, and may also be used as a wayfinding element or integrated into functional street furniture, such as benches, planters, and tables.

**PA 3.4. Landmark Building Design.** Design and build new signature, landmark buildings to reflect Milpitas Metro's regional connectivity within Silicon Valley as a place for innovation, and to create a memorable skyline. Buildings are encouraged to have their own identity and use contemporary methods to define the character of the district.

**PA 3.5. Frame Open Spaces with Active Uses.** Surround publicly accessible open spaces with active uses that provide visibility of indoor activity and entrances onto open spaces. Shared building entrances should be oriented to adjacent open spaces, where possible. Community gathering places shall be framed by placing an active building frontage on at least two sides. Where open spaces cannot be framed by buildings, an active use, architectural elements, or significant landscaping can be used to create a sense of enclosure, identity, and place.

**PA 3.6. Event Programming and "Pop-Up" Uses.** Event programming and temporary "pop-up" uses in the Plan Area are highly encouraged to enliven public spaces and vacant retail spaces. Design of open spaces should anticipate and support a variety of temporary events.

**PA 3.7. Streetscape.** Design the streetscape in the district to support active uses and social gathering. Provide streetscape amenities that support walkability and socializing by providing benches and seating areas.

**PA 3.7.1. Unified Design Identity through Streetscape.** Provide a continuity of streetscape features along the length of a street. At a district scale, coordinated design, type, color and material of

street furniture contribute to a sense of community identity, and reflect and strengthen the local character.

**PA 3.7.2. Street Trees.** Street trees shall be planted in the Amenity Zone at a maximum of 30 feet apart. Street trees shall be selected from Milpitas's Approved Street Trees list. No more than one species shall be planted per block in planters between the street and the sidewalk. Trees should be the same species on both sides of the street on each block. Specimens may be more varied adjacent to buildings.

**PA 3.8. Trail Improvements.** Recreational trails are part of a connective network that includes the Milpitas VTA Transit Center. Trail improvements and new trails shall be provided along both sides of South Penitencia Creek East Channel to improve connectivity to the Milpitas Transit Center and between districts. All trail improvements must be designed in partnership with Valley Water.

**PA 3.9. Trail Relationship to Private Development.** When appropriate, trails should relate to adjacent development with access points, complimentary landscape palettes, or shared public space.

**PA 3.10. Trail Design.** Trails are envisioned as providing minimum 8-foot-wide multi-weather pathways that can also accommodate maintenance vehicles. Locate landscaping minimally on the outside edge of trails away from water channels. The trail network includes multi-use paths and should be designed to support non motorized recreational activities such as walking, running, or biking.

**PA 3.11. Coordination with Valley Water.** All creek-side trail construction shall be coordinated with Valley Water and include considerations for flood control.

*Paved trails next to creeks, designed for walking and biking will help to connect the Metro Area. Photo by Kimberly Nicholls.*

*An example of district wayfinding signage.*

**PA 3.11.1. Trail Shade Trees.** Shade trees along trails should be placed an average of 30 feet on-center at the edges of parcels along the multi-use path.

**PA 3.11.2. Trail Lighting.** Trails should be lit with pedestrian-scale, fully downward-shielded lighting. Lighting should be integrated with development adjacent to the trail. Adequate lighting shall be provided along trails for safety at night.

**PA 3.12. Milpitas Metro Wayfinding Signage.** Provide universally accessible public wayfinding signage through a Milpitas Metro Signage Program. Milpitas Metro Wayfinding Signage should be accessible by a wide range of users, including people of all ages and ability levels.

**PA 3.12.1. Create Guidelines for Wayfinding Branding.** Provide Guidelines for Milpitas Metro Branding that includes a map of the features in the Plan Area that enhance and highlight opportunities for public transit, walking, and cycling. Design and install attractive, consistent Milpitas Metro Wayfinding Signage that builds off the City of Milpitas's branding and wayfinding.

**PA 3.12.2. Create a Milpitas Metro Signage Program.** Create a Milpitas Metro Signage Program that includes a Streetlight Banner program to provide

streetlight banners throughout the Plan Area at major intersections and along corridor access points where pedestrians, bikers, and drivers will be making route decisions. Use the banners to highlight local events in the district.

**PA 3.12.3. Private Wayfinding Signage.** Provide additional district signage and navigational information for pedestrians with privately funded signage that follow the Guidelines for Milpitas Metro Branding. Wayfinding Signage should be coordinated with nearby public art to create a cohesive look and sense of place for the Milpitas Metro Area.

**PA 3.12.4. Wayfinding Information.** Information on wayfinding signage may include regional maps, directional signage, walk and bike distance and mileage to destinations, local maps, community guides, mile markers, and interpretive signage.

**PA 3.12.5. Promote Milpitas Metro Amenities.** Provide district signage at major intersections and corridor access points, near transit, and on Great Mall Parkway and Montague Expressway to highlight the Milpitas Metro Area and list the area's amenities. Promote pathway usage by providing navigational and safety signage for the connections throughout the Metro Area.

**PA 4. Milpitas Metro Specific Building Design.**

**PA 4.1. Citywide Objective Design Standards.** Follow Citywide Objective Design Standards for multi-family and mixed-use buildings, when applicable.

**PA 4.2. Commercial and Mixed-Use Building Guidelines.** Guidelines for Commercial land uses can be found in Section 3.3 of this chapter.

**PA 4.3. Material Guidelines.** Building materials must be selected to contribute to a high quality urban realm and low carbon footprint.

**PA 4.3.1. Finishes.** High-quality, durable exterior finishes should be utilized.

**PA 4.3.2. Mitigate Glare.** Façade materials should serve to mitigate visual glare from both diffused interior lighting and reflected exterior sources.

**PA 4.3.3. Exterior Materials.** Preferred exterior wall materials include: glass, concrete, precast concrete, aluminum and high quality metal panels, composite panels, stone, and stucco.

**PA 4.3.4. Glass Materials.** Preferred glass types include: clear glass, frit glass, sandblasted glass, spandrel glass, and channel glass. Glazing should provide a high degree of light transmittance and be non-reflective.

*Examples of research and development building design in Northern California.*

**PA 4.3.5. Roofing Materials.** Preferred roofing materials include: vegetated roofs, high-albedo built-up roofs, high albedo single-ply roofing, metal, terracotta tile, concrete tile, composite concrete tile, skylights, solar collectors, and photovoltaics.

**PA 4.3.6. Carbon Storage.** Require building materials that store carbon (e.g. wood, calcium carbonate-based cementitious substances, synthetic limestone) in all nonresidential construction.

**PA 4.3.7. Concrete.** Concrete materials must be low-carbon in all viable applications.

**PA 4.3.8. Window Materials.** Vinyl-frame windows and doors are prohibited. Woodframe windows must have metal or fiberglass cladding on the exterior. Metal-frame windows must be thermally broken.

**PA 4.3.9. Functional Architectural Features.** Extraneous building elements that cannot be functionally justified, such as non-functional balconies and false facades are discouraged.

**PA 5. Publicly Accessible Open Spaces**

Refer to the City's Parks and Recreation Master Plan and Chapter 2: Land Use and Public Space for additional descriptions on different types of open spaces and amenities.

**PA 5.1. Location.** A publicly accessible open space is required in every district.

**PA 5.2. Open Space Types.** Open spaces may include plazas, squares, gathering places, paseos, pathways, trails, and parklets. The types of open space desired provide amenities for socializing in big and small groups, performance, recreation, events, and pets.

**PA 5.3. Privately Owned Spaces.** Privately owned public spaces may be provided in addition to public spaces.

**PA 5.4. Accessibility.** Publicly accessible open spaces must be accessible at all times and entry may not be controlled through fencing or gates. Open spaces should be accessible from a public sidewalk and be inviting to the public.

**PA 5.5. Universal Design.** Spaces should be designed to be accessible to all users. Public plazas shall be constructed with ADA-compliant ramps and tactile warning strips at the crosswalks. Extra attention should be paid to how mobility-impaired and sight-impaired individuals will navigate these spaces. Equipment and facilities such as tables, trash cans, restrooms, and drinking fountains should allow for universal access, including people of all ages and ability levels.

*Examples of publicly accessible open spaces.*

*Examples of an urban plaza with ample gathering spaces and multifunctional design. Photo by Rios.*

**PA 5.6. Open Space Materials.** The design of open spaces should combine durable hardscape (paving) and softscape (planted area) materials. Landscaping should be designed using a unique landscape palette that incorporates plants at a variety of heights and with a range of visual textures, colors, and blooming habits.

**PA 5.7. Native Plants.** Open spaces should include native, drought-tolerant plantings that are inviting to local wildlife. Plantings should support the habitat for local birds, bees, and butterflies.

**PA 5.8. Special Features.** Unique features such as fountains, sculptures, landscaping, and/ or artwork should be provided as an integral part of the landscape design. Lighting should be thoughtfully placed around special features to provide ambiance and promote safety.

**PA 5.9. Multifunctional Use.** Open spaces should be designed to be multi-functional and utilize as much of the horizontal area provided as possible to accommodate flexible programming and activities. Design elements that extend a community space's hours and months of use should be selected, such as lighting and weather protection.

**PA 5.10. Seating.** A variety of seating in open spaces should be provided including both moveable and fixed seating as well as seat walls, steps, boulders, and other multi-use objects. Seating should allow for both social interaction and private relaxation; be placed along pathways and within or near gathering spaces; and be comfortable yet durable.

## 3.2 DISTRICT GUIDELINES

### SD 1. Great Mall District

**SD 1.1. Provide a New Street Grid**. New public streets shall be carefully planned and constructed in the Great Mall District to provide a walkable and bicycle friendly street grid. These new streets include three types: pedestrian retail street, neighborhood street, and trails.

**SD 1.2. Street Development and Ownership.** Developers of parcels with edges that abut a new street shall install complete street improvements to the centerline of the street as part of the development. The street right-of-way will then be transferred to City ownership and maintenance unless developed as a private street. Developers of parcels through which a proposed street runs are responsible for the development and ongoing maintenance of the public right-of-way and shall provide an access easement to the right-of-way

**SD 1.3. Activity Streets.** Ground floor retail is required along Activity Streets. The sidewalk on Activity Streets has a frontage zone, a pedestrian throughway, and an amenity zone. Activity Streets also include a multiuse street zone for on-street parking, loading, parklets, landscaping, or

other pedestrian amenities. Activity Streets are described in further detail in Chapter 4: Mobility and Circulation.

**SD 1.3.1. Ground Floor Entrance Orientation.** Ground floor retail storefronts and entrances must be oriented toward Activity Streets.

**SD 1.3.2. Loading Areas.** Loading and service entrances for ground floor retail must not be located on Activity Streets.

**SD 1.3.3. Preferred Commercial Uses on Activity Streets.** Preferred uses on Activity Streets include retail and service establishments; food and beverage, such as restaurants; cafes; bars and brew pubs; co-working spaces; art and craft studios; gyms; and other similar uses. Office uses are permitted if operations provide products or services to the public in a manner similar to retail sales (e.g. travel and real estate businesses).

**SD 1.3.4. Ground Floor Treatment on Activity Streets.** On streets with commercial frontages, the design of the exterior of the ground floor along Activity Streets are encouraged to prioritize the highest level of finishes and decorative elements (e.g. landscaping, potted plants, patios, architectural elements, etc.) to visually enhance the building frontage, identify building entrances, add to the streetscape, and generally engage the public realm without constricting the flow of pedestrian traffic.

**SD 1.3.5. Signage.** Signage along Activity Streets should be provided at both a pedestrian and vehicular scales and orientations. All signage shall be consistent with City and local wayfinding and branding systems.

**Figure 3-1. Sidewalk Zones on Activity Streets**

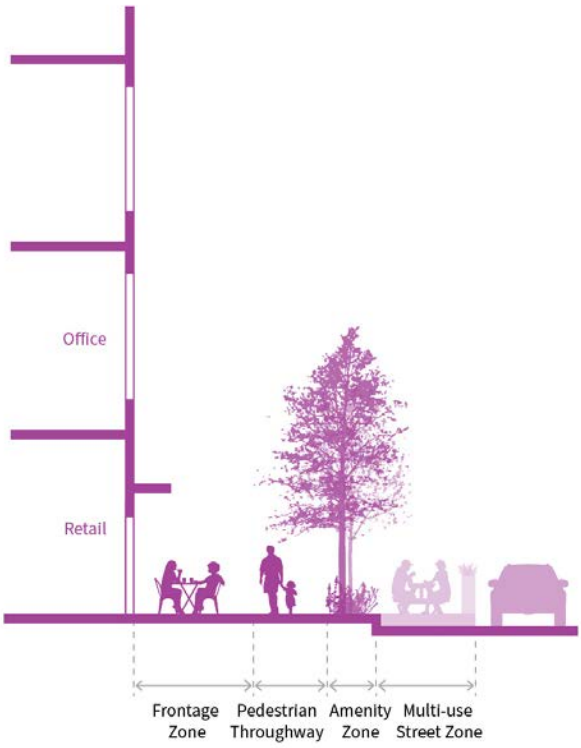


**Figure 3-1. Great Mall District**

*Example of the ground floor treatment on an Activity Street with visibility of active uses, and pedestrian oriented details.*

**SD 1.3.6. Sidewalk Cafes.** Sidewalk cafes are encouraged within the frontage zone of Activity Streets. Such uses must comply with all applicable local, state, and federal regulations for permitting, accessibility, and health.

**SD 1.3.7. Private Furnishings.** Private furnishings are permitted in the frontage zone of Activity Streets. Furnishings may include seating, tables, planters, and art.

**SD 1.3.8. Vertical Clearance.** Awnings, canopies, and umbrellas used within the frontage zone should provide a minimum vertical clearance of 8 feet and should not project into the vehicular right of way.

**SD 1.3.9. Parklets on Activity Streets.** Public spaces can be provided in the street right-of-way in place of existing parking spaces near any food and beverage establishment. These types of spaces are typically called "parklets."

**SD 1.3.10. Frontage Zones.** Frontage Zones shall be located on private property or on the outside edge of the clear sidewalk area adjacent to the ground floor building frontage that supports adjoining commercial uses by accommodating features and activities, such as outdoor dining.

**SD 1.3.11. Pedestrian Throughway.** An unobstructed pedestrian throughway shall be located between the frontage and amenity zones.

**SD 1.3.12. Amenity Zones.** Amenity zones shall be located between the street and the Pedestrian Zone and provide amenities contributing to pedestrian comfort, convenience, safety and interest, and support positive social interaction.

**SD 1.4. Neighborhood Streets.** Neighborhood streets include a planting strip, sidewalk, and landscaped setback.

**SD 1.4.1. Active Frontages.** Active frontages are required on Neighborhood Streets. Active uses can be storefront

commercial, live/ work, ground floor office, or ground floor residential shared amenities, such as a lobby, gym, or conference room.

**SD 1.4.2. Landscaping.** Landscaping in the planting strip may include low bushes and street trees and must be clear of the sidewalk.

**SD 1.5. Mid-block Pathway Design.** Opportunities for new mid-block connections, such as pedestrian paseos, pedestrian paths, or other pedestrian routes should be considered to break up long block length and enhance pedestrian connectivity. Public accesses extending to the rear of a development should be configured with active uses and building entries. Mid-block pathways are narrow lanes that can accommodate light service traffic and pedestrian circulation but have the characteristics of a pedestrian walkway with regard to pavement, furnishings, lighting, and signage. All mid-block pathways shall encourage public use for all members of the community.

**SD 1.5.1. Mid-Block Pathway Uses.** Mid-block pathways can be used for outdoor dining, gathering spaces and children's play areas. Landscaping, seating, tables, potted plants, artworks, bicycle racks, kiosks and textured or decorative paving should be considered to promote passageway activity and create visual interest. A clear pathway of 5 feet should be maintained next to additional uses in the pathway for accessibility and egress.

**SD 1.5.2. Pathway Design between Residential Buildings.** Refer to Citywide Objective Design Standards for Passageway design between residential buildings.

**SD 1.5.3. Utility and Trash Enclosures in Pathways.** All utilities located in mid-block pathways should be screened and keep a clear pathway of 5 feet.

## SD 2. Tango District

**SD 2.1. Tango District Connections.** New public pathways and streets shall be carefully planned and constructed in the Tango District to provide clear and efficient pedestrian and bicycle connectivity to the Milpitas Transit Center and adjacent neighborhoods.

**SD 2.1.1. Pedestrian Bridge to the VTA Transit Center.** The publicly funded pathway and pedestrian bridge that connects to VTA Transit Center on S. Milpitas Boulevard Extension to the Tango District shall be designed for Emergency Vehicle Access but restricted from through traffic.

**SD 2.1.2. Trail Improvements in the Tango District.** Trail improvements shall be provided along both sides of South Penitencia Creek East Channel to improve connectivity to the Milpitas Transit Center and between districts. The trail should extend from Montague Expressway to the City boundary. All trail improvements must be designed in partnership with Valley Water.

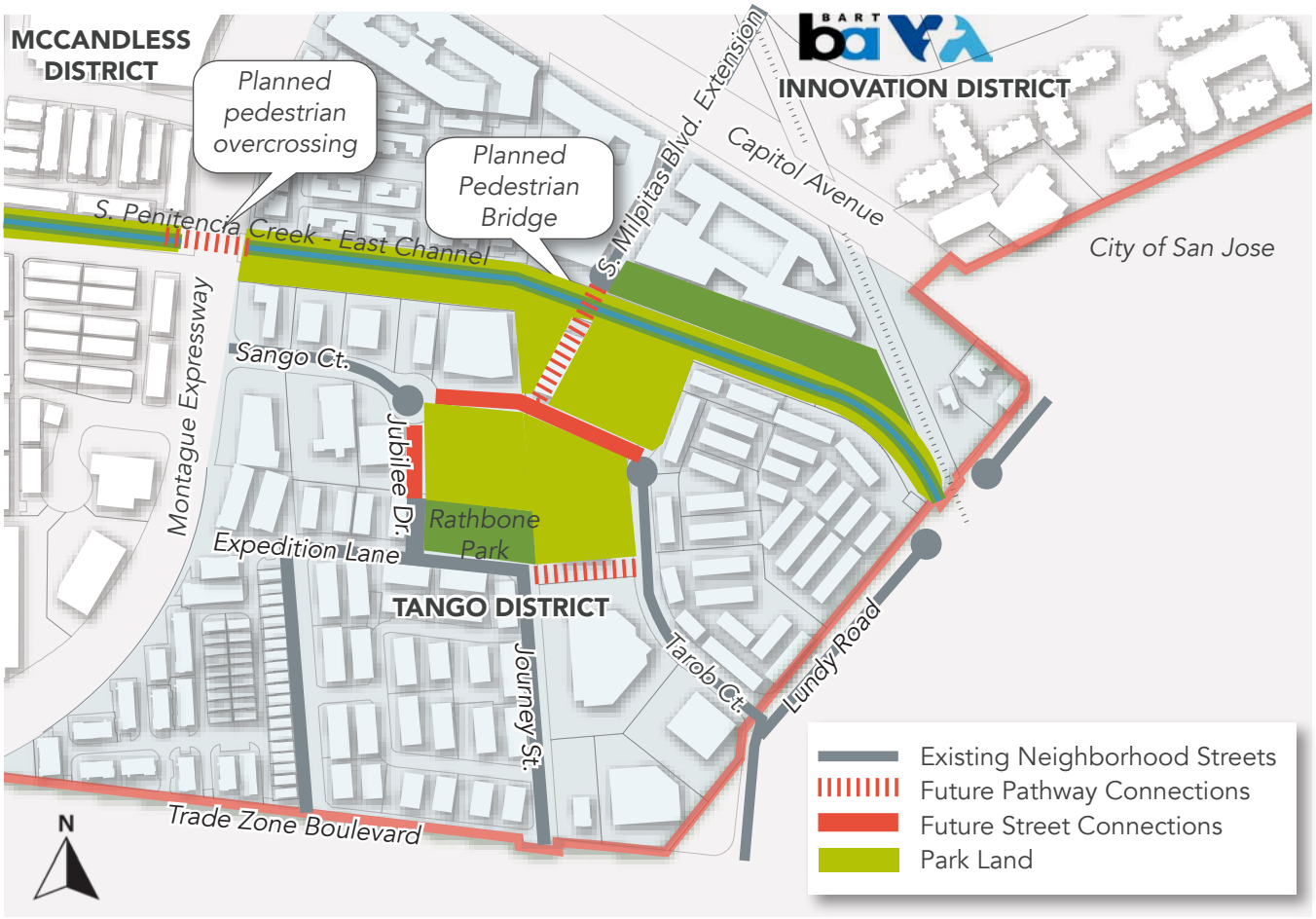
**SD 2.2. Private Development along Creek Trail Improvements.** New development next to South Penitencia Creek East Channel should orient to the creek trail and provide landscaping, lighting, and edge treatment through low walls, landscaped edges, or using the design of the ground floor of the building to activate the trail. Individual entries for units fronting the trail are encouraged.

**SD 2.2.1. Connection between Tarob Court and Sango Court.** A pedestrian pathway shall connect northward from the end of Tarob Court with the creek trail and at midblock on Tarob Court with Journey Way. Portions of the connection shall be provided as an easement on private property.

**SD 2.2.2. Connection between Sango Court and Jubilee Street.** New street and sidewalk extensions are required at Jubilee Street to meet Sango Court and from Sango Court to meet Tarob Court to complete connectivity in this subdistrict. Portions of the connection shall be provided as an easement on private property.

**SD 2.3. Publicly Accessible Connection between Jubilee Street to Tango Court.** A publicly accessible connection between Jubilee Street and Tango Court is needed to complete the street grid in the Tango District. This easement on private property must be maintained as a publicly accessible mid-block pathway to complete the pedestrian and bicycle network.

**Figure 3-2. Tango District**




**SD 2.4. Pedestrian Overcrossing Connection to McCandless District.** The connection of the creek trail next to South Penitencia Creek East Channel on both sides of Montague Exprssway shall be bridged with a Pedestrian Overcrossing. This overcrossing has been planned since the original Transit Area Specific Plan.

**SD 2.5. Tango Park.** The expansion of the park in the Tango Subdistrict adds to Rathbone Park and connects both Tango Court and Sango Court. Tango Park extends to the edge of South Penitencia Creek East Channel and the creek trail. Tango Park will be designed for passive recreational uses and spontaneous sports with ample space for gathering and socializing including areas for a children's play area, picnic areas, pet area, and native planting that attracts birds, bees, and pollinators. An area for a community garden is encouraged within the park for local volunteers to operate.

## SD 3. McCandless District

**SD 3.1. Trail Improvements in McCandless District.** Trail improvements and new trails shall be provided along both sides of South Penitencia Creek East Channel to improve connectivity to the Milpitas Transit Center and between districts. This includes the segment between Montague Expressway and the north-south channel parallel to South Main Street that extends from Montague Expressway to Great Mall Parkway. All trail improvements must be designed in partnership with Valley Water.

**SD 3.2. Redesign of Houret Court.** Vehicle circulation and pedestrian pathways off of Houret Court shall be redesigned to provide access to McCandless Drive and McCandless Park.

SD 3.2.1. Vacate a portion of the existing cul-de-sac to permit through traffic while continuing to accommodate existing driveways and access points.

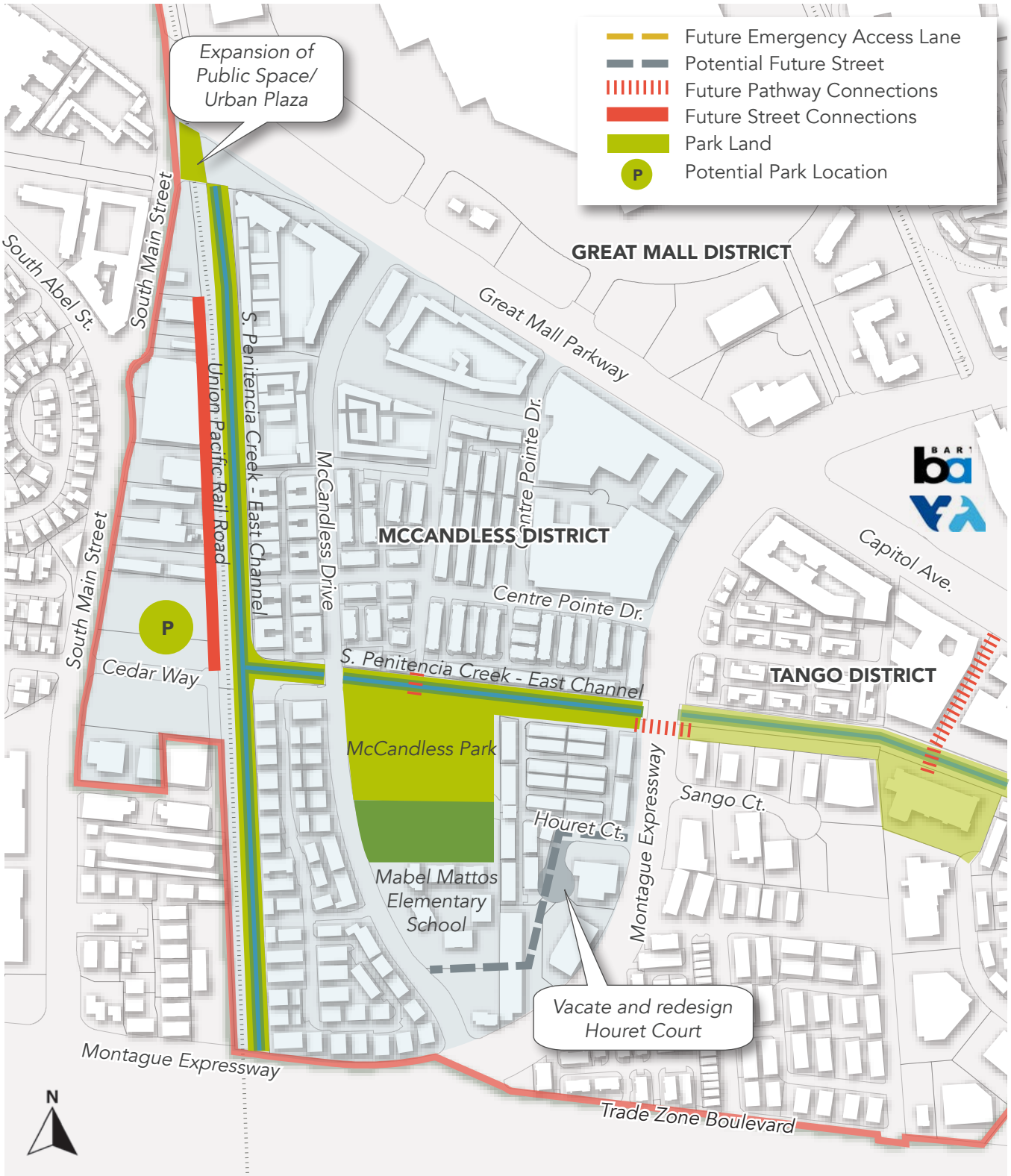
SD 3.2.2. Extend a public street between McCandless Drive and Montague Expressway.

**SD 3.3. South Main Street Connection.** A new street connection shall be provided on South Main Street adjacent to the railway that extends from Cedar Way to the northern boundary of the property at 1416 South Main Street. This street connection shall include at least one street connection to South Main Street.

**SD 3.4. South Main Street Park.** A small park is required along South Main Street. It is encouraged that the park provides a visual connection between the creek and South Main Street. Future development around the park shall activate it as much as possible by orienting to it and bordering it with active uses. A future connection across the creek should be considered to extend the trail network from South Main Street to the VTA Transit Center.

**SD 3.5. Public Space at South Main Street and Great Mall Parkway.** The southeastern corner of the intersection of South Main Street and Great Mall Parkway includes a separated right turn lane and railroad tracks. The infill of the right turn lane extends the public space at that corner. The public space is envisioned to be an urban plaza. New development next to the public space should be designed to activate it as much as possible by orienting to it and bordering it with active uses.

**Figure 3-3. McCandless District**



## SD 4. Innovation District

**SD 4.1. Promote Office and Research & Development Land Uses in the Innovation District.** Work with future developers to build office and research and development in alignment with the Milpitas Economic Development Strategy.

SD 4.1.1. Work with VTA to build office and R&D near the Milpitas Transit Center on VTA-owned sites in the Plan Area.

SD 4.1.2. Business incubators and co-working spaces in the Innovation District are encouraged and may be included as an interim use.

SD 4.1.3. Future development programming that provides shared meeting rooms and conference spaces is encouraged.

**SD 4.2. Deploy 5G Wireless Service.** Target deployment of 5G Wireless service for growth of the office/ R&D uses as part of a new Innovation District and to all related districts in the Plan Area.

**SD 4.3. Trail Improvements in the Innovation District.** Trail improvements and new trails shall be provided across Berryessa Creek to improve connectivity to the Milpitas Transit Center. The connection should be an at-grade pedestrian crossing that provides direct access from the eastern portion of the Innovation District to the VTA Transit Center. All trail improvements must be designed in partnership with Valley Water.

**SD 4.4. New Street Connections.** New public streets shall be carefully planned and constructed in the Innovation District to provide a walkable and bicycle friendly street grid. At a minimum, the connection between the two existing cul-de-sacs west of Berryessa Creek should be made with two new streets.

**SD 4.5. Police Substation.** Provide a police substation in the Innovation District preferably near public open space.

**SD 4.6. Rooftop Open Space.** Rooftop parks, gardens, and open space are encouraged on top of Innovation District buildings.

**Figure 3-4. Innovation District**

## 3.3 COMMERCIAL AND MIXED-USE BUILDINGS DESIGN GUIDELINES

Commercial and mixed-use building design guidelines are applicable throughout the Plan Area, particularly to the Innovation District, Great Mall District, and part of Piper District.

**CB 1. Site Design and Access**

**CB 1.1. Site Specific Design.** Site specific building design is encouraged. There should be differences between buildings depending on their location. Buildings are encouraged to demonstrate identity within each phase.

**CB 1.2. Outdoor Amenities.** Site development for places of employment should include generous gathering spaces, comfortable and attractive outdoor environments, and amenities that support multi-modal transportation. Whenever possible, make outdoor amenities available to the public.

**CB 1.2.1. Open Space and Pedestrian Access.** Ground floor interest can be achieved by introducing plazas, courtyards, walkways, and alleys that allow access through development and create visual breaks in the facade.

**CB 1.2.2. Landscaping.** Landscape design shall be used to activate building facades, soften building contours, highlight important architectural features, screen less attractive elements, provide shade, and add color, texture, and visual interest.

**CB 1.2.3. Climate Appropriate Planting and Materials.** Landscape materials should be of high quality and suitable for the Bay Area climate. In order to reduce water consumption, naturalized and low-water use plant species are preferred.

**CB 1.3. Pedestrian Entry.** An at grade pedestrian entry, including a walking path to the public pedestrian circulation network, shall be provided on each street frontage.

**CB 1.4. Parking Access.** Parking entry points are preferably accessed from nearby lanes or side streets rather along the primary frontage where conditions apply.

**CB 1.4.1. Curb Cuts.** Curb cuts should be located to minimize transit, bicycle, and pedestrian conflicts. Parking access shall use the minimum feasible curb cuts and may be a minimum of 12 feet wide and accommodate ingress and egress.

**CB 1.4.2. Street Access.** Vehicular access to parking structures should be provided primarily from side (i.e. secondary) streets to reduce conflicts with pedestrians and minimize interruptions to the continuity of the primary street facade.

**CB 1.5. Service and Loading Areas.** Service and loading areas must be designed to efficiently allow access to delivery points while screening public areas from the noise and visual impacts of these facilities.

**CB 1.5.1. Loading Zones.** Loading zones should be located away from major pedestrian routes and intersections and shared with parking entrances, where possible.

**CB 1.5.2. Access to Loading.** Access to loading spaces should include adequate space to maneuver trucks and service vehicles into and out of all provided spaces, and be designed so as to facilitate access to the building while minimizing interference with street and sidewalk circulation. Entrances to loading facilities should be minimized in size and designed with visual buffers from pedestrian areas.

*Examples of innovative building design that is articulated, modulated, frames open spaces and activates the ground floor experience. Top photo by Sam Fentress. Bottom Photo by Nick Merrick*

**CB 2. Innovative Building Design.** Commercial buildings should be designed as signature, distinctive, and innovative reflecting the research and development that is occurring within them and the prestige of companies that occupy them.

**CB 2.1. Commercial Mix.** Vertical mixed-use in mid-rise and high-rise buildings is encouraged. Mixed-use buildings throughout the district may include ground floor neighborhood retail.

**CB 2.2. Flexibility of Use and Building Design.** Office/ R&D buildings should be designed to be flexible and adaptable through use of modularity. The module will influence the structural system design.

**CB 2.3. Articulated Facades.** Facade design should include high quality materials, windows, solar control devices, and other design elements to provide a well articulated building.

**CB 3. Building Massing.** Massing should vary and remain flexible until specific projects are identified and their program requirements are understood. Applicants should consider segmenting the building into smaller masses that correspond to the internal function of the building and employing variations in the building facades that provide more visual relief, such as streetwall indents and recessed building planes, deep entry and window openings, balconies, window bays, varied horizontal treatment (i.e. a roof, cornice or parapet), and piers at corners and structural bays.

**CB 3.1. Solar Orientation.** Consider orienting buildings to be south-facing to maximize passive solar heating and cooling for sites greater than five acres in the Innovation Subdistrict and Great Mall Subdistrict.

**CB 3.2. Framing Open Space.** The base of towers must be designed to form and enhance open spaces and sidewalks at the ground level.

**CB 3.3. Minimizing the Perception of Mass.** The building base should provide a change in color, massing, recess or projection to differentiate the base, which can be at minimum the ground floor level to reduce the perception of mass along the street frontage. Buildings must step back after the first 3-5 floors.

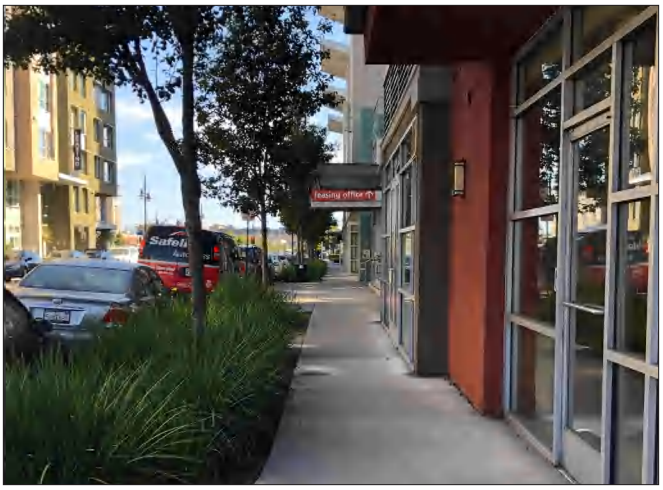
**CB 3.4. Modulate Long Facades.** Long building façades shall use modulation and articulation to create break up long street walls. Provide visual interest and variation on major facades by utilizing the following architectural elements: recesses; awnings; colonnades; pronounced entrances; projections; step-backs; changes in height, floor level, and roof form; window reveals; cornice treatments; parapets; and changes in color or material.

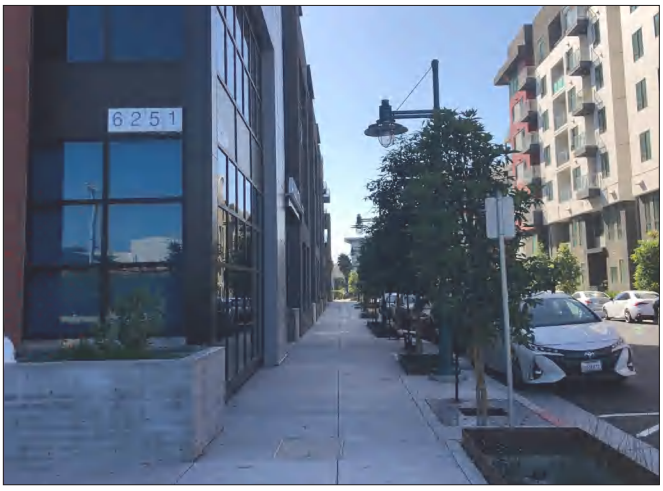
**CB 3.5. Building Base and Orientation.** The design of the lower floors of mid-rise and high-rise buildings affects the public realm and pedestrian environment. The role of the base building is to frame the public realm and adjacent open spaces, articulate entrances, and assist in the creation of an attractive and animated public realm which provides a safe, interesting, and comfortable pedestrian experience. The ground floor should be designed to be an attractive and animated public realm which provides a safe, interesting, and comfortable pedestrian experience.

**CB 3.6. Varying Rooflines.** Office/ R&D Buildings should include variable roof lines using different heights, differentiated treatment, projections and recesses and special features to make the skyline memorable.

**CB 4. Ground Floor Design.** The ground floor of a commercial building delivers an important sense of design to the adjacent streets and other uses, as serves as a transition area between public spaces and the interior of the building. These ground floor guidelines aim to help maximize the function of the ground floor.

**CB 4.1. Active Uses.** Locate active ground floor uses along the primary facade. Active ground floor uses include retail, office, live/ work, and residential common



*Examples of ground floor design that promote active uses, orient to adjacent streets, and treats service entries with similar architectural character.*

spaces such as mail rooms, bike rooms, communal kitchens, community rooms, conference rooms, social gathering areas (porches/patios), and lobbies. Active uses in commercial buildings include: gathering areas such as auditoriums, meeting rooms, cafeterias, reception areas, and shared work spaces should be located on the first floor to encourage interaction with sidewalks, public areas, and plazas.

**CB 4.2. Ground Floor Treatment.** The base of buildings shall place active ground floor uses and primary building entrances along their primary facades oriented to adjacent streets, parks, and open space.

**CB 4.3. Entrances.** Primary entrances should be enhanced with extra detailing, framing, awnings and signage to provide visual interest, wayfinding, and weather protection.

*This example shows the service entrance treated with the same architectural character as the rest of the building and located away from active entries by a loading zone.*

**CB 4.3.1. Orientation to All Adjacent Streets.** Multiple entrances for buildings are encouraged from the side and/ or rear streets.

**CB 4.3.2. Entries Activating Streets.** The main entrance may not face a parking lot and must be placed to support activity on streets.

**CB 4.3.3. Welcoming Lobbies.** Primary entry lobbies should be designed to provide visual interest, orientation, and a sense of welcome from streets, public rights of way and plazas.

**CB 4.3.4. Universal Access.** Universal access best practices should be integrated into all building designs.

**CB 4.3.5. Consolidate and Activate All Entries.** Exit door alcoves on the building exterior are encouraged to share space with primary entries and active pedestrian circulation where possible. Minor entry and exit door alcoves on the building exterior are discouraged when they do not share space with active visual surveillance such as primary entries or active pedestrian circulation.

**CB 4.4. Service Entrances.** Service entrances should include either opaque or translucent garage door panels or treat that portion of the service yard visible from the public realm with the architectural character employed throughout the rest of the building.

**CB 4.4.1. Mitigate Noise from Service Areas.** Noise from loading areas, emergency supply areas, and equipment should be mitigated so as not to disturb users of nearby public open spaces.

**CB 4.5. Maximize Leasability.** Design ground floor retail spaces to accommodate leasable features.

**CB 4.5.1. City of Milpitas Design Standards for Commercial Frontages apply.** Standards addresses transparency, weather protection, provisions for setback design, depth of use, floor-to-floor heights and more.

**CB 4.5.2. Efficiency of Space.** Locate demising walls around columns in larger retail spaces to maximize the efficiency of the space and minimize small gaps between columns and walls. Provide a minimum of 5 feet between walls and columns.

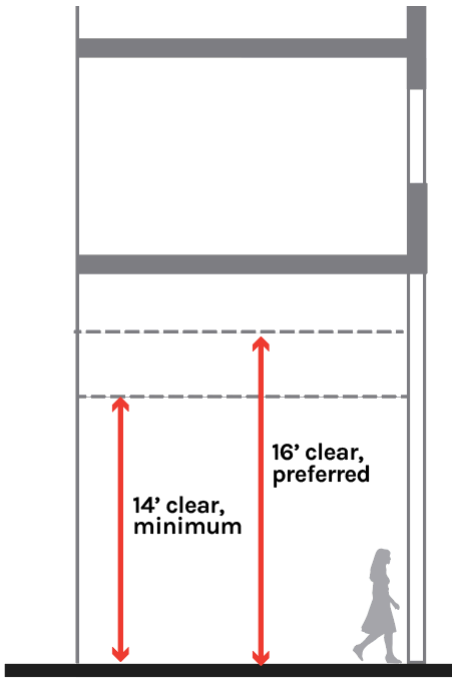
**CB 4.5.3. Retail Depth.** Provide a space with a minimum of 60 feet in depth for a minimum of 50 percent of the space, and a minimum of 40 feet in depth any remaining space.

**CB 4.5.4. Ground Floor Height.** Ground floor retail must have a minimum of 18 feet floor to floor height with a minimum of 14 feet clear inside the leasable space, 16 feet clear is preferred.

**CB 4.5.5. Interchangeable Storefront.** Provide interchangeable storefront systems to accommodate changes in tenants.

**CB 4.5.6. Restaurant Considerations.** Where food and beverage retail is anticipated, grease traps are required.

**Figure 3-5. Commercial Ground Retail Floor Height**



**CB 4.5.7. Placement of Upper-Level Lobbies.** Lobbies for commercial office or residential uses above the ground floor shall be oriented to ensure continuous and uninterrupted retail and other active uses along the ground floor.

**CB 4.5.8. Flood Elevation for Non-Residential Buildings.** The lowest floor of non-residential construction in the floodplain can be built at the Base Flood Elevation.

**CB 5. Rooftop Design**. Roofs of buildings may be used as shared spaces. Rooftops may also include green roof systems, alternative forms of energy production, and rainwater catchment systems.

**CB 5.1. Multifunction Roofs:** Roof designs should consider systems such as vegetated roof covers (green roofs), alternative forms of energy production, and rainwater catchment systems.

**CB 5.2. Screening Rooftop Equipment.** Screening shall be incorporated into the overall architectural character of the building. Rooftop mechanical equipment must not be visible from the street and shall be visually screened from public view and next to shared spaces like rooftop gardens and patios.

**CB 5.3. Natural Lighting.** Roofs are encouraged to utilize skylights to maximize natural lighting within buildings.

**CB 5.4. Universal Access to Rooftop Common Spaces.** Provide universal access to rooftop amenities. Provide an accessible path to a publicly accessible restroom on an adjacent floor or at the rooftop level for any common outdoor open space on the rooftop.

**CB 5.5. Rooftop Landscaping.** A minimum of 10 percent of the open space shall be landscaped using green roofs or planters. Drought tolerant vegetation and landscape variety are encouraged on rooftop gardens.

**CB 6. Parking Garage Design.** These design standards and guidelines are additional to citywide design standards.

**CB 6.1. Parking Layout.** On-site parking shall be provided at the rear of the site and above the ground floor, wherever possible. Structured parking is preferred and should be screened from the primary street; no parking shall be allowed along the main frontage of buildings.

**CB 6.2. Separated Pedestrian Entrances.** Pedestrian entries to parking garages should be separate from vehicular entrances and located along major pedestrian connections where they are

easily seen and conveniently accessed as a pedestrian or cyclist. They should be designed to be as open and visible as possible, incorporating adequate lighting to promote a feeling of security and comfort.

**CB 6.3. Bicycle Parking.** Bicycle parking is required in all parking garages or other approved alternative on-site locations that serve commercial and residential uses. Bicycle parking shall be located at the ground floor in a conveniently accessible location near a shared pedestrian entrances and exits and secured and weather protected.

**CB 6.4. Conceal Parking Garages.** All parking garages should be concealed as much as possible from public view, especially at the ground level. Whenever feasible, parking should be either located below ground, wrapped behind buildings, located on the interior of blocks where it is screened from public view.

**CB 6.5. Parking Garage Facade Design.** Where structured parking is visible to the public realm, the design of the facade shall be treated in a similar manner as the adjacent buildings. The facade shall not repeat the sloping floor lines of interior parking ramps on the facade.

**CB 6.6. Parking Garage Rooftop Materials and Amenities.** The standard roofing materials must have a low albedo, cool roof system or finish. Rooftop amenities that provide vegetation, generate energy, or are designed as shared amenities are an exception to the standard design.

**CB 6.7. Design for Conversion.** The design of parking structures shall be designed for future conversion to other uses. Parking floors shall not be sloped and parking circulation should be designed in a way that anticipates its removal. Ramps from

*Bicycle parking facilities at The Logan (Oakland) and The Parker (Berkeley).*

the ground floor to upper parking levels should be designed in a way that can be adaptable for future conversion of parking spaces to usable space.

**CB 6.8. Parking Signage.** Signage for public parking shall be clearly marked and visible from the street. Vehicular Entry. At grade entries facing the street shall be no more than 20 feet wide and recessed a minimum of three feet from the facade

**CB 6.9. Lighting.** Structured parking shall be designed such that interior lighting shall be fully shielded and automobile headlamps shall not be visible from adjacent buildings, parcels, streets, public parks, publicly accessible outdoor space or designated open space area.

**CB 6.10. Tandem Parking.** Parking configurations may utilize tandem parking for more efficient use of space, provided that both parking spaces are used by the same tenant or otherwise conform to a site parking plan approved by the City.

**CB 6.11. Parking Lifts.** Parking lifts may be used for more than one unit. Parking lifts may not require backing one car out to get to another car.

## CB 7. Sustainability

**CB 7.1. Citywide Sustainability Policies.** The Milpitas Metro Plan Area is a center of development and change in Milpitas, and will serve as an example for the implementation of sustainable building practices in the city. Additional sustainability policies are located in the City of Milpitas Climate Action Plan.

**CB 7.2. Energy.** New buildings shall include features that include the most impactful methods for reducing energy uses and greenhouse gas emissions.

**CB 7.2.1. Solar Design Management Plan.** All new developments shall develop a management plan for solar exposure, including optimizing natural lighting and managing passive heating and cooling.

**CB 7.2.2. Residential Electrification.** All new residential buildings shall be all-electric.

**CB 7.2.3. Nonresidential Electrification.** All new nonresidential buildings shall be all-electric, unless uses essential to the key functions of the internal business, such as manufacturing or laboratory work, require natural gas. Kitchens and cooking do not require natural gas. All new nonresidential buildings shall install electric cooking appliances, water heaters, and space heaters.

**CB 7.3. On-Site Energy Generation.** Encourage on-site renewable energy generation, including the use of solar panels on rooftops and over parking lots.

**CB 7.3.1. Solar Energy.** All new nonresidential buildings shall install solar photovoltaic systems or purchase electricity from a community energy provider (e.g. Silicon Valley Clean Energy).

**CB 7.3.2. Generators.** All new residential and nonresidential buildings shall use zero-emission generator engines for generators with a supply of 25 kW or less.

**CB 7.4. Construction Equipment.** All off-road heavy-duty construction equipment shall use high-performance renewable diesel.

**CB 7.5. Water Conservation and Recycling.** New buildings shall include features that reduce water usage and incorporate water recycling systems.

**CB 7.5.1. Low Flow Plumbing Fixtures.** Ultra low-flow fixtures in residential and nonresidential development are required.

**CB 7.5.2. Recycled Water for Industrial Uses.** Incorporate the use of recycled water for industrial uses and landscape irrigation where feasible, within the parameters of State and County Health Codes and standards and in compliance with regional agency requirements.

**CB 7.5.3. Recycled Water for Residential and Nonresidential Uses.** All new residential and nonresidential development shall include a separate piping system for recycled water (i.e. purple pipes) to be used for irrigation and other outdoor water uses, as feasible.

**CB 7.5.4. On-site Recycled Water.** All new development projects shall install on-site recycled water systems (i.e. greywater systems) and rainwater harvesting systems, consistent with all State and County Health Codes and standards and in compliance with regional water agency requirements.

**CB 7.6. Low Impact Development and Stormwater Runoff.** All projects shall comply with State, regional local regulations related to Low Impact Development and Stormwater capture and treatment, and be designed and constructed in accordance with Low Impact Development principals to mimic the site's predevelopment hydrology.

**CB 7.6.1. Stormwater Retention.** Encourage incorporation of water collection and retention devices, such as rain barrels and cisterns, into building design to allow for water reuse.

**CB 7.6.2. Integration of Stormwater Runoff Features.** Encourage incorporation of water runoff strategies such as rain gardens, bioretention swales, and permeable pathways into development roadways, and parks.

**CB 7.7. Solid Waste.** Building construction and operations shall incorporate measures to screen waste areas from view, reduce waste generation and maximize waste diversion from landfills and reuse.

**CB 7.7.1. Waste Facility Location.** Waste and recycling facilities and other services are to be provided for all buildings in a location that balances access, convenient pickup, and maintenance, and is screened from pedestrian zones.

**CB 7.7.2. Waste Diversion.** All construction and demolition projects shall achieve a 75 percent diversion waste rate.

**CB 7.7.3. Organic Waste Collection for Residential.** All multifamily residential buildings shall provide organic waste collection services for tenants and employees.

**CB 7.7.4. Organic Waste Collection for Nonresidential.** All nonresidential buildings shall provide collection containers for organic waste and recyclables in all areas where disposal containers are provided, except in restrooms.

**CB 7.8. Electric Outlets.** All new development shall install sufficient exterior electrical outlets to power electric-powered landscaping equipment.

## 3.4 SPECIAL CONDITIONS

**SC 1. Historic Resource.** For any future development project occurring within the Metro Plan area that proposes to alter or demolish a building that is more than 50 years old, the City will require the project sponsor to engage a professionally qualified historian or architectural historian to prepare a historical evaluation of the building unless a previously prepared historical evaluation is available. This requirement can be met through the preparation of California Department of Parks and Recreation 523 Forms. The historical evaluation will analyze whether the building meets the eligibility requirements of the California Register of Historical Resources. If the building is determined to be eligible, the project sponsor's professionally qualified historian or architectural historian must also assess the project's compliance with the Secretary of the Interior's Standards for Rehabilitation. If the building is determined not to be eligible, or if the project is found to adhere to the Secretary's Standards relative to eligible resources, no further action is required.

**SC 2. Central Corridors.** Enhance arterial streets - Montague Expressway, Great Mall Parkway/ Capitol Avenue, South Main Street, and Trade Zone Boulevard - to include facilities for active transportation.

**SC 2.1. Features.** Central Corridors should include the following features:

- Bike lanes and sidewalks on both sides of the road
- Street furnishings, including ample seating, bike racks, waste and recycling bins, bollards, and human scale street lights.
- Ground-level activity that invites Central Corridor users on to Activity Streets.
- Landscaped setbacks along Great Mall Parkway, Capitol Avenue, South Main Street, and South Milpitas Boulevard to buffer uses from heavy traffic.
- Pedestrian crossing enhancements for traffic awareness and speed reduction.

**SC 3. Great Mall Parkway**

**SC 3.1. Multimodal Streetscape on Great Mall Parkway.** A protected bike lane and linear park shall be provided on Great Mall Parkway to improve the walking and bicycling experience and transform the corridor into a multi-modal streetscape.

**SC 3.2. Complete Streets Improvements.** Great Mall Parkway between Montague Expressway and Main Street shall be transformed into a complete street by narrowing travel lanes and the central

median and adding protected bicycle lanes and a linear park with a minimum width of 20 feet, next to a sidewalk with a minimum width of 20 feet. This corridor requires building entrances and active ground floor uses to orient towards Great Mall Parkway.

**SC 3.3. District Identity on Great Mall Parkway.** Great Mall Parkway is a gateway to the Milpitas Metro Area that should be enhanced with public art in the form of murals, district identifying signage and wayfinding, and consistent streetscape. Future development along Great Mall Parkway in the Great Mall District shall orient to and activate Great Mall Parkway with signature building design, an activated ground floor, and landscaping to support the vibrancy and walkability of the linear parkway.

**SC 4. Separation from Rail Lines.** Any development projects, parks, or pedestrian trails built directly adjacent to a rail line (i.e. sharing a property boundary, not separated from the rail line by a roadway) shall build continuous fencing or solid walls between the development and the rail line to ensure that there will be no pedestrian access to the line. Fencing shall be designed to deter graffiti and trespassing.

**SC 4.1. Residential Units next to Rail Lines.** Housing units next to rail lines must be constructed to mitigate negative impacts of train noise.

**SC 4.2. Acoustics for Bedrooms Adjacent to Rail lines.** The acoustical exterior of bedrooms in areas within 200 feet of rail right of ways shall be enhanced to address the sound of the trains.

**SC 5. Waterways**

**SC 5.1. Santa Clara Valley Water District.** For properties adjacent to any waterway in the study area, the following requirements shall apply:

- Any plans for construction over the Santa Clara Valley Water District (SCVWD) fee or easement lands require review and issuance of a permit.
- The SCVWD's Milpitas Pipeline, located at the north end of the study area [of the TASP] and adjacent and parallel to the rail line continuing south onto Capital Avenue at the southern end of the study area, shall be shown on all future plans.
- Projects should generally be consistent with the recommendations developed by the Water Resources Protection Collaborative in the "Guidelines and Standards for Land Use Near Streams."

**SC 5.2. Penitencia and Berryessa Creek.** Consistent with current City practice, all new development located on or adjacent to Penitencia and Berryessa Creek will be required to comply with the standards and guidelines for land uses near streams,

as adopted by the City of Milpitas. Any development or construction activity to be conducted on or adjacent to SCVWD property or easements, such as creek crossings, shall be required to obtain applicable permits from the SCVWD prior to such construction activity.

**SC 5.3. Setbacks Adjacent to Creeks and Drainage Channels.** A minimum setback of 25 feet from top of bank, or from a maintenance road if one exists (in addition to required rear or side yard setbacks) shall be maintained.

**SC 6. Temporary Buffers.** Require the installation of temporary buffers—fences, walls, or vegetation— when residential uses are developed adjacent to existing industrial uses. The type of buffer must be reviewed and approved by the City Planning Department. The temporary buffers may be removed if and when an adjacent site is redeveloped as a non-industrial use.

**SC 7. Archaeological Resources.** Any future ground-disturbing activities, including grading, in the Metro Plan Area shall be monitored by a qualified archaeologist to ensure that the accidental discovery of significant archaeological materials and/or human remains is handled according to State CEQA Guidelines Section 15064.5 regarding discovery of archaeological sites and burial sites, and State CEQA Guidelines Section 15126.4(b) identifying mitigation measures for impacts on historic and cultural resources (reference CEQA Sections 21083.2 and 21084.1). A Native American monitor will also be present during future ground-disturbing activities due to the high potential for inadvertent discoveries of archaeological materials and/or human remains. Prior to commencement of ground-disturbing activities, the City shall ensure that the general contractor and those conducting ground-disturbing activities receive cultural sensitivity training from a tribal representative. Cultural sensitivity training will ensure that any cultural material encountered during ground-disturbing activities is protected and treated with culturally appropriate dignity. This training will be administered by a Native American monitor and a qualified archaeologist. In the event that buried cultural materials are encountered, construction will be temporarily halted until a mitigation plan can be developed. In the event that human remains are encountered, the developer shall halt work in the immediate area and contact the Santa Clara County coroner and the City of Milpitas. The coroner will then contact the Native American Heritage Commission (NAHC), which will in turn contact the appropriate Most Likely Descendant (MLD). The MLD will then have the opportunity to make a recommendation for the respectful treatment of the Native American remains and related burial goods.

**SC 8. Air Quality.**

**SC 8.1. CEQA.** For new residential development that is proposed within 500 feet of active rail lines where vehicles emit diesel exhaust, or roadways where total daily traffic volumes from all roadways within 500 feet of such location exceed 100,000 vehicles per day, will, as part of its CEQA review, include an analysis of toxic air contaminants (which includes primarily diesel particulate matter (DPM)). If the results show that the carcinogenic human health risk exceeds the 10 people in a million standard for carcinogenic human health impacts established by the BAAQMD, the City may require upgraded ventilation systems with high efficiency filters, or other equivalent mechanisms, to minimize exposure of future residents. This standard shall also apply to other sensitive uses such as schools, daycare facilities, and medical facilities with inpatient services.

**SC 8.2. Communication with Sensitive Receptors.** Require project sponsors to inform future and/or existing sensitive receptors (such as hospitals, schools, residential uses, and nursing homes) of any potential health impacts resulting from nearby sources of dust, odors, or toxic air contaminants, and where mitigation cannot reduce these impacts.

**SC 9. Birds and Roosting Bats**

**SC 9.1. Bird Habitat.** To the extent feasible, future developers in the Metro Plan Area will conduct initial construction activities outside the nesting season between September 16 and January 14 including, but not limited to, tree trimming or tree removal, ground disturbance, demolition, site grading, and other activities that may compromise breeding birds or the success of their nests occurring within or outside the development site.

If construction must occur during the migratory bird nesting season between February 1 and to August 31, for small bird species, January 15 to September 15 for owls, and February 15 to September 15 for other raptors, a qualified wildlife biologist will conduct two preconstruction nesting surveys within 140 days and 48 hours prior to the start of construction or demolition. Additional surveys will be conducted 48 hours prior to the start of construction or demolition in areas that have not been previously disturbed by construction activities or after any construction breaks of 10 days or more. Typical experience requirements for a "qualified biologist" include a minimum of 4 years of academic training and professional experience in biological sciences and related resource management activities, and a minimum

of 2 years of experience in biological monitoring or surveying for nesting birds. Surveys of suitable habitat will be performed in publicly accessible areas within 250 feet, 500 feet, and 1,000 feet of the construction site to locate any active passerine, small raptor (e.g., accipiters), and large raptor (e.g, buteos) nests, respectively of common bird species and within 250 feet of the construction site to locate any active nests of raptors (i.e., birds of prey). Surveys will be conducted at the appropriate times of day and during appropriate nesting times.

If active nests are located during the preconstruction nesting bird surveys, a qualified biologist will evaluate the construction schedule and location to determine if construction activities could affect an active nest. If so, the following measures will apply, as determined by the qualified biologist:

- If construction would not affect an active nest, construction may proceed without restriction; however, a qualified biologist will regularly monitor the nest at a frequency determined appropriate for the surrounding construction activity, to confirm that there would be no adverse effect. The frequency of spot check monitoring would be determined on a case-by-case basis, considering the scope of the particular construction activity, duration, proximity to the nest, and any physical barriers that may screen the nest. The qualified biologist may revise the determination at any time during the nesting season.
- If it is determined that construction could affect an active nest, the qualified biologist will establish a no disturbance buffer around the nest. All construction will halt within the buffer until the qualified biologist determines that the nest is no longer active. Buffer distances will be equal to the survey distances (i.e., 50 feet for passerines and 250 feet for raptors); however, the buffer may be adjusted if an obstruction, such as a building, is within the line of sight between the nest and construction.
- Modifying nest buffer distances, allowing certain construction activities within the buffer, and/or modifying construction methods in proximity to active nests will be done at the discretion of the qualified biologist.
- Any construction that must occur within established no disturbance buffers will be monitored by a qualified biologist. If adverse effects in response to construction within the buffer are observed that could compromise the nest, construction within the no disturbance buffer will halt until the nest occupants have fledged.
- Any birds that begin nesting within the construction area and survey buffers amid construction activities are assumed to be habituated to construction related or similar noise and disturbance levels. Therefore, exclusion zones around nests may be reduced or eliminated in these cases, as determined by the qualified

biologist. Construction may proceed around active nests as long as the nests and their occupants would not be directly affected.

- If inactive nests are observed within or adjacent to the construction site, removal or relocation of the inactive nests will be at the discretion of the qualified biologist. Construction may proceed around inactive nests.

**SC 9.2. Bird Strike.** Future developers shall ensure that a qualified biologist experienced with bird strikes and building lighting design issues identifies recommended measures related to the external appearance of the building to minimize the risk of bird strikes. Future developers shall incorporate such measures into the building's design, subject to design review and approval by the City, which may include the following and/or other measures:

- Use strobe or flashing lights in place of continuously burning lights for obstruction lighting. Use flashing white lights rather than continuous light, red light, or rotating beams.
- Install shields onto light sources not necessary for air traffic to direct light towards the ground.
- Extinguish all exterior lighting (i.e., rooftop floods, perimeter spots) not required for public safety as determined by the City.
- When interior or exterior lights must be left on at night, the operator of the buildings shall examine and adopt feasible alternatives to bright, all-night, floor-wide lighting, which may include installing motion-sensitive lighting, using desk lamps and task lighting, reprogramming timers, or using lower-intensity lighting.
- Use window films, mullions, blinds, or other internal or external features to "break up" reflective surfaces rather than having large, uninterrupted areas of surfaces that reflect, and thus to a bird may not appear noticeably different from, vegetation or the sky.
- Minimize the extent of glazing.
- Use low-reflective glass and/or patterned or fritted glass.

**SC 9.3. Roosting Bat.** In order to avoid impacts on roosting bats, a pre-construction habitat assessment and survey(s) for bat roosts shall be conducted in any large trees (>24 inches diameter at breast height) within 100 feet of any planned construction and in any buildings planned for demolition. This effort shall occur prior to the start of work to evaluate whether potential roost habitat occurs and to determine the type (i.e., maternity or non-maternity) and status (i.e., active or inactive) of the roost. If an active maternity or special-status bat roost is found, removal of maternity roost trees or buildings shall be avoided during the maternity roosting season or until a

qualified biologist determines the roost has been vacated. Felled trees without maternity or special-status roosts shall be allowed to lay on the ground for one night to allow any undetected roosting bats to leave the tree before it is chipped or taken offsite.

The overhead VTA light rail at the Milpitas Station, located near the Transit Center.

# 4. MOBILITY AND CIRCULATION


4.1. Planning Context
4.2. Approach
4.3. Mobility and Circulation Policies


This chapter describes mobility and circulation conditions in the Metro Area and sets standards for street and roadway design to create a balanced multimodal transportation environment. New development will bring more residents, workers, and visitors to the area. Standards and guidelines in this chapter detail roadway improvements to ensure efficient and safe circulation for pedestrians, bicyclists, transit, and automobiles throughout the Plan Area. Additional transportation demand management (TDM) policies strategically address curb space and parking demand.

## 4.1 PLANNING CONTEXT

Because the Metro Plan Area is flanked by the I-680 and I-880 freeways on the east and west, respectively, and the Montague Expressway serves as a connector between the two for regional traffic circulation, there will be substantial traffic that passes through the area that cannot be diminished. Similarly, Great Mall Parkway/ Capitol Avenue is a significant east-west corridor that carries high traffic volumes. Both of these regional roadways pass through the area and cannot be reduced in capacity by design, but improvements are planned to overcome the incompatibility of the roadway with the goals of the Metro Plan. Particularly high traffic volumes occur during AM and PM commute hours, but these roadways are generally well traveled most hours of the day. The planned infrastructure improvements are intended to enhance safety and convenience for those living in, working in, and visiting the Metro Area.

### 4.1.1 General Plan Direction

The City of Milpitas' General Plan Circulation Element directs the City to maintain and improve multimodal transportation opportunities by providing safe and efficient transportation options that are equitably located and accessible to all people. Through strategic transportation solutions, the City will support a network of transportation facilities that improves safety and promotes an active lifestyle by increasing opportunities for physical activity for all people. The Metro Plan is consistent with and implements the following six circulation goals from the General Plan:

- **CIR-1 Circulation and Transportation Network:** Provide a transportation system that efficiently, equitably, and effectively supports the City's land use vision, minimizes vehicle miles traveled (VMT), enhances connectivity of the existing network, and supports the use of all modes of transportation.
- **CIR-2 Complete Streets:** Provide safe, healthy, comfortable, equitable, and efficient transportation choices for all modes of transportation that enable people of all races, cultures, ethnicities, religions, sexual orientation, genders, income levels, ages and abilities, especially people of color and those disproportionately affected by access to a personal vehicle, systemic transportation inequities, racism, oppression, and poverty to increase safe physical activity, reduce usage of personal vehicles, access goods and services, employment opportunities, and for personal travel; to provide for efficient goods movement.
- **CIR-3 Transit:** Support the development and maintenance of the public transit system to provide integrated, accessible, convenient, safe, equitable, health-promoting, comfortable, and effective mobility options.
- **CIR-4 Bicycle/Pedestrian/Trails:** Promote, provide, and maintain an expanded, safe, convenient and comprehensive network of facilities for pedestrians and bicyclists of all ages and abilities to support walking and bicycling as viable modes of transportation, for recreational use, and to promote public health.
- **CIR-5 Transportation Demand Management:** Implement measures that increase transit use and other non-motorized travel modes that lead to improved utilization of the existing transportation system, such as accessibility improvements to public transit stops and stations by walking and biking, and provide transit stops near employment centers and higher density residential developments and in areas where infrastructure is lacking and access without a car is unsafe.
- **CIR-6 Sustainability:** Support and expand the City's efforts to promote economic, environmental and social sustainability

through initiatives to reduce greenhouse gas emissions and other air pollutants, reduce runoff, promote public health, equity and engage the community in an inclusive planning process.

As part of the community outreach process for the Milpitas Metro Plan, the community also expressed that improving pedestrian and bicycle connections within and beyond the Metro Area to form a continuous network that emphasizes safety is a higher priority than vehicular ease of access in the Metro Area.

### 4.1.2 Mobility and Circulation Conditions in the Milpitas Metro Plan Area

The Milpitas Metro Specific Plan Area is centrally located within the Bay Area, bounded on the west by I-880 and on the east by I-680. Within the Plan Area, the circulation system features multi-lane arterial streets including Great Mall Parkway-Tasman Drive, Montague Expressway, South Milpitas Boulevard, and Trade Zone Boulevard. These streets provide access to and from the regional highway system as well as circulate local traffic. Connectivity and access to residential neighborhoods, industrial sites, and other land uses within the Metro Plan Area are provided by lower volume, local streets.

The circulation pattern in the Plan Area also has several barriers, including the Union Pacific Railroad tracks, BART tracks, elevated light rail structures, and Penitencia and Berryessa Creeks. Just north of the Plan Area, the Great Mall and the rail yard also limit east-west connectivity. The Tango District in the southern part of the Plan Area has several cul-de-sacs that were designed to serve local businesses. With plans to change land uses in this district, this current lack of connectivity is problematic as it would limit access for future residents, impede access for emergency vehicles, and create circuitous travel routes if left unchanged. The City has purchased two properties that allow for street connections between Sango Court and Tarob Court, which will help mitigate the existing connectivity issues.

The first developments in the Plan Area following the adoption of the TASP were townhome projects. These projects are characterized by separated vehicular and pedestrian access to each unit. This is made up of vehicular access to each unit off of driveway/alleyways that lead to two-car garages typically, and primary pedestrian access off of shared walkways that lead to front doors. The alleyways and walkways typically flank either side of a row of townhome units with landscaping along the walkway/ entry side of the unit. No significant landscaped yard areas are generally provided in this arrangement other than what is available near the front entry. Access to the development as a whole and between blocks of buildings is usually provided via local streets with sidewalks that serve front entries. These developments generate vehicle trips consistent with townhomes throughout the Bay Area and were primarily automobile oriented insofar as they

## Figure 4-1. Existing Roadways

GIS data provided by:
Blocks - City of Milpitas / Roads - US Census Bureau 2019 TIGER

0 200 400 600 800 1,000 Feet

need year - waiting on Barry

**Figure 4-2. Existing Barriers**

**Table 4-1. Traffic Volumes**

| Segment | Northbound/ Eastbound (average vehicles per day) | Southbound/ Westbound (average vehicles per day) | Total (vehicles per day) |
|---|---|---|---|
| Great Mall Parkway west of Montague Expressway | 16,179 | 15,188 | 31,367 |
| Montague Expressway west of Great Mall Parkway | 17,659 | 19,910 | 37,569 |
| S. Main Street north of Montague Expressway | 9,199 | 10,651 | 19,850 |

**Figure 4-3. Transit Network**

predated the construction and opening of BART, but nearly all are within the half-mile walkshed of a transit station (VTA or BART).

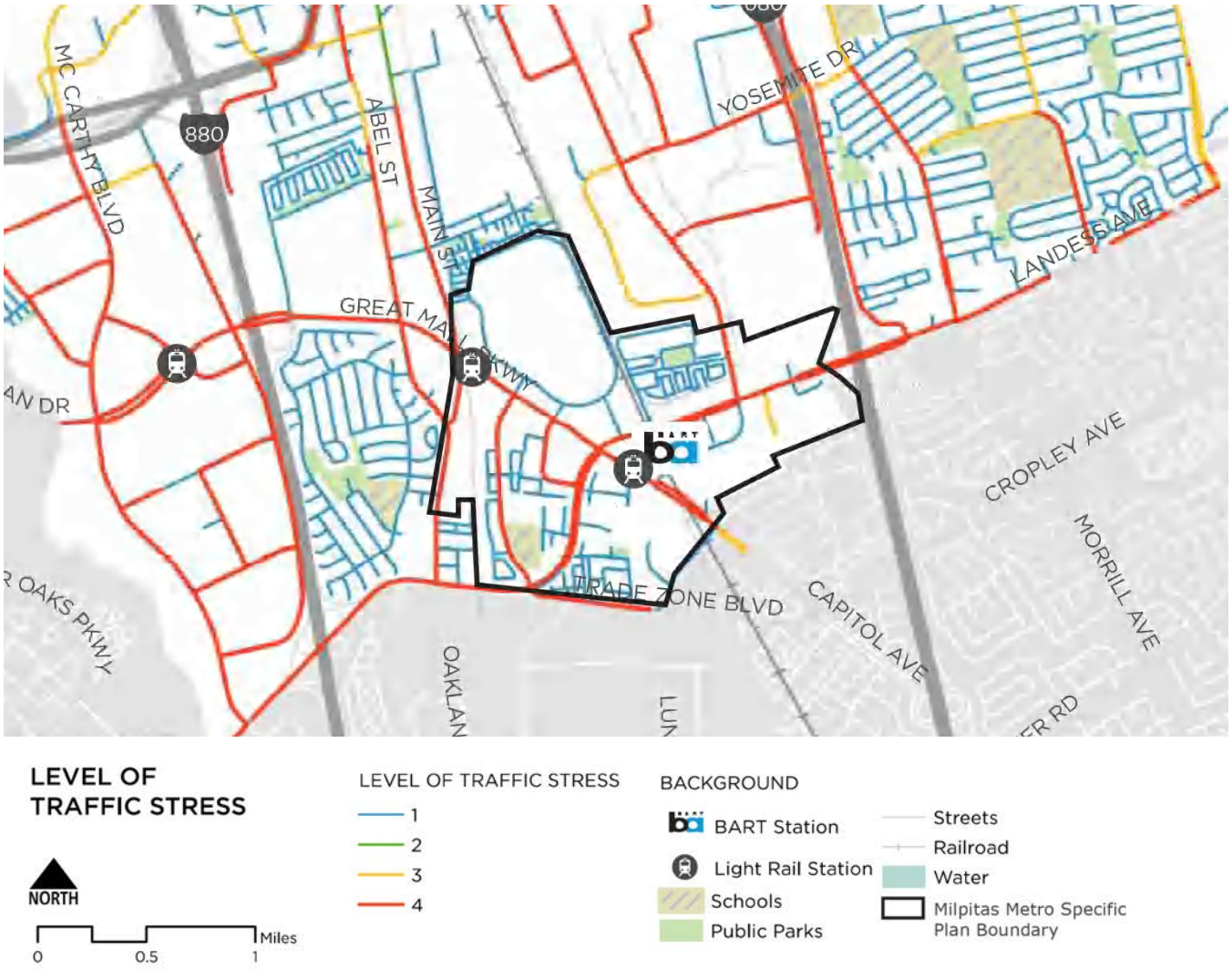
With 78 percent of Milpitas residents driving alone to work and an additional 12 percent carpooling, motor vehicles are the dominant transportation mode in the city as well as in the Metro Area. While driving is expected to remain the dominant transportation mode, traffic congestion will become increasingly challenging as a result of local and regional growth. Great Mall Parkway-Tasman Drive and Montague Expressway are the two major corridors through the area and are among the most congested roadways in Milpitas. The City's General Plan estimates that several study area intersections will be further impacted by incoming growth by the year 2040, increasing delay for drivers.

As the local development pattern has shifted to include more multifamily housing surrounding the recently opened Milpitas Transit Center, and the need for multimodal transportation options has increased, there have been substantial changes to mobility options for traveling to, from, and within the Milpitas Metro Specific Plan Area. The initiation of BART service to the Milpitas Transit Center in mid-2020, the relocation of the VTA bus transfer hub to the Transit Center, and the nearby multi-station access to light rail service, all have helped to establish Milpitas Metro as a major transit hub, offering vastly improved connections through the city generally, the Metro Area specifically, and locations throughout the Bay Area. These connections include:

- **BART:** Service runs through Milpitas every 30 minutes between the Berryessa/North San Jose and Richmond stations. Service to Alameda County is available via AC Transit Route 217, which connects to Fremont BART.
- **Bus:** VTA provides bus service at the Milpitas Transit Center that serves local and regional routes, including lines 20, 44, 60, 66, 70, 71, 77, and 104.
- **Light rail:** The Milpitas Transit Center is connected by a pedestrian bridge to the Milpitas light rail station on VTA's Orange Line.
- **Shuttle:** The Altamont Commuter Express (ACE) offers its Violet Shuttle service from Montague Expressway/Main Street to the Great America Station in Santa Clara.
- **Milpitas OnDemand:** This pilot program provides micro-transit connection services throughout the city and functions as a hybrid between first-last mile and point-to-point service. Riders will be able to book trips from nearly 100 virtual stops in the city to one of four hub locations, including the Milpitas Transit Center.

With a limited ability to accommodate additional vehicle traffic, completing networks of safe and comfortable facilities for walking and bicycling will become increasingly important for local trips

**Figure 4-4. Level of Traffic Stress**




*Source: Milpitas Bicycle / Pedestrian and Trails Plan*

within the Plan Area, including access to work, to shopping, and to the regional transit system.

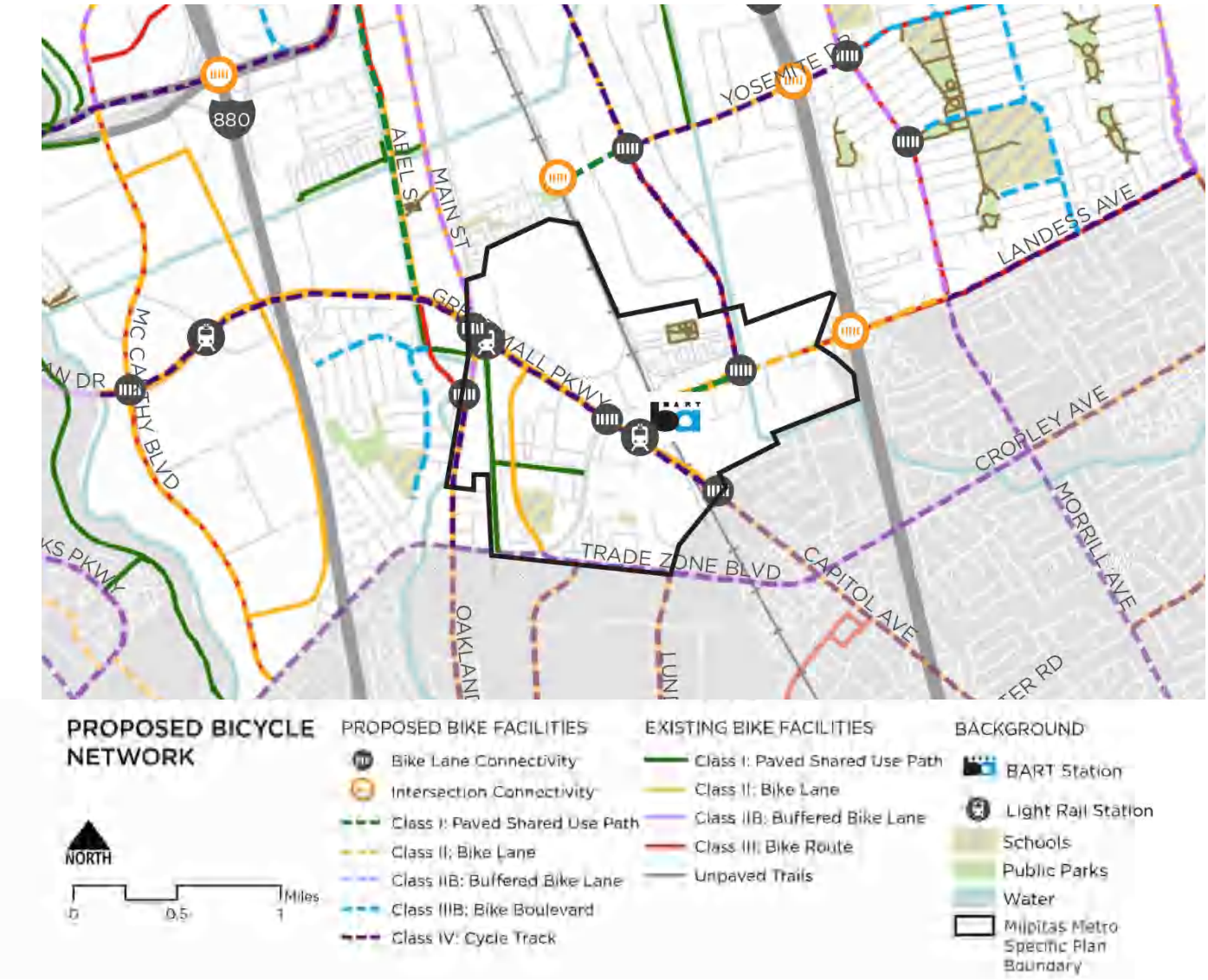
Generally, sidewalks are present throughout the Plan Area and bike lanes are included along several major streets, but the environment can still be intimidating to pedestrians and bicyclists, as they are often in close proximity to high volume, high speed traffic. Users are frequently required to cross multi-lane roadways and may need to travel circuitous routes to reach their destinations. Great Mall Parkway is particularly challenging for pedestrians. Grade-separated overpasses have been constructed across Montague Expressway and Great Mall Parkway to provide protected pedestrian crossings near the BART station and VTA light rail stations. Such facilities improve pedestrian safety and provide an opportunity for public art but can only be funded in a few strategic locations due to their high cost. A broader approach that includes at-grade crossing improvements will be needed.

The City's Bicycle/ Pedestrian and Trails Plan evaluated conditions for bicyclists using a Bicycle Level of Traffic Stress (LTS) analysis, which illustrates how high stress conditions limit connectivity and access for bicyclists (Figure 4-4). While Great Mall Parkway and other heavily traveled roadway have striped bike lanes, the traffic conditions still result in their ranking as high LTS streets, which are not suitable for casual bicyclists. Without a buffer or barrier between bicyclists and vehicle traffic, bicyclists do not typically feel comfortable in such conditions.

In addition to sidewalks and bike lanes, off-street paths have the potential to provide an "all ages and all abilities" facility to improve bicycling and walking access, both for transportation and recreational uses. The existing paths along East Penitencia Creek - South Channel and Berryessa Creek have begun to make these connections but need to be extended and enhanced with street crossing improvements to provide more direct and convenient routing. As these trails are improved, the City and Valley Water should consider landscaping adjacent to trails on the outside edges away from the creek, trail surfaces, and lighting.

Visible changes in infrastructure for other modes have also begun to emerge as development following the adoption of the TASP is completed, such as improved sidewalks with landscaping that have been constructed as part of new residential development. As incoming development continues to build out these facilities and the City pursues implementation of priority projects identified in the Bicycle/ Pedestrian and Trails Plan, multimodal mobility options will continue to be strengthened throughout the Metro Area. Additional bicycle and pedestrian infrastructure will not decrease roadway capacity for vehicle travel. Refer to Figure 4-5 for existing and proposed bike infrastructure identified in the Bicycle/ Pedestrian and Trails Plan.

**Figure 4-5. Existing and Proposed Bicycle Facilities**




*Source: Milpitas Bicycle / Pedestrian and Trails Plan*

## 4.2 APPROACH

The Metro Plan establishes a street hierarchy with three street typologies. Each street typology has its own design standards that are sensitive to surrounding land contexts to ensure that the safety of all transportation modes are addressed. The three street typologies are described below:

- **Central Corridors** are wide arterials that support multiple lanes of traffic and include facilities for active transportation.
- **Activity Streets** are 2-lane roads that are pedestrian-oriented and support high levels of retail and active uses. There are two configurations for Activity Streets: one with a parking lane and another with accommodations for bike lanes and transit.
- **Neighborhood Streets** are local streets within residential neighborhoods that support slower speeds and have a pedestrian character.

For many people in Milpitas, the automobile is the primary mode of travel, and well-managed parking is important for both the economic vitality of commercial uses and the prioritization of resident needs in nearby neighborhoods. Because of the wealth of transit options as well as the dense mixed-use land use pattern, the Plan promotes lifestyles that are less car dependent and targets residents and workers who are seeking this more urban environment. Consequently, many of the trips in the Metro Area are expected to be taken by transit, foot, or bike. However, as the area continues to develop and more housing is built at higher densities with improved access to daily destinations, demand for parking will still continue to increase though at a slower rate than it would in areas with less access to transit and less convenience to jobs, housing, and services.

Flexible parking policies that balance demand with goals to limit unnecessary automobile usage will be key to ensuring an effective mobility strategy that meets the needs of residents, workers, and visitors, and implements the General Plan's charge to create strategic transportation solutions that improve and maintain an efficient multimodal transportation network. The efficient use of parking resources combined with the high level of transit service and multimodal access options amid a diverse mix of uses can result in a much more balanced, multi-modal environment.

An important focus of the Metro Plan is moving beyond the more car-centric townhomes and other low-intensity development. The remaining housing sites not developed under the TASP are targeted for higher densities and are generally closer to jobs, services, and transit. The job centers will also be closer to transit, services, and higher density planned housing. This will allow those who live and work in the area to be able to move about without driving and parking a car.

One of the goals of the Plan is to create a high-quality environment for visitors and residents that provides parking where needed in the most efficient and convenient way possible and avoids

unused spaces that are too inconvenient or excessive. This is accomplished through strategic siting and management of off- and on-street parking resources.

For off-street parking, this plan proposes a "park-once" approach. This approach emphasizes shared parking opportunities between compatible land uses and convenient discovery. In this scenario, in addition to TDM measures noted below, there might be agreement(s) between two or more property owners to share the costs of parking development and usage in the interest of efficiency and cost savings, and as an alternative to the costs of public parking garages. The City may consider contributing to the costs of shared parking for mixed-use developments. This approach also provides quality pedestrian connections to enable easy access to destinations or for exploration and incentivizes publicly-accessible parking.

Meanwhile, on-street parking should be actively managed to help ensure the availability of spaces, prioritize certain spaces for particular users, and limit parking impacts both upon and from Milpitas Metro properties located in adjacent neighborhoods. In practice, this means that in commercial areas, on-street parking should be managed appropriately through mechanisms such as time limits and pricing to achieve a peak occupancy of 85 percent on each block face. In residential areas near commercial areas, parking permits should be made available to residents and could potentially be paid for through some fee mechanism related to development or activity within the Metro Plan. All of these activities are well worth the effort but will require some level of management and oversight from the City, and fees for development or management of these systems should be calibrated accordingly.

In addition to active management, effective parking requirements are key to limiting excessive auto congestion while allowing development to provide enough parking to serve anticipated market demand of each type of use. To this end, minimum parking supply requirements for all uses in the Milpitas Metro Specific Plan are to be significantly reduced and maximum requirements are intended to limit excessive parking supply that effectively supports while allowing for development flexibility.

To encourage less driving, options are provided for developers to reduce parking minimums through more robust Transportation Demand Management (TDM) measures or through payment of in-lieu fees that can be used to collectively finance multi-modal transportation improvements. Reduced parking generally means savings in construction and maintenance costs for developers, which can offset investments in VTA transit passes, Clipper Cards, and the like. These requirements combined with the required TDM measures below allow for development to meet resident, employee, and visitor mobility needs in the most cost-effective fashion.

### 4.2.1 Transportation Demand Management

Transportation Demand Management (TDM) is typically categorized as a set of strategies aimed at encouraging transit use, walking, biking, and carpooling while reducing single occupant vehicle trips, vehicle miles traveled, and parking demand. TDM primarily focuses on programmatic elements as opposed to physical infrastructure to cost-effectively reduce congestion and address broader community concerns such as sustainability and equity goals. Examples of TDM measures include, but are not limited to, telecommuting, ridesharing, subsidized commuter benefits, and parking management. TDM measures are required for all new development projects within the Metro Area but is also encouraged for existing uses. The broad implementation of TDM measures is directly tied to the site's reduced minimum parking requirements and an integral element to the overall success of the area's mobility.

A comprehensive TDM program is best implemented when a particular organization can serve as a mobility champion. Often, this takes the form of a Transportation Management Association (TMA) whose mission is to collectively represent all uses, existing or new, within the Milpitas Metro Specific Plan; oversee TDM measures; and ensure their ongoing success. General Plan Action ED-2c directs the City to "[e]valuate the feasibility of creating business improvement districts (BIDs), maintenance assessment districts, and/or a transportation management association to fund improvements and maintenance that support economic development." The Metro Plan will work to implement a TMA at the specific plan level. Over time, the City may choose to expand the TMA to cover other specific plan areas, neighborhoods, or the city as a whole.

A TMA is typically a non-profit, member-controlled organization that is established to promote commute alternatives to driving alone. TMAs are controlled and funded through membership with the goal of reducing vehicle congestion. Typically, TMAs allow for businesses of all different sizes to collectively provide commute reduction services to a broader range of professionals. TMAs allow multiple companies within a geographic area to collectively provide TDM services and measures to employees, rather than each company providing services individually. Residential projects would also be included in the TMA, enabling local residents to take advantage of these services and the incentives to walk, bike, or use transit to reach their destinations. As the formation of a TMA is Action CIR-5b from the City's General Plan, the Metro Plan recommends establishing a TMA for the Metro Area at a minimum. The TMA will be responsible for monitoring trip reduction, VMT targets, and services within the Plan Area. Participation in the TMA is required of all new development and optional for existing uses.

**Figure 4-6. Circulation Network**

In addition to implementing TDM measures, the reduction of vehicle trips resulting from those strategies should be monitored and reported by the TMA to participants and the City. The monitoring and reporting of vehicle trips will allow participants of the TMA to more efficiently mitigate vehicle trips, vehicle miles traveled, and parking demand within the Milpitas Metro Specific Plan.

## 4.3 MOBILITY AND CIRCULATION POLICIES

**M 1. Multi-Modal Circulation.** Develop a highly-connected street grid that prioritizes multimodal transportation including walking, bicycling, and transit.

M 1.1. New streets shall be located as generally shown on the Circulation Network Map (Figure 4-6).

M 1.2. Provide an intuitive hierarchy of streets that includes a continuum from bustling activity on boulevards and retail concentrated streets to contemplative and neighborhood-oriented in character. These streets shall meet all Milpitas Fire Department fire apparatus design requirements for access and firefighting operations, and should follow the hierarchy and actions provided in M 2 – M 5:

- Central Corridors
- Activity Streets
- Neighborhood Streets
- Trails

M 1.3. New streets on the Great Mall parcel shall be aligned in a grid pattern as shown in Figure 4-6. Exact alignment shall be determined by the developer and City. Refer to the citywide objective design standards on appropriate block lengths.

M 1.4. Street ownership and maintenance will be negotiated between the developer and the City on a project-by-project basis.

M 1.5. Maintain pedestrian and biking facilities.

M 1.6. Review individual development applications to ensure that adequate street right-of-way, bicycle facilities, pedestrian facilities and landscaping are provided and are consistent with the policies and standards in Chapter 3: Site and Building Design Standards and Guidelines.

**Figure 4-7. Great Mall Parkway Street Section**

**M 2. Central Corridor.** Enhance arterial streets - Montague Expressway, Great Mall Parkway/ Capitol Avenue, South Main Street, and Trade Zone Boulevard - to include facilities for active transportation: pedestrians, bicyclists, and more. Where the City does not control an arterial street, as in the case of Montague Expressway, work with the relevant agency to increase multimodal safety and accessibility over time.

M 2.1. Great Mall Parkway. Transform Great Mall Parkway/ Capitol Avenue into multimodal complete streets that provides for the mobility needs and safety of transit users, bicyclists, pedestrians, and drivers as indicated in Figure 4-7 and by providing bike lanes and sidewalks on both sides of the road.

M 2.1.1. Maintain the number of vehicle lanes and reduce lane widths on Great Mall Parkway to calm traffic, create a more comfortable environment for non-vehicular modes, and to decrease Vehicle Miles Traveled.

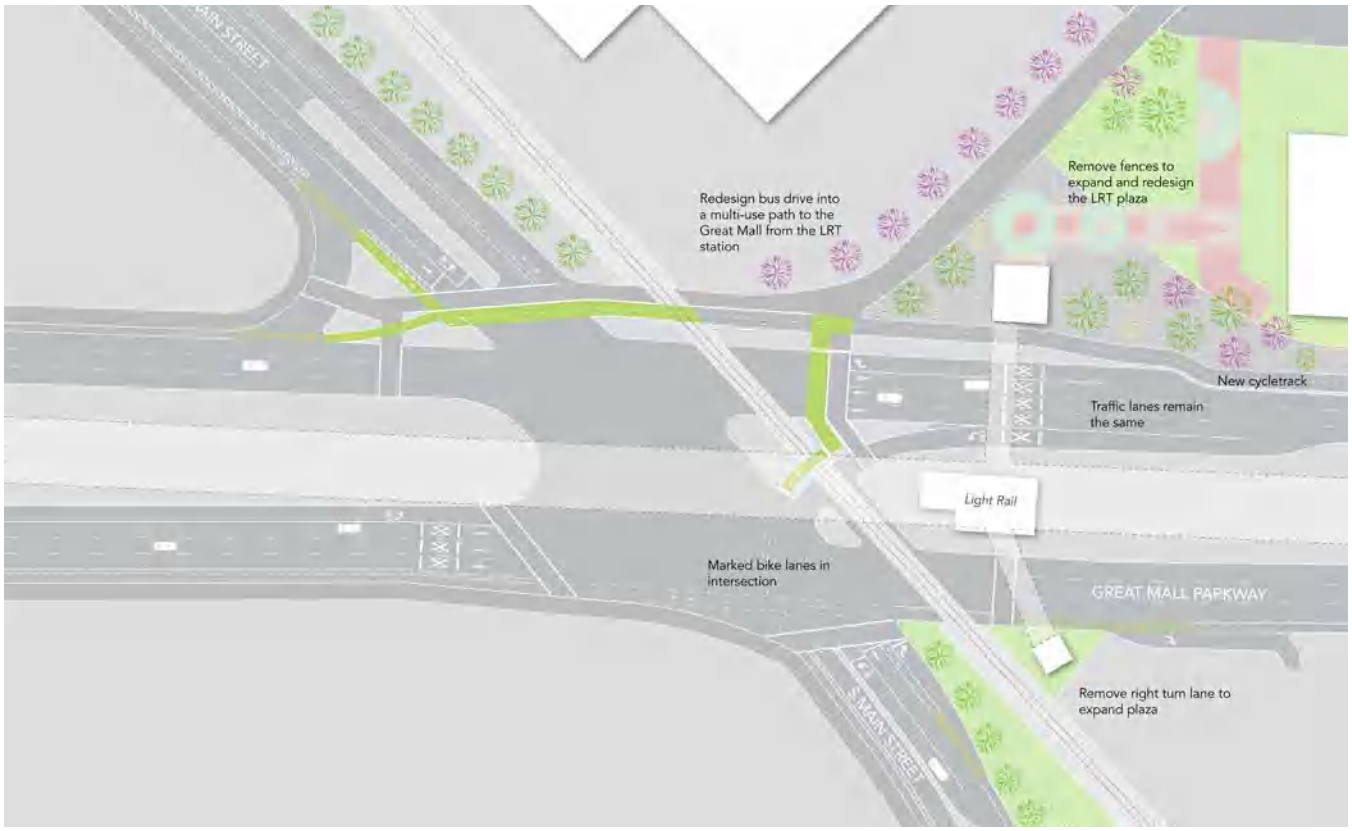
M 2.1.2. Provide protected bike lanes in both directions on Great Mall Parkway.

M 2.1.3. Develop a multi-use path between Montague Expressway and Main Street on the Great Mall District side of the street.

M 2.1.4. Provide a linear park and pedestrian path along Great Mall Parkway from Montague Expressway to Main Street.

M 2.1.5. Provide enhancements to pedestrian crossings along Great Mall

**Figure 4-8. Great Mall Parkway and Main Street Intersection**




Parkway and other major roadways through measures including curb extensions, traffic signal modifications, and/or other amenities.

M 2.1.6. Refer to SC 2 in Chapter 3 for additional Central Corridor guidelines.

M 2.2. Great Mall Parkway and Main Street Intersection. Accommodate bicycle and pedestrian improvements and improve the connection between the Great Mall VTA Light Rail Station to the Great Mall (Figure 4-8).

M 2.2.1. Remove fencing and redesign the bus drive to become a multi-use path that directly connects the VTA Light Rail Station with the Great Mall.

M 2.2.2. Redesign the plaza by the Light Rail Station Elevator on the north side of Great Mall Parkway to be more landscaped, more usable as a public plaza, with commercial uses oriented to it and features that activate the plaza. Coordinate with VTA and developers to improve the pedestrian and transit user experience at the LRT Station.

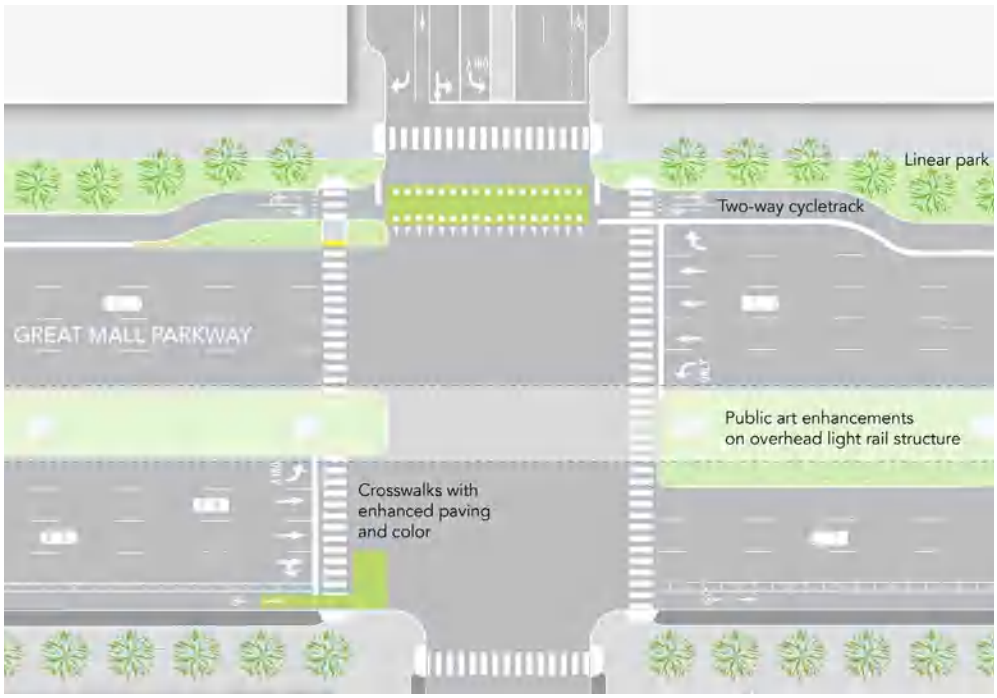
M 2.2.3. Use colored paving to define bike lanes, particularly in areas with potential conflict with vehicular traffic.

M 2.2.4. Remove the existing separated right turn lane at Great Mall Parkway and Main Street to expand the plaza on the south side of Great Mall Parkway at the train tracks. Replace the through lane with an optional right turn lane. Redesign the plaza to include hardscape and softscape treatment to make the plaza as activated and usable as possible.

M 2.2.5. Build a new pedestrian overcrossing from the elevated level at the Great Mall Light Rail Station to the corner plaza at Main and Great Mall Parkway.

M 2.3. Great Mall Parkway and McCandless Drive Intersection. Accommodate bicycle and pedestrian improvements as indicated in Figure 4-9.

**Figure 4-9. Great Mall Parkway and McCandless Intersection**



M 2.4. Montague Expressway. Work with County Roads to complete improvements on Montague Expressway as described in Figure 4-10 and with the following features:

- Deciduous trees shall be planted in the median and in planting strips on both sides of Montague Expressway.
- Pedestrian-scale street lights, avenue-scaled street lights, benches, and trash receptacles shall be located on the sidewalk.

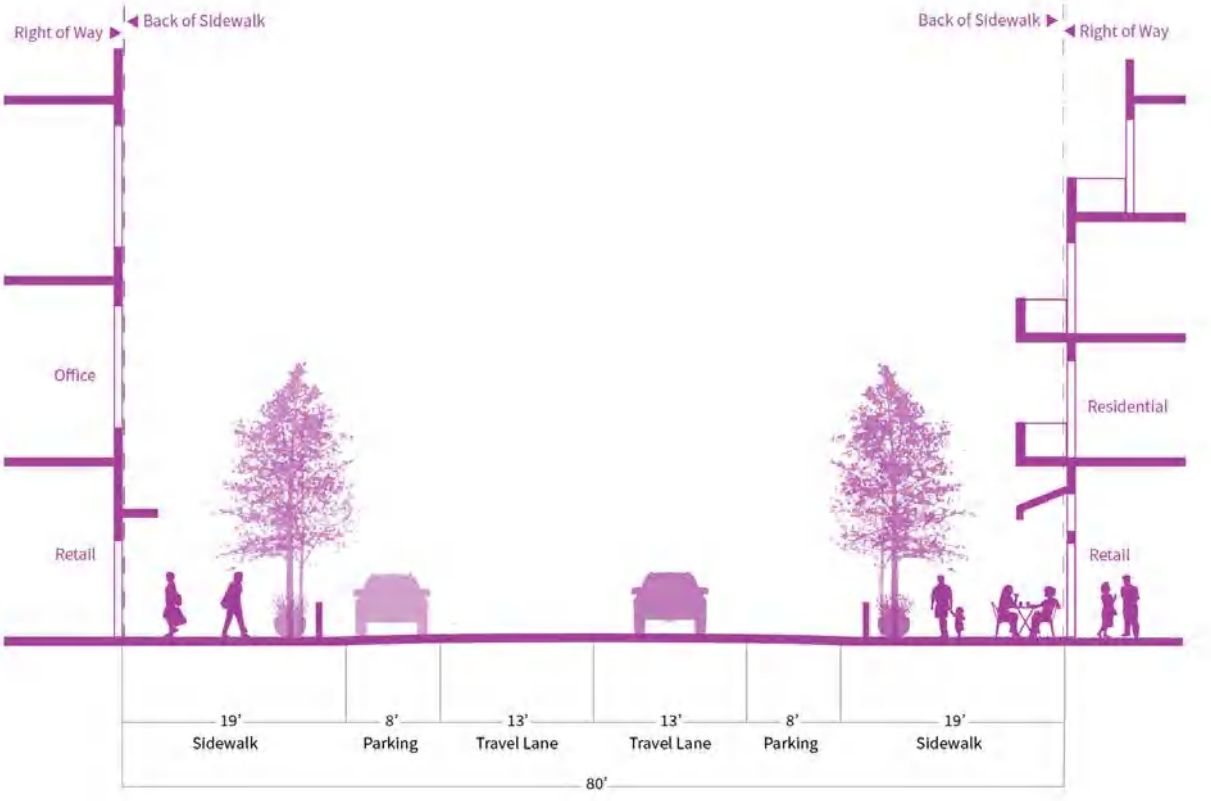
M 2.5. Trade Zone Boulevard. Complete multimodal street improvements on Trade Zone Boulevard as described in Figure 4-10 and with the following features:

- Provide a staggered row of deciduous trees, avenue-scaled street lights, and pedestrian-scaled street lights in the planting strip.
- Provide a bicycle lane on both sides of the road.
- Provide or require new development to provide ornamental trees at the back of the sidewalk along private frontages.

**Figure 4-10. Montague Expressway and Trade Zone Boulevard**

**Figure 4-11. Activity Street.**

*Envisioned as a retail lined street with an 80-foot building-face to building-face dimension. Activity Streets can be designed as a curbless pedestrian environment, with the central lanes for vehicles occasionally vacated for festivals and markets.*




**M 3. Activity Streets.** Provide Activity Streets that support and promote high levels of pedestrian and retail activity.

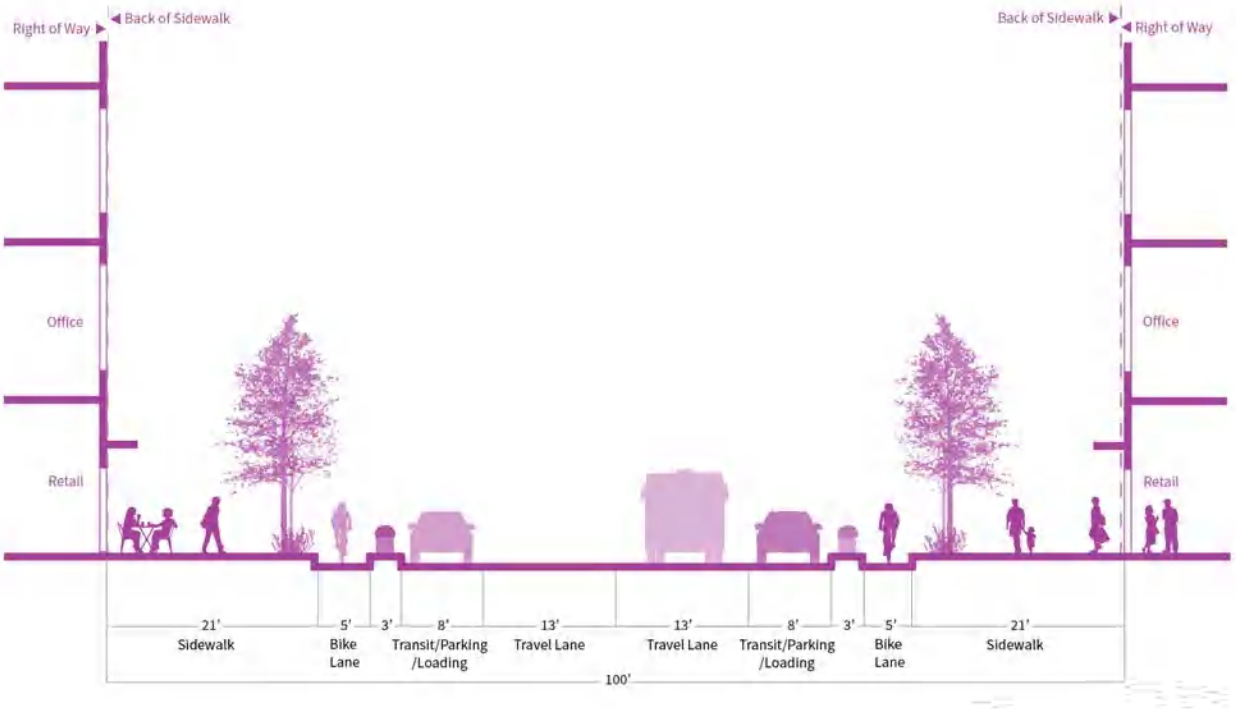
M 3.1. Sidewalks. Provide wide sidewalks that are a minimum of 18 feet in width that have attributes described in SD 1.4 in Chapter 3: Site and Building Design Standards and Guidelines.

M 3.2. Loading Zones. Loading zones are required to be located away from building frontages and encouraged to be placed on side streets or minimized visually.

M 3.3. Dynamic Curb Management. On-street curb spaces should be evaluated in the context of both the surrounding land uses and transportation needs and designed for their highest and best use (vehicle or bicycle parking, loading, micromobility, parklets, transit access, etc.)

**Figure 4-12. Activity Street with Transit.**

*This Activity Street is designed for transit, service, and cycling with a 100-foot building-face to building-face dimension. Curb and planters divide and protect pedestrians and cyclists from vehicular traffic. The outside vehicular lanes can be used as bus pull-outs, loading zones, or on-street parking.*




M 3.4. On-Street Parking. On-street parking along Activity Streets shall be managed through a combination of pricing, time limits, or other mechanisms to maintain a peak occupancy of 85 percent. Provide parking for disabled, loading, transit, temporary customer parking on Activity Streets.

M 3.4.1. On-street parking can also be used as a multi-use zone and an extension of the pedestrian realm as described in Chapter 3: Site and Building Design Standards and Guidelines. Uses can include outdoor dining or seating, use as a transit stop, or loading zone.

M 3.4.2. On-street parking configurations are preferred to be parallel parking and allowed to be back-in angled parking.

**Figure 4-13. Local Neighborhood Street.**

*The parallel parking is located on alternating sides of the street. This street condition occurs in the Tango District, and wherever new housing development occurs.*

**Figure 4-14. Larger Local Neighborhood Streets.**

Larger Local Neighborhood Streets such as the extension of McCandless Drive into the Great Mall District provide traffic in two directions and many areas for landscaping to make it a more walkable environment.

**M 4. Neighborhood Streets.** Create local streets within residential neighborhoods with a slower, pedestrian character.

M 4.1. Provide on-street parking in coordination with the Engineering Department on at least one side of all neighborhood streets to provide parking for guests and residents, slow traffic, and buffer pedestrians on the sidewalk. Where parking only occurs on one side of the street, parking locations should be provided on alternating sides of the street for different blocks and shall utilize permeable pavers and/ or decorative pavers in parking aisles.

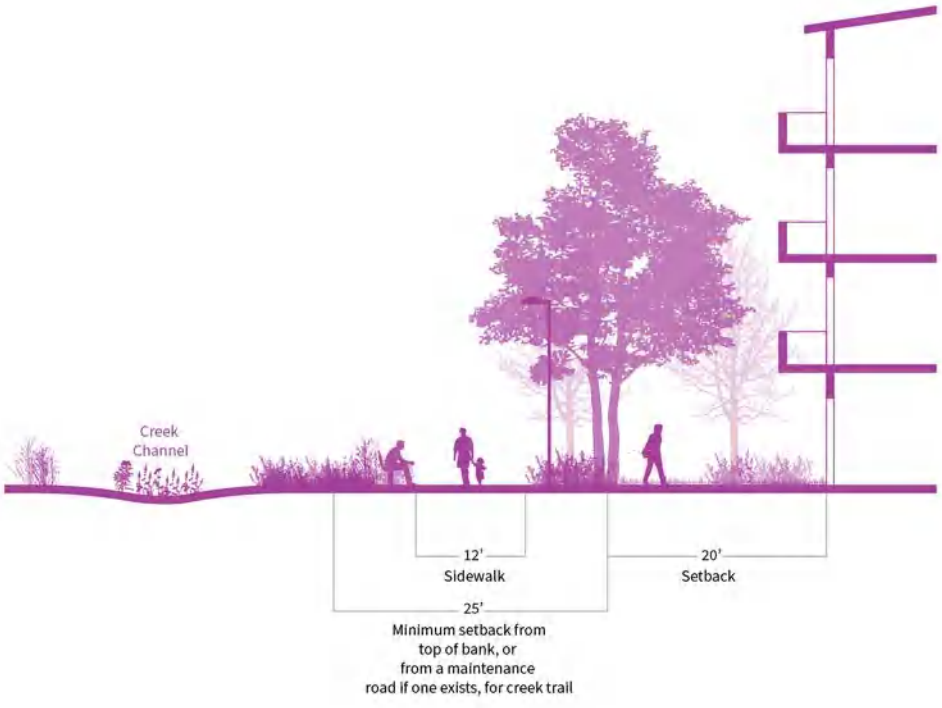
**M 5. Trails.** Develop trails that link into the citywide trail system in order to aid connectivity and provide recreational and leisure spaces.

M 5.1. Create a complete pedestrian and bicycle network that connects trails and pathways and includes continuous sidewalks and safe bike travel routes throughout the entire Milpitas Metro Area.

M 5.2. Create a network of trails along Penitencia Creek, Berryessa Creek, and railroad right of ways.

M 5.3. Require all properties that the proposed trail network runs through or adjacent to set aside land for the trails.

**Figure 4-15. Typical Trail Section**



This land will count towards the public park land dedication requirement. If trail easements already exist or are acquired within the rail line or flood control right of ways, these easements may be used in lieu of land on development sites.

M 5.4. Refer to PA 3.8 in Chapter 3: Site and Building Development Standards and Guidelines for trail design guidelines and standards.

M 5.5. Ensure adequate lighting on and visual observation of trails to ensure user safety at all times of day.

**M 6. Vision Zero.** Adopt the "Vision Zero" framework to minimize traffic fatalities and severe injuries as described in General Plan Action CIR-1a with particular attention to the following:

- Separate truck and van deliveries from local trips as much as feasible via street signage and design.
- Adopt and continuously update curb management for safe transportation network companies (TNCs, also known as ride hailing companies) and local delivery use.
- Where feasible, separate pedestrian and bicycle/ micromobility modes (including parking/ gathering) from automobile/ truck modes.

M 6.1. Provide continuous pedestrian and bicycle facilities that prioritize safety and are accessible to users of all ages and abilities.

M 6.2. Work with Safe Routes to School programs to encourage children to walk or bike to school.

M 6.3. Provide new roads that enable safe and comfortable access to all modes of transportation. Refer to Figure 4-7 for additional guidance on the design of new streets.

M 6.4. Provide mid-block public access routes through the block to reduce the length of the block, particularly for blocks longer than 400 feet, where feasible. The access route can be a paseo, alleyway, service road, or interior passageway as long as it is always publicly accessible and well-lit.

M 6.5. Maintain and enhance public safety by requiring uniform safety standards for all at-grade rail crossings.

**M 7. Reduce Climate Impacts.** Manage automobile demand and promote low-carbon transportation to minimize emissions in the planning area.

M 7.1. Zero and Low Emission Vehicles. Promote use of zero and low-emission vehicles through the following measures:

- Require all new multifamily residential and all new nonresidential buildings to provide at least 45 percent of parking spaces as EV capable (including the raceway and panel capacity) to support future installation of Level 2 chargers on a dedicated 40-amp, 208/240-volt branch circuit.
- Require all new multifamily residential and new nonresidential buildings to install at least 33 percent of EV capable parking spaces with EVSE Level 2. Where six Level 2 EVSE are installed, one DC Fast Charger can be installed to substitute for five Level 2 EVSEs. The DCFC shall be rated at 80 kW minimum.
- Require all new warehouses, grocery stores, and retail stores with planned loading docks to install at least one EV capable loading dock with a raceway(s) and service panel(s) or subpanel(s) for each 25,000 square feet of floor space planned.
- Provide preferentially-located charging stations for electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs).

M 7.2. Work to implement the Climate Action Plan as it becomes available and updated.

**M 8. Parking and Transportation Demand Management.** Establish and implement a travel demand management (TDM) program with the non-compulsory goal of reducing VMT by 15 percent or more below the regional baseline per employee or resident and efficiently provides parking that meet the needs of residents, employees, and visitors. TDM measures should be incorporated into all new development and may be implemented by individual uses or through TMA oversight.

M 8.1. Establish a Transportation Management Association (TMA) that is responsible for monitoring trip reduction, VMT targets, and services within the planning area. Participation in the TMA is required of all new development and optional for existing uses.

M 8.2. All projects should provide the following TDM measures at a minimum individually or as participants of the TMA:

- Annual monitoring reports
- Annual employee commuter survey

- Participation within the Milpitas Metro Specific Plan TMA
- Provision of bicycle parking spaces
- Fully subsidized transit passes (e.g. VTA, BART, etc.). At a minimum, the transit subsidy should be equivalent to the cost of a monthly VTA pass
- Commute shuttle funding
- Unbundled parking
- 511.org participation
- Production of marketing and education materials

M 8.3. Development projects are encouraged to implement additional optional TDM measures to achieve VMT and trip reduction goals. Section 7.6 details some potential strategies. The Santa Clara Countywide VMT Evaluation Tool is another resource for selecting TDM measures.

M 8.4. Require provision of bicycle and pedestrian facilities at workplaces, commercial centers, and residential complexes.

**Table 4-2. Bicycle Parking Requirements**

| Land Use | Long-Term Parking Requirement | Short-Term Parking Requirement |
|---|---|---|
| Multifamily Residential | 0.5 spaces per bedroom | 0.1 spaces per bedroom |
| Retail | 1 space per 10,000 square feet | 1 space per 5,000 square feet |
| Office | 1.5 spaces per 10,000 square feet | 1 space per 20,000 square feet |

**Table 4-3. Vehicular Parking Requirements**

| Land Use | Minimum Requirement | Maximum Requirement |
|---|---|---|
| Residential/Lodging | 0.5 spaces per unit | 1.5 spaces per unit |
| Non-Residential (industrial) | 1 space per 1,000 square feet | 2 spaces per 1,000 square feet |
| Non-Residential (non-industrial) | 1 space per 1,500 square feet | 1 space per 1,000 square feet |

M 8.4.1. This includes long-term bicycle parking that is weather-protected (either indoor or in an enclosed outdoor locker) at residential complexes and workplaces and short-term parking for bicycles that is visible from the entrance of the building at commercial developments. Required bicycle parking ratios are listed in Table 4-2. (NOTE: the Association of Pedestrian and Bicycle Professionals provides specific design guidance and the following requirements).

M 8.4.2. Required vehicular parking ratios are listed in Table 4-3. Valet and/or mechanical lift stalls are counted as individual spaces for purposes of required ratios.

M 8.5. Require separate designated parking for publicly accessible parks.

**Table 4-4. Parking Reduction Point System**

| Total Points | Allowed Parking Reduction |
|---|---|
| 40 or more | 100 percent |
| 30 or more | 75 percent |
| 20 or more | 50 percent |
| 10 or more | 25 percent |

M 8.6. Minimum parking requirements may be reduced at the discretion of the decision-making authority based on a demonstrated program that is approved by the City in the form of a written commitment to reduce demand for on-site parking and maximize the efficient use of parking areas. A reduction in required parking shall be granted based on the point system in Table 4-4 and described in sections 1 and 2 below.

1. Parking Reduction Near Fixed Guideway Transit. A parking reduction may be granted for development within one-half (0.5) mile of a VTA Light Rail or BART transit station. (15 points).

2. On-Site Parking Demand Reduction and Site Design Measures. Any combination of the following optional measures may be incorporated into the site plan and operational plan to support a reduction in the minimum required on-site parking:

    a. Shared parking agreement with owners of other property or properties in the vicinity of the development. This can also include distinct uses that are part of one development. The shared parking spaces must be located within 0.25 mile of the proposed use. (10 points for a number of shared parking spaces totaling at least 25

percent of the base parking space requirement for the use)

b. Direct free 24-hour airport-to-lodging shuttle service (10 points)

c. Providing dedicated, permanent on-site parking spaces for shared cars in a residential or lodging use. To qualify for this measure the use must provide at least one shared car space for every 50 units (when applying this calculation, any fractional number of required shared cars shall be rounded up to the nearest whole number). (5 points)

e. Providing on-site, free micro-mobility devices for a residential or lodging use. To qualify for this measure the use must provide at least one shared micro-mobility device for every 50 units (when applying this calculation, any fractional number of required shared micro-mobility devices shall be rounded up to the nearest whole number). The operator of the proposed use shall obtain approval from the Planning Director or designee for the proposed placement and use of micro-mobility devices prior to commencing operations. The operator shall maintain micro-mobility devices in good working order at all times. (5 points)

f. Paying employees a daily parking cash-out fee equivalent for the daily cost of a structured parking space. (15 points)

g. Offering an actively managed ride-matching service to residents or employees to assist in car or van-pooling. (5 points)

h. Other measures as proposed by the applicant. (points to be determined by the decision-making authority based on the potential for parking demand reduction of the proposed measure)

M 8.7. Minimum parking requirements may be reduced through payment of an in-lieu fee to the TMA that is set at $12,900 in 2022 dollars and adjusted annually for inflation using the Bureau of Labor Statistics. Acceptance of an in-lieu fee would be at the discretion of the City Council following a Planning Commission recommendation. In-lieu fee payments must be used on multimodal programmatic or infrastructure improvements.

**M 9. Pedestrian Circulation.** Promote pedestrian circulation for daily trips under a half mile and to transit by implementing the proposed street improvements and safety features, including pedestrian infrastructure enhancements on Great Mall Parkway (M 2.1) and intersection improvements (M 2.2). For a full list of street and circulation improvements to increase pedestrian safety, refer to Chapter 6: Implementation.

**M 10. Bicycle and Micromobility Circulation.** Promote bicycle and micromobility modes (e.g. e-bikes, motorized scooters, and skateboards) for trips to local destinations (e.g. Milpitas Transit Center, neighborhood retail, parks). Determine if the Metro Area is a suitable place for implementing the one-year shared micromobility pilot program detailed in the City's Bicycle/ Pedestrian and Trails Plan.

M 10.1. Provide direct and convenient bicycle circulation through the project site and to adjacent areas by closing existing gaps in bicycle lanes and bicycle routes, per Milpitas' Bicycle/ Pedestrian and Trails Plan and as shown on the Circulation Network Map (Figure 4-6) as well as routes suggested above for individual roadways such as Great Mall Parkway.

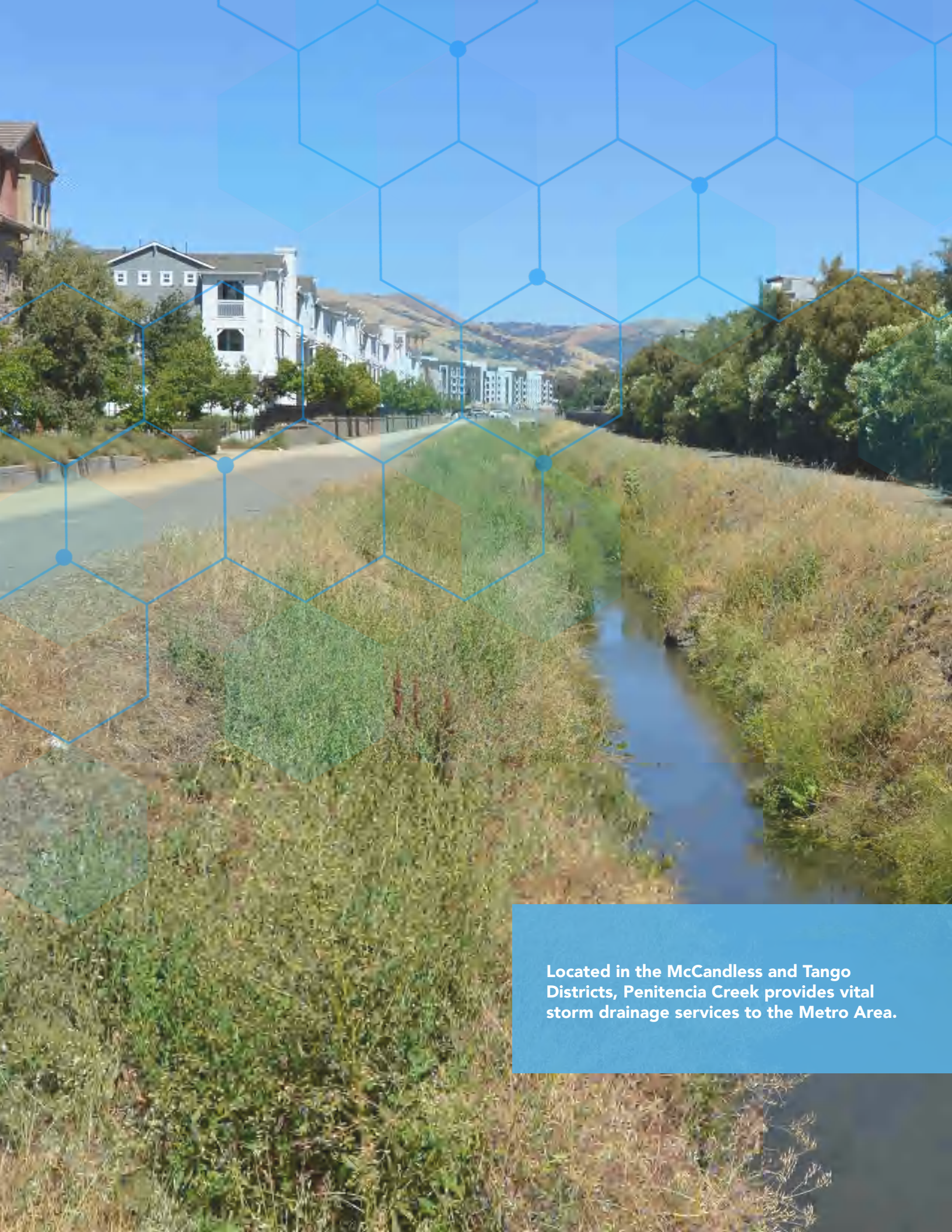
M 10.2. Signage alerting pedestrians of potentially fast-moving traffic should be considered where this connectivity network intersects or runs alongside pedestrian-focused routes, particularly at intersections with the trail network described in M 5.

**M 11. Transit.** Connect the Milpitas Metro Plan Area to local and regional transit.

M 11.1. Encourage the development of local circulators (by the City or property owners) as shown on the Circulation Network Map (Figure 4-6).

M 11.2. Integrate the Metro Plan into the City's first/ last mile programs, such as Milpitas OnDemand by ensuring the program's on-demand shuttle services the area, providing quality facilities for on-demand users, and connecting the shuttle to first mile-last mile amenities such as micromobility options.

M 11.3. Encourage multimodal infrastructure improvements near transit to improve local connectivity to transit stops, with particular focus on the Milpitas Transit Center, as per Milpitas' Bicycle/ Pedestrian and Trails Plan (2021).



**Located in the McCandless and Tango Districts, Penitencia Creek provides vital storm drainage services to the Metro Area.**

# 5. INFRASTRUCTURE


5.1. Storm Drainage
5.2. Flooding
5.3. Water Supply and Distribution System
5.4. Sewer
5.5. Solid Waste
5.6. Energy and Technology
5.7. Fire Protection and Emergency Response
5.8. Police Services
5.9. Schools
5.10. Libraries
5.11. Child Care


The City and private developers constructed a substantial amount of new infrastructure, including new streets, streetscapes, and utilities with the implementation of the TASP. As a result, the planning area already has much of the infrastructure needed to provide public utilities and services to the development projected in this plan.

This chapter describes the infrastructure needed to provide public infrastructure and services for the planning area. It establishes policies and describes improvement projects necessary for the upgrading and expansion of public facilities, including:

1. Public utilities such as storm drainage, sewer, water, and waste disposal
2. Community services provided by public agencies (e.g., schools, public safety, child care)

Policies and development standards for parks and trail infrastructure; and streets and mobility infrastructure are covered in Chapters 2 and 4, respectively.

## 5.1 STORM DRAINAGE

The City of Milpitas 2013 Storm Drain Master Plan (Master Plan) is in the process of being updated and is expected to be adopted in 2021. The Master Plan provides both background and analysis pertinent to the Milpitas Metro Specific Plan. The 2021 Master Plan includes the following statement on page ES-4:

> *This updated master plan and corresponding CIP differs from previous master plans due to the ICM (Integrated Catchment Modeling) model, which integrates updated rainfall and a different hydrologic methodology as described herein. Additionally, the model accounts for surface storage within streets and other open spaces and the precise timing of coincident creek discharges, which was not directly accounted for in previous master plans. These updates generally result in less flooding at the desired level of service and fewer CIP projects to meet the city's storm drainage criteria.*

Storm runoff in Milpitas is collected in a system of gutters, underground pipes, and open channels. The open channels flow to Coyote Creek which ultimately discharges to San Francisco Bay. Drainage in Milpitas generally is from the southeast to the northwest. Many storm drains in the lower areas of the City, near the bay, rely on pumping to convey major flows. In addition, the Santa Clara Valley Water District is also responsible for storm drainage in the City of Milpitas.

> *The Santa Clara Valley Water District (Valley Water) is Milpitas' primary partner in the management of local storm water issues. The District's stated mission is to "[provide Silicon Valley safe, clean water for a healthy life, environment, and economy]". More specifically, the District manages most of the major drainage-ways in Milpitas including Arroyo de los Coches, Berryessa Creek, Calera Creek, Coyote Creek, Lower Penitencia Creek, East Penitencia Creek, Piedmont Creek, and Tularcitos Creek. Coordination with the District is integral to the success of the storm drain master plan, since all of the City's storm drainage systems eventually discharge into a Valley Water-managed facility. Valley Water is keenly interested in any City storm drain project that might potentially impact one of their receiving creeks. In turn, the City has a vested interest in how Valley Water manages its legislated flood protection responsibility. (City of Milpitas Storm Drain Master Plan 2021, Page ES-1)*

The City of Milpitas and the Metro Specific Plan area lie wholly within the lower reaches of the Coyote Creek watershed as shown in Figure 5-1.

The 2021 Master Plan has included proposed land uses within the Metro Specific Plan Area and identified one low priority improvement at Comet Dr. The following statements from the Master Plan pages 1-7 and 3-51 summarize the impact of development for the Plan Area.

*Generally, impervious surface does not increase with infill development, so the impacts of the specific plan areas would be based on realigned roads or identifying currently underserved areas where parcels drain by gravity to the street frontage*

*The Milpitas Metro Specific Plan area is now almost entirely built out, and there are no longer areas identified that do not have adequate storm water runoff collection.*

### 5.1.1 Stormwater Policies

ICS 1. Support stormwater infrastructure that is appropriate for planned development in the Metro Area.

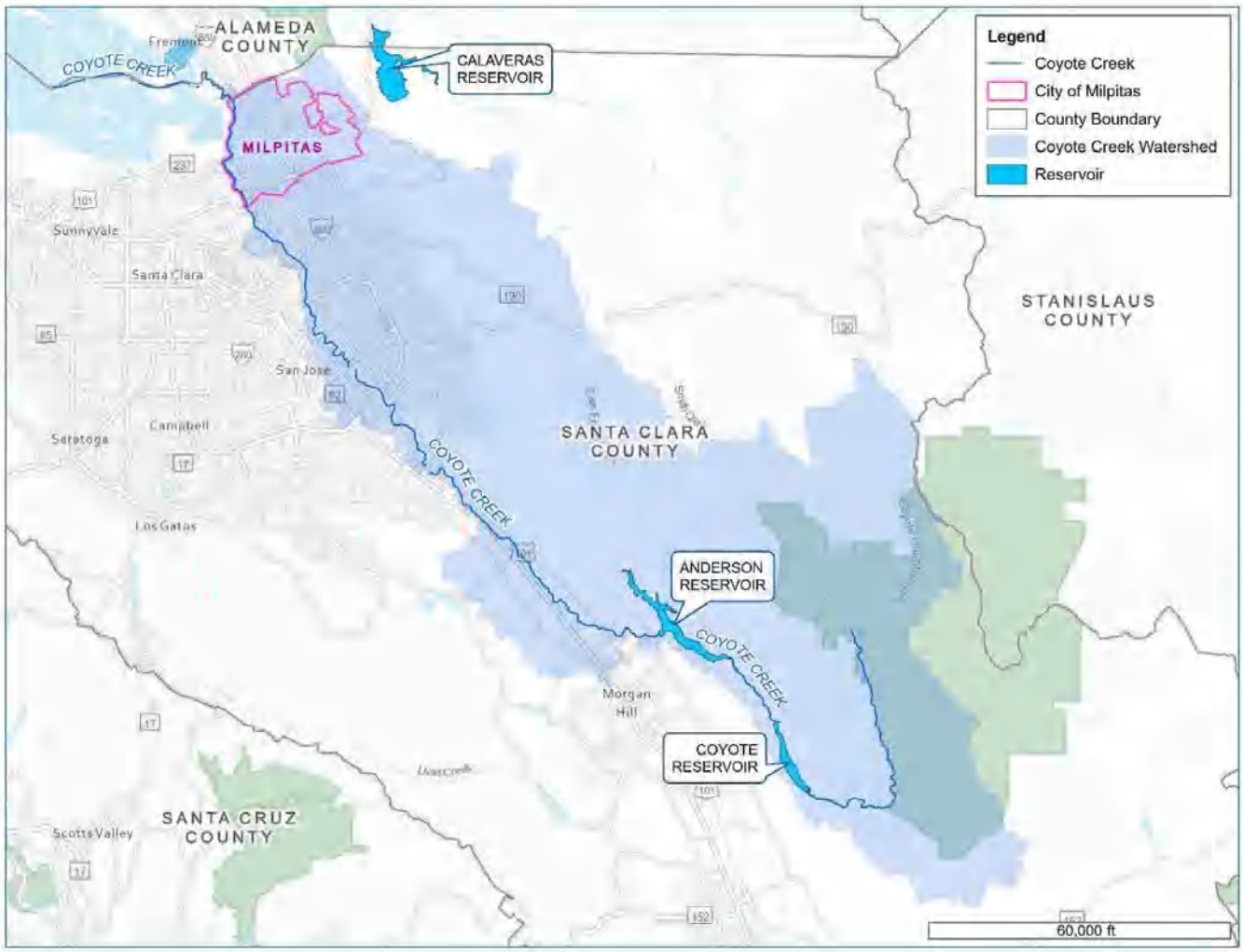
ICS 1.1. Provide storm drain infrastructure to adequately serve new development and meet City standards.

ICS 1.2. Ensure that runoff in storm drains does not lower water quality within or outside of the Plan Area by implementing Best Management Practices (BMPs) in new developments within the Metro Area.

ICS 1.3. Construct the improvements within the Metro Area that were identified in the 2013 Storm Drainage Master Plan, and any other improvements identified in updates to the Master Plan including:

- South Main St. SD Improvements at Cedar Way (P2)
- Montague Expressway SD Improvements (P1)
- Montague Expressway SD Improvements at Lower Penitencia Creek (P1)
- Tarob Court Outfall Relocation (P1)
- Lundy Place Relief Line (P1)
- Watson Ct. Relief Drain (PDB1)

**Figure 5-1. Milpitas Regional Drainage Location**




*Source: Storm Drain Master Plan*

## 5.2 FLOODING

The MMSP has adequate storm drainage capacity for the 10-year storm event upon completion of the improvements identified within the 2021 Storm Drain Master Plan. Within the MMSP, removal of paved areas for new parks, open space, and landscape areas will decrease impervious surfaces and therefore decrease stormwater runoff. However, the area will still be subject to flooding during 100-year storm events due to its location in the flatter portion of the city and flows from upstream areas which cannot be mitigated within the MMSP without major channel improvements.

Most of the Metro Area is within a federally-designated floodplain, which triggers compliance with federal and local regulations. As a result, the MMSP is subject to the provisions specified in Section XI-15 'Floodplain Management Regulations' of the Milpitas Municipal Code.

All new residential construction must have the lowest floor built to at least one foot above the Base Flood Elevation, or in the case of areas within Zone AO, at least one foot above the depth number listed on the Flood Insurance Rate Map (FIRM), or three feet above the highest adjacent grade if no depth number is shown. For non-residential construction, the lowest floor elevation can be at Base Flood Elevation. The FEMA-Designated Special Flood Hazard Areas are shown in Figure 5-2.

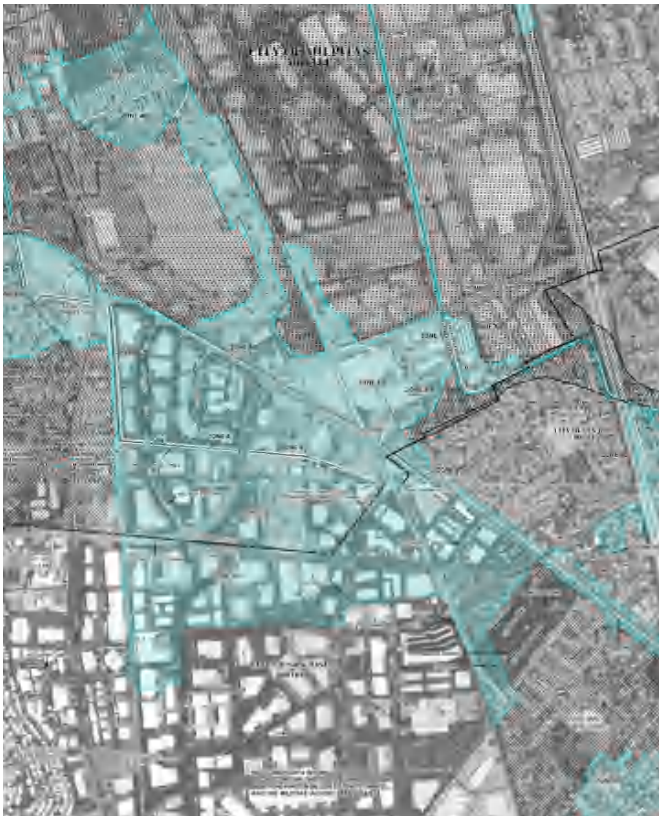
### 5.2.1 Flooding Policies

ICS 2. Ensure development is protected from flooding hazards.

ICS 2.1. Minimize damage associated with flooding events and comply with regulations stipulated by FEMA and the National Flood Insurance Program.

ICS 2.2. New development within a FEMA-designated flood hazard zone must follow the City's construction standards for such areas, as currently laid out in Section XI-15 'Floodplain Management Regulations' of the Milpitas Municipal Code.

**Figure 5-2. FEMA - Designated Special Flood Hazard Areas**



## 5.3 WATER SUPPLY AND DISTRIBUTION SYSTEM

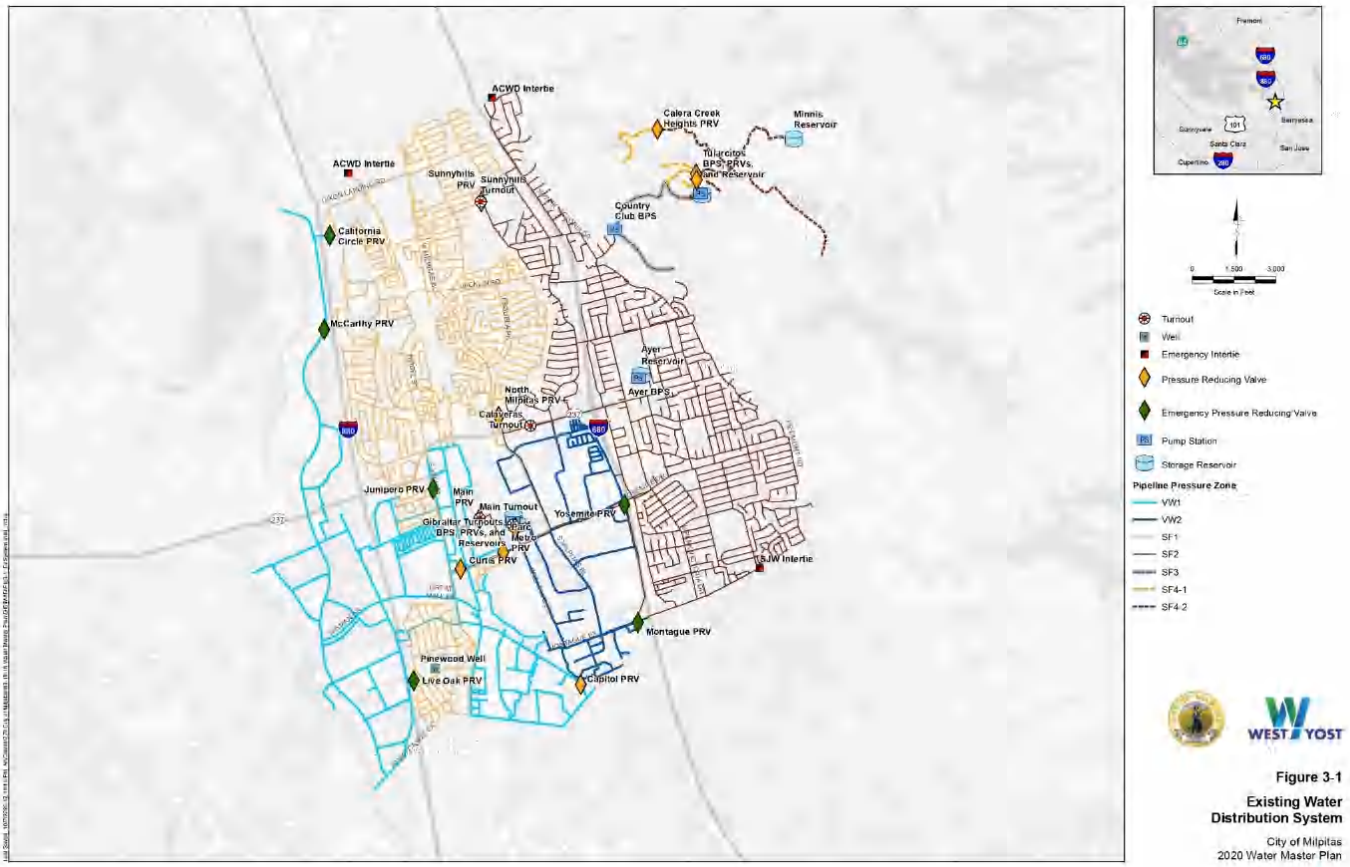
The City of Milpitas Water Master Plan (WMP) was prepared in 2021 and provides both background and analysis pertinent to the Milpitas Metro Specific Plan.

The City's water system is divided into two service areas that operate separately under normal conditions. The San Francisco Public Utilities Commission (SFPUC) serves one area, while Valley Water (VW, formerly known as the Santa Clara Valley Water District) serves the other (which includes the Milpitas Metro Specific Plan Area).

There are two pressure zones in the VW service area, and the Milpitas Metro Specific Plan Area spans both. A turnout from a VW transmission main supplies the higher pressure zone (referred to in the WMP as Zone VW2), which supplies the lower pressure zone (Zone VW1) via pressure-reducing valves (PRVs).

Among other analyses, the WMP evaluated the ability of the City's distribution system to

**Figure 5-3. Existing Water Distribution System**




*Source: 2021 Water Master Plan*

meet hydraulic performance criteria under different demand and outage conditions. Both the existing (2019) and buildout (2040) systems were evaluated, with the latter incorporating new water demands from planned future growth and development (including the Milpitas Metro Specific Plan). Hydraulic evaluation of the City's buildout water distribution system included scenarios for peak hour demand, maximum day demand plus fire flow, and water supply and power outages.

The Milpitas Metro Specific Plan Area met hydraulic performance criteria under all scenarios evaluated. At buildout, pressures and flows in the Milpitas Metro Specific Plan Area were adequate to serve peak hour demands and maximum day demand plus fire flow conditions. Outside the Milpitas Metro Specific Plan Area but adjacent to its southwest corner, one area did not meet the recommended fire flow criterion. To improve fire flows in that area, the WMP recommends installing a new Emergency PRV (Cedar EPRV) near the intersection of Cedar Way and South

**Figure 5-4. Water Infrastructure Improvements**

*Source: 2021 Water Master Plan*

Main Street that would allow flow from the SFPUC service area to the VW service area during fires.

In addition to the hydraulic evaluation, the WMP evaluated the supply, storage, and pumping capacities for the City's buildout water system. While pumping capacity is sufficient to handle increased water demands in the VW service area (resulting from the Milpitas Metro Specific Plan and other developments), water supply and storage improvements are recommended to meet associated performance criteria. Because the timing of future development was not available for the WMP, it is not clear which specific development(s) will "trigger" these improvements, but they are nevertheless recommended prior to buildout. Based on the buildout system analysis in the WMP, recommended water supply and storage improvements for the VW service area include:

- A new turnout from VW with a capacity of 10,000 gallons per minute (gpm).
- Two new groundwater wells (Curtis Well and McCandless Well), each with a capacity of at least 400 gpm. The McCandless well will be located in McCandless Park.
- A new, 2-million-gallon potable water storage tank.
- A new pump station (drawing from the new storage tank) with a firm capacity of 4,000 gpm.

These recommended improvements are one potential portfolio of projects the City could implement to address the water supply and storage challenges identified in the WMP. Other improvements or combinations of improvements may also address these challenges.

### 5.3.1 Water Supply and Distribution Policies

ICS 3. Provide a reliable and sustainable water supply that supports future growth projections.

ICS 3.1. Provide water supply for the Milpitas Metro Area from the City's portfolio of water supplies, including potable water from Valley Water District and San Francisco Public Utilities Commission and groundwater and recycled water from South Bay Water Recycling, per the Water Master Plan. No development is entitled to municipal water until a building permit is issued by the City.

ICS 3.2. Continue to provide potable water on a "first-come-first-served basis." If development in Milpitas exceeds growth projections in adopted plans, municipal potable water may not be immediately available to all developments.

ICS 3.3. Update the Water Supply Assessment if development in the Plan Area exceeds the water demand estimated in the Water Supply Assessment.

ICS 3.4. Reduce overall water consumption and particularly potable water

consumption through water conservation measures, including but not limited to the following:

- use of recycled water
- water-saving features
- drought-tolerant landscaping

ICS 3.5. Require installation of water-saving devices, as required by the California Building Code, in all residential, commercial, industrial, and institutional facilities within the Plan Area. Such devices are capable of reducing the amount of water used indoors, resulting in substantial wastewater flow reductions.

ICS 3.6. Require that recycled water be used for all irrigation, including parks, plazas, community facilities, linear parks, landscaped front yards, buffer zones, vegetated setbacks, and private common areas.

ICS 3.7. Require, where reasonable and feasible, that commercial uses, schools, and non-residential mixed-use developments include dual plumbing to enable indoor recycled water use for non-potable uses to the extent feasible.

ICS 3.8. Upgrade and expand the water distribution system in accordance with the Water Master Plan such that it will be adequate to serve new development in the Plan Area.

ICS 3.9. Expand recycled water infrastructure in the Innovation District, along Main Street, and in the Tango District to support future development.

ICS 3.10. Recycled water mains shall be installed up to and across the frontage of parcels that do not have access to recycled water. The cost of extending recycled water mains, excluding the length across the frontage, shall be funded through the TADIF.

## 5.4 SEWER

The City of Milpitas Sewer Master Plan (Master Plan) was prepared in 2021 and provides both background and analysis pertinent to the Milpitas Metro Specific Plan. Relevant passages are quoted below.

> *The wastewater collection system consists of approximately 160 miles of gravity sewers, with pipe diameters ranging from 4- to 66-inches. The collection system generally flows from east to west and south to north towards the San Francisco Bay. Most of the collection system flows by gravity to the Milpitas Main Lift Station (Main LS) then is pumped to the San Jose-Santa Clara Regional Wastewater Facility (RWF) through dual force mains. (City of Milpitas Sewer Master Plan, Page ES-1)*

> *The City of Milpitas pays a share of the capital cost of the RWF, based on the City's capacity rights in proportion to the 167 MGD total capacity of the RWF. The City also pays a share of the operating cost, based on the volume of wastewater discharged to RWF. The City has rights to discharge 14.25 MGD to the RWF under its current allotment. (Sewer Master Plan, Page 2-4)*

The Milpitas Metro Specific Plan Area is located on the southern border of the City at the upper end of the sewer shed for the City.

The Master Plan identified system risk exposure and developed a 5-point scoring ranking that includes all segments of the existing system. Neither #4 (High) or #5 (Extreme) risks were identified in the Milpitas Metro Specific Plan Area.

> *As part of the City's Master Plan project, a Sewer Utility Asset Renewal and Replacement Study (R&R Study) was conducted. The study documents the City's Business Risk Exposure (BRE) based on the physical condition and desktop assessment of the City's collection system applying a set of factors developed to determine the relative risk of failure for each pipeline segment. (City of Milpitas Sewer Master Plan, Page ES-1)*

A capacity analysis of the citywide system is included in the 2021 Sewer Master Plan which anticipated land uses within the Milpitas Metro Specific Plan Area (Figure 5-2 in the Sewer Master Plan). The capacity analysis did not identify any deficiencies in the Milpitas Metro Specific Plan Area; however, some downstream segments are under capacity and have been identified as CIP projects.

> *There were no major capacity deficiencies identified as part of this analysis. There were no additional capacity deficiencies identified under future conditions that were not seen under existing conditions. (City of Milpitas Sewer Master Plan, Page ES-1)*

### 5.4.1 Sewer Policies

ICS 4. Ensure sewer infrastructure can support future growth in the Metro Area.

ICS 4.1. Require development to obtain a building permit issued by the City prior to being entitled to wastewater treatment capacity.

ICS 4.2. Consider additional review of available wastewater treatment capacity if development in the Metro Area exceeds 7,000 housing units.

ICS 4.3. Construct improvements within the Plan Area as required to serve new projects. Participate in fair share contributions to downstream improvements that were identified as deficient in the 2021 Sewer Master Plan, and any other improvements identified in updates to the Master Plan.

## 5.5 SOLID WASTE

The City of Milpitas disposes of solid waste at different facilities depending on the material waste stream (e.g. garbage, recyclables, food waste, yard trimmings, and C&D) in accordance with the Franchise Hauler Agreement that the City has with Milpitas Sanitation, Inc. (MSI). The Franchise Hauler Agreement was entered on December 8, 2016; the term of the contract is from September 6, 2017 to August 31, 2032.

While collection is performed by MSI, the facilities where all of the waste streams are transported to are varied. Waste facilities by waste stream are listed below:

- **Solid waste.** Solid waste is processed at GreenWaste Recovery MRF with the end destination of the material at Kirby Canyon Landfill.
- **Recyclables.** The primary approved facility for recyclables is GreenWaste Recovery MRF. Alternate approved facilities include Alameda County Industries Material Recovery Facility and the Sunnyvale Materials Recovery and Transport Station (SMaRT Station).
- **Yard trimmings.** Yard trimmings are processed at GreenWaste Recovery MRF.
- **Food scraps.** The primary approved facility for food scraps is Sustainable Organic Solutions (SOS). Food waste is used to make animal feed. Alternate approved facilities include East Bay Municipal Utility

District Treatment Plant and the Sunnyvale Materials Recovery and Transport Station (SMaRT Station)

- **Construction and demolition (C&D).** The primary approved facility for C&D is Mission Trails Waste Systems (MTWS). Alternate approved facilities include Zanker Road Resource Management Facilities, Guadalupe C&D Recovery Facility, and the Sunnyvale Materials Recovery and Transport Station (SMaRT Station).

The NISL does not accept hazardous waste, but the City of Milpitas currently participates in Santa Clara County's Hazardous Waste Program, which provides a drop-off site for residents and small generators.

Hazardous waste is being managed through Santa Clara County's household hazardous waste (HHW) program, which provides a drop-off site for residents and small generators through an appointment-based system. Milpitas continues to participate in this program. Santa Clara County and the City of Milpitas hold an annual HHW collection event within the city to encourage proper disposal of hazardous waste. Recent HHW collection events were canceled due to Covid-19, but will resume in the future.

### 5.5.1 Solid Waste Policies

ICS 5. Ensure solid waste facilities can support growth in the Metro Area and that waste continues to be collected and disposed of safely.

ICS 5.1. Require all new development to participate to the maximum extent practical in solid waste source reduction and diversion programs.

ICS 5.2. Negotiate new agreements to handle the long-term disposal of its solid waste before the expiration of the current waste disposal contract.

## 5.6 ENERGY AND TECHNOLOGY

The Metro Plan Area is a highly urbanized area that already includes electrical, gas and telecommunication facilities that future projects would be able to connect to. Moreover, the Metro Plan supports energy and greenhouse gas (GHG) reduction measures by encouraging and requiring more efficient building systems.

**Electricity & Gas**

Pacific Gas & Electric (PG&E) provides electric and gas services to the planning area. The Metro Plan encourages building design features that reduce energy consumption and increase renewable energy generation. In addition, development associated with the Metro Plan would be required to comply with the California Green Building Standards Code, which includes green and sustainable building requirements to achieve energy efficiency. New development will be served through the extension of existing electrical lines, with existing and new utilities (e.g., transformers) located underground, whenever possible.

The Metro Plan identifies policies to limit the use of natural gas, stating that all new residential or non-residential buildings must be all-electric, unless gas is essential to the key functions of the internal business, such as manufacturing or laboratory work. See CB 7. Sustainability for energy policies.

**Technology**

Located in Silicon Valley, Milpitas is embedded in the region's culture of innovation. The City is exploring opportunities for providing an efficient and reliable citywide broadband network, which could create new opportunities for businesses, public safety, healthcare, and other services. Citywide technological innovations can also elevate the City's reputation as a 21st century city and will be a key asset to the development of the Innovation District. A public broadband network would provide high-speed connectivity in public spaces within the city and could require collaboration with the private sector to implement.

### 5.6.1 Energy and Technology Policies

ICS 6. Provide a public broadband network in the Metro Area to establish the City as an innovative technological center.

ICS 6.1. Require new development to provide fiber connections.

ICS 6.2. Encourage the development of new fiber connections to existing development when utility construction is underway.

ICS 7. Consistent with the City's Economic Development Strategy (EDS) #29, facilitate deployment of 5G wireless service in the Metro Area, especially in underserved areas and in locations targeted for growth of office/R&D uses as part of a new Innovation District.

## 5.7 FIRE PROTECTION AND EMERGENCY RESPONSE

The Milpitas Fire Department (MFD) is responsible for fire suppression, emergency medical services, rescue services, hazardous and toxic materials emergency response, coordination of City-wide disaster response efforts, enforcement of fire and life safety codes, enforcement of State and Federal hazardous materials regulations, and investigation of fire cause, arson and other emergency events for cause and origin.

Three fire stations near the project area are: Fire Station #1, just northwest of the Great Mall at Curtis and South Main streets; Station #2, located northeast of the project on Yosemite Drive and South Park Victoria Drive; and Station #4 on Barber Lane just west of I-880. The City has automatic aid and mutual aid agreements with the cities of San Jose and Fremont.

More firefighting personnel and equipment will be needed to provide the level of service described in the General Plan, roughly at the ratio of one firefighter per 1,000 residents.

Ultimately, MFD will need to conduct a "standards of cover" analysis to determine the Metro Plan's precise impact on the department's staffing and equipment, and any required facility enhancements.

The MFD will also need to write an addendum to the City's emergency management plan to address the development of the project area. Adjustments to communication systems, evacuation plans, and community warning systems may also be necessary.

The City currently has building regulations that ensure adequate emergency access to buildings. However, the building and streetscape standards established in Chapter 3 were developed in coordination with MFD in order to balance dense development with safety.

The Fire Department will evaluate individual development plans to assess whether emergency access is adequate.

### 5.7.1 Fire Protection and Emergency Response Policies

ICS 8. Provide fire and emergency services and facilities that can support growth in the Metro Area, while maintaining an adequate level of service

ICS 8.1. Conduct a "standards of cover" analysis to determine the Metro Plan's precise impact on the Fire Department's staffing and equipment, and any required facility needs. Identify and evaluate potential sites for an expanded or new fire station near the Plan Area if the standards of cover analysis determines it is warranted.

ICS 8.2. Provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors

of the Plan Area by hiring additional fire department staff, purchasing equipment, and building facilities. New equipment and facilities shall be funded by the Community Facilities District fee and new staff paid from the City's General Fund.

ICS 8.3. These facilities are not expected to be sited within the Plan Area.

ICS 8.4. If a new fire station is built to meet the service needs of the Plan Area, it must be sited and developed in such a way as to not create substantial adverse physical impacts or significant environmental impacts.

ICS 8.5. Any new facilities should minimize noise and traffic impacts on existing land uses.

ICS 8.6. Update the City's emergency and disaster response plans to take the location and type of new development, and future traffic levels, into account.

## 5.8 POLICE SERVICES

Law enforcement services in Milpitas are provided by the City of Milpitas Police Department (MPD). Additionally, BART Police provides law enforcement services to the BART station and the Transit Patrol Division of the Santa Clara County Sheriff provides contract security and law enforcement services for the Valley Transportation Authority (VTA), which includes the parking structure and parking lot of the BART station.

Most of the crime that occurs in the Metro Area is specific to the Great Mall—thefts, forgery/fraud, and stolen vehicles—and there is little violent crime. In the rest of the Metro Area, more than half of the police-related calls are vehicle violations, traffic accidents, and theft from autos.

The increase in population, business traffic, and vehicular traffic resulting from the buildout of the Metro Area will increase the workload of MPD. To maintain current levels of service, an increase in staffing and equipment will be necessary. The City has also determined that an additional police station is necessary.

Milpitas has one existing police station located in the north part of the city that is approximately three miles from the Metro Plan Area's northern boundary. To reduce response times in the southern part of Milpitas, a new police substation is planned to be located in the Metro Area. The substation will be located near the Milpitas Transit Center though the exact location has not

yet been determined. One potential location is the vacant parcel near the Milpitas Transit Center as indicated on the Land Use Map in Figure 2-1. This area was previously identified as a potential park location but was determined to be unsuitable due to the visibility challenges of police patrolling on the parcel.

Given the estimated addition of 17,500 residents to the city—a population increase of 22 percent—maintaining the ratio of police officers to residents used in the TASP would require an additional 25 officers. However, the metrics that MPD would use to determine the precise number of additional staff required are the projected call volume and impact in service levels, such as an increase in dispatch and response times; ring times for 9-1-1 calls; and calls that are pending for an officer. The City should also anticipate investing in additional MPD communications staff and equipment, professional staff needed to support the additional officers, technology related to crime prevention, deterrence, and enforcement, and increasing the vehicle fleet of MPD.

### 5.8.1 Police Services Policies

ICS 9. Provide adequate police services and facilities that ensure the safety of the community.

ICS 9.1. Hire additional police staff and purchase equipment to provide an adequate level of service—as determined by City Council—for the residents, workers, and visitors of the Metro Area as well as surrounding areas. New equipment shall be funded by the Community Facilities District fee and new staff paid from the City's General Fund.

ICS 9.2. Construct an additional Police Substation in the Metro Area on the Milpitas Boulevard Extension adjacent to Berryessa Creek, or in another location determined by the City.

## 5.9 SCHOOLS

The planning area falls within three different school districts: Milpitas Unified School District (MUSD), which handles students in grades K-12, and two overlapping districts: Berryessa Union School District (grades K-8) and East Side Union High School District (grades 9-12). The student generation assumptions in Table 5-1 resulting from the residential component of the project are based on the TASP's attendance data from these districts, with variations by grade group and housing type.

Total student generation by school district is summarized in Table 5-2. The Metro Plan will generate approximately 1,407 new students at buildout assuming that 20 percent of housing units are below market rate. Most of these new students (60 percent) will be located in the MUSD.

The Milpitas Unified School District plans to expand student capacity in the Phase II construction of Mabel Mattos Elementary School, which is located adjacent to McCandless Park, in the McCandless District, to accommodate the anticipated growth in enrollment in this district.

Both school districts south of Montague Expressway—Berryessa Union and East Side Union High—have existing capacity for more students and will likely not need to add new school sites to accommodate increased demand. It is anticipated that the Berryessa Union School District will receive an increase of 224 students in K-5 and 103 students in grades 6-8, while East Side Union High School District will experience an increase of 231 students in grades 9-12.

### 5.9.1 State Criteria

The State of California has standards for acceptable locations and sizes for new public schools. While exceptions can be granted, the location of schools shall generally comply with the following. For the full list of standards, refer to Section 14010 of the California Code of Regulations, Title 5.

- At least 100 feet from 50-133 kV power lines, 150 feet from 220-230 kV power lines, and 350 feet from 500-550 kV power lines;
- Sites within 1,500 feet of a railroad easement require a safety study;
- Not adjacent to a road or freeway that will create safety problems or noise that will adversely affect the educational program;
- Not on an active earthquake fault of fault trace;
- Not on major arterial streets with a heavy traffic pattern, unless mitigation of traffic hazards and a plan for the safe arrival and departure of students appropriate to the grade level is provided;
- Cannot be within an area of flood inundation, unless the cost of mitigating the flood is reasonable;
- Not located near an above-ground water or fuel storage tank, nor within 1,500 feet of an above ground or underground pipeline easement that can pose a safety hazard;

- Not subject to moderate to high liquefaction or landslides;
- The shape of the site can accommodate the building layout, parking, and playfields and does not exceed the allowed passing time to classes for the district;
- Is easily accessible from arterial roads and has minimum peripheral visibility from the planned driveways;
- Zoning of the surrounding properties shall not pose a potential health or safety risk to students or staff; and
- The site shall be conveniently located for public services, including fire protection, police protection, public transit, and trash disposal whenever feasible.

### 5.9.2 School Policies

ICS 10. Ensure that affected school districts have the funding needed to support the student population in the Metro Area.

ICS 10.1. Coordinate with the affected school districts on facilities needed to accommodate new students and define actions the City can take to assist or support them in their efforts.

ICS 10.2. Ensure that all school impact fees are paid from individual projects prior to the issuance of any building permits.

## 5.10 LIBRARIES

The Milpitas Library, located at 160 North Main Street, is a member of the Santa Clara County Library District. The Santa Clara County Library District is governed by a Joint Powers Authority (JPA) and overseen by the Santa Clara Board of Supervisors. The JPA membership consists of a City Council representative from participating jurisdictions including the cities of Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Milpitas, Monte Sereno, Morgan Hill, and Saratoga and two County Supervisors from the County of Santa Clara.

The Library District prepares and annually reviews a Capital Plan and Budget that account for population changes in the County.

### 5.10.1 Library Policies

ICS 11. Ensure that the Milpitas community continues to have access to adequate library resources as development occurs in the Milpitas Metro Plan Area as part of the Santa Clara County Library District Joint Powers Authority.

**Table 5-1. Student Generation Rates**

| | Market-Rate Housing Generation | Below Market-Rate Generation |
|---|---|---|
| Milpitas Unified School District | | |
| K-6 | 0.087 | 0.246 |
| 7-8 | 0.017 | 0.047 |
| 9-12 | 0.03 | 0.076 |
| Berryessa Union School District | | |
| K-5 (Northwood Elementary) | 0.046 | 0.300 |
| 6-8 (Morrill Middle School) | 0.016 | 0.159 |
| East Side Union High School District | | |
| 9-12 (Independence High School) | 0.1 | 0.1 |

*Student generation rates from the TASP EIR.*

**Table 5-2. Projected Student Enrollment**

| | New Students |
|---|---|
| Milpitas Unified School District (Housing Units = 4,690) | |
| K-6 | 557 |
| 7-8 | 108 |
| 9-12 | 184 |
| Total | 849 |
| Berryessa Union School District (Housing Units = 2,310) | |
| K-5 (Northwood Elementary) | 224 |
| 6-8 (Morrill Middle School) | 103 |
| East Side Union High School District | |
| 9-12 (Independence High School) | 231 |
| **Total** | **1,407 students** |

*Student enrollment was calculated by applying the student generation assumptions from the TASP EIR to the MMSP's population projections.*

## 5.11 CHILD CARE

Childcare plays an important role in economic development and household wealth, by permitting parents to work either part- or full-time. It plays an especially important role in single-parent households, where the sole adult must work. Childcare can also provide informal income for home-based caregivers. Demand for childcare can be all-day or just after-school in nature and can come from local residents as well as workers within the area.

The City adopted a Childcare Master Plan in 2002 and updated it in 2004. It calls for the following:

- Support the development of childcare within transit overlay districts,
- Require incoming projects to be evaluated for their potential impact on childcare demand within the city, and
- Require incoming projects to be evaluated for their potential to provide childcare facilities within the project.

The City has an incentive program for developers should they incorporate childcare into their developments. The City now offers fee reductions for large family childcare homes and has a practice of prioritizing the processing of childcare centers. The Childcare Master Plan suggests that additional incentives, such as density bonuses, could be developed to further bolster the incentive program.

The Midtown Specific Plan has a policy to encourage the provision of childcare services to support demand generated by employees and residents in the Midtown area, with new childcare centers especially encouraged near large housing developments, near transit stations, and within new office developments.

### 5.11.1 Child Care Policies

ICS 12. Support the expansion of childcare services to support demand in the Metro Area.

ICS 12.1. Encourage childcare services near the BART and light rail stations.

ICS 12.2. Encourage childcare services to be integrated into affordable housing projects.

ICS 12.3. Encourage new commercial space to provide childcare services for its employees. Floor area devoted exclusively to childcare shall be exempted from FAR limits on a parcel.

908B
ORANGE LINE
EMERGENCY

The recently built pedestrian bridge provides direct a direct connection over Capitol Avenue from the BART station and bus depot to the elevated VTA light rail line.

# 6. IMPLEMENTATION


6.1. Updates to the General Plan and Zoning
6.2. Coordination with the Midtown Specific Plan
6.3. Entitlement Process
6.4. Great Mall
6.5. Innovation District
6.6. Phasing
6.7. Environmental Review (CEQA)
6.8. Public Infrastructure and Investments
6.9. Funding Strategy
6.10. Implementation Actions


The implementation of the Milpitas Metro Specific Plan will require action by the public, City departments, regional agencies, and private property owners. The City will take the lead in coordinating areawide actions and establishing funding mechanisms for public investment in programs and capital projects. However, private investment through the architecture, landscaping, and maintenance of individual development projects will be a significant determinant of the look and feel of the Plan Area.

Table 6-2, at the end of this chapter, lays out actions, responsible parties, and timeframes needed to ensure the Plan's implementation. Following the Metro Plan's adoption, a nexus fee study will be conducted to determine suitable fees needed to support the Basic Improvement Program (BIP) and ensure the completion of public improvements identified in the Plan.

## 6.1 UPDATES TO THE GENERAL PLAN AND ZONING

As part of adopting the Milpitas Metro Specific Plan, the City will adopt amendments to the Zoning Ordinance to ensure consistency between planning documents. The General Plan was updated just prior to the completion of the Specific Plan and has been coordinated with the Milpitas Metro Specific Plan, but will need to be amended to reflect annexations of parcels into the Metro Plan, including properties on S. Main Street and east of the Innovation District. The General Plan Land Use Map will also need to be amended to reflect the new land use designations in the Milpitas Metro Specific Plan, including along Main Street and in the Innovation District.

The Zoning Ordinance amendment adds new zoning districts, revises the Zoning Map, and amends other sections, including but not limited to zoning designations and development standards.

## 6.2 COORDINATION WITH THE MIDTOWN SPECIFIC PLAN

The boundaries of the Milpitas Metro Specific Plan will expand the original TASP boundaries to include additional parcels along Main Street, which were formerly part of the Midtown Specific Plan. At the adoption of the Metro Plan, the City will be in the process of updating the Midtown Specific Plan and renaming it the Milpitas Gateway-Main Street Specific Plan. City Council will adopt the changes to the Midtown Plan boundaries when the Metro Plan is approved, and these changes will be noted in the Midtown Plan.

## 6.3 ENTITLEMENT PROCESS

Development projects in Milpitas Metro typically require two phases of review and approval: the planning/ zoning entitlement phase and the building permit phase.

During the entitlement phase, developers of proposed projects submit applications for review by Planning staff and relevant City departments to determine whether the proposed project is consistent with the General Plan, this Specific Plan, and other associated regulatory requirements, including the Zoning Ordinance. Uses that are permitted by-right in a zoning district may only require administrative review by Planning staff. More complex development projects or uses that require a Conditional Use Permit are reviewed by the Planning Commission and/or City Council. Specifics are further outlined in the Zoning Ordinance.

However, the recent changes in State Law related to affordable housing may alter the City's processing and approval procedures. Applicants are advised to consult with the Planning Department staff prior to project submittal. Planning fees are required at formal project submittal to the Planning Department.

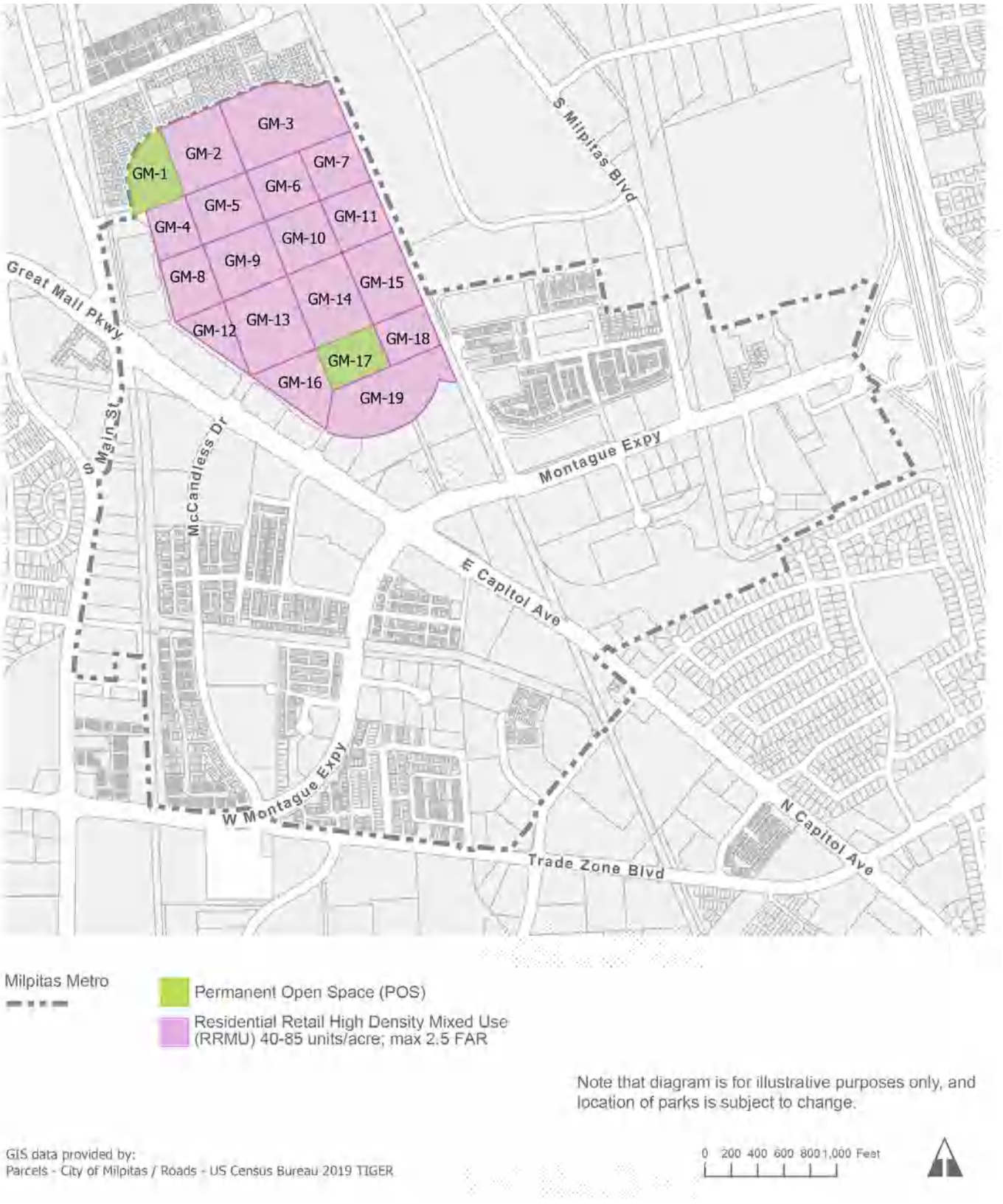
Following the approval of all required planning entitlements, developers submit detailed building permit applications, which are reviewed by several departments including Building, Planning, Engineering-Land Development, and Fire Safety prior to approval and permit issuance. Detailed permit applications must include information that has been approved by the City on the location of, funding for, and ownership of identified public improvements on or adjacent to each site, including roadways, parks, trails, sidewalks, and similar. The payment of building permit fees, TADIF fees, and other development impact fees is required prior to issuance of a building permit. Examples of the expected public improvements are provided in the Infrastructure chapter of this Plan and include those listed below. These features are intended to improve the livability, quality, and experience of Milpitas Metro:

- New publicly-accessible streets, bicycle and pedestrian connections, plaza, and open spaces in the Great Mall District
- New publicly-accessible streets, Penitencia Creek trail and bridge, and redesign of the Houret Court in the McCandless District
- New publicly-accessible streets, plazas, and open spaces in the Innovation District
- A new pedestrian bridge, the Penitencia Creek trail, bike routes, parks, streets, and a through-connection between Tarob Court and Sango Court in the Tango District
- A linear park, with a minimum width of 20 feet, to support the redesign of Great Mall Parkway into a complete street; public access easements will be established, as necessary
- Widen sidewalks to approximately 18 feet on Activity Streets in accordance with approved plans; public access easements may be established, as necessary
- New linear park/ landscape feature with public art under the overhead VTA Light Rail line
- Trail improvements and new trails shall be provided along Berryessa Creek and South Penitencia Creek East Channel to improve connectivity to the Milpitas Transit Center and between districts
- Sidewalk, street trees, and street furnishings (e.g., lighting, benches) along each development project frontage

Project applicants must account for the locations and design of adjacent or onsite improvements in their project plans.

Upon completing the final stages of project entitlement, such as with the Final Map process but in any case before project occupancy, a project that is wholly or partially residential shall be annexed to the Community Facilities District (CFD) in order to contribute property tax revenues that support ongoing services and maintenance of public facilities that serve the Metro Area.

## Figure 6-1. Great Mall Conceptual Planning Area



## 6.4 GREAT MALL

The Great Mall District is conveniently located near the Milpitas Transit Center and is poised for redevelopment depending upon economic conditions. In light of the current challenges to typical retail formats, the district has an opportunity to transform into a transit-oriented, high-density neighborhood with a walkable street grid and public gathering spaces. The district's comprehensive vision is detailed in Chapter 2: Land Use and Public Space.

The Great Mall parcel occupies most of the land in the Great Mall District at approximately 99 acres. Located north of the Milpitas Transit Center and stretching north towards Main Street, the Great Mall is a large indoor mall that is a historic property that was formerly a Ford plant. It is located on an expansive commercial parcel owned by Simon Property Group and is currently a significant attraction, drawing regional visitors.

Property owners in the Great Mall District have expressed interest in developing a mix of land uses that may occur over time rather than immediately. The Plan aims to be responsive to developer needs while ensuring that the development of the parcel results in a high-quality, well-integrated, pedestrian-accessible urban node. As a result, the MMSP rezones the district to allow mixed-use land uses that support flexibility and capacity for change. Future development of the Great Mall and the surrounding parcels is guided by policies in previous chapters of the Metro Plan.

To fulfill the Great Mall District's vision, the Metro Plan establishes a framework for developing the Great Mall parcel, including mixed-use opportunities, housing capacity, roadways, and open space. Due to the size of the Great Mall parcel, redevelopment will likely occur in phases. The Great Mall is broken into conceptual subareas in Figure 6-1 with maximum residential and nonresidential capacity by subarea summarized in Table 6-1. These subarea boundaries are conceptual and subject to change through future negotiations with the property owner over their needs and goals for future development.

Environmental documentation will likely establish a development threshold for the Plan that is less than the full capacities shown in the table below. Housing capacity shown in the table below represents the maximum housing according to the land use density designation, which density could be averaged across the site. Actual housing yield on the Great Mall parcel is restricted in this Plan by the number of units identified in the Housing Element as assigned to the site, unless a Development Agreement (DA) is negotiated and approved by City Council to provide other allowances. Alternatively, this Specific Plan could be amended in the future to provide for more total housing development than allowed by either the Housing Element or the total number of units on the site as is indicated here.

The design, ownership of, and access to infrastructure, roadways, and parks in the Great Mall District must be agreed upon by the City before project development can begin. Agreements for the use of the publicly-accessible facilities will be developed alongside

**Table 6-1. Great Mall Conceptual Development Capacity**

| Subarea | Land Use | Acreage | Residential Development Capacity (units) | Non-Residential/ Mixed-Use Development Capacity (square feet) |
|---|---|---|---|---|
| GM-01 | POS | 4.07 | -- | -- |
| GM-02 | RRMU | 6.20 | 527 | 675,455 |
| GM-03 | RRMU | 10.01 | 851 | 1,090,029 |
| GM-04 | RRMU | 3.06 | 260 | 333,067 |
| GM-05 | RRMU | 4.65 | 395 | 505,999 |
| GM-06 | RRMU | 4.08 | 346 | 443,877 |
| GM-07 | RRMU | 3.95 | 336 | 429,848 |
| GM-08 | RRMU | 4.02 | 341 | 437,259 |
| GM-09 | RRMU | 5.34 | 454 | 581,819 |
| GM-10 | RRMU | 4.48 | 381 | 487,857 |
| GM-11 | RRMU | 4.05 | 344 | 441,194 |
| GM-12 | RRMU | 2.73 | 232 | 297,502 |
| GM-13 | RRMU | 7.27 | 618 | 792,105 |
| GM-14 | RRMU | 6.34 | 539 | 690,952 |
| GM-15 | RRMU | 5.73 | 487 | 623,943 |
| GM-16 | RRMU | 4.30 | 365 | 468,011 |
| GM-17 | POS | 3.73 | -- | -- |
| GM-18 | RRMU | 3.22 | 273 | 350,269 |
| GM-19 | RRMU | 8.81 | 749 | 959,460 |
| Total | | | 7,500 | 9,608,643 |

development review and approvals and will be included as conditions of project approval and/or through a Development Agreement. The Circulation Network map (Figure 4-6) provides a proposed street grid. Exact alignments for the new street network are flexible but must maintain a maximum block size as prescribed in the citywide objective design standards. The new street network on the Great Mall parcel could include key entries from Great Mall Drive, Mustang Drive, and Falcon Drive, which will provide connections onto Main Street, Great Mall Parkway, and Montague Expressway. Approximate locations and size for public open space are also identified in Figure 6-1. Open space development on the Great Mall site must comply with minimum common space requirements contained in Chapter 2: Land Use and Public Space.

To facilitate redevelopment of the Great Mall site, the City has graphically subdivided the Great Mall parcel into subareas for the purpose of planning efforts only. These subareas do not reflect legal parcel subdivisions and do not constrain development within individual subarea boundaries but allow the City to refer to specific areas of the parcel when identifying sites for the Housing Element or identifying proposed open space locations. Table 6-1 identifies the land use, acreage and maximum capacity of each subarea. The capacity calculations assume development of only residential uses or only non-residential uses, and do not represent the combined capacity for residential and non-residential development. As noted above, achieving these capacities in full will be restrained by the governing CEQA analysis.

## 6.5 INNOVATION DISTRICT

The Innovation District is another district in the Milpitas Metro Specific Plan Area that is poised for redevelopment focused on increasing the availability of employment lands. In contrast to the Great Mall District, the Innovation District has multiple property owners with varying parcel sizes. To facilitate the district's redevelopment, the MMSP establishes mixed-use land uses that support office, research and development, and light industrial uses with the goal of creating a hub of innovation and commerce.

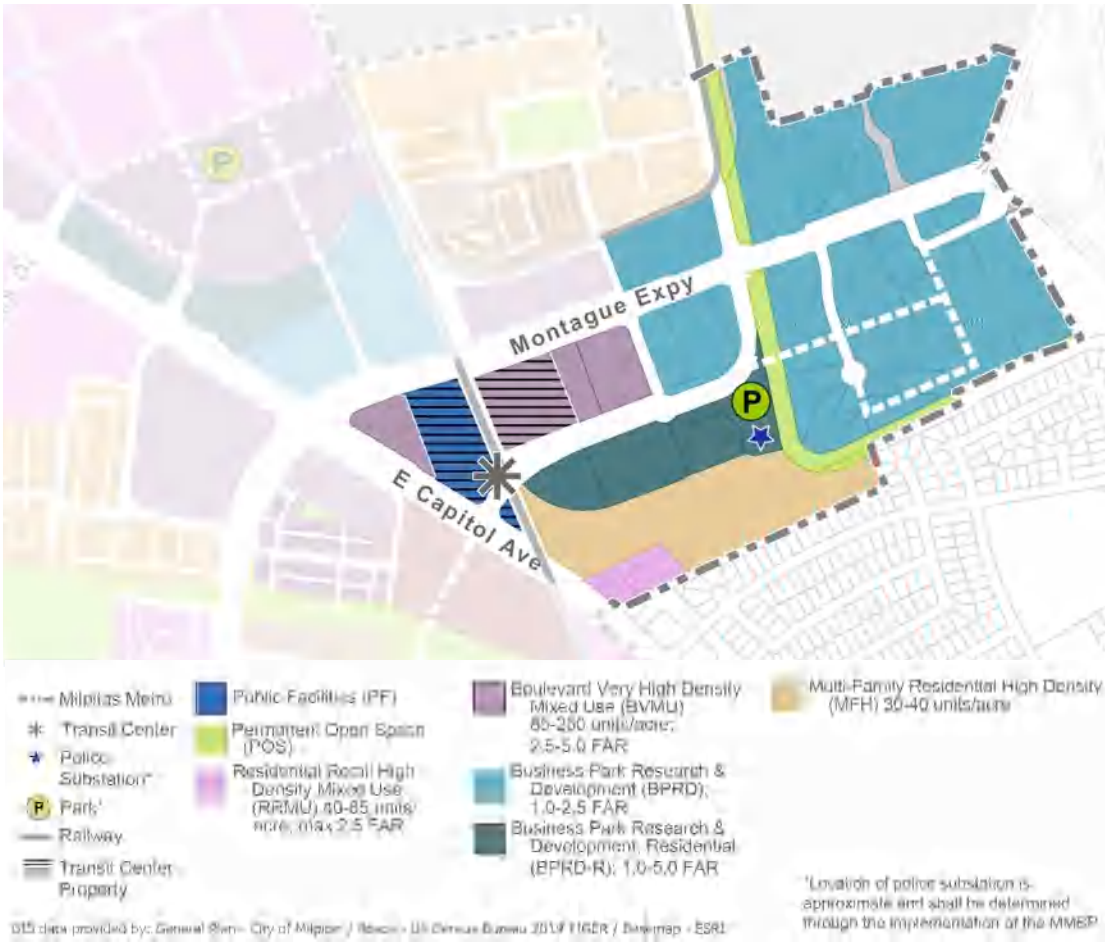
As part of the Milpitas Innovation District, there are additional commercial-focused land uses outside of the Metro Plan's Innovation District that provide additional employment land near transit. The Innovation District is primarily reserved for employment uses with limited capacity for new residential development closer to the Milpitas Transit Center. The MMSP proposes new land uses and street connections for the district, but the City's Economic Development Department will develop the strategic plan to guide development in this area. The assemblage of multiple parcels by a single entity would also make this district a good candidate for phased development and proportional obligations for public infrastructure improvements. For a map of the programmatic Milpitas Innovation District, refer to Figure 2-4.

Public realm improvements, including streetscape connections and improvements, signage, and public art, will be needed to complete the Innovation District and connect it with nearby areas. Roadways and open spaces in this district

will be funded and developed in conjunction with building development and will be publicly owned and maintained. A new bicycle and pedestrian bridge across Berryessa Creek south of Montague Expressway will provide direct access to the Milpitas Transit Center and thereby enhance the district's accessibility, sense of place, and development value. Several additional new roadways are described and mapped in the Circulation Map (Figure 4-6). Property owners will need to provide roadway dedications or agree to an alternative with the City. The City will also need to purchase and improve proposed park parcels identified on the Land Use Map (Figure 2-1). The TADIF is an expected funding source for some of this public infrastructure as well.

The Milpitas Police Department has indicated an interest in building a new police substation on the parcel west of Berryessa Creek on South Milpitas Boulevard. The City will need to

**Figure 6-2. Milpitas Metro Innovation District**




*Land uses in the Milpitas Innovation District reserve space for employment uses, such as office parks, R&D uses, and light industrial spaces.*

purchase and develop this parcel. The parcel was originally designated for parkland, but this designation could be relocated to adjacent parcels to accommodate Police Department security concerns about access and visibility at the original site.

While the City of Milpitas does not typically act as a real estate developer, the City Council, as a legislative body, has the authority to enact legislation, establish policies, and provide direction for actions which affect development and land use. In order to develop a successful Innovation District, the following types of policies and actions will need to be explored in the future by the City Council to ensure that development projects are feasible:

- Protect and preserve employment lands through land use designations;
- Offer flexibility in density and height to support development economics;
- Consider reduced parking requirements for employment uses near the Milpitas Transit Center;
- Consider reduced development impact fees on future anchor Class A/B Office and Research and Development (R&D) projects; and
- Expedite entitlement and permit processes.

## 6.6 PHASING

Following the adoption of the TASP, property redevelopment was modest for several years during the Great Recession recovery, then accelerated and intensified relatively quickly. The next phase of development in the Metro Area is anticipated to occur gradually, with some market-related variability. The number of developable residential sites available outside the Great Mall District has been reduced through recent development, and market conditions are not yet favorable for office development. However, the recent opening of the Transit Center with regional connections via BART could spur office development following Covid-19 conditions recovery, assuming a favorable economy. Residential demand will likely continue to be high in the near term, but retail trends will likely continue to shift over this planning period. In order to manifest the vision for the Milpitas Metro Specific Plan Area, it is important for the City to stimulate investment through catalyst projects, infrastructure financing, and communication with property owners.

Working with local brokers and property owners to understand options and opportunities for specific sites will be critical to establishing a foundation for future project proposals. Infrastructure improvements that will be funded by the TADIF are to be constructed in tandem with development to assure that they are adequate to serve an individual project and the neighborhood as it is built out. Additionally, the City's leadership in securing grant funding and designating local funds for key projects can catalyze private investment and attract the greater Milpitas community, transit riders, and other visitors.

Some development sites, such as the Great Mall area and portions of the Innovation District, are large or may become large sites with potential lot combinations or development partnerships, such that phasing and unique considerations of development may be suitable. This Metro Plan recognizes and supports the use of special tools, such as but not limited to a Development Agreement, which a property owner/developer may propose to address a complex development project. A project for which a DA is proposed must be consistent with the goals and objectives of the Metro Plan, as well as with the overall development plan and land use limitations provided in the adopted Plan. Issues such as, but not limited to, project phasing, transfer of density or intensity within the boundaries of the DA area, and unique approaches to the provision of public facilities or fee payments may be negotiated through the development agreement process, subject to findings that the project would be consistent with the Plan.

## 6.7 ENVIRONMENTAL REVIEW (CEQA)

This Specific Plan is accompanied by the Milpitas Metro Specific Plan Draft Subsequent Environmental Impact Report. The Milpitas Metro Specific Plan (Metro Plan) Draft Subsequent Environmental Impact Report (SEIR) includes an Initial Study that concluded that impacts to the following resources would be less than significant: aesthetics, agricultural and forestry resources, biological resources, cultural resources, energy, geology and soils, hazards and hazardous materials, hydrology and water quality, mineral resources, tribal cultural resources, and wildfire. The Draft SEIR also concluded that impacts to the following resources would be less than significant: land use and planning, population and housing, public services and recreation, transportation, and utilities and services systems. Finally, the Draft SEIR identified significant and unavoidable impacts even after mitigation for air quality, greenhouse gas emissions, noise, as well as cumulative impacts for these resources.

As a result, individual projects consistent with this Specific Plan may qualify for a statutory exemption under CEQA. From the project sponsor's standpoint, once consistency is determined, no additional CEQA review is required though projects will still need to be reviewed by the City's Engineering Department for non-CEQA related site-specific measures.

The City, as lead agency, must determine whether any of the circumstances in Public Resources Code Section 21166 are present and require further environmental review. Specifically, if there have been substantial changes proposed

in an individual project or implementation program resulting from this Specific Plan or to the circumstances under which the project or program is being undertaken, major revisions to the EIR will be required. Or, if new information that was not known and could not have been known when the EIR was certified becomes available, then the exemption may not apply unless a supplemental EIR or Addendum is certified.

## 6.8 PUBLIC INFRASTRUCTURE AND INVESTMENTS

The Milpitas Metro Specific Plan envisions continued investments in essential infrastructure to serve new development and to build complete neighborhoods. A revised Basic Improvement Program (BIP) will be prepared to identify an initial list of future public infrastructure, improvements, and facilities. This will include current BIP projects not completed or not yet fully funded and new projects that are required to support the continued evolution of this area of the City. The BIP list can be adjusted over time as needs and the types of new development evolve over time.

Investments in mobility/ transportation, public spaces/ parks, community amenities, and required utilities are expected to represent the primary public infrastructure/ public improvements required. These investments will include:

1. Existing BIP. Investments in improvement projects in the current BIP list that are still required and are yet to be completed.

2. New Infrastructure Investments. New utility and other base infrastructure investments required to accommodate the new types of development expected under the Milpitas Metro Specific Plan.

3. New Improvement Investments. New public space and mobility investments required to support the vision for the Milpitas Metro Specific Plan.

## 6.9 FUNDING STRATEGY

### 6.9.1 BIP Primary Financing Tools and Strategies

The core Milpitas Metro Specific Plan public infrastructure and improvement financing strategy is expected to remain similar to the TASP's financing strategy. More specifically, investments in new infrastructure and improvements expected to serve the Milpitas Metro Specific Plan are expected to be primarily funded through:

- **TADIF.** The Transit Area Development Impact Fee will continue to be levied on new development within the Milpitas Metro Specific Plan Area to ensure that new development pays its appropriate and proportionate share of new infrastructure and other improvements. It is expected that the TADIF will be formally updated directly after the completion of the Milpitas Metro Specific Plan to reflect the changes in the expected public investments and new development and updated Plan boundaries. A nexus study will be undertaken to determine a unit-cost basis for new development and its responsibilities to proportionally fund the needed pubic improvements. This schedule of per-unit fees will be updated annually and evaluated periodically in accordance with the requirements of the resolution establishing the TADIF fees.

- **Citywide Fees/ Exactions.** In some cases, new and existing infrastructure/ improvement investments will serve new development in both the Milpitas Metro Specific Plan and other areas of the city. This could include new public safety facilities. In these cases, a portion of the new funding for these improvements will likely come from other city funding sources, including fees/exactions on new development outside of the Milpitas Metro Specific Plan

- **Grants.** The City has successfully pursued grant funding for a range of BIP improvements since TASP adoption. Grant funding helps cover portions of new public infrastructure and improvements' costs that cannot be allocated to new development. This can allow the City to potentially charge fees below the maximum level on certain types of new development that provide particular policy benefits and help make the planning area a desirable location for development. Grant funding is often a particularly important source of funding for transportation and mobility projects.

It is important to note that beyond the TADIF, new development is also required to pay other types of fees adopted by the City and other special districts (e.g. the school district) and will need to meet other pertinent development conditions.

### 6.9.2 Additional Infrastructure/ Improvement Financing Opportunities.

Beyond the core financing strategy described above, the City may utilize additional funding opportunities. A subset of potential funding strategies are described below:

**Development Agreements.** In some cases, Development Agreements result in the provision by developers of investments above and beyond those required through development impact fees. Where developers see a benefit in securing entitlements through a formal contract

(a Development Agreement), negotiations with developers can establish different or additional investments in exchange for the associated entitlement security and development arrangement. The actual use of Development Agreements and the potential for additional investments will depend on the scale and nature of future developments and associated negotiations with the landowners/ developers. It is likely that a Development Agreement could accompany new development on large multi-phase sites, such as at the Great Mall or in the Innovation District.

**Incentive Zoning/Value Capture.** The land use designations and zoning associated with the Milpitas Metro Specific Plan will generally define the uses, heights, and densities available to developers of different sites. The City may also consider creating an Incentive Zoning system to provide additional funding for specific City priority investments. Under these programs, the City could grant developers additional entitlement (where they are interested in it) in exchange for these additional investments in specified areas.

**Enhanced Infrastructure Financing District (EIFD)/ Tax Increment Financing.** New development in the Milpitas Metro Specific Plan Area will generate new property tax revenues and other revenues to the City's General Fund. The EIFD is one of the newer tools established since the dissolution of Redevelopment Agencies that shifts property tax revenues towards infrastructure improvements. While the City might consider this tool in the future, in the short to medium term it will be important for the City's General Fund to retain its full allocation of property taxes to help shore up the City's budget in the wake of the impact of the Covid-19 pandemic. A tax increment tool could be a useful complement to the TADIF for certain large-scale developments that anticipate significant public infrastructure, such as at the Great Mall site or in the Innovation District.

**Affordable Housing Support.** Beyond infrastructure and improvements, the City is also interested in exploring supporting affordable housing development in the Milpitas Metro Specific Plan Area (as well as elsewhere in the City).

The City has adopted inclusionary housing policies that require new residential developments to offer a proportion of their units at below-market rates. In limited circumstances, the City may allow developers are to pay affordable housing fees in lieu of providing inclusionary housing. There are benefits and drawbacks to each method of implementation. Inclusionary housing requirements allow for more fine-grained integration of low-income households in any particular project. On-site affordable housing units can contribute to more incremental economic equity and diversity in smaller increments within a specific project or block. However, the residents of inclusionary below-market rate units are not provided the services provided in non-profit mission-driven projects.

At this time, the City has limited public land and resources accrued through affordable housing fees to help support these types of housing development. The City supports affordable housing development projects on City-owned

land on Main Street properties that will be annexed to the Metro Area, and the City is monitoring opportunities to obtain support for affordable housing through State programs as well as potential countywide funding initiatives. As fees accrue in the Affordable Housing Fund, the City should consider opportunities for site acquisition, landlord assistance to maintain older housing stock, and financing support for affordable housing developers. An affordable housing provider can leverage the City's local contribution to access Low Income Housing Tax Credits (LIHTC) and other sources of financing. This can amount to actual housing production that is two to four times greater than inclusionary unit production and with on-site services.

**Funding Public Services.** The primary source of funding for the City's public services, including police and fire services as well as road and parks maintenance, are the general tax revenues that accrue to the City's General Fund. These include property taxes, sales, use taxes, and transient occupancy taxes among others. In the TASP, there was a recognition that additional funding would be required to support public safety and other services to new residential development within the TASP. As a result, a Community Facilities District (CFD) was established that requires new residential development to pay an annual special tax to cover the cost of additional public service provision. For market-rate housing, the base rate established in 2009/2010 was $510 per annum, though these rates can be escalated using the Consumer Price Index up to a maximum of 2 percent each year. It should also be noted that Community Facilities District special taxes can also be established to help fund and potentially issue bonds for infrastructure.

## 6.10 IMPLEMENTATION ACTIONS

Plan policies in the preceding chapters will be implemented by developers, property owners, and the City over the course of the Plan horizon, many as a result of development applications. However, certain policies require implementation that must be initiated by City staff and/or coordinated with other public agencies. Table 6-1 summarizes proactive steps needed to implement the Milpitas Metro Specific Plan, agencies responsible for implementation, and the expected timeframe for each action. Related policies and goals from preceding chapters for each implementation action are also referenced.

"Following Plan Adoption" actions are anticipated to completed directly following the adoption of the Metro Plan.

**Ongoing actions** are expected to be implemented throughout the planning period.

**Short-term actions** are actions that are expected to be completed within 0 to 4 years from the Milpitas Metro Specific Plan's adoption.

**Mid-term actions** are anticipated to be implemented within 5 to 9 years from the Plan's adoption,

**Long-term actions** are expected to be completed between 10 to 20 years from adoption.

**Table 6-2. Implementation Plan**

| # | Action | City Department or Public Agency Responsible | Timeframe | District or Areawide |
|---|---|---|---|---|
| **Land Use and Zoning** | | | | |
| IM 1 | Establish a methodology to internally track and evaluate on at least an annual basis the implementing of the Milpitas Metro Specific Plan and its success in promoting desired development, infrastructure and other changes in the Plan Area, and to facilitate plan updates where necessary. | Planning/ City Manager's Office/ Economic Development | Following Plan Adoption | Areawide |
| IM 2 | Revise zoning code to establish new zoning districts specific to Milpitas Metro. The revisions increase residential and commercial density closest to the transit stations and major corridors to take advantage of transit and circulation infrastructure. (LU 1.1) | Planning | Following Plan Adoption | Areawide |
| IM 3 | Revise zoning code to establish design guidelines and standards for new development that support human-scaled vibrant development. (LU 1.1, LU 6) | Planning | Following Plan Adoption | Areawide |
| IM 4 | Update the General Plan to reflect the newly adopted MMSP boundaries. (LU 1.2) | Planning | Following Plan Adoption | Innovation District, Main Street |
| IM 5 | Revise the plan boundaries of the Midtown/ Milpitas Gateway-Main Street Plan to reflect the Metro Plan's boundaries. (LU 1.2) | Planning | Following Plan Adoption | Areawide |
| IM 6 | Field questions, facilitate desired project design, and proactively reach out to property owners and local brokers to identify opportunities for investment and lot consolidation and to promote the transit-orientation vision of the Plan. (LU 2) | Economic Development, Planning | Ongoing | Areawide |
| IM 7 | Assign Housing Element sites to the Great Mall property upon adoption of the Housing Element. (LU 3) | Housing | Short-term | Great Mall |

| | | | | |
|---|---|---|---|---|
| IM 8 | Consider designating parcels in the Plan Area as Housing Opportunity Zones to facilitate affordable housing development. (LU 3.5) | Housing | Short-term | Areawide |
| IM 9 | Amend Below Market Rate (BMR) Housing Program in the Housing Element and related policies to include the promotion of affordable housing development in the Metro Plan Area. (LU 3.1) | Planning | Short-term | Areawide |
| IM 10 | Consider annexation of the 3.5-acre parcel between the Innovation District and I-680. (LU 1) | Planning | Mid-Term | Innovation District |
| IM 11 | Work with private property owners to explore the feasibility of creating an EcoDistrict in the Innovation District and/or Great Mall District. (LU 1.4) | Planning | Mid-Term | Innovation District |
| IM 12 | Explore feasibility of establishing an incentive zone using planning regulations, such as density or streamlining bonuses, or adjustments to the TADIF, in the Innovation District. (LU 5) | Economic Development | Mid-Term | Innovation District |
| | **Open Space and Public Realm** | | | |
| IM 13 | During the planning review process, assess and determine the siting of public open spaces throughout the Plan Area for their ability to provide social, contemplative, and active recreational opportunities based on the Recreation Value System. (PPS 3) | Planning, Parks and Recreation | Ongoing | Areawide |
| IM 14 | Develop a methodology for permitting and managing privately owned, publicly-accessible open spaces, including credit for providing that space in lieu of a parks fee, access, easements, operating hours, programming and maintenance policies. (PPS 4) | Planning | Short-term | Areawide |
| IM 15 | Partner with developers to develop privately owned, publicly accessible open spaces maintained by property owners when desired by the City. (PPS 1, PPS 4) | Planning | Short-term | Areawide |

| | | | | |
|---|---|---|---|---|
| IM 16 | Establish a Business Improvement District (BID) or similar entity to develop and maintain public amenities in the Plan Area. (PPS 6, PPS 7) | Economic Development | Short-term | Areawide |
| IM 17 | Construct a park on city-owned property in the Tango District. (LU 8) | Public Works | Mid-term | Tango District |
| IM 18 | Purchase parkland and construct a public park in the Innovation District adjacent to Berryessa Creek. (PPS 1.4, PPS 4.3) | Public Works | Mid-term | Innovation District |
| IM 19 | Work with Great Mall developer to ensure the construction of publicly accessible open spaces that are at least 1-acre in size each. (PPS 4.2) | Planning | Mid-term | Great Mall District |
| IM 20 | Acquire parkland and construct a public park in the McCandless District along South Main Street. (SD 3.4) | Public Works | | |
| IM 21 | Identify priority areas for tree maintenance and new tree plantings based on the City's Urban Forest Management Plan, particularly in areas underserved by street trees. (PPS 8.7) | Public Works | Mid-term | Areawide |
| IM 22 | Develop and install a Branding, Signage and Wayfinding Program for Milpitas Metro, including the trail network, which integrates with the citywide branding program. (PPS 3.6) | Planning, City Manager's Office | Mid-Term | Areawide |
| IM 23 | Collaborate with public and/or private partners to develop public broadband infrastructure allowing for continuous connectivity in public areas. (ICS 6) | Public Works | Mid-term | Areawide |
| IM 24 | Identify a location, funding and management strategy for a performing and visual art center in the plan area when feasible. (PPS 9) | Planning, City Manager's Office | Long-term | Areawide |

| | Street and Trail Improvements | | | |
|---|---|---|---|---|
| IM 25 | Review individual development applications to ensure that design enhances multimodal street design including bicycle facilities, pedestrian facilities, and landscaping are provided and consistent with Milpitas Metro Specific Plan circulation policies and street design standards. (M 1.6) | Planning | On-going | Areawide |
| IM 26 | Work with the Valley Transportation Authority, Bay Area Rapid Transit, and AC Transit to increase ridership for residents and workers in the planning area. Potential tools to increase ridership such include first/last-mile solutions (e.g., explore Milpitas OnDemand beyond a pilot program), improved operations (i.e., quicker travel), and infrastructure improvements where appropriate (i.e., better bus shelters and station amenities, bus boarding islands, BRT, etc.). (M 11.2) | Planning | Ongoing | Areawide |
| IM 27 | Coordinate with VTA to provide sufficient amenities (such as transit shelters) at all transit stops within the Metro Area. (M 11.3) | | | |
| IM 28 | Establish a Transportation Management Association (TMA) for the Metro Area. Establish a funding mechanism to pay for the costs of the TMA, including the cost of a transportation coordinator to administer the program. (M 8.1) | Planning | Short-term | Areawide |
| IM 29 | Establish a transportation demand management program (TDM). (M 8) | Public Works | Short-term | Areawide |
| IM 30 | Improve Great Mall Parkway as a Complete Street with the addition of protected bike lanes, a multi-use trail, and linear park. (M 2.1) | Engineering, Public Works | Mid-term | Areawide |
| IM 31 | Remove the cul-de-sac bulb at the end of Houret Court, and connect to private roads. Accommodate the turn around as a loop on connecting private roads. (M 1.1) | Engineering | Mid-term | McCandless District |

| | | | | |
|---|---|---|---|---|
| IM 32 | Connect private roads across parcels from McCandless Drive to Houret Court to provide pedestrian and Emergency Vehicle Access and allow for access to all parcels that are connected. (M 1.1) | Engineering | Mid-term | McCandless District |
| IM 33 | Construct a pathway for pedestrians and bicyclists off of Houret Court that provides access to McCandless Park. (M 1.1) | Engineering | Mid-term | McCandless District |
| IM 34 | Construct roads to connect Sango Court to Jubilee Drive and Tarob Court. (M 1.1) | Engineering | Mid-term | Tango District |
| IM 35 | Extend the existing trails along Penitencia Creek and the railroad tracks in the McCandless and Tango Districts to the Milpitas Transit Center, and provide connections from the neighborhood to the trail system as indicated. (M 1.1, M 5.1, M 5.2) | Public Works | Mid-term | McCandless District, Tango District |
| IM 36 | Construct trails adjacent to Berryessa Creek in the Innovation District. (M 1.1, M 5.2) | Public Works | Mid-term | Innovation District |
| IM 37 | Pave city-owned trails with multi-weather, permeable surfacing. (PA 1.1.1) | Public Works | Mid-term | Areawide |
| IM 38 | Coordinate with Santa Clara Valley Water District to develop a creek trail system that connects with the citywide pedestrian and bicycle network. (M 5) | Planning, Engineering | Long-term | Areawide |
| IM 39 | Work with private developers to construct new roads as identified in the Circulation Map (Figure 4-6) that comply with the Plan's design standards for different street types. (M 1, M 2, M 3, M 4) | Planning, Engineering | Long-term | Areawide |
| IM 40 | Improve the Great Mall Parkway and Main Street intersection (M 2.2) | Engineering, Public Works | Long-term | Main Street |
| IM 41 | Work with Santa Clara County Roads to complete improvements on Montague Expressway (M 2.4) | Engineering, Public Works | Long-term | Areawide |
| IM 42 | Complete multimodal street improvements on Trade Zone Boulevard (M 2.5) | Engineering, Public Works | Long-term | Tango District |

| | | | | |
|---|---|---|---|---|
| IM 43 | Consult with the Union Pacific Railroad and the Public Utilities Commission prior to any improvements to segments of Milpitas Boulevard, Capitol Avenue, and Montague Expressway that include at-grade rail crossings, to determine if improvements to existing at-grade highway-rail crossings are warranted. (M 6.5) | Engineering, Public Works | Long-term | Areawide |
| IM 44 | Provide pedestrian connections between the following districts using the TADIF:<br><br>Tango District: Provide an at-grade bridge across East Penitencia Creek to connect Mattos Mabel Elementary and expand existing safe walking and bicycling routes to schools into the Milpitas Metro Area. (SD 2)<br><br>Tango to McCandless District: Provide a pedestrian overcrossing bridge across Montague Expressway at Penitencia Creek East. (SD 2.4)<br><br>Innovation District: Connect the Milpitas Transit Center to the Innovation District with an at grade bridge over Berryessa Creek. (SD 4.3)<br><br>Enhance at-grade pedestrian crossings at S. Milpitas Blvd Extension and Capitol Avenue, McCandless and Great Mall Parkway, and at Great Mall Parkway and Main Street. (M 9)<br><br>Provide an overhead pedestrian connection between the Great Mall LRT Station and the corner of Main and Great Mall Parkway. (M 2.2.5)<br><br>(Desired) Provide a safe and attractive overhead or underground pedestrian route from the Piper District to the Great Mall across the BART tracks. (M 9, SD 1)<br><br>(Desired) Provide an at-grade connection between Great Mall District and the neighborhood adjacent to the north. (M 9, SD 1)<br><br>(Desired) Provide an at-grade connection between Innovation District and neighborhoods to the south. (SD 4) | Engineering | Long-term | Areawide |

| | | | | |
|---|---|---|---|---|
| | (Desired) Provide a pedestrian connection across Lower Penitencia Creek from McCandless District to Main Street. (SD 3.1) | | | |
| | (Desired) Provide a new overhead bridge over Capitol Avenue connecting the Transit Center Light Rail Station to the south side of Capitol Avenue at South Milpitas Boulevard. (M 9, SD 2.1) | | | |
| | **Infrastructure and Public Service Improvements** | | | |
| IM 45 | For infrastructure and public services implementation, refer to policies in Chapter 5: Infrastructure. | | | |
| IM 46 | Identify potential partners that are local, regional, and/or private to coordinate regional improvements and share costs. (M 2.4, ICS 3.8, ICS 3.9, ICS 4.3) | Planning, Engineering | Ongoing | Areawide |
| | **Development and Permitting** | | | |
| IM 47 | Update the TADIF to reflect changes in expected development, public investments and improvements, and transportation projects, including the Montague Expressway and Calaveras Boulevard Widening Project. (M 2) | Planning | Following Plan Adoption | Areawide |
| IM 48 | Expand the TADIF boundaries to reflect the boundaries of the Metro Plan Area. (LU 1.2) | Planning | Following Plan Adoption | Areawide |
| IM 49 | Work with property owners and developers to provide for unique and detailed consideration of development of significant large sites, such as the use of a Development Agreement to secure development rights and obligations that are consistent with the Plan generally and within the allowances of the governing environmental document. (PPS 4) | Planning | Ongoing | Great Mall District |
| IM 50 | Work with large commercial energy customers, such as industrial uses, to promote use of clean energy. This could include focused collaboration on implementing the General Plan's solar promotion policies, rebates for on-site energy generation, or other innovative methods to reduce reliance on non-renewable energy. (CB 7) | Public Works | Ongoing | Areawide |

Appendix D

# Air Quality and Greenhouse Gas Emissions Data

**Milpitas Metro Specific Plan (Project Change) - Operational Calculations**

**Regional Operations Summary - Unmitigated**

| | Daily Emissions (lb/day) | | | | | | | | | | GHG Emission (MT/yr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Source | ROG | NOX | CO | SOX | Fugitive PM10 | Exhaust PM10 | Total PM10 | Fugitive PM2.5 | Exhaust PM2.5 | Total PM2.5 | CO2 | CH4 | N2O | CO2e |
| Mobile Emissions | 70.5 | 115.4 | 776.9 | 3.4 | 381.6 | 1.8 | 383.4 | 95.5 | 1.7 | 97.2 | 41,382 | 1 | 2 | 41,975 |
| Area | 254.8 | 5.3 | 437.1 | 0.0 | - | 2.4 | 2.4 | - | 2.4 | 2.4 | 59 | 0 | 0 | 61 |
| Energy | 4.5 | 40.0 | 27.5 | 0.2 | - | 3.1 | 3.1 | - | 3.1 | 3.1 | 9,839 | 0 | 0 | 9,907 |
| Waste | - | - | - | - | - | - | - | - | - | - | 348 | 21 | 0 | 863 |
| Water | - | - | - | - | - | - | - | - | - | - | 388 | 28 | 1 | 1,272 |
| Total Daily Emissions | **329.9** | **160.7** | **1241.5** | **3.7** | **381.6** | **7.3** | **388.9** | **95.5** | **7.2** | **102.7** | 52,017 | 50 | 3 | **54,077** |

**Regional Operations Summary - Mitigated**[1]

| | Daily Emissions (lb/day) | | | | | | | | | | GHG Emission (MT/yr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Source | ROG | NOX | CO | SOX | Fugitive PM10 | Exhaust PM10 | Total PM10 | Fugitive PM2.5 | Exhaust PM2.5 | Total PM2.5 | CO2 | CH4 | N2O | CO2e |
| Mobile Emissions | 70.54 | 115.36 | 776.89 | 3.42 | 381.57 | 1.80 | 383.37 | 95.51 | 1.69 | 97.20 | 41,382 | 1 | 2 | 41,975 |
| Area | 254.80 | 5.28 | 437.07 | 0.02 | - | 2.39 | 2.39 | - | 2.39 | 2.39 | 59 | 0.04 | 0.00 | 61 |
| Energy | - | - | - | - | - | - | - | - | - | - | 1,695 | 0.29 | 0.04 | 1,715 |
| Waste | - | - | - | - | - | - | - | - | - | - | 348 | 21 | 0 | 863 |
| Water | - | - | - | - | - | - | - | - | - | - | 388 | 28 | 1 | 1,272 |
| Total Daily Emissions | **325.35** | **120.64** | **1213.97** | **3.44** | **381.57** | **4.19** | **385.76** | **95.51** | **4.08** | **99.59** | 43,874 | 49 | 3 | 45,885 |

1. Mitigation includes no Natural Gas Infrastracture, which results in no daily criteria pollutant Energy emissions and reduced GHG emissions.

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# Milpitas Metro Specific Plan - Operational Emissions (No Mobile)

**Bay Area AQMD Air District, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Condo/Townhouse High Rise | 7,000.00 | Dwelling Unit | 109.38 | 7,000,000.00 | 20020 |
| General Office Building | 2,500.00 | 1000sqft | 57.39 | 2,500,000.00 | 0 |
| Industrial Park | 500.00 | 1000sqft | 11.48 | 500,000.00 | 0 |
| Hotel | 700.00 | Room | 23.33 | 1,016,400.00 | 0 |
| Strip Mall | 300.00 | 1000sqft | 6.89 | 300,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 64 |
| **Climate Zone** | 4 | | | **Operational Year** | 2040 |
| **Utility Company** | Pacific Gas and Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 41.06 | **CH4 Intensity (lb/MWhr)** | 0.007 | **N2O Intensity (lb/MWhr)** | 0.001 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milpitas Metro Specific Plan Ops emissions only. Mobile emissions are in separate spreadsheet. Elec. emissions extrapolated to 2040 RPS.

Land Use - MMSP 2040 buildout, refer to Project Description.

Construction Phase - Ops only.

Grading - Ops only.

Trips and VMT - Ops only.

Architectural Coating - Ops only.

Vehicle Trips - Mobile emissions have been calculated in a separate worksheet.

Woodstoves - no wood burning allowed.

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

Area Mitigation - Mitigation - required low VOC paint of 10 g/L. All electric landscaping equipment.

Water Mitigation - CalGreen Code requirement.

Waste Mitigation - AB 341 requirement for post 2020.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblArchitecturalCoating | ConstArea_Nonresidential_Exterior | 2,158,200.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Nonresidential_Interior | 6,474,600.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Residential_Exterior | 4,725,000.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Residential_Interior | 14,175,000.00 | 0.00 |
| tblAreaMitigation | UseLowVOCPaintNonresidentialExteriorValue | 150 | 10 |
| tblAreaMitigation | UseLowVOCPaintNonresidentialInteriorValue | 100 | 10 |
| tblAreaMitigation | UseLowVOCPaintParkingCheck | False | True |
| tblAreaMitigation | UseLowVOCPaintParkingValue | 150 | 0 |
| tblAreaMitigation | UseLowVOCPaintResidentialExteriorValue | 150 | 10 |
| tblAreaMitigation | UseLowVOCPaintResidentialInteriorValue | 100 | 10 |
| tblConstructionPhase | NumDays | 330.00 | 0.00 |
| tblConstructionPhase | NumDays | 4,650.00 | 0.00 |
| tblConstructionPhase | NumDays | 300.00 | 0.00 |
| tblConstructionPhase | NumDays | 465.00 | 0.00 |
| tblConstructionPhase | NumDays | 330.00 | 0.00 |
| tblConstructionPhase | NumDays | 180.00 | 0.00 |
| tblConstructionPhase | PhaseEndDate | 12/21/2063 | 9/15/2062 |
| tblConstructionPhase | PhaseEndDate | 6/10/2061 | 8/14/2043 |
| tblConstructionPhase | PhaseEndDate | 2/22/2041 | 12/30/2039 |
| tblConstructionPhase | PhaseEndDate | 8/14/2043 | 11/1/2041 |
| tblConstructionPhase | PhaseEndDate | 9/15/2062 | 6/10/2061 |
| tblConstructionPhase | PhaseEndDate | 11/1/2041 | 2/22/2041 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 1,190.00 | 0.00 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | |
|---|---|---|---|
| tblProjectCharacteristics | CH4IntensityFactor | 0.033 | 0.007 |
| tblProjectCharacteristics | CO2IntensityFactor | 203.98 | 41.06 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.004 | 0.001 |
| tblTripsAndVMT | VendorTripNumber | 1,456.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 18.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 20.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 6,573.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 1,315.00 | 0.00 |
| tblVehicleTrips | ST_TR | 4.91 | 0.00 |
| tblVehicleTrips | ST_TR | 2.21 | 0.00 |
| tblVehicleTrips | ST_TR | 8.19 | 0.00 |
| tblVehicleTrips | ST_TR | 2.54 | 0.00 |
| tblVehicleTrips | ST_TR | 42.04 | 0.00 |
| tblVehicleTrips | SU_TR | 4.09 | 0.00 |
| tblVehicleTrips | SU_TR | 0.70 | 0.00 |
| tblVehicleTrips | SU_TR | 5.95 | 0.00 |
| tblVehicleTrips | SU_TR | 1.24 | 0.00 |
| tblVehicleTrips | SU_TR | 20.43 | 0.00 |
| tblVehicleTrips | WD_TR | 5.44 | 0.00 |
| tblVehicleTrips | WD_TR | 9.74 | 0.00 |
| tblVehicleTrips | WD_TR | 8.36 | 0.00 |
| tblVehicleTrips | WD_TR | 3.37 | 0.00 |
| tblVehicleTrips | WD_TR | 44.32 | 0.00 |
| tblWoodstoves | WoodstoveWoodMass | 582.40 | 0.00 |

## 2.0 Emissions Summary

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 2.1 Overall Construction (Maximum Daily Emission)

### Unmitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.4276 | 0.0000 | 0.0000 | 0.4276 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0737 | 0.0000 | 0.0000 | 0.0737 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1164 | 0.0000 | 0.0000 | 0.1164 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 7.4300e-003 | 0.0000 | 0.0000 | 7.4300e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Maximum** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.4276** | **0.0000** | **0.0000** | **0.4276** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Mitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.4276 | 0.0000 | 0.0000 | 0.4276 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0737 | 0.0000 | 0.0000 | 0.0737 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1164 | 0.0000 | 0.0000 | 0.1164 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 7.4300e-003 | 0.0000 | 0.0000 | 7.4300e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Maximum** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.4276** | **0.0000** | **0.0000** | **0.4276** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## 2.2 Overall Operational

### Unmitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 301.1162 | 26.9609 | 584.0248 | 0.1602 | | 4.8470 | 4.8470 | | 4.8470 | 4.8470 | 0.0000 | 26,981.9180 | 26,981.9180 | 1.4892 | 0.4756 | 27,160.8744 |
| Energy | 4.5088 | 40.0439 | 27.4971 | 0.2459 | | 3.1152 | 3.1152 | | 3.1152 | 3.1152 | | 49,187.3921 | 49,187.3921 | 0.9428 | 0.9018 | 49,479.6882 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **305.6251** | **67.0049** | **611.5219** | **0.4062** | **0.0000** | **7.9622** | **7.9622** | **0.0000** | **7.9622** | **7.9622** | **0.0000** | **76,169.3101** | **76,169.3101** | **2.4320** | **1.3774** | **76,640.5626** |

### Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Category | lb/day | | | | | | | | | | lb/day | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | 254.80 | 5.28 | 437.07 | 0.02 | | 2.39 | 2.39 | | 2.39 | 2.39 | 0.0000 | 728 | 728 | 1 | 0 | 741 |
| Energy | 4.51 | 40.04 | 27.50 | 0.25 | | 3.12 | 3.12 | | 3.12 | 3.12 | | 49,187 | 49,187 | 1 | 1 | 49,480 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **259.3124** | **45.3264** | **464.5709** | **0.2657** | **0.0000** | **5.5052** | **5.5052** | **0.0000** | **5.5052** | **5.5052** | **0.0000** | **49,915.5131** | **49,915.5131** | **1.4617** | **0.9018** | **50,220.7830** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **15.15** | **32.35** | **24.03** | **34.57** | **0.00** | **30.86** | **30.86** | **0.00** | **30.86** | **30.86** | **0.00** | **34.47** | **34.47** | **39.90** | **34.53** | **34.47** |

## 3.0 Construction Detail

### Construction Phase

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Demolition | Demolition | 1/1/2040 | 12/30/2039 | 5 | 0 | |
| 2 | Site Preparation | Site Preparation | 2/23/2041 | 2/22/2041 | 5 | 0 | |
| 3 | Grading | Grading | 11/2/2041 | 11/1/2041 | 5 | 0 | |
| 4 | Building Construction | Building Construction | 8/15/2043 | 8/14/2043 | 5 | 0 | |
| 5 | Paving | Paving | 6/11/2061 | 6/10/2061 | 5 | 0 | |
| 6 | Architectural Coating | Architectural Coating | 9/16/2062 | 9/15/2062 | 5 | 0 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Demolition | Excavators | 3 | 8.00 | 158 | 0.38 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Demolition | Rubber Tired Dozers | 2 | 8.00 | 247 | 0.40 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |

## Trips and VMT

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 6 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Site Preparation | 7 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Building Construction | 9 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

## 3.3 Site Preparation - 2041

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.4 Grading - 2041

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.5 Building Construction - 2043

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.6 Paving - 2061

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Paving | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

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Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Paving | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.7 Architectural Coating - 2062

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

### 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Condo/Townhouse High Rise | 0.00 | 0.00 | 0.00 | | |
| General Office Building | 0.00 | 0.00 | 0.00 | | |
| Hotel | 0.00 | 0.00 | 0.00 | | |
| Industrial Park | 0.00 | 0.00 | 0.00 | | |
| Strip Mall | 0.00 | 0.00 | 0.00 | | |
| Total | 0.00 | 0.00 | 0.00 | | |

### 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Condo/Townhouse High Rise | 10.80 | 4.80 | 5.70 | 31.00 | 15.00 | 54.00 | 86 | 11 | 3 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| General Office Building | 9.50 | 7.30 | 7.30 | 33.00 | 48.00 | 19.00 | 77 | 19 | 4 |
| Hotel | 9.50 | 7.30 | 7.30 | 19.40 | 61.60 | 19.00 | 58 | 38 | 4 |
| Industrial Park | 9.50 | 7.30 | 7.30 | 59.00 | 28.00 | 13.00 | 79 | 19 | 2 |
| Strip Mall | 9.50 | 7.30 | 7.30 | 16.60 | 64.40 | 19.00 | 45 | 40 | 15 |

### 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Condo/Townhouse High Rise | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| General Office Building | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Hotel | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Industrial Park | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Strip Mall | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| NaturalGas Mitigated | 4.5088 | 40.0439 | 27.4971 | 0.2459 | | 3.1152 | 3.1152 | | 3.1152 | 3.1152 | | 49,187.3921 | 49,187.3921 | 0.9428 | 0.9018 | 49,479.6882 |
| NaturalGas Unmitigated | 4.5088 | 40.0439 | 27.4971 | 0.2459 | | 3.1152 | 3.1152 | | 3.1152 | 3.1152 | | 49,187.3921 | 49,187.3921 | 0.9428 | 0.9018 | 49,479.6882 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 5.2 Energy by Land Use - NaturalGas

### Unmitigated

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Condo/Townhouse High Rise | 160745 | 1.7335 | 14.8137 | 6.3037 | 0.0946 | | 1.1977 | 1.1977 | | 1.1977 | 1.1977 | | 18,911.1233 | 18,911.1233 | 0.3625 | 0.3467 | 19,023.5026 |
| General Office Building | 110959 | 1.1966 | 10.8783 | 9.1378 | 0.0653 | | 0.8268 | 0.8268 | | 0.8268 | 0.8268 | | 13,053.9887 | 13,053.9887 | 0.2502 | 0.2393 | 13,131.5621 |
| Hotel | 122274 | 1.3186 | 11.9877 | 10.0697 | 0.0719 | | 0.9111 | 0.9111 | | 0.9111 | 0.9111 | | 14,385.2132 | 14,385.2132 | 0.2757 | 0.2637 | 14,470.6973 |
| Industrial Park | 22191.8 | 0.2393 | 2.1757 | 1.8276 | 0.0131 | | 0.1654 | 0.1654 | | 0.1654 | 0.1654 | | 2,610.7977 | 2,610.7977 | 0.0500 | 0.0479 | 2,626.3124 |
| Strip Mall | 1923.29 | 0.0207 | 0.1886 | 0.1584 | 1.1300e-003 | | 0.0143 | 0.0143 | | 0.0143 | 0.0143 | | 226.2691 | 226.2691 | 4.3400e-003 | 4.1500e-003 | 227.6137 |
| **Total** | | **4.5088** | **40.0439** | **27.4971** | **0.2459** | | **3.1152** | **3.1152** | | **3.1152** | **3.1152** | | **49,187.3921** | **49,187.3921** | **0.9428** | **0.9018** | **49,479.6882** |

### Mitigated

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Condo/Townhouse High Rise | 160.745 | 1.7335 | 14.8137 | 6.3037 | 0.0946 | | 1.1977 | 1.1977 | | 1.1977 | 1.1977 | | 18,911.1233 | 18,911.1233 | 0.3625 | 0.3467 | 19,023.5026 |
| General Office Building | 110.959 | 1.1966 | 10.8783 | 9.1378 | 0.0653 | | 0.8268 | 0.8268 | | 0.8268 | 0.8268 | | 13,053.9887 | 13,053.9887 | 0.2502 | 0.2393 | 13,131.5621 |
| Hotel | 122.274 | 1.3186 | 11.9877 | 10.0697 | 0.0719 | | 0.9111 | 0.9111 | | 0.9111 | 0.9111 | | 14,385.2132 | 14,385.2132 | 0.2757 | 0.2637 | 14,470.6973 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Industrial Park | 22.1918 | 0.2393 | 2.1757 | 1.8276 | 0.0131 | | 0.1654 | 0.1654 | | 0.1654 | 0.1654 | | 2,610.7977 | 2,610.7977 | 0.0500 | 0.0479 | 2,626.3124 |
| Strip Mall | 1.92329 | 0.0207 | 0.1886 | 0.1584 | 1.1300e-003 | | 0.0143 | 0.0143 | | 0.0143 | 0.0143 | | 226.2691 | 226.2691 | 4.3400e-003 | 4.1500e-003 | 227.6137 |
| **Total** | | **4.5088** | **40.0439** | **27.4971** | **0.2459** | | **3.1152** | **3.1152** | | **3.1152** | **3.1152** | | **49,187.3921** | **49,187.3921** | **0.9428** | **0.9018** | **49,479.6882** |

## 6.0 Area Detail

### 6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 254.8036 | 5.2824 | 437.0738 | 0.0198 | | 2.3900 | 2.3900 | | 2.3900 | 2.3900 | 0.0000 | 728.1210 | 728.1210 | 0.5190 | 0.0000 | 741.0948 |
| Unmitigated | 301.1162 | 26.9609 | 584.0248 | 0.1602 | | 4.8470 | 4.8470 | | 4.8470 | 4.8470 | 0.0000 | 26,981.9180 | 26,981.9180 | 1.4892 | 0.4756 | 27,160.8744 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 6.2 Area by SubCategory

### Unmitigated

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 39.3332 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 242.1710 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 2.3779 | 20.3206 | 8.6471 | 0.1297 | | 1.6429 | 1.6429 | | 1.6429 | 1.6429 | 0.0000 | 25,941.1765 | 25,941.1765 | 0.4972 | 0.4756 | 26,095.3319 |
| Landscaping | 17.2341 | 6.6403 | 575.3777 | 0.0305 | | 3.2040 | 3.2040 | | 3.2040 | 3.2040 | | 1,040.7415 | 1,040.7415 | 0.9920 | | 1,065.5425 |
| **Total** | **301.1162** | **26.9609** | **584.0248** | **0.1602** | | **4.8470** | **4.8470** | | **4.8470** | **4.8470** | **0.0000** | **26,981.9180** | **26,981.9180** | **1.4893** | **0.4756** | **27,160.8744** |

### Mitigated

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 3.4963 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 242.1710 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Landscaping | 9.1364 | 5.2824 | 437.0738 | 0.0198 | | 2.3900 | 2.3900 | | 2.3900 | 2.3900 | | 728.1210 | 728.1210 | 0.5190 | | 741.0948 |
| **Total** | **254.8036** | **5.2824** | **437.0738** | **0.0198** | | **2.3900** | **2.3900** | | **2.3900** | **2.3900** | **0.0000** | **728.1210** | **728.1210** | **0.5190** | **0.0000** | **741.0948** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# Milpitas Metro Specific Plan - Operational Emissions (No Mobile)

**Bay Area AQMD Air District, Annual**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Condo/Townhouse High Rise | 7,000.00 | Dwelling Unit | 109.38 | 7,000,000.00 | 20020 |
| General Office Building | 2,500.00 | 1000sqft | 57.39 | 2,500,000.00 | 0 |
| Industrial Park | 500.00 | 1000sqft | 11.48 | 500,000.00 | 0 |
| Hotel | 700.00 | Room | 23.33 | 1,016,400.00 | 0 |
| Strip Mall | 300.00 | 1000sqft | 6.89 | 300,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 64 |
| **Climate Zone** | 4 | | | **Operational Year** | 2040 |
| **Utility Company** | Pacific Gas and Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 41.06 | **CH4 Intensity (lb/MWhr)** | 0.007 | **N2O Intensity (lb/MWhr)** | 0.001 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milpitas Metro Specific Plan Ops emissions only. Mobile emissions are in separate spreadsheet. Elec. emissions extrapolated to 2040 RPS.

Land Use - MMSP 2040 buildout, refer to Project Description.

Construction Phase - Ops only.

Grading - Ops only.

Trips and VMT - Ops only.

Architectural Coating - Ops only.

Vehicle Trips - Mobile emissions have been calculated in a separate worksheet.

Woodstoves - no wood burning allowed.

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

Area Mitigation - Mitigation - required low VOC paint of 10 g/L. All electric landscaping equipment.

Water Mitigation - CalGreen Code requirement.

Waste Mitigation - AB 341 requirement for post 2020.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblArchitecturalCoating | ConstArea_Nonresidential_Exterior | 2,158,200.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Nonresidential_Interior | 6,474,600.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Residential_Exterior | 4,725,000.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Residential_Interior | 14,175,000.00 | 0.00 |
| tblAreaMitigation | UseLowVOCPaintNonresidentialExteriorValue | 150 | 10 |
| tblAreaMitigation | UseLowVOCPaintNonresidentialInteriorValue | 100 | 10 |
| tblAreaMitigation | UseLowVOCPaintParkingCheck | False | True |
| tblAreaMitigation | UseLowVOCPaintParkingValue | 150 | 0 |
| tblAreaMitigation | UseLowVOCPaintResidentialExteriorValue | 150 | 10 |
| tblAreaMitigation | UseLowVOCPaintResidentialInteriorValue | 100 | 10 |
| tblConstructionPhase | NumDays | 330.00 | 0.00 |
| tblConstructionPhase | NumDays | 4,650.00 | 0.00 |
| tblConstructionPhase | NumDays | 300.00 | 0.00 |
| tblConstructionPhase | NumDays | 465.00 | 0.00 |
| tblConstructionPhase | NumDays | 330.00 | 0.00 |
| tblConstructionPhase | NumDays | 180.00 | 0.00 |
| tblConstructionPhase | PhaseEndDate | 12/21/2063 | 9/15/2062 |
| tblConstructionPhase | PhaseEndDate | 6/10/2061 | 8/14/2043 |
| tblConstructionPhase | PhaseEndDate | 2/22/2041 | 12/30/2039 |
| tblConstructionPhase | PhaseEndDate | 8/14/2043 | 11/1/2041 |
| tblConstructionPhase | PhaseEndDate | 9/15/2062 | 6/10/2061 |
| tblConstructionPhase | PhaseEndDate | 11/1/2041 | 2/22/2041 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 1,190.00 | 0.00 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | |
|---|---|---|---|
| tblProjectCharacteristics | CH4IntensityFactor | 0.033 | 0.007 |
| tblProjectCharacteristics | CO2IntensityFactor | 203.98 | 41.06 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.004 | 0.001 |
| tblTripsAndVMT | VendorTripNumber | 1,456.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 18.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 20.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 6,573.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 1,315.00 | 0.00 |
| tblVehicleTrips | ST_TR | 4.91 | 0.00 |
| tblVehicleTrips | ST_TR | 2.21 | 0.00 |
| tblVehicleTrips | ST_TR | 8.19 | 0.00 |
| tblVehicleTrips | ST_TR | 2.54 | 0.00 |
| tblVehicleTrips | ST_TR | 42.04 | 0.00 |
| tblVehicleTrips | SU_TR | 4.09 | 0.00 |
| tblVehicleTrips | SU_TR | 0.70 | 0.00 |
| tblVehicleTrips | SU_TR | 5.95 | 0.00 |
| tblVehicleTrips | SU_TR | 1.24 | 0.00 |
| tblVehicleTrips | SU_TR | 20.43 | 0.00 |
| tblVehicleTrips | WD_TR | 5.44 | 0.00 |
| tblVehicleTrips | WD_TR | 9.74 | 0.00 |
| tblVehicleTrips | WD_TR | 8.36 | 0.00 |
| tblVehicleTrips | WD_TR | 3.37 | 0.00 |
| tblVehicleTrips | WD_TR | 44.32 | 0.00 |
| tblWoodstoves | WoodstoveWoodMass | 582.40 | 0.00 |

## 2.0 Emissions Summary

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 2.1 Overall Construction

### Unmitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Maximum** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Mitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Maximum** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

| Quarter | Start Date | End Date | Maximum Unmitigated ROG + NOX (tons/quarter) | Maximum Mitigated ROG + NOX (tons/quarter) |
|---|---|---|---|---|
| | | **Highest** | | |

## 2.2 Overall Operational

**Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 52.9388 | 0.7108 | 51.8322 | 3.4700e-003 | | 0.2975 | 0.2975 | | 0.2975 | 0.2975 | 0.0000 | 216.0543 | 216.0543 | 0.0835 | 2.4000e-003 | 218.8582 |
| Energy | 0.8229 | 7.3080 | 5.0182 | 0.0449 | | 0.5685 | 0.5685 | | 0.5685 | 0.5685 | 0.0000 | 9,838.9313 | 9,838.9313 | 0.4451 | 0.1906 | 9,906.8548 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 1,393.1777 | 0.0000 | 1,393.1777 | 82.3344 | 0.0000 | 3,451.5389 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 335.0252 | 143.9338 | 478.9589 | 34.4348 | 0.8160 | 1,583.0000 |
| **Total** | **53.7617** | **8.0188** | **56.8504** | **0.0484** | **0.0000** | **0.8660** | **0.8660** | **0.0000** | **0.8660** | **0.8660** | **1,728.2029** | **10,198.9194** | **11,927.1223** | **117.2979** | **1.0090** | **15,160.2518** |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Mitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 45.6565 | 0.4754 | 39.3367 | 1.7800e-003 | | 0.2151 | 0.2151 | | 0.2151 | 0.2151 | 0.0000 | 59.45 | 59.45 | 0.04 | 0.00 | 60.51 |
| Energy | 0.8229 | 7.3080 | 5.0182 | 0.0449 | | 0.5685 | 0.5685 | | 0.5685 | 0.5685 | 0.0000 | 9,838.93 | 9,838.93 | 0.45 | 0.19 | 9,906.85 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.00 | 0.00 | 0.00 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 348.29 | 0.0000 | 348.29 | 20.58 | 0.00 | 862.88 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 268.02 | 120.36 | 388.38 | 27.55 | 0.65 | 1,271.67 |
| **Total** | **46.4794** | **7.7834** | **44.3549** | **0.0467** | **0.0000** | **0.7836** | **0.7836** | **0.0000** | **0.7836** | **0.7836** | **616.3146** | **10,018.7410** | **10,635.0556** | **48.6199** | **0.8435** | **12,101.9216** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **13.55** | **2.94** | **21.98** | **3.50** | **0.00** | **9.52** | **9.52** | **0.00** | **9.52** | **9.52** | **64.34** | **1.77** | **10.83** | **58.55** | **16.40** | **20.17** |

## 3.0 Construction Detail

**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Demolition | Demolition | 1/1/2040 | 12/30/2039 | 5 | 0 | |
| 2 | Site Preparation | Site Preparation | 2/23/2041 | 2/22/2041 | 5 | 0 | |
| 3 | Grading | Grading | 11/2/2041 | 11/1/2041 | 5 | 0 | |
| 4 | Building Construction | Building Construction | 8/15/2043 | 8/14/2043 | 5 | 0 | |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 | Paving | Paving | 6/11/2061 | 6/10/2061 | 5 | 0 | |
| 6 | Architectural Coating | Architectural Coating | 9/16/2062 | 9/15/2062 | 5 | 0 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

**OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Demolition | Excavators | 3 | 8.00 | 158 | 0.38 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Demolition | Rubber Tired Dozers | 2 | 8.00 | 247 | 0.40 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | |
|---|---|---|---|---|---|
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 6 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Site Preparation | 7 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

## 3.3 Site Preparation - 2041

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### 3.4 Grading - 2041

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Unmitigated Construction Off-Site**

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction Off-Site**

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.5 Building Construction - 2043

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Unmitigated Construction Off-Site**

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.6 Paving - 2061

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Paving | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Paving | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.7 Architectural Coating - 2062

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

### 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | |
|---|---|---|---|---|---|
| Condo/Townhouse High Rise | 0.00 | 0.00 | 0.00 | | |
| General Office Building | 0.00 | 0.00 | 0.00 | | |
| Hotel | 0.00 | 0.00 | 0.00 | | |
| Industrial Park | 0.00 | 0.00 | 0.00 | | |
| Strip Mall | 0.00 | 0.00 | 0.00 | | |
| Total | 0.00 | 0.00 | 0.00 | | |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Condo/Townhouse High Rise | 10.80 | 4.80 | 5.70 | 31.00 | 15.00 | 54.00 | 86 | 11 | 3 |
| General Office Building | 9.50 | 7.30 | 7.30 | 33.00 | 48.00 | 19.00 | 77 | 19 | 4 |
| Hotel | 9.50 | 7.30 | 7.30 | 19.40 | 61.60 | 19.00 | 58 | 38 | 4 |
| Industrial Park | 9.50 | 7.30 | 7.30 | 59.00 | 28.00 | 13.00 | 79 | 19 | 2 |
| Strip Mall | 9.50 | 7.30 | 7.30 | 16.60 | 64.40 | 19.00 | 45 | 40 | 15 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Condo/Townhouse High Rise | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| General Office Building | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Hotel | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Industrial Park | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Strip Mall | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |

# 5.0 Energy Detail

Historical Energy Use: N

## 5.1 Mitigation Measures Energy

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Electricity Mitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,695.4069 | 1,695.4069 | 0.2890 | 0.0413 | 1,714.9376 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,695.4069 | 1,695.4069 | 0.2890 | 0.0413 | 1,714.9376 |
| NaturalGas Mitigated | 0.8229 | 7.3080 | 5.0182 | 0.0449 | | 0.5685 | 0.5685 | | 0.5685 | 0.5685 | 0.0000 | 8,143.5244 | 8,143.5244 | 0.1561 | 0.1493 | 8,191.9173 |
| NaturalGas Unmitigated | 0.8229 | 7.3080 | 5.0182 | 0.0449 | | 0.5685 | 0.5685 | | 0.5685 | 0.5685 | 0.0000 | 8,143.5244 | 8,143.5244 | 0.1561 | 0.1493 | 8,191.9173 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Condo/Townhouse High Rise | 5.86718e+007 | 0.3164 | 2.7035 | 1.1504 | 0.0173 | | 0.2186 | 0.2186 | | 0.2186 | 0.2186 | 0.0000 | 3,130.9486 | 3,130.9486 | 0.0600 | 0.0574 | 3,149.5542 |
| General Office Building | 4.05e+007 | 0.2184 | 1.9853 | 1.6677 | 0.0119 | | 0.1509 | 0.1509 | | 0.1509 | 0.1509 | 0.0000 | 2,161.2342 | 2,161.2342 | 0.0414 | 0.0396 | 2,174.0774 |
| Hotel | 4.46301e+007 | 0.2407 | 2.1878 | 1.8377 | 0.0131 | | 0.1663 | 0.1663 | | 0.1663 | 0.1663 | 0.0000 | 2,381.6334 | 2,381.6334 | 0.0457 | 0.0437 | 2,395.7862 |
| Industrial Park | 8.1e+006 | 0.0437 | 0.3971 | 0.3335 | 2.3800e-003 | | 0.0302 | 0.0302 | | 0.0302 | 0.0302 | 0.0000 | 432.2469 | 432.2469 | 8.2800e-003 | 7.9200e-003 | 434.8155 |
| Strip Mall | 702000 | 3.7900e-003 | 0.0344 | 0.0289 | 2.1000e-004 | | 2.6200e-003 | 2.6200e-003 | | 2.6200e-003 | 2.6200e-003 | 0.0000 | 37.4614 | 37.4614 | 7.2000e-004 | 6.9000e-004 | 37.6840 |
| **Total** | | **0.8229** | **7.3080** | **5.0182** | **0.0449** | | **0.5685** | **0.5685** | | **0.5685** | **0.5685** | **0.0000** | **8,143.5244** | **8,143.5244** | **0.1561** | **0.1493** | **8,191.9173** |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Condo/Townhouse High Rise | 5.86718e+007 | 0.3164 | 2.7035 | 1.1504 | 0.0173 | | 0.2186 | 0.2186 | | 0.2186 | 0.2186 | 0.0000 | 3,130.9486 | 3,130.9486 | 0.0600 | 0.0574 | 3,149.5542 |
| General Office Building | 4.05e+007 | 0.2184 | 1.9853 | 1.6677 | 0.0119 | | 0.1509 | 0.1509 | | 0.1509 | 0.1509 | 0.0000 | 2,161.2342 | 2,161.2342 | 0.0414 | 0.0396 | 2,174.0774 |
| Hotel | 4.46301e+007 | 0.2407 | 2.1878 | 1.8377 | 0.0131 | | 0.1663 | 0.1663 | | 0.1663 | 0.1663 | 0.0000 | 2,381.6334 | 2,381.6334 | 0.0457 | 0.0437 | 2,395.7862 |
| Industrial Park | 8.1e+006 | 0.0437 | 0.3971 | 0.3335 | 2.3800e-003 | | 0.0302 | 0.0302 | | 0.0302 | 0.0302 | 0.0000 | 432.2469 | 432.2469 | 8.2800e-003 | 7.9200e-003 | 434.8155 |
| Strip Mall | 702000 | 3.7900e-003 | 0.0344 | 0.0289 | 2.1000e-004 | | 2.6200e-003 | 2.6200e-003 | | 2.6200e-003 | 2.6200e-003 | 0.0000 | 37.4614 | 37.4614 | 7.2000e-004 | 6.9000e-004 | 37.6840 |
| **Total** | | **0.8229** | **7.3080** | **5.0182** | **0.0449** | | **0.5685** | **0.5685** | | **0.5685** | **0.5685** | **0.0000** | **8,143.5244** | **8,143.5244** | **0.1561** | **0.1493** | **8,191.9173** |

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Condo/Townhouse High Rise | 2.88826e+007 | 537.9246 | 0.0917 | 0.0131 | 544.1214 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | |
|---|---|---|---|---|---|
| General Office Building | 4.2925e+007 | 799.4568 | 0.1363 | 0.0195 | 808.6663 |
| Hotel | 7.52136e+006 | 140.0816 | 0.0239 | 3.4100e-003 | 141.6953 |
| Industrial Park | 8.585e+006 | 159.8914 | 0.0273 | 3.8900e-003 | 161.7333 |
| Strip Mall | 3.117e+006 | 58.0526 | 9.9000e-003 | 1.4100e-003 | 58.7213 |
| **Total** | | **1,695.4069** | **0.2890** | **0.0413** | **1,714.9375** |

**Mitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Condo/Townhouse High Rise | 2.88826e+007 | 537.9246 | 0.0917 | 0.0131 | 544.1214 |
| General Office Building | 4.2925e+007 | 799.4568 | 0.1363 | 0.0195 | 808.6663 |
| Hotel | 7.52136e+006 | 140.0816 | 0.0239 | 3.4100e-003 | 141.6953 |
| Industrial Park | 8.585e+006 | 159.8914 | 0.0273 | 3.8900e-003 | 161.7333 |
| Strip Mall | 3.117e+006 | 58.0526 | 9.9000e-003 | 1.4100e-003 | 58.7213 |
| **Total** | | **1,695.4069** | **0.2890** | **0.0413** | **1,714.9375** |

## 6.0 Area Detail

### 6.1 Mitigation Measures Area

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 45.6565 | 0.4754 | 39.3367 | 1.7800e-003 | | 0.2151 | 0.2151 | | 0.2151 | 0.2151 | 0.0000 | 59.4486 | 59.4486 | 0.0424 | 0.0000 | 60.5079 |
| Unmitigated | 52.9388 | 0.7108 | 51.8322 | 3.4700e-003 | | 0.2975 | 0.2975 | | 0.2975 | 0.2975 | 0.0000 | 216.0543 | 216.0543 | 0.0835 | 2.4000e-003 | 218.8582 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architectural Coating | 7.1783 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 44.1962 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 0.0133 | 0.1132 | 0.0482 | 7.2000e-004 | | 9.1500e-003 | 9.1500e-003 | | 9.1500e-003 | 9.1500e-003 | 0.0000 | 131.0813 | 131.0813 | 2.5100e-003 | 2.4000e-003 | 131.8602 |
| Landscaping | 1.5511 | 0.5976 | 51.7840 | 2.7500e-003 | | 0.2884 | 0.2884 | | 0.2884 | 0.2884 | 0.0000 | 84.9730 | 84.9730 | 0.0810 | 0.0000 | 86.9980 |
| **Total** | **52.9388** | **0.7108** | **51.8322** | **3.4700e-003** | | **0.2975** | **0.2975** | | **0.2975** | **0.2975** | **0.0000** | **216.0543** | **216.0543** | **0.0835** | **2.4000e-003** | **218.8582** |

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.6381 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 44.1962 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 0.8223 | 0.4754 | 39.3367 | 1.7800e-003 | | 0.2151 | 0.2151 | | 0.2151 | 0.2151 | 0.0000 | 59.4486 | 59.4486 | 0.0424 | 0.0000 | 60.5079 |
| **Total** | **45.6565** | **0.4754** | **39.3367** | **1.7800e-003** | | **0.2151** | **0.2151** | | **0.2151** | **0.2151** | **0.0000** | **59.4486** | **59.4486** | **0.0424** | **0.0000** | **60.5079** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 388.3812 | 27.5488 | 0.6529 | 1,271.6741 |
| Unmitigated | 478.9589 | 34.4348 | 0.8160 | 1,583.0000 |

## 7.2 Water by Land Use

**Unmitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Condo/Townhouse High Rise | 456.078 / 287.528 | 209.3975 | 14.8723 | 0.3525 | 686.2463 |
| General Office Building | 444.334 / 272.334 | 203.4979 | 14.4893 | 0.3434 | 668.0621 |
| Hotel | 17.7567 / 1.97297 | 7.5515 | 0.5789 | 0.0137 | 26.1100 |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | |
|---|---|---|---|---|---|
| Industrial Park | 115.625 / 0 | 48.3348 | 3.7696 | 0.0893 | 169.1709 |
| Strip Mall | 22.2218 / 13.6198 | 10.1772 | 0.7246 | 0.0172 | 33.4107 |
| **Total** | | **478.9589** | **34.4348** | **0.8160** | **1,582.9999** |

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Condo/Townhouse High Rise | 364.863 / 269.988 | 170.1233 | 11.8983 | 0.2821 | 551.6323 |
| General Office Building | 355.467 / 255.722 | 165.2659 | 11.5919 | 0.2748 | 536.9457 |
| Hotel | 14.2054 / 1.85262 | 6.0591 | 0.4632 | 0.0110 | 20.9061 |
| Industrial Park | 92.5 / 0 | 38.6679 | 3.0157 | 0.0714 | 135.3367 |
| Strip Mall | 17.7774 / 12.789 | 8.2652 | 0.5797 | 0.0137 | 26.8534 |
| **Total** | | **388.3812** | **27.5488** | **0.6529** | **1,271.6741** |

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |
| Mitigated | 348.2944 | 20.5836 | 0.0000 | 862.8847 |
| Unmitigated | 1,393.1777 | 82.3344 | 0.0000 | 3,451.5389 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Condo/Townhouse High Rise | 3220 | 653.6309 | 38.6285 | 0.0000 | 1,619.3429 |
| General Office Building | 2325 | 471.9540 | 27.8917 | 0.0000 | 1,169.2460 |
| Hotel | 383.25 | 77.7963 | 4.5976 | 0.0000 | 192.7370 |
| Industrial Park | 620 | 125.8544 | 7.4378 | 0.0000 | 311.7989 |
| Strip Mall | 315 | 63.9422 | 3.7789 | 0.0000 | 158.4140 |
| **Total** | | **1,393.1777** | **82.3344** | **0.0000** | **3,451.5389** |

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Condo/Townhouse High Rise | 805 | 163.4077 | 9.6571 | 0.0000 | 404.8357 |
| General Office Building | 581.25 | 117.9885 | 6.9729 | 0.0000 | 292.3115 |
| Hotel | 95.8125 | 19.4491 | 1.1494 | 0.0000 | 48.1843 |
| Industrial Park | 155 | 31.4636 | 1.8595 | 0.0000 | 77.9497 |
| Strip Mall | 78.75 | 15.9855 | 0.9447 | 0.0000 | 39.6035 |
| **Total** | | **348.2944** | **20.5836** | **0.0000** | **862.8847** |

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile)

**Bay Area AQMD Air District, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Office Building | 2,500.00 | 1000sqft | 57.39 | 2,500,000.00 | 0 |
| Industrial Park | 500.00 | 1000sqft | 11.48 | 500,000.00 | 0 |
| Hotel | 700.00 | Room | 23.33 | 1,016,400.00 | 0 |
| Condo/Townhouse High Rise | 7,000.00 | Dwelling Unit | 109.38 | 7,000,000.00 | 20020 |
| Strip Mall | 300.00 | 1000sqft | 6.89 | 300,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 64 |
| **Climate Zone** | 4 | | | **Operational Year** | 2040 |
| **Utility Company** | Pacific Gas and Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 41.06 | **CH4 Intensity (lb/MWhr)** | 0.007 | **N2O Intensity (lb/MWhr)** | 0.001 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milpitas Metro Specific Plan Ops emissions only. Mobile emissions are in separate spreadsheet. Elec. emissions extrapolated to 2040 RPS.

Land Use - MMSP 2040 buildout, refer to Project Description.

Construction Phase - Ops only.

Trips and VMT - Ops only.

Grading - Ops only.

Architectural Coating - Ops only.

Vehicle Trips - Mobile emissions have been calculated in a separate worksheet.

Woodstoves - no wood burning allowed.

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

Area Mitigation - Mitigation - required low VOC paint of 10 g/L. All electric landscaping equipment.

Water Mitigation - CalGreen Code requirement.

Waste Mitigation - AB 341 requirement for post 2020.

Energy Use - Mitigation - No Natural Gas infrastructure.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblArchitecturalCoating | ConstArea_Nonresidential_Exterior | 2,158,200.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Nonresidential_Interior | 6,474,600.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Residential_Exterior | 4,725,000.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Residential_Interior | 14,175,000.00 | 0.00 |
| tblAreaMitigation | UseLowVOCPaintNonresidentialExteriorValue | 150 | 10 |
| tblAreaMitigation | UseLowVOCPaintNonresidentialInteriorValue | 100 | 10 |
| tblAreaMitigation | UseLowVOCPaintParkingCheck | False | True |
| tblAreaMitigation | UseLowVOCPaintParkingValue | 150 | 0 |
| tblAreaMitigation | UseLowVOCPaintResidentialExteriorValue | 150 | 10 |
| tblAreaMitigation | UseLowVOCPaintResidentialInteriorValue | 100 | 10 |
| tblConstructionPhase | NumDays | 300.00 | 0.00 |
| tblConstructionPhase | NumDays | 180.00 | 0.00 |
| tblConstructionPhase | NumDays | 465.00 | 0.00 |
| tblConstructionPhase | NumDays | 4,650.00 | 0.00 |
| tblConstructionPhase | NumDays | 330.00 | 0.00 |
| tblConstructionPhase | NumDays | 330.00 | 0.00 |
| tblEnergyUse | NT24NG | 3,155.00 | 0.00 |
| tblEnergyUse | NT24NG | 0.06 | 0.00 |
| tblEnergyUse | NT24NG | 4.75 | 0.00 |
| tblEnergyUse | NT24NG | 0.06 | 0.00 |
| tblEnergyUse | T24NG | 5,226.68 | 0.00 |
| tblEnergyUse | T24NG | 16.14 | 0.00 |
| tblEnergyUse | T24NG | 39.16 | 0.00 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | |
|---|---|---|---|
| tblEnergyUse | T24NG | 16.14 | 0.00 |
| tblEnergyUse | T24NG | 2.34 | 0.00 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 1,190.00 | 0.00 |
| tblProjectCharacteristics | CH4IntensityFactor | 0.033 | 0.007 |
| tblProjectCharacteristics | CO2IntensityFactor | 203.98 | 41.06 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.004 | 0.001 |
| tblTripsAndVMT | VendorTripNumber | 1,456.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 18.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 20.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 6,573.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 1,315.00 | 0.00 |
| tblVehicleTrips | ST_TR | 4.91 | 0.00 |
| tblVehicleTrips | ST_TR | 2.21 | 0.00 |
| tblVehicleTrips | ST_TR | 8.19 | 0.00 |
| tblVehicleTrips | ST_TR | 2.54 | 0.00 |
| tblVehicleTrips | ST_TR | 42.04 | 0.00 |
| tblVehicleTrips | SU_TR | 4.09 | 0.00 |
| tblVehicleTrips | SU_TR | 0.70 | 0.00 |
| tblVehicleTrips | SU_TR | 5.95 | 0.00 |
| tblVehicleTrips | SU_TR | 1.24 | 0.00 |
| tblVehicleTrips | SU_TR | 20.43 | 0.00 |
| tblVehicleTrips | WD_TR | 5.44 | 0.00 |
| tblVehicleTrips | WD_TR | 9.74 | 0.00 |
| tblVehicleTrips | WD_TR | 8.36 | 0.00 |
| tblVehicleTrips | WD_TR | 3.37 | 0.00 |
| tblVehicleTrips | WD_TR | 44.32 | 0.00 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | |
|---|---|---|---|
| tblWoodstoves | WoodstoveWoodMass | 582.40 | 0.00 |

## 2.0 Emissions Summary

### 2.1 Overall Construction (Maximum Daily Emission)

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.4276 | 0.0000 | 0.0000 | 0.4276 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0737 | 0.0000 | 0.0000 | 0.0737 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1164 | 0.0000 | 0.0000 | 0.1164 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 7.4300e-003 | 0.0000 | 0.0000 | 7.4300e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Maximum** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.4276** | **0.0000** | **0.0000** | **0.4276** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.4276 | 0.0000 | 0.0000 | 0.4276 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0737 | 0.0000 | 0.0000 | 0.0737 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1164 | 0.0000 | 0.0000 | 0.1164 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 7.4300e-003 | 0.0000 | 0.0000 | 7.4300e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Maximum** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.4276** | **0.0000** | **0.0000** | **0.4276** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## 2.2 Overall Operational

### Unmitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 301.12 | 26.96 | 584.02 | 0.16 | | 4.85 | 4.85 | | 4.85 | 4.85 | 0.0000 | 26,981.9180 | 26,981.9180 | 1.4892 | 0.4756 | 27,160.8744 |
| Energy | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **301.1162** | **26.9609** | **584.0248** | **0.1602** | **0.0000** | **4.8470** | **4.8470** | **0.0000** | **4.8470** | **4.8470** | **0.0000** | **26,981.9180** | **26,981.9180** | **1.4892** | **0.4756** | **27,160.8744** |

### Mitigated Operational

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 254.80 | 5.28 | 437.07 | 0.02 | | 2.39 | 2.39 | | 2.39 | 2.39 | 0.0000 | 728.1210 | 728.1210 | 0.5190 | 0.0000 | 741.0948 |
| Energy | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **254.8036** | **5.2824** | **437.0738** | **0.0198** | **0.0000** | **2.3900** | **2.3900** | **0.0000** | **2.3900** | **2.3900** | **0.0000** | **728.1210** | **728.1210** | **0.5190** | **0.0000** | **741.0948** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **15.38** | **80.41** | **25.16** | **87.64** | **0.00** | **50.69** | **50.69** | **0.00** | **50.69** | **50.69** | **0.00** | **97.30** | **97.30** | **65.15** | **100.00** | **97.27** |

## 3.0 Construction Detail

### Construction Phase

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Demolition | Demolition | 1/1/2040 | 12/30/2039 | 5 | 0 | |
| 2 | Site Preparation | Site Preparation | 2/23/2041 | 2/22/2041 | 5 | 0 | |
| 3 | Grading | Grading | 11/2/2041 | 11/1/2041 | 5 | 0 | |
| 4 | Building Construction | Building Construction | 8/15/2043 | 8/14/2043 | 5 | 0 | |
| 5 | Paving | Paving | 6/11/2061 | 6/10/2061 | 5 | 0 | |
| 6 | Architectural Coating | Architectural Coating | 9/16/2062 | 9/15/2062 | 5 | 0 | |

**Acres of Grading (Site Preparation Phase): 0**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

## OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Demolition | Excavators | 3 | 8.00 | 158 | 0.38 |
| Demolition | Rubber Tired Dozers | 2 | 8.00 | 247 | 0.40 |
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

## Trips and VMT

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 6 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Site Preparation | 7 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

## 3.3 Site Preparation - 2041

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Unmitigated Construction Off-Site**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction Off-Site**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.4 Grading - 2041

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Unmitigated Construction Off-Site**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction Off-Site**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.5 Building Construction - 2043

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Category | lb/day | | | | | | | | | | lb/day | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.6 Paving - 2061

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Paving | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Paving | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.7 Architectural Coating - 2062

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

### 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Condo/Townhouse High Rise | 0.00 | 0.00 | 0.00 | | |
| General Office Building | 0.00 | 0.00 | 0.00 | | |
| Hotel | 0.00 | 0.00 | 0.00 | | |
| Industrial Park | 0.00 | 0.00 | 0.00 | | |
| Strip Mall | 0.00 | 0.00 | 0.00 | | |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | |
|---|---|---|---|---|---|
| Total | 0.00 | 0.00 | 0.00 | | |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Condo/Townhouse High Rise | 10.80 | 4.80 | 5.70 | 31.00 | 15.00 | 54.00 | 86 | 11 | 3 |
| General Office Building | 9.50 | 7.30 | 7.30 | 33.00 | 48.00 | 19.00 | 77 | 19 | 4 |
| Hotel | 9.50 | 7.30 | 7.30 | 19.40 | 61.60 | 19.00 | 58 | 38 | 4 |
| Industrial Park | 9.50 | 7.30 | 7.30 | 59.00 | 28.00 | 13.00 | 79 | 19 | 2 |
| Strip Mall | 9.50 | 7.30 | 7.30 | 16.60 | 64.40 | 19.00 | 45 | 40 | 15 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Condo/Townhouse High Rise | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| General Office Building | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Hotel | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Industrial Park | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Strip Mall | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Category | lb/day | | | | | | | | | | lb/day | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NaturalGas Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| NaturalGas Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Condo/Townhouse High Rise | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| General Office Building | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hotel | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Industrial Park | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Condo/Townhouse High Rise | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| General Office Building | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hotel | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Industrial Park | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 6.0 Area Detail

### 6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 254.8036 | 5.2824 | 437.0738 | 0.0198 | | 2.3900 | 2.3900 | | 2.3900 | 2.3900 | 0.0000 | 728.1210 | 728.1210 | 0.5190 | 0.0000 | 741.0948 |
| Unmitigated | 301.1162 | 26.9609 | 584.0248 | 0.1602 | | 4.8470 | 4.8470 | | 4.8470 | 4.8470 | 0.0000 | 26,981.9180 | 26,981.9180 | 1.4892 | 0.4756 | 27,160.8744 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 39.3332 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 242.1710 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 2.3779 | 20.3206 | 8.6471 | 0.1297 | | 1.6429 | 1.6429 | | 1.6429 | 1.6429 | 0.0000 | 25,941.1765 | 25,941.1765 | 0.4972 | 0.4756 | 26,095.3319 |
| Landscaping | 17.2341 | 6.6403 | 575.3777 | 0.0305 | | 3.2040 | 3.2040 | | 3.2040 | 3.2040 | | 1,040.7415 | 1,040.7415 | 0.9920 | | 1,065.5425 |
| **Total** | **301.1162** | **26.9609** | **584.0248** | **0.1602** | | **4.8470** | **4.8470** | | **4.8470** | **4.8470** | **0.0000** | **26,981.9180** | **26,981.9180** | **1.4893** | **0.4756** | **27,160.8744** |

**Mitigated**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 3.4963 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 242.1710 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 9.1364 | 5.2824 | 437.0738 | 0.0198 | | 2.3900 | 2.3900 | | 2.3900 | 2.3900 | | 728.1210 | 728.1210 | 0.5190 | | 741.0948 |
| **Total** | **254.8036** | **5.2824** | **437.0738** | **0.0198** | | **2.3900** | **2.3900** | | **2.3900** | **2.3900** | **0.0000** | **728.1210** | **728.1210** | **0.5190** | **0.0000** | **741.0948** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile)

**Bay Area AQMD Air District, Annual**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Office Building | 2,500.00 | 1000sqft | 57.39 | 2,500,000.00 | 0 |
| Industrial Park | 500.00 | 1000sqft | 11.48 | 500,000.00 | 0 |
| Hotel | 700.00 | Room | 23.33 | 1,016,400.00 | 0 |
| Condo/Townhouse High Rise | 7,000.00 | Dwelling Unit | 109.38 | 7,000,000.00 | 20020 |
| Strip Mall | 300.00 | 1000sqft | 6.89 | 300,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 64 |
| **Climate Zone** | 4 | | | **Operational Year** | 2040 |
| **Utility Company** | Pacific Gas and Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 41.06 | **CH4 Intensity (lb/MWhr)** | 0.007 | **N2O Intensity (lb/MWhr)** | 0.001 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milpitas Metro Specific Plan Ops emissions only. Mobile emissions are in separate spreadsheet. Elec. emissions extrapolated to 2040 RPS.

Land Use - MMSP 2040 buildout, refer to Project Description.

Construction Phase - Ops only.

Trips and VMT - Ops only.

Grading - Ops only.

Architectural Coating - Ops only.

Vehicle Trips - Mobile emissions have been calculated in a separate worksheet.

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

Woodstoves - no wood burning allowed.

Area Mitigation - Mitigation - required low VOC paint of 10 g/L. All electric landscaping equipment.

Water Mitigation - CalGreen Code requirement.

Waste Mitigation - AB 341 requirement for post 2020.

Energy Use - Mitigation - No Natural Gas infrastructure.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblArchitecturalCoating | ConstArea_Nonresidential_Exterior | 2,158,200.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Nonresidential_Interior | 6,474,600.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Residential_Exterior | 4,725,000.00 | 0.00 |
| tblArchitecturalCoating | ConstArea_Residential_Interior | 14,175,000.00 | 0.00 |
| tblAreaMitigation | UseLowVOCPaintNonresidentialExteriorValue | 150 | 10 |
| tblAreaMitigation | UseLowVOCPaintNonresidentialInteriorValue | 100 | 10 |
| tblAreaMitigation | UseLowVOCPaintParkingCheck | False | True |
| tblAreaMitigation | UseLowVOCPaintParkingValue | 150 | 0 |
| tblAreaMitigation | UseLowVOCPaintResidentialExteriorValue | 150 | 10 |
| tblAreaMitigation | UseLowVOCPaintResidentialInteriorValue | 100 | 10 |
| tblConstructionPhase | NumDays | 300.00 | 0.00 |
| tblConstructionPhase | NumDays | 180.00 | 0.00 |
| tblConstructionPhase | NumDays | 465.00 | 0.00 |
| tblConstructionPhase | NumDays | 4,650.00 | 0.00 |
| tblConstructionPhase | NumDays | 330.00 | 0.00 |
| tblConstructionPhase | NumDays | 330.00 | 0.00 |
| tblEnergyUse | NT24NG | 3,155.00 | 0.00 |
| tblEnergyUse | NT24NG | 0.06 | 0.00 |
| tblEnergyUse | NT24NG | 4.75 | 0.00 |
| tblEnergyUse | NT24NG | 0.06 | 0.00 |
| tblEnergyUse | T24NG | 5,226.68 | 0.00 |
| tblEnergyUse | T24NG | 16.14 | 0.00 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | |
|---|---|---|---|
| tblEnergyUse | T24NG | 39.16 | 0.00 |
| tblEnergyUse | T24NG | 16.14 | 0.00 |
| tblEnergyUse | T24NG | 2.34 | 0.00 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 1,190.00 | 0.00 |
| tblProjectCharacteristics | CH4IntensityFactor | 0.033 | 0.007 |
| tblProjectCharacteristics | CO2IntensityFactor | 203.98 | 41.06 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.004 | 0.001 |
| tblTripsAndVMT | VendorTripNumber | 1,456.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 18.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 20.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 6,573.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 0.00 |
| tblTripsAndVMT | WorkerTripNumber | 1,315.00 | 0.00 |
| tblVehicleTrips | ST_TR | 4.91 | 0.00 |
| tblVehicleTrips | ST_TR | 2.21 | 0.00 |
| tblVehicleTrips | ST_TR | 8.19 | 0.00 |
| tblVehicleTrips | ST_TR | 2.54 | 0.00 |
| tblVehicleTrips | ST_TR | 42.04 | 0.00 |
| tblVehicleTrips | SU_TR | 4.09 | 0.00 |
| tblVehicleTrips | SU_TR | 0.70 | 0.00 |
| tblVehicleTrips | SU_TR | 5.95 | 0.00 |
| tblVehicleTrips | SU_TR | 1.24 | 0.00 |
| tblVehicleTrips | SU_TR | 20.43 | 0.00 |
| tblVehicleTrips | WD_TR | 5.44 | 0.00 |
| tblVehicleTrips | WD_TR | 9.74 | 0.00 |
| tblVehicleTrips | WD_TR | 8.36 | 0.00 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | |
|---|---|---|---|
| tblVehicleTrips | WD_TR | 3.37 | 0.00 |
| tblVehicleTrips | WD_TR | 44.32 | 0.00 |
| tblWoodstoves | WoodstoveWoodMass | 582.40 | 0.00 |

## 2.0 Emissions Summary

### 2.1 Overall Construction

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Maximum** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2041 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2043 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2061 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2062 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Maximum** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

| Quarter | Start Date | End Date | Maximum Unmitigated ROG + NOX (tons/quarter) | Maximum Mitigated ROG + NOX (tons/quarter) |
|---|---|---|---|---|
| | | **Highest** | | |

## 2.2 Overall Operational

**Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 52.9388 | 0.7108 | 51.8322 | 3.4700e-003 | | 0.2975 | 0.2975 | | 0.2975 | 0.2975 | 0.0000 | 216.0543 | 216.0543 | 0.0835 | 2.4000e-003 | 218.8582 |
| Energy | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,695.4069 | 1,695.4069 | 0.2890 | 0.0413 | 1,714.9376 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 1,393.1777 | 0.0000 | 1,393.1777 | 82.3344 | 0.0000 | 3,451.5389 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 335.0252 | 143.9338 | 478.9589 | 34.4348 | 0.8160 | 1,583.0000 |
| **Total** | **52.9388** | **0.7108** | **51.8322** | **3.4700e-003** | **0.0000** | **0.2975** | **0.2975** | **0.0000** | **0.2975** | **0.2975** | **1,728.2029** | **2,055.3950** | **3,783.5979** | **117.1418** | **0.8597** | **6,968.3345** |

**Mitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 45.6565 | 0.4754 | 39.3367 | 1.7800e-003 | | 0.2151 | 0.2151 | | 0.2151 | 0.2151 | 0.0000 | 59.45 | 59.45 | 0.04 | 0.00 | 60.51 |
| Energy | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1695.41 | 1695.41 | 0.29 | 0.04 | 1714.94 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 348.29 | 0.00 | 348.29 | 20.58 | 0.00 | 862.88 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 268.02 | 120.36 | 388.38 | 27.55 | 0.65 | 1271.67 |
| **Total** | **45.6565** | **0.4754** | **39.3367** | **1.7800e-003** | **0.0000** | **0.2151** | **0.2151** | **0.0000** | **0.2151** | **0.2151** | **616.3146** | **1,875.2166** | **2,491.5312** | **48.4638** | **0.6942** | **3,910.0043** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **13.76** | **33.12** | **24.11** | **48.70** | **0.00** | **27.70** | **27.70** | **0.00** | **27.70** | **27.70** | **64.34** | **8.77** | **34.15** | **58.63** | **19.25** | **43.89** |

## 3.0 Construction Detail

**Construction Phase**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Demolition | Demolition | 1/1/2040 | 12/30/2039 | 5 | 0 | |
| 2 | Site Preparation | Site Preparation | 2/23/2041 | 2/22/2041 | 5 | 0 | |
| 3 | Grading | Grading | 11/2/2041 | 11/1/2041 | 5 | 0 | |
| 4 | Building Construction | Building Construction | 8/15/2043 | 8/14/2043 | 5 | 0 | |
| 5 | Paving | Paving | 6/11/2061 | 6/10/2061 | 5 | 0 | |
| 6 | Architectural Coating | Architectural Coating | 9/16/2062 | 9/15/2062 | 5 | 0 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

**OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Demolition | Excavators | 3 | 8.00 | 158 | 0.38 |
| Demolition | Rubber Tired Dozers | 2 | 8.00 | 247 | 0.40 |
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | |
|---|---|---|---|---|---|
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 6 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Site Preparation | 7 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 0.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

## 3.3 Site Preparation - 2041

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.4 Grading - 2041

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.5 Building Construction - 2043

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Date: 1/28/2022 1:59 PM

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.6 Paving - 2061

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Paving | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Paving | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 3.7 Architectural Coating - 2062

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Condo/Townhouse High Rise | 0.00 | 0.00 | 0.00 | | |
| General Office Building | 0.00 | 0.00 | 0.00 | | |
| Hotel | 0.00 | 0.00 | 0.00 | | |
| Industrial Park | 0.00 | 0.00 | 0.00 | | |
| Strip Mall | 0.00 | 0.00 | 0.00 | | |
| Total | 0.00 | 0.00 | 0.00 | | |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Condo/Townhouse High Rise | 10.80 | 4.80 | 5.70 | 31.00 | 15.00 | 54.00 | 86 | 11 | 3 |
| General Office Building | 9.50 | 7.30 | 7.30 | 33.00 | 48.00 | 19.00 | 77 | 19 | 4 |
| Hotel | 9.50 | 7.30 | 7.30 | 19.40 | 61.60 | 19.00 | 58 | 38 | 4 |
| Industrial Park | 9.50 | 7.30 | 7.30 | 59.00 | 28.00 | 13.00 | 79 | 19 | 2 |
| Strip Mall | 9.50 | 7.30 | 7.30 | 16.60 | 64.40 | 19.00 | 45 | 40 | 15 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Condo/Townhouse High Rise | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| General Office Building | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Hotel | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Industrial Park | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |
| Strip Mall | 0.554371 | 0.060330 | 0.185934 | 0.122323 | 0.022029 | 0.006101 | 0.011187 | 0.006846 | 0.000892 | 0.000437 | 0.025991 | 0.000924 | 0.0026 |

## 5.0 Energy Detail

Historical Energy Use: N

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Electricity Mitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,695.4069 | 1,695.4069 | 0.2890 | 0.0413 | 1,714.9376 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 1,695.4069 | 1,695.4069 | 0.2890 | 0.0413 | 1,714.9376 |
| NaturalGas Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| NaturalGas Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Condo/Townhouse High Rise | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| General Office Building | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hotel | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Industrial Park | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Condo/Townhouse High Rise | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| General Office Building | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hotel | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Industrial Park | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Condo/Townhouse High Rise | 2.88826e+007 | 537.9246 | 0.0917 | 0.0131 | 544.1214 |
| General Office Building | 4.2925e+007 | 799.4568 | 0.1363 | 0.0195 | 808.6663 |
| Hotel | 7.52136e+006 | 140.0816 | 0.0239 | 3.4100e-003 | 141.6953 |
| Industrial Park | 8.585e+006 | 159.8914 | 0.0273 | 3.8900e-003 | 161.7333 |
| Strip Mall | 3.117e+006 | 58.0526 | 9.9000e-003 | 1.4100e-003 | 58.7213 |
| **Total** | | **1,695.4069** | **0.2890** | **0.0413** | **1,714.9375** |

**Mitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Condo/Townhouse High Rise | 2.88826e+007 | 537.9246 | 0.0917 | 0.0131 | 544.1214 |
| General Office Building | 4.2925e+007 | 799.4568 | 0.1363 | 0.0195 | 808.6663 |
| Hotel | 7.52136e+006 | 140.0816 | 0.0239 | 3.4100e-003 | 141.6953 |
| Industrial Park | 8.585e+006 | 159.8914 | 0.0273 | 3.8900e-003 | 161.7333 |
| Strip Mall | 3.117e+006 | 58.0526 | 9.9000e-003 | 1.4100e-003 | 58.7213 |
| **Total** | | **1,695.4069** | **0.2890** | **0.0413** | **1,714.9375** |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 6.0 Area Detail

### 6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 45.6565 | 0.4754 | 39.3367 | 1.7800e-003 | | 0.2151 | 0.2151 | | 0.2151 | 0.2151 | 0.0000 | 59.4486 | 59.4486 | 0.0424 | 0.0000 | 60.5079 |
| Unmitigated | 52.9388 | 0.7108 | 51.8322 | 3.4700e-003 | | 0.2975 | 0.2975 | | 0.2975 | 0.2975 | 0.0000 | 216.0543 | 216.0543 | 0.0835 | 2.4000e-003 | 218.8582 |

### 6.2 Area by SubCategory

**Unmitigated**

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 7.1783 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 44.1962 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 0.0133 | 0.1132 | 0.0482 | 7.2000e-004 | | 9.1500e-003 | 9.1500e-003 | | 9.1500e-003 | 9.1500e-003 | 0.0000 | 131.0813 | 131.0813 | 2.5100e-003 | 2.4000e-003 | 131.8602 |
| Landscaping | 1.5511 | 0.5976 | 51.7840 | 2.7500e-003 | | 0.2884 | 0.2884 | | 0.2884 | 0.2884 | 0.0000 | 84.9730 | 84.9730 | 0.0810 | 0.0000 | 86.9980 |
| **Total** | **52.9388** | **0.7108** | **51.8322** | **3.4700e-003** | | **0.2975** | **0.2975** | | **0.2975** | **0.2975** | **0.0000** | **216.0543** | **216.0543** | **0.0835** | **2.4000e-003** | **218.8582** |

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.6381 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 44.1962 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 0.8223 | 0.4754 | 39.3367 | 1.7800e-003 | | 0.2151 | 0.2151 | | 0.2151 | 0.2151 | 0.0000 | 59.4486 | 59.4486 | 0.0424 | 0.0000 | 60.5079 |
| **Total** | **45.6565** | **0.4754** | **39.3367** | **1.7800e-003** | | **0.2151** | **0.2151** | | **0.2151** | **0.2151** | **0.0000** | **59.4486** | **59.4486** | **0.0424** | **0.0000** | **60.5079** |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 388.3812 | 27.5488 | 0.6529 | 1,271.6741 |
| Unmitigated | 478.9589 | 34.4348 | 0.8160 | 1,583.0000 |

### 7.2 Water by Land Use

**Unmitigated**

| Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|

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**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Land Use | Mgal | MT/yr | | | |
|---|---|---|---|---|---|
| Condo/Townhouse High Rise | 456.078 / 287.528 | 209.3975 | 14.8723 | 0.3525 | 686.2463 |
| General Office Building | 444.334 / 272.334 | 203.4979 | 14.4893 | 0.3434 | 668.0621 |
| Hotel | 17.7567 / 1.97297 | 7.5515 | 0.5789 | 0.0137 | 26.1100 |
| Industrial Park | 115.625 / 0 | 48.3348 | 3.7696 | 0.0893 | 169.1709 |
| Strip Mall | 22.2218 / 13.6198 | 10.1772 | 0.7246 | 0.0172 | 33.4107 |
| **Total** | | **478.9589** | **34.4348** | **0.8160** | **1,582.9999** |

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Condo/Townhouse High Rise | 364.863 / 269.988 | 170.1233 | 11.8983 | 0.2821 | 551.6323 |
| General Office Building | 355.467 / 255.722 | 165.2659 | 11.5919 | 0.2748 | 536.9457 |
| Hotel | 14.2054 / 1.85262 | 6.0591 | 0.4632 | 0.0110 | 20.9061 |
| Industrial Park | 92.5 / 0 | 38.6679 | 3.0157 | 0.0714 | 135.3367 |
| Strip Mall | 17.7774 / 12.789 | 8.2652 | 0.5797 | 0.0137 | 26.8534 |
| **Total** | | **388.3812** | **27.5488** | **0.6529** | **1,271.6741** |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# 8.0 Waste Detail

## 8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |
| Mitigated | 348.2944 | 20.5836 | 0.0000 | 862.8847 |
| Unmitigated | 1,393.1777 | 82.3344 | 0.0000 | 3,451.5389 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Condo/Townhouse High Rise | 3220 | 653.6309 | 38.6285 | 0.0000 | 1,619.3429 |
| General Office Building | 2325 | 471.9540 | 27.8917 | 0.0000 | 1,169.2460 |
| Hotel | 383.25 | 77.7963 | 4.5976 | 0.0000 | 192.7370 |

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | | | | | |
|---|---|---|---|---|---|
| Industrial Park | 620 | 125.8544 | 7.4378 | 0.0000 | 311.7989 |
| Strip Mall | 315 | 63.9422 | 3.7789 | 0.0000 | 158.4140 |
| **Total** | | **1,393.1777** | **82.3344** | **0.0000** | **3,451.5389** |

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Condo/Townhouse High Rise | 805 | 163.4077 | 9.6571 | 0.0000 | 404.8357 |
| General Office Building | 581.25 | 117.9885 | 6.9729 | 0.0000 | 292.3115 |
| Hotel | 95.8125 | 19.4491 | 1.1494 | 0.0000 | 48.1843 |
| Industrial Park | 155 | 31.4636 | 1.8595 | 0.0000 | 77.9497 |
| Strip Mall | 78.75 | 15.9855 | 0.9447 | 0.0000 | 39.6035 |
| **Total** | | **348.2944** | **20.5836** | **0.0000** | **862.8847** |

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

Milpitas Metro Specific Plan - Mit Operational Emissions (No Mobile) - Bay Area AQMD Air District, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

**Regional Operations Summary - Mobile Only**

| | Daily Emissions (lb/day) | | | | | | | | | | GHG Emission (MT/yr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Source | ROG | NOX | CO | SOX | Fugitive PM10 | Exhaust PM10 | Total PM10 | Fugitive PM2.5 | Exhaust PM2.5 | Total PM2.5 | CO2 | CH4 | N2O | CO2e |
| 2015 - Existing MMSP Area | 355.47 | 966.37 | 3890.36 | 6.44 | 484.41 | 16.19 | 500.60 | 142.33 | 15.39 | 157.72 | 77563.44 | 4.72 | 5.23 | 79239.56 |
| 2040 - No Project MMSP Area | 194.14 | 326.32 | 2205.35 | 9.83 | 1097.37 | 5.15 | 1102.52 | 274.67 | 4.86 | 279.52 | 118874.42 | 2.62 | 5.45 | 120562.53 |
| 2040 - Project MMSP Area | 264.69 | 441.68 | 2982.24 | 13.25 | 1478.94 | 6.95 | 1485.89 | 370.17 | 6.55 | 376.72 | 160256.56 | 3.55 | 7.36 | 162537.30 |
| **2040 - Project Only Emissions** | 70.54 | 115.36 | 776.89 | 3.42 | 381.57 | 1.80 | 383.37 | 95.51 | 1.69 | 97.20 | 41,382.13 | 0.93 | 1.91 | 41,974.77 |

Notes:

1. Based off VMT and ADT data provided by W-Trans.
2. Assumed the EMFAC fleet mix based off the operational year.
3. Annual factor of 260 was applied for the daily VMT data.

**Table 1: Milpitas Metro MMSP - Systemwide SB 743 VMT Forecasts**

| Scenario | | | | | | | | | | | | Difference - 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 - Existing** | **Area** | **Households** | **Population** | **Employees** | **ADT_Total** | **VMT_Total** | **VMT_HH_HBW** | **VMT_A_HW** | **VMT per capita** | **VMT per employee** | **VMT per Service** | VMT total |
| MMSP TAZs | MMSP | 5,880 | 20,005 | 9,608 | 64,319 | 682,584 | 190,267 | 180,846 | 9.5 | 18.8 | 23.1 | 10.61 |
| City | Milpitas | 20,122 | 68,867 | 41,934 | 266,723 | 3,096,575 | 990,010 | 834,353 | 14.4 | 19.9 | 27.9 | |
| County - SC | 3 | 625,203 | 1,851,298 | 1,042,011 | 7,095,150 | 75,601,190 | 27,829,239 | 19,668,287 | 15.0 | 18.9 | 26.1 | |
| Bay Area Region | 1 to 9 | 2,682,925 | 7,496,776 | 3,764,469 | 61,558 | 266,484,444 | 117,515,572 | 65,139,587 | 15.7 | 17.3 | 23.7 | |
| **2040 - PLUM No-Project** | **Area** | **Households** | **Population** | **Employees** | **ADT_Total** | **VMT_Total** | **VMT_HH** | **VMT_A_HW** | **VMT per capita** | **VMT per employee** | **VMT per Service** | |
| MMSP TAZs | MMSP | 12,559 | 42,564 | 20,213 | 132,169 | 1,548,069 | 318,675 | 397,831 | 7.5 | 19.7 | 24.7 | 11.712816 |
| City | Milpitas | 27,129 | 92,499 | 67,810 | 386,718 | 4,897,095 | 1,098,363 | 1,401,265 | 11.9 | 20.7 | 30.5 | |
| County - SC | 3 | 857,372 | 2,568,707 | 1,331,181 | 8,915,197 | 98,137,484 | 36,266,383 | 25,811,812 | 14.1 | 19.4 | 25.2 | |
| Bay Area Region | 1 to 9 | 3,423,147 | 9,663,454 | 4,739,677 | 67,525 | 346,818,185 | 154,522,271 | 84,684,263 | 16.0 | 17.9 | 24.1 | |
| **2040 - MMSP Plus Project** | **Area** | **Households** | **Population** | **Employees** | **ADT_Total** | **VMT_Total** | **VMT_HH** | **VMT_A_HW** | **VMT per capita** | **VMT per employee** | **VMT per Service** | **Households** |
| MMSP TAZs | MMSP | 19,559 | 64,208 | 32,496 | 180,517 | 2,086,360 | 438,415 | 572,998 | 6.8 | 17.6 | 21.6 | 11.557671 7,000 |
| City | Milpitas | 31,829 | 106,450 | 74,224 | 418,749 | 5,184,950 | 1,166,298 | 1,488,767 | 11.0 | 20.1 | 28.7 | |
| County - SC | 3 | 864,372 | 2,590,351 | 1,343,464 | 8,951,090 | 98,537,664 | 36,404,690 | 25,879,537 | 14.1 | 19.3 | 25.0 | |
| Bay Area Region | 1 to 9 | 3,430,147 | 9,684,942 | 4,751,960 | 67,474 | 346,908,244 | 154,547,085 | 84,617,868 | 16.0 | 17.8 | 24.0 | |

Note: MMSP TAZs cover a wider area than the MMSP

| | | |
|---|---|---|
| Region | 90,058 | 538,291 Plan |
| County | 400,180 | |
| City | 287,855 | |
| All | 778,094 | |

**Table 2: 2015 Milpitas Metro MMSP - TAZ level VMT Forecasts**

| MMSP Subarea | MMSP TAZ | 2015NOP Households | 2015NOP Population | 2015NOP Jobs | 2015NOP ADT | 2015NOP VMT_P | 2015NOP VMT_A | 2015 NOP VMT Total | 2015NOP VMT_HH | 2015NOP VMT_A_HW | 2015NOP VMT/Cap | 2015NOP VMT/Job | 2015NOP VMT/Service |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| McCandless - West | 253 | 537 | 1,955 | 66 | 3,963 | 22,423 | 14,869 | 37,293 | 22,226 | 2,185 | 11.4 | 33.1 | 18.5 |
| McCandless - Center | 254 | 970 | 3,463 | 421 | 7,375 | 40,194 | 36,879 | 77,073 | 39,474 | 11,665 | 11.4 | 27.7 | 19.8 |
| McCandless - East | 287 | 879 | 3,057 | 861 | 6,594 | 25,707 | 38,497 | 64,204 | 24,227 | 14,714 | 7.9 | 17.1 | 16.4 |
| Piper | 255 | 1,140 | 3,586 | 511 | 7,858 | 37,367 | 39,526 | 76,893 | 35,910 | 13,608 | 10.0 | 26.6 | 18.8 |
| Great Mall | 280 | 361 | 1,000 | 3,681 | 20,060 | 15,667 | 211,903 | 227,571 | 11,550 | 68,230 | 11.5 | 18.5 | 48.6 |
| Tango | 317 | 1,957 | 6,831 | 1,028 | 13,122 | 58,384 | 64,853 | 123,237 | 55,691 | 20,707 | 8.2 | 20.1 | 15.7 |
| Innovation | 319 | 36 | 113 | 670 | 1,365 | 2,135 | 16,127 | 18,262 | 1,190 | 11,032 | 10.5 | 16.5 | 23.3 |
| Innovation | 312 | - | - | 2,370 | 3,983 | 3,228 | 54,824 | 58,052 | 0 | 38,706 | - | 16.3 | 24.5 |
| sum | | 5,880 | 20,005 | 9,608 | 64,319 | 205,105 | 477,480 | 682,584 | 190,267 | 180,846 | 9.5 | 18.8 | 23.1 |

**Table 3: 2040 No-Project Milpitas Metro MMSP - TAZ level VMT Forecasts**

| MMSP Subarea | MMSP TAZ | 2040NOP Households | 2040NOP Population | 2040NOP Jobs | 2040NOP ADT | 2040NOP VMT_P | 2040NOP VMT_A | 2040NOP VMT Total | 2040NOP VMT_HH | 2040NOP VMT_Jobs | 2040NOP VMT/Cap | 2040NOP VMT/Job | 2040NOP VMT/Service |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| McCandless - West | 253 | 1,107 | 4,034 | 66 | 6,606 | 37,826 | 28,417 | 66,243 | 37,336 | 2,658 | 9.3 | 40.3 | 16.2 |
| McCandless - Center | 254 | 1,234 | 4,408 | 939 | 10,573 | 43,050 | 81,031 | 124,081 | 42,058 | 20,934 | 9.5 | 22.3 | 23.2 |
| McCandless - East | 287 | 2,376 | 8,263 | 2,123 | 19,534 | 51,333 | 162,343 | 213,676 | 47,902 | 40,626 | 5.8 | 19.1 | 20.6 |
| Piper | 255 | 1,893 | 5,956 | 1,318 | 16,408 | 64,476 | 128,330 | 192,805 | 61,167 | 31,626 | 10.3 | 24.0 | 26.5 |
| Great Mall | 280 | 361 | 1,000 | 5,154 | 27,070 | 15,338 | 326,948 | 342,285 | 10,015 | 98,717 | 10.0 | 19.2 | 55.6 |
| Tango | 317 | 3,791 | 13,234 | 2,331 | 27,046 | 88,527 | 194,839 | 283,366 | 83,689 | 48,440 | 6.3 | 20.8 | 18.2 |
| Innovation | 319 | 1,797 | 5,669 | 2,127 | 14,296 | 39,644 | 112,207 | 151,851 | 36,494 | 36,959 | 6.4 | 17.4 | 19.5 |
| Innovation | 312 | - | - | 6,155 | 10,636 | 8,201 | 165,560 | 173,762 | 14 | 117,871 | - | 19.2 | 28.2 |
| sum | | 12,559 | 42,564 | 20,213 | 132,169 | 348,395 | 1,199,674 | 1,548,069 | 318,675 | 397,831 | 7.5 | 19.7 | 24.7 |

**Table 4: 2040 Plus Project - Milpitas Metro MMSP - TAZ level VMT Forecasts**

| MMSP Subarea | MMSP TAZ | 2040PRO Households | 2040PRO Population | 2040PRO Jobs | 2040PRO ADT | 2040PRO VMT_P | 2040PRO VMT_A | 2040PRO VMT Total | 2040PRO VMT_HH | 2040PRO VMT_Jobs | 2040PRO VMT/Cap | 2040PRO VMT/Job | 2040PRO VMT/Service |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| McCandless - West | 253 | 1,607 | 5,856 | 66 | 8,541 | 48,246 | 37,930 | 86,176 | 47,781 | 2,962 | 8.2 | 44.9 | 14.6 |
| McCandless - Center | 254 | 1,234 | 4,408 | 939 | 10,065 | 39,912 | 78,505 | 118,417 | 39,088 | 20,335 | 8.9 | 21.7 | 22.1 |
| McCandless - East | 287 | 3,076 | 10,697 | 2,123 | 21,096 | 59,565 | 165,502 | 225,067 | 56,897 | 43,412 | 5.3 | 20.4 | 17.6 |
| Piper | 255 | 1,893 | 5,956 | 2,087 | 15,061 | 47,169 | 115,536 | 162,705 | 44,098 | 36,882 | 7.4 | 17.7 | 20.2 |
| Great Mall | 280 | 3,861 | 10,695 | 8,141 | 53,591 | 105,532 | 502,980 | 608,512 | 97,529 | 147,237 | 9.1 | 18.1 | 32.3 |
| Tango | 317 | 5,091 | 17,772 | 2,360 | 30,410 | 100,425 | 211,867 | 312,292 | 96,897 | 48,712 | 5.5 | 20.6 | 15.5 |
| Innovation | 319 | 2,797 | 8,824 | 7,967 | 25,625 | 65,985 | 248,483 | 314,468 | 56,110 | 107,217 | 6.4 | 13.5 | 18.7 |
| Innovation | 312 | - | - | 8,813 | 16,129 | 11,520 | 247,202 | 258,722 | 15 | 166,240 | - | 18.9 | 29.4 |
| sum | | 19,559 | 64,208 | 32,496 | 180,517 | 478,355 | 1,608,005 | 2,086,360 | 438,415 | 572,998 | 6.8 | 17.6 | 21.6 |
| Difference | PP - NP | 7,000 | 21,644 | 12,283 | 48,349 | 129,960 | 408,331 | 538,291 | 119,741 | 175,167 | (0.7) | (2.0) | (3.1) |
| | | | | | | | | 11.1 | | | | | |
| | | | | | | | | av trip length | | | | | |

**Project Mobile Emissions**

| | | | | | | | Running Exhaust Emission Factor (g/mi) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trip Type[1,2] | Vehicle Category | Annual Factor | Year | Average Daily Trips | Daily VMT Total | Trip Lenth (mi)[4] | ROG | NOX | CO | SOX | Fugitive PM10 | Exhaust PM10 | Total PM10 | Fugitive PM2.5 | Exhaust PM2.5 | Total PM2.5 | CO2 | CH4 | N2O |
| 2015 - Existing MMSP Area | EMFAC Fleet Mix | 260 | 2015 | 64,319 | 682,584 | 10.61 | 0.071 | 0.572 | 1.953 | 0.004 | 0.322 | 0.010 | 0.332 | 0.095 | 0.010 | 0.104 | 426.648 | 0.013 | 0.025 |
| 2040 - No Project MMSP Area | EMFAC Fleet Mix | 260 | 2040 | 132,169 | 1,548,069 | 11.71 | 0.008 | 0.065 | 0.483 | 0.003 | 0.322 | 0.001 | 0.323 | 0.080 | 0.001 | 0.082 | 288.836 | 0.003 | 0.011 |
| 2040 - Project MMSP Area | EMFAC Fleet Mix | 260 | 2040 | 180,517 | 2,086,360 | 11.56 | 0.008 | 0.065 | 0.483 | 0.003 | 0.322 | 0.001 | 0.323 | 0.080 | 0.001 | 0.082 | 288.836 | 0.003 | 0.011 |

1. Includes exhuast, non-process, and evaporative emissions.

**Project Mobile Emissions**

| | | | | | | | Non-Running Emission Factors (g/trip) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trip Type[1,2] | Vehicle Category | Annual Factor | Year | Average Daily Trips | Daily VMT Total | Trip Lenth (mi)[4] | ROG | NOX | CO | SOX | Fugitive PM10 | Exhaust PM10 | Total PM10 | Fugitive PM2.5 | Exhaust PM2.5 | Total PM2.5 | CO2 | CH4 | N2O |
| 2015 - Existing MMSP Area | EMFAC Fleet Mix | 260 | 2015 | 64,319 | 682,584 | 10.61 | 1.749 | 0.748 | 6.714 | 0.001 | 0.000 | 0.004 | 0.004 | 0.000 | 0.004 | 0.004 | 110.323 | 0.141 | 0.046 |
| 2040 - No Project MMSP Area | EMFAC Fleet Mix | 260 | 2040 | 132,169 | 1,548,069 | 11.71 | 0.576 | 0.359 | 1.907 | 0.001 | 0.000 | 0.001 | 0.001 | 0.000 | 0.001 | 0.001 | 76.184 | 0.039 | 0.027 |
| 2040 - Project MMSP Area | EMFAC Fleet Mix | 260 | 2040 | 180,517 | 2,086,360 | 11.56 | 0.576 | 0.359 | 1.907 | 0.001 | 0.000 | 0.001 | 0.001 | 0.000 | 0.001 | 0.001 | 76.184 | 0.039 | 0.027 |

1. Includes exhuast, non-process, and evaporative emissions.

**Project Mobile Emissions**

| | | | | | | | Emissions (lb/day) | | | | | | | | | | | | Emissions (MT/day) | | | | Emissions (MT/year) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trip Type[1,2] | Vehicle Category | Annual Factor | Year | Average Daily Trips | Daily VMT Total | Trip Lenth (mi)[4] | ROG | NOX | CO | SOX | Fugitive PM10 | Exhaust PM10 | Total PM10 | Fugitive PM2.5 | Exhaust PM2.5 | Total PM2.5 | CO2 | CH4 | N2O | CO2 | CH4 | N2O | $CO_2e$ | CO2 | CH4 | N2O | $CO_2e$ |
| 2015 - Existing MMSP Area | EMFAC Fleet Mix | 260 | 2015 | 64,319 | 682,584 | 10.61 | 355.47 | 966.37 | 3890.36 | 6.44 | 484.41 | 16.19 | 500.60 | 142.33 | 15.39 | 157.72 | 657,684.24 | 40.06 | 44.33 | 298.32 | 0.02 | 0.02 | 304.77 | 77,563.44 | 4.72 | 5.23 | 79,239.56 |
| 2040 - No Project MMSP Area | EMFAC Fleet Mix | 260 | 2040 | 132,169 | 1,548,069 | 11.71 | 194.14 | 326.32 | 2205.35 | 9.83 | 1097.37 | 5.15 | 1102.52 | 274.67 | 4.86 | 279.52 | 1,007,972.82 | 22.18 | 46.17 | 457.21 | 0.01 | 0.02 | 463.70 | 118,874.42 | 2.62 | 5.45 | 120,562.53 |
| 2040 - Project MMSP Area | EMFAC Fleet Mix | 260 | 2040 | 180,517 | 2,086,360 | 11.56 | 264.69 | 441.68 | 2982.24 | 13.25 | 1478.94 | 6.95 | 1485.89 | 370.17 | 6.55 | 376.72 | 1,358,864.66 | 30.11 | 62.37 | 616.37 | 0.01 | 0.03 | 625.14 | 160,256.56 | 3.55 | 7.36 | 162,537.30 |

1. Includes exhuast, non-process, and evaporative emissions.

## Road Dust Emission Factors

**Daily Paved Road Dust EF[1]**

$$E_{ext} = [\, k\,(sL)^{0.91} \times (W)^{1.02} \,]$$

| | |
|---|---|
| $EF_{paved}$ | Annual or other long-term average emission factor in the same units as k |
| k | particle size multiplier for particle size range and units of interest |
| sL | road surface silt loading ($g/m^2$) |
| W | average weight (tons) of all the vehicles raveling the road (2.4 tons) |
| P | Number of "wet' days with at least 0.254 (0.01 in) of precipitation during the averaging period |
| N | Number of days in the averaging period (e.g. 365 for annual, 91 for seasonal, 30 for monthly) |

| **Parameters** | **PM10** | **PM2.5** |
|---|---|---|
| k $(g/VMT)^2$ | 0.99792 | 0.244944 |
| sL ($g/m^2$) | 0.1 | 0.1 |
| W (tons) | 2.4 | 2.4 |
| EF (g/mi) | 3.00E-01 | 7.36E-02 |

1) CalEEMod User's Guide, Appendix A, p. 29
2) AP42: Chapter 13: Miscellaneous Sources, 13.2.1 Paved Roads, Table 13.2.1-1

Appendix E

# Noise Data

# Construction Modeling Outputs

Demolition

| Source Data: | Maximum Sound Level (dBA) | Utilization Factor | Leq Sound Level (dBA) |
|---|---|---|---|
| **Construction Condition: Demolition** | | | |
| Source 1: Concrete saw - Sound level (dBA) at 50 feet = | 90 | 20% | 83.0 |
| Source 1: Tractor - Sound level (dBA) at 50 feet = | 84 | 40% | 80.0 |
| Source 1: Excavator - Sound level (dBA) at 50 feet = | 81 | 40% | 77.0 |
| Calculated Data: | | | |
| All Sources Combined - Lmax sound level (dBA) at 50 feet = | | | 91 |
| All Sources Combined - Leq sound level (dBA) at 50 feet = | | | 85 |

| Distance Between Source and Receiver (ft.) | Geometric Attenuation (dB) | Ground Effect Attenuation (dB) | Calculated Lmax Sound Level (dBA) | Calculated Leq Sound Level (dBA) |
|---|---|---|---|---|
| 15 | 10 | 0.0 | 102 | 96 |
| 25 | 6 | 0.0 | 97 | 91 |
| 50 | 0 | 0.0 | 91 | 85 |
| **100** | **-6** | **0.0** | **85** | **79** |
| 120 | -8 | 0.0 | 84 | 78 |
| 150 | -10 | 0.0 | 82 | 76 |
| 200 | -12 | 0.0 | 79 | 73 |
| 300 | -16 | 0.0 | 76 | 70 |
| 400 | -18 | 0.0 | 73 | 67 |
| 500 | -20 | 0.0 | 71 | 65 |
| 600 | -22 | 0.0 | 70 | 64 |
| 800 | -24 | 0.0 | 67 | 61 |
| 1000 | -26 | 0.0 | 65 | 59 |

Geometric attenuation based on 6 dB per doubling of distance.

Note: This calculation does not include the effects, if any, of local shielding from walls, topography or other barriers which may reduce sound levels further, or ground effect attenuation

Site Preparation

| Source Data: | Maximum Sound Level (dBA) | Utilization Factor | Leq Sound Level (dBA) |
|---|---|---|---|
| **Construction Condition: Site Preparation** | | | |
| Source 1: Backhoe - Sound level (dBA) at 50 feet = | 78 | 40% | 74.0 |
| Source 1: Dump truck - Sound level (dBA) at 50 feet = | 76 | 40% | 72.0 |
| Source 1: Excavator - Sound level (dBA) at 50 feet = | 81 | 40% | 77.0 |
| Calculated Data: | | | |
| All Sources Combined - Lmax sound level (dBA) at 50 feet = | | | 84 |
| All Sources Combined - Leq sound level (dBA) at 50 feet = | | | 80 |

| Distance Between Source and Receiver (ft.) | Geometric Attenuation (dB) | Ground Effect Attenuation (dB) | Calculated Lmax Sound Level (dBA) | Calculated Leq Sound Level (dBA) |
|---|---|---|---|---|
| 15 | 10 | 0.0 | 94 | 90 |
| 25 | 6 | 0.0 | 90 | 86 |
| 50 | 0 | 0.0 | 84 | 80 |
| **100** | **-6** | **0.0** | **78** | **74** |
| 120 | -8 | 0.0 | 76 | 72 |
| 150 | -10 | 0.0 | 74 | 70 |
| 200 | -12 | 0.0 | 72 | 68 |
| 300 | -16 | 0.0 | 68 | 64 |
| 400 | -18 | 0.0 | 66 | 62 |
| 500 | -20 | 0.0 | 64 | 60 |
| 600 | -22 | 0.0 | 62 | 58 |
| 800 | -24 | 0.0 | 60 | 56 |
| 1000 | -26 | 0.0 | 58 | 54 |

Geometric attenuation based on 6 dB per doubling of distance.

Note: This calculation does not include the effects, if any, of local shielding from walls, topography or other barriers which may reduce sound levels further, or ground effect attenuation

Grading

| Source Data: | Maximum Sound Level (dBA) | Utilization Factor | Leq Sound Level (dBA) |
|---|---|---|---|
| **Construction Condition: Grading** | | | |
| Source 1: Dozer - Sound level (dBA) at 50 feet = | 82 | 40% | 78.0 |
| Source 1: Grader - Sound level (dBA) at 50 feet = | 85 | 40% | 81.0 |
| Source 1: Compactor - Sound level (dBA) at 50 feet = | 83 | 20% | 76.0 |
| Calculated Data: | | | |
| All Sources Combined - Lmax sound level (dBA) at 50 feet = | | | 88 |
| All Sources Combined - Leq sound level (dBA) at 50 feet = | | | 84 |

| Distance Between Source and Receiver (ft.) | Geometric Attenuation (dB) | Ground Effect Attenuation (dB) | Calculated Lmax Sound Level (dBA) | Calculated Leq Sound Level (dBA) |
|---|---|---|---|---|
| 15 | 10 | 0.0 | 99 | 94 |
| 25 | 6 | 0.0 | 94 | 90 |
| 50 | 0 | 0.0 | 88 | 84 |
| **100** | **-6** | **0.0** | **82** | **78** |
| 120 | -8 | 0.0 | 81 | 76 |
| 150 | -10 | 0.0 | 79 | 74 |
| 200 | -12 | 0.0 | 76 | 72 |
| 300 | -16 | 0.0 | 73 | 68 |
| 400 | -18 | 0.0 | 70 | 66 |
| 500 | -20 | 0.0 | 68 | 64 |
| 600 | -22 | 0.0 | 67 | 62 |
| 800 | -24 | 0.0 | 64 | 60 |
| 1000 | -26 | 0.0 | 62 | 58 |

Geometric attenuation based on 6 dB per doubling of distance.

Note: This calculation does not include the effects, if any, of local shielding from walls, topography or other barriers which may reduce sound levels further, or ground effect attenuation

Building and Utilities

| Source Data: | Maximum Sound Level (dBA) | Utilization Factor | Leq Sound Level (dBA) |
|---|---|---|---|
| **Construction Condition: Building and Utilities** | | | |
| Source 1: Crane - Sound level (dBA) at 50 feet = | 81 | 16% | 73.0 |
| Source 1: Forkliftc - Sound level (dBA) at 50 feet = | 84 | 40% | 80.0 |
| Source 1: Concrete pump truck - Sound level (dBA) at 50 fe | 81 | 20% | 74.0 |
| Calculated Data: | | | |
| All Sources Combined - Lmax sound level (dBA) at 50 feet = | | | 87 |
| All Sources Combined - Leq sound level (dBA) at 50 feet = | | | 82 |

| Distance Between Source and Receiver (ft.) | Geometric Attenuation (dB) | Ground Effect Attenuation (dB) | Calculated Lmax Sound Level (dBA) | Calculated Leq Sound Level (dBA) |
|---|---|---|---|---|
| 15 | 10 | 0.0 | 97 | 92 |
| 25 | 6 | 0.0 | 93 | 88 |
| 50 | 0 | 0.0 | 87 | 82 |
| **100** | **-6** | **0.0** | **81** | **76** |
| 120 | -8 | 0.0 | 79 | 74 |
| 150 | -10 | 0.0 | 77 | 72 |
| 200 | -12 | 0.0 | 75 | 70 |
| 300 | -16 | 0.0 | 71 | 66 |
| 400 | -18 | 0.0 | 69 | 64 |
| 500 | -20 | 0.0 | 67 | 62 |
| 600 | -22 | 0.0 | 65 | 60 |
| 800 | -24 | 0.0 | 63 | 58 |
| 1000 | -26 | 0.0 | 61 | 56 |

Geometric attenuation based on 6 dB per doubling of distance.

Note: This calculation does not include the effects, if any, of local shielding from walls, topography or other barriers which may reduce sound levels further, or ground effect attenuation

Architectural Coating

| Source Data: | Maximum Sound Level (dBA) | Utilization Factor | Leq Sound Level (dBA) |
|---|---|---|---|
| **Construction Condition: Arch Coating** | | | |
| Source 1: Air Compressor - Sound level (dBA) at 50 feet = | 78 | 40% | 74.0 |
| Source 1: Air Compressor - Sound level (dBA) at 50 feet = | 78 | 40% | 74.0 |
| Calculated Data: | | | |
| All Sources Combined - Lmax sound level (dBA) at 50 feet = | | | 81 |
| All Sources Combined - Leq sound level (dBA) at 50 feet = | | | 77 |

| Distance Between Source and Receiver (ft.) | Geometric Attenuation (dB) | Ground Effect Attenuation (dB) | Calculated Lmax Sound Level (dBA) | Calculated Leq Sound Level (dBA) |
|---|---|---|---|---|
| 15 | 10 | 0.0 | 91 | 87 |
| 25 | 6 | 0.0 | 87 | 83 |
| 50 | 0 | 0.0 | 81 | 77 |
| **100** | **-6** | **0.0** | **75** | **71** |
| 120 | -8 | 0.0 | 73 | 69 |
| 150 | -10 | 0.0 | 71 | 67 |
| 200 | -12 | 0.0 | 69 | 65 |
| 300 | -16 | 0.0 | 65 | 61 |
| 400 | -18 | 0.0 | 63 | 59 |
| 500 | -20 | 0.0 | 61 | 57 |
| 600 | -22 | 0.0 | 59 | 55 |
| 800 | -24 | 0.0 | 57 | 53 |
| 1000 | -26 | 0.0 | 55 | 51 |

Geometric attenuation based on 6 dB per doubling of distance.

Note: This calculation does not include the effects, if any, of local shielding from walls, topography or other barriers which may reduce sound levels further, or ground effect attenuation

Paving

| Source Data: | Maximum Sound Level (dBA) | Utilization Factor | Leq Sound Level (dBA) |
|---|---|---|---|
| **Construction Condition: Paving** | | | |
| Source 1: Roller - Sound level (dBA) at 50 feet = | 80 | 20% | 73.0 |
| Source 1: Paver - Sound level (dBA) at 50 feet = | 77 | 50% | 74.0 |
| Source 1: Paver - Sound level (dBA) at 50 feet = | 77 | 50% | 74.0 |
| Calculated Data: | | | |
| All Sources Combined - Lmax sound level (dBA) at 50 feet = | | | 83 |
| All Sources Combined - Leq sound level (dBA) at 50 feet = | | | 78 |

| Distance Between Source and Receiver (ft.) | Geometric Attenuation (dB) | Ground Effect Attenuation (dB) | Calculated Lmax Sound Level (dBA) | Calculated Leq Sound Level (dBA) |
|---|---|---|---|---|
| 15 | 10 | 0.0 | 93 | 89 |
| 25 | 6 | 0.0 | 89 | 84 |
| 50 | 0 | 0.0 | 83 | 78 |
| **100** | **-6** | **0.0** | **77** | **72** |
| 120 | -8 | 0.0 | 75 | 71 |
| 150 | -10 | 0.0 | 73 | 69 |
| 200 | -12 | 0.0 | 71 | 66 |
| 300 | -16 | 0.0 | 67 | 63 |
| 400 | -18 | 0.0 | 65 | 60 |
| 500 | -20 | 0.0 | 63 | 58 |
| 600 | -22 | 0.0 | 61 | 57 |
| 800 | -24 | 0.0 | 59 | 54 |
| 1000 | -26 | 0.0 | 57 | 52 |

Geometric attenuation based on 6 dB per doubling of distance.

Note: This calculation does not include the effects, if any, of local shielding from walls, topography or other barriers which may reduce sound levels further, or ground effect attenuation

# Traffic Noise Modeling

## Traffic Noise Modeling Summary, All Conditions

| Roadway | Segment | Existing[a] Ldn (dBA) | Year 2040 No Project Ldn (dBA) | Year 2040 Plus Project Ldn (dBA) | Year 2040 No Project to year 2040 Plus Project Noise Increase dB |
|---|---|---|---|---|---|
| Centre Pointe Drive | South of Great Mall Parkway | 49.7 | 63.6 | 64.2 | 0.6 |
| Dempsey Road | North of Landess Avenue | 62.8 | 64.3 | 64.4 | 0.1 |
| Fairlane Drive | North of Great Mall Parkway | 60.3 | 61.1 | 61.4 | 0.3 |
| Great Mall Parkway | East of Centre Point Drive/Mustang Drive | 69.0 | 70.0 | 70.0 | 0.0 |
| Great Mall Parkway | East of McCandless Drive/Fairlane Drive | 68.4 | 70.2 | 70.6 | 0.5 |
| Great Mall Parkway | East of Montague Expressway | 70.5 | 71.3 | 71.2 | -0.1 |
| Great Mall Parkway | East of South Abel Street | 68.3 | 69.2 | 69.7 | 0.5 |
| Great Mall Parkway | East of South Main Street | 68.9 | 71.0 | 71.1 | 0.1 |
| Great Mall Parkway | West of Centre Pointe Drive/Mustang Drive | 68.4 | 70.2 | 70.7 | 0.5 |
| Great Mall Parkway | West of McCandless Drive/Fairlane Drive | 69.0 | 71.0 | 71.2 | 0.2 |
| Great Mall Parkway | West of Montague Expressway | 69.5 | 70.2 | 70.3 | 0.0 |
| Great Mall Parkway | West of South Abel Street | 69.3 | 70.1 | 70.1 | 0.0 |
| Great Mall Parkway | West of South Main Street | 68.2 | 69.0 | 69.6 | 0.6 |
| I680 NB Off Ramp | South of Landess Avenue | 61.7 | 63.7 | 64.0 | 0.3 |
| I880 NB Ramps | South of Tasnman Drive/GMP | 67.0 | 68.3 | 67.9 | -0.4 |
| I880 SB Off Ramp | North of Tasman Drive/GMP | 63.9 | 64.2 | 64.1 | -0.1 |
| I880 SB On Ramp | South of Tasnman Drive/GMP | 64.5 | 64.8 | 64.8 | 0.0 |
| Landess Avenue | East of Dempsey Road/ I680 NB Off Ramp | 70.2 | 70.5 | 70.6 | 0.1 |
| Landess Avenue | West of Dempsey Road/ I680 NB Off Ramp | 69.1 | 69.7 | 70.0 | 0.3 |
| McCandless Drive | North of Montague Expressway | 58.8 | 62.2 | 61.7 | -0.5 |
| McCandless Drive | South of Great Mall Parkway | 58.4 | 61.0 | 60.0 | -1.0 |
| McCarthy Boulevard | North of Montague Expressway | 66.4 | 70.1 | 70.1 | -0.1 |
| Montague Expressway | East of McCandless Drive/Trade Zone Boulevard | 72.3 | 74.5 | 74.5 | 0.0 |
| Montague Expressway | East of McCarthy Boulevard/O'Toole Avenue | 75.1 | 75.6 | 75.7 | 0.1 |
| Montague Expressway | East of South Main Street/Oakland Road | 74.4 | 75.3 | 75.6 | 0.3 |
| Montague Expressway | East of South Milpitas Boulevard | 71.2 | 72.2 | 72.4 | 0.2 |
| Montague Expressway | North of Great Mall Parkway | 71.6 | 73.3 | 73.9 | 0.6 |
| Montague Expressway | South of Great Mall Parkway | 68.4 | 71.7 | 72.1 | 0.4 |
| Montague Expressway | West of McCandless Drive/Trade Zone Boulevard | 74.1 | 75.1 | 75.5 | 0.4 |
| Montague Expressway | West of McCarthy Bloulevard/O'Toole Avenue | 75.1 | 76.1 | 76.2 | 0.1 |
| Montague Expressway | West of South Main Street/Oakland Road | 75.5 | 76.0 | 76.0 | 0.1 |
| Montague Expressway | West of South Milpitas Boulevard | 71.5 | 72.8 | 72.4 | -0.4 |
| Mustang Drive | North of Great Mall Parkway | 58.7 | 60.9 | 60.4 | -0.4 |
| Oakland Road | South of Montague Expressway | 67.5 | 71.5 | 71.6 | 0.1 |
| O'Toole Avenue | South of Montague Expressway | 63.1 | 65.9 | 66.0 | 0.1 |
| South Abel Street | North of Great Mall Parkway | 66.8 | 70.1 | 70.1 | 0.0 |
| South Abel Street | South of Great Mall Parkway | 66.3 | 69.5 | 69.6 | 0.1 |
| South Main Street | North of Great Mall Parkway | 64.6 | 68.2 | 68.9 | 0.8 |
| South Main Street | North of Montague Expressway | 66.6 | 69.9 | 69.4 | -0.4 |
| South Main Street | South of Great Mall Parkway | 62.7 | 66.2 | 66.0 | -0.3 |
| South Milpitas Boulevard | North of Montague Expressway | 63.8 | 70.1 | 69.9 | -0.2 |
| South Milpitas Boulevard | South of Montague Expressway | 44.5 | 69.2 | 68.8 | -0.4 |
| Tasman Drive/GMP | East of I880 SB Ramps | 69.9 | 70.4 | 70.6 | 0.1 |
| Tasman Drive/GMP | East of Thompson Street | 69.1 | 69.9 | 70.0 | 0.1 |
| Tasman Drive/GMP | West of I880 SB Ramps | 70.5 | 71.1 | 71.2 | 0.1 |
| Tasman Drive/GMP | West of Thompson Street | 69.5 | 70.0 | 70.3 | 0.2 |
| Thompson Street | North of Tasman Drive/GMP | 61.2 | 63.1 | 63.5 | 0.5 |
| Trade Zone Boulevard | South of Montague Expressway | 68.2 | 69.9 | 69.4 | -0.5 |

[a] Existing = Year 2017 (Prior to the 2020 Coronovirus Pandemic)

All Segments modeled at a fixed distance of 50 feet from the roadway centerline

## More detailed Traffic Noise Assessment for Impacted Segments

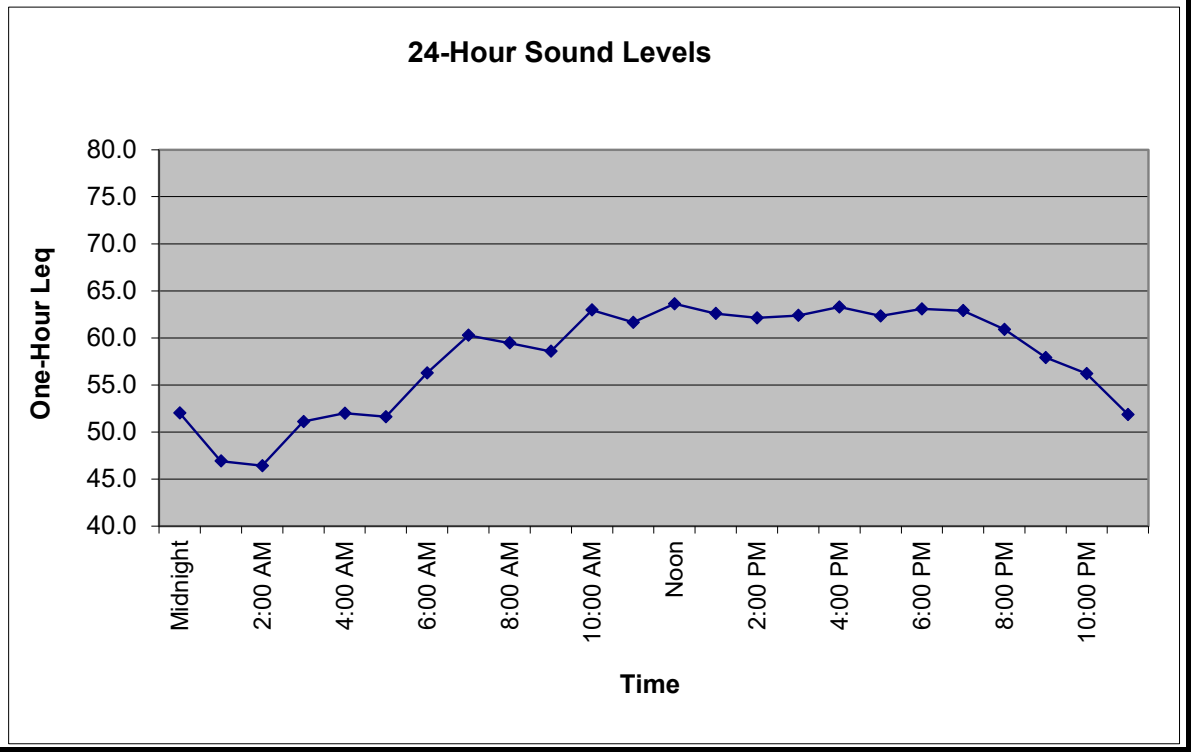
| Roadway | Segment | Year 2040 No Project (dBA Ldn) | Year 2040 Plus Project (dBA Ldn) | Project-related increase (dB) | Most Sensitive Adjacent Land Uses | Applicable Compatability Standard (dBA Ldn) | Exceeds Compatability Standard? | Allowable Increase (dB) | Exceeds Allowable Increase? |
|---|---|---|---|---|---|---|---|---|---|
| Centre Pointe Drive | South of Great Mall Parkway | 63.6 | 64.2 | 0.6 | MFR | 65 | No | 5 | **No** |

# Noise Appendix

## Long Term Measurement Data

# Ldn/CNEL Calculation Spreadsheet

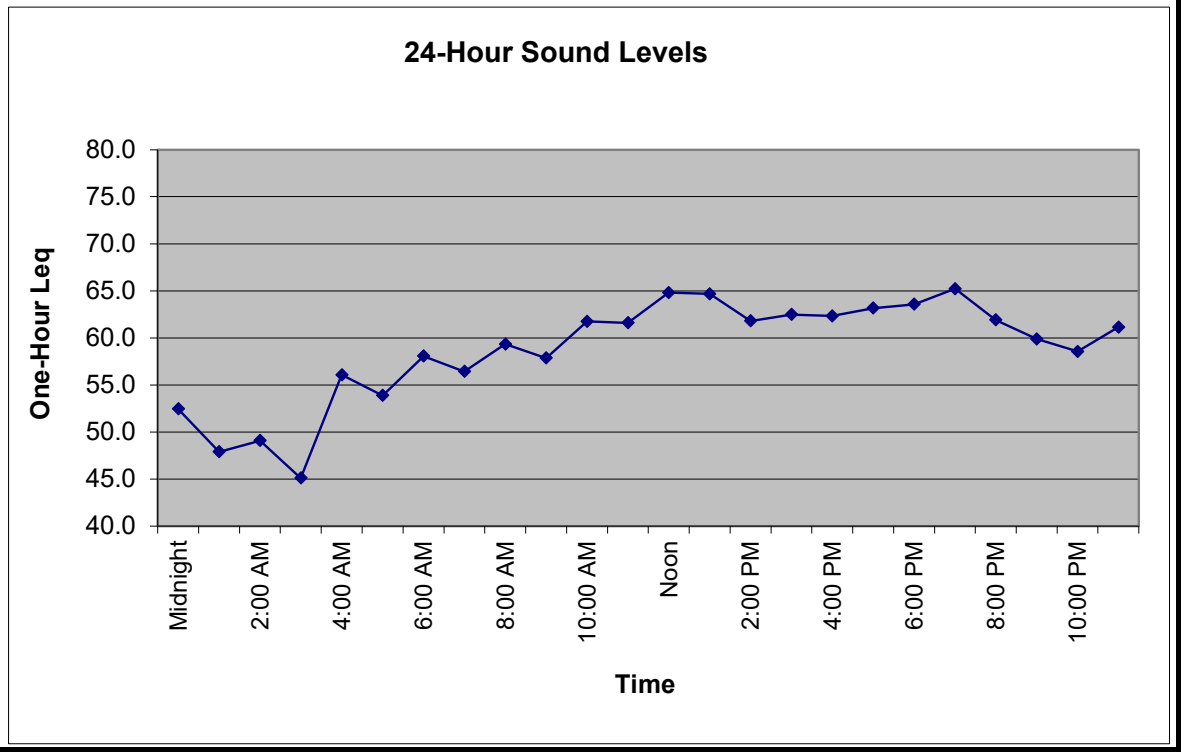
| Project: | | Milpitas TASP | | Date: | 9/14/2021 | Analyst: | Schumaker, N | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | LT-1 | | | | | | | | |
| Time | Tuesday 9/14/2021 | Leq(24) | Ldn | CNEL | Worst Hour Leq | Ldn minus Worst Hour Leq | CNEL minus Ldn | Day |
| Midnight | 52.0 | 60.2 | 62.2 | 63.0 | 63.6 | -1.4 | 0.8 | Evening |
| 1:00 AM | 46.9 | | 2.0 | 2.8 | | | | Night |
| 2:00 AM | 46.4 | | | | | | | |
| 3:00 AM | 51.1 | | | | | | | |
| 4:00 AM | 52.0 | | | | | | | |
| 5:00 AM | 51.6 | | | | | | | |
| 6:00 AM | 56.3 | | | | | | | |
| 7:00 AM | 60.3 | | | | | | | |
| 8:00 AM | 59.4 | | | | | | | |
| 9:00 AM | 58.6 | | | | | | | |
| 10:00 AM | 63.0 | | | | | | | |
| 11:00 AM | 61.7 | | | | | | | |
| Noon | 63.6 | | | | | | | |
| 1:00 PM | 62.6 | | | | | | | |
| 2:00 PM | 62.1 | | | | | | | |
| 3:00 PM | 62.4 | | | | | | | |
| 4:00 PM | 63.3 | | | | | | | |
| 5:00 PM | 62.3 | | | | | | | |
| 6:00 PM | 63.1 | | | | | | | |
| 7:00 PM | 62.9 | | | | | | | |
| 8:00 PM | 60.9 | | | | | | | |
| 9:00 PM | 57.9 | | | | | | | |
| 10:00 PM | 56.2 | | | | | | | |
| 11:00 PM | 51.9 | | | | | | | |




| | |
|---|---|
| Ldn | 62.2 |
| Worst Hour Leq | 63.6 |
| Lowest Hour LEQ | 46.4 |
| 12-hour Leq | 62.1 |

# Ldn/CNEL Calculation Spreadsheet

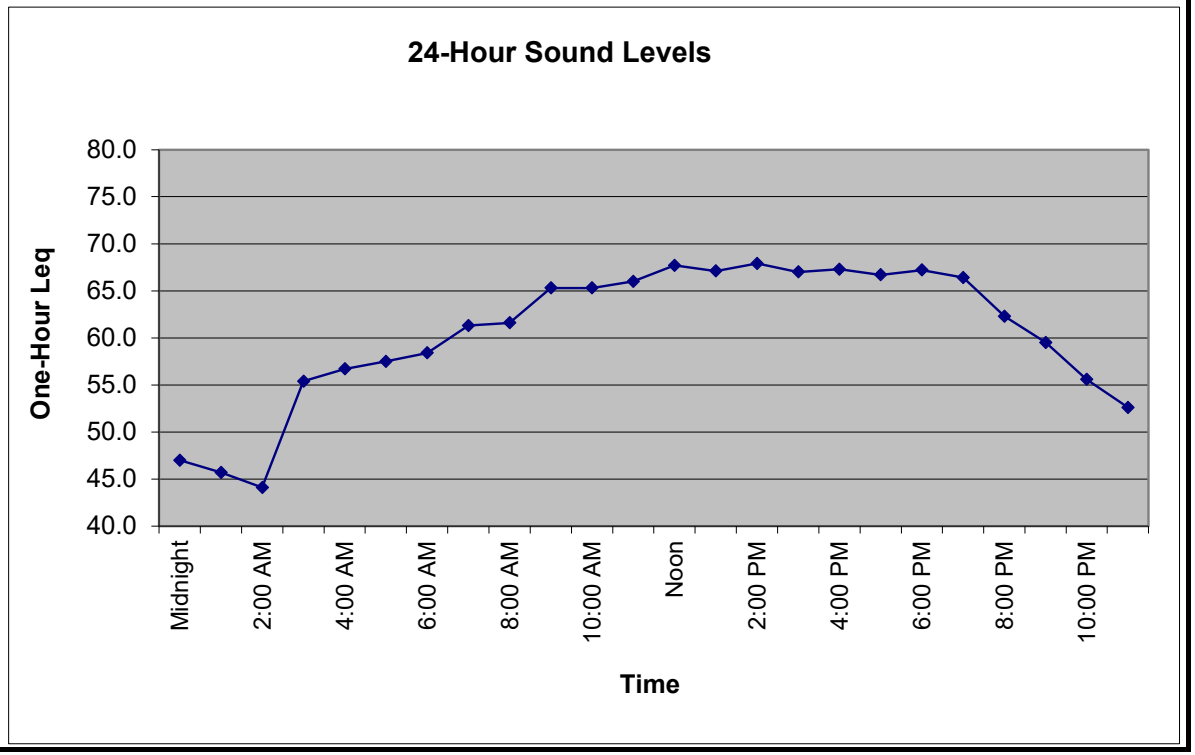
| Project: | | Milpitas TASP | | Date: | 9/15/2021 | Analyst: | Schumaker, N | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | LT-1 | | | | | | | | |
| Time | Wednesday 9/15/2021 | Leq(24) | Ldn | CNEL | Worst Hour Leq | Ldn minus Worst Hour Leq | CNEL minus Ldn | Day |
| Midnight | 52.4 | 60.9 | 64.2 | 65.0 | 65.2 | -1.1 | 0.8 | Evening |
| 1:00 AM | 47.9 | | 7.7 | 8.5 | | | | Night |
| 2:00 AM | 49.1 | | | | | | | |
| 3:00 AM | 45.1 | | | | | | | |
| 4:00 AM | 56.1 | | | | | | | |
| 5:00 AM | 53.9 | | | | | | | |
| 6:00 AM | 58.1 | | | | | | | |
| 7:00 AM | 56.4 | | | | | | | |
| 8:00 AM | 59.3 | | | | | | | |
| 9:00 AM | 57.9 | | | | | | | |
| 10:00 AM | 61.8 | | | | | | | |
| 11:00 AM | 61.6 | | | | | | | |
| Noon | 64.8 | | | | | | | |
| 1:00 PM | 64.7 | | | | | | | |
| 2:00 PM | 61.8 | | | | | | | |
| 3:00 PM | 62.5 | | | | | | | |
| 4:00 PM | 62.3 | | | | | | | |
| 5:00 PM | 63.2 | | | | | | | |
| 6:00 PM | 63.6 | | | | | | | |
| 7:00 PM | 65.2 | | | | | | | |
| 8:00 PM | 61.9 | | | | | | | |
| 9:00 PM | 59.9 | | | | | | | |
| 10:00 PM | 58.6 | | | | | | | |
| 11:00 PM | 61.1 | | | | | | | |




| | |
|---|---|
| Ldn | 64.2 |
| Worst Hour Leq | 65.2 |
| Lowest Hour LEQ | 45.1 |
| 12-hour Leq | 62.3 |

# Ldn/CNEL Calculation Spreadsheet

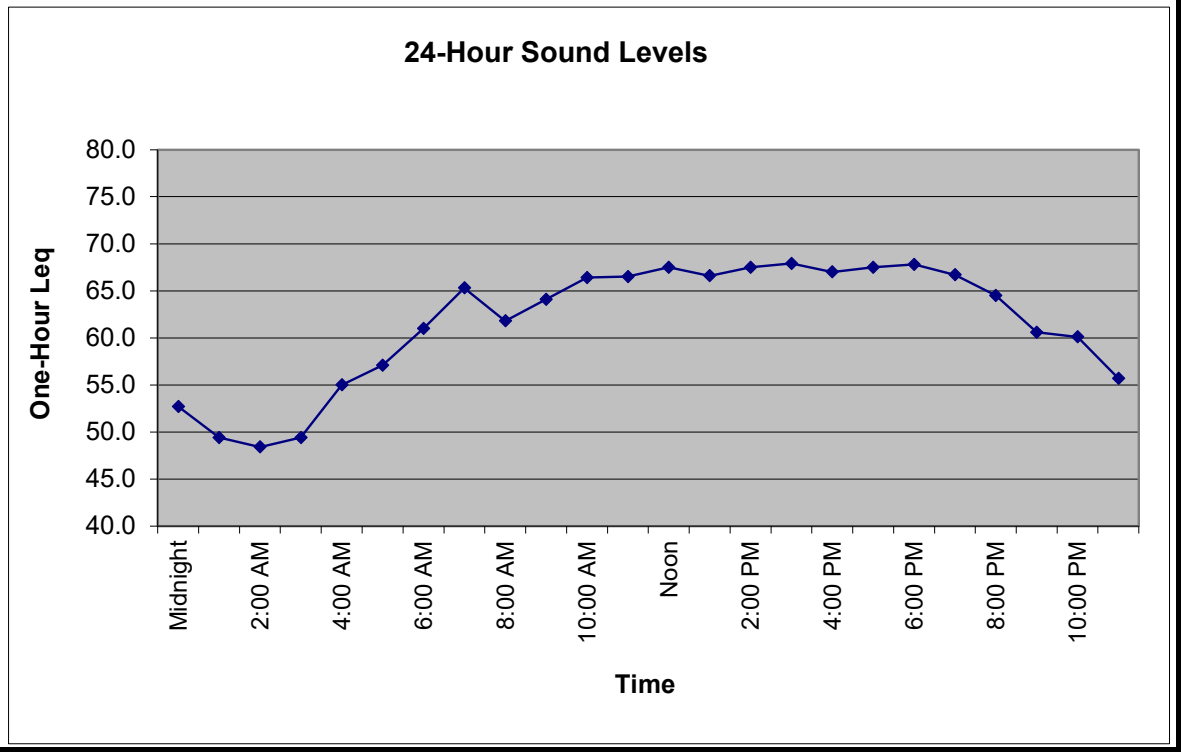
| Project: | | Milpitas TASP | | Date: | 9/14/2021 | Analyst: | Schumaker, N | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | LT-2 | | | | | | | | |
| | Tuesday | | | | | Worst Hour | Ldn minus | CNEL minus | |
| Time | 9/14/2021 | Leq(24) | Ldn | CNEL | | Leq | Worst Hour Leq | Ldn | Day |
| Midnight | 47.0 | 64.0 | 65.5 | 66.2 | | 67.9 | -2.4 | 0.7 | Evening |
| 1:00 AM | 45.7 | | 4.2 | 4.9 | | | | | Night |
| 2:00 AM | 44.1 | | | | | | | | |
| 3:00 AM | 55.4 | | | | | | | | |
| 4:00 AM | 56.7 | | | | | | | | |
| 5:00 AM | 57.5 | | | | | | | | |
| 6:00 AM | 58.4 | | | | | | | | |
| 7:00 AM | 61.3 | | | | | | | | |
| 8:00 AM | 61.6 | | | | | | | | |
| 9:00 AM | 65.3 | | | | | | | | |
| 10:00 AM | 65.3 | | | | | | | | |
| 11:00 AM | 66.0 | | | | | | | | |
| Noon | 67.7 | | | | | | | | |
| 1:00 PM | 67.1 | | | | | | | | |
| 2:00 PM | 67.9 | | | | | | | | |
| 3:00 PM | 67.0 | | | | | | | | |
| 4:00 PM | 67.3 | | | | | | | | |
| 5:00 PM | 66.7 | | | | | | | | |
| 6:00 PM | 67.2 | | | | | | | | |
| 7:00 PM | 66.4 | | | | | | | | |
| 8:00 PM | 62.3 | | | | | | | | |
| 9:00 PM | 59.5 | | | | | | | | |
| 10:00 PM | 55.6 | | | | | | | | |
| 11:00 PM | 52.6 | | | | | | | | |




| | |
|---|---|
| Ldn | 65.5 |
| Worst Hour Leq | 67.9 |
| Lowest Hour LEQ | 44.1 |
| 12-hour Leq | 66.3 |

# Ldn/CNEL Calculation Spreadsheet

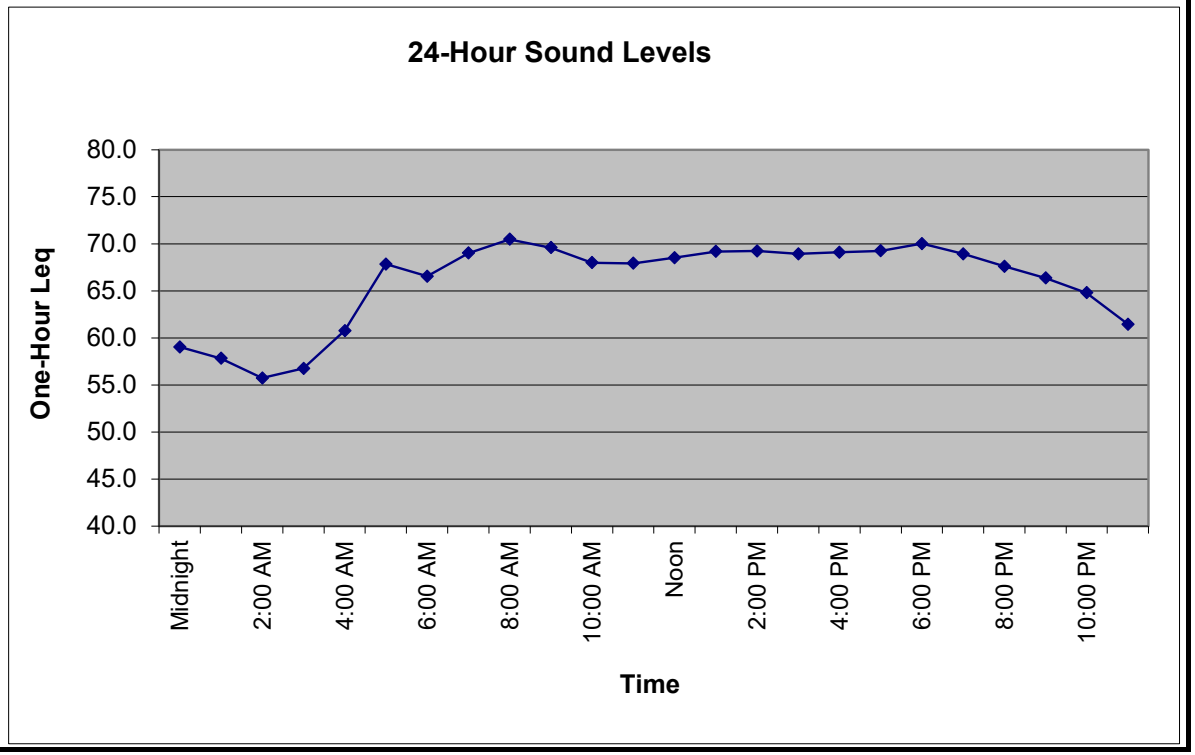
| Project: | | Milpitas TASP | | Date: | 9/15/2021 | Analyst: | Schumaker, N | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | LT-2 | | | | | | | | |
| Time | Wednesday 9/15/2021 | Leq(24) | Ldn | CNEL | Worst Hour Leq | Ldn minus Worst Hour Leq | CNEL minus Ldn | Day |
| Midnight | 52.7 | 64.5 | 66.3 | 67.0 | 67.9 | -1.6 | 0.7 | Evening |
| 1:00 AM | 49.4 | | 1.0 | 1.7 | | | | Night |
| 2:00 AM | 48.4 | | | | | | | |
| 3:00 AM | 49.4 | | | | | | | |
| 4:00 AM | 55.0 | | | | | | | |
| 5:00 AM | 57.1 | | | | | | | |
| 6:00 AM | 61.0 | | | | | | | |
| 7:00 AM | 65.3 | | | | | | | |
| 8:00 AM | 61.8 | | | | | | | |
| 9:00 AM | 64.1 | | | | | | | |
| 10:00 AM | 66.4 | | | | | | | |
| 11:00 AM | 66.5 | | | | | | | |
| Noon | 67.5 | | | | | | | |
| 1:00 PM | 66.6 | | | | | | | |
| 2:00 PM | 67.5 | | | | | | | |
| 3:00 PM | 67.9 | | | | | | | |
| 4:00 PM | 67.0 | | | | | | | |
| 5:00 PM | 67.5 | | | | | | | |
| 6:00 PM | 67.8 | | | | | | | |
| 7:00 PM | 66.7 | | | | | | | |
| 8:00 PM | 64.5 | | | | | | | |
| 9:00 PM | 60.6 | | | | | | | |
| 10:00 PM | 60.1 | | | | | | | |
| 11:00 PM | 55.7 | | | | | | | |




| | |
|---|---|
| Ldn | 66.3 |
| Worst Hour Leq | 67.9 |
| Lowest Hour LEQ | 48.4 |
| 12-hour Leq | 66.6 |

# Ldn/CNEL Calculation Spreadsheet

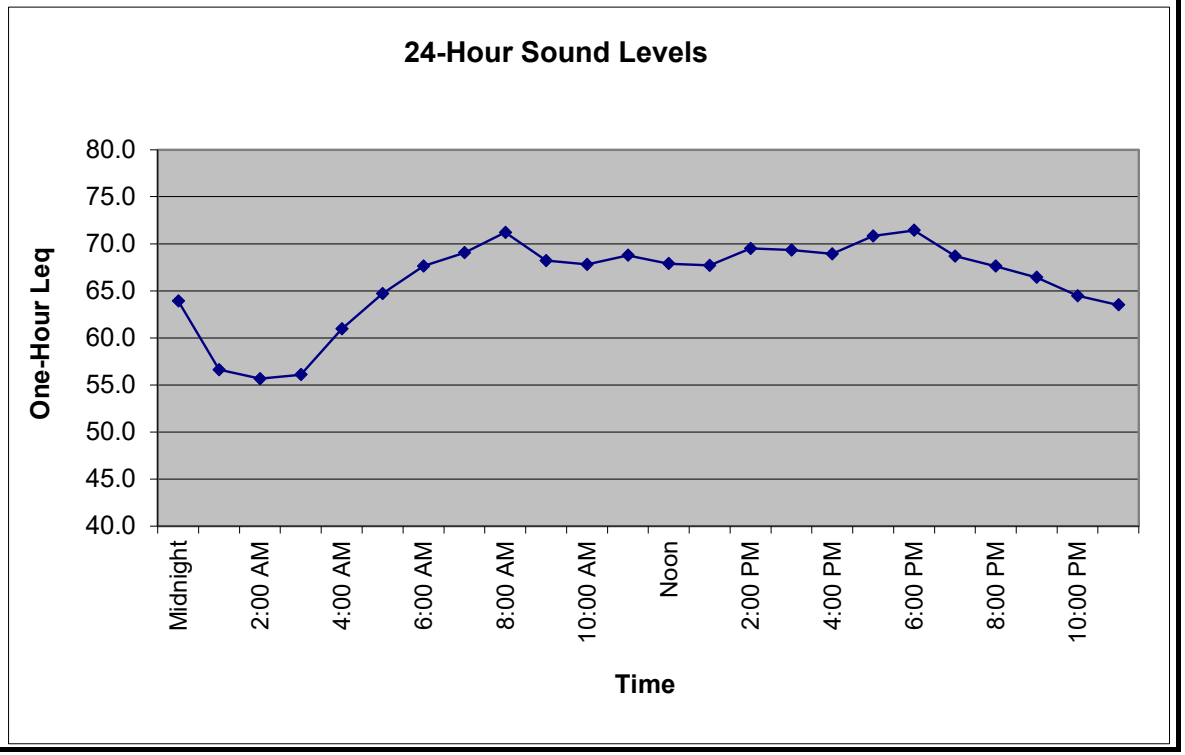
| Project: | | Milpitas TASP | | Date: | 9/14/2021 | Analyst: | Schumaker, N | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | LT-3 | | | | | | | | |
| | Tuesday | | | | | Worst Hour | Ldn minus | CNEL minus | |
| Time | 9/14/2021 | Leq(24) | Ldn | CNEL | | Leq | Worst Hour Leq | Ldn | Day |
| Midnight | 59.0 | 67.5 | 71.0 | 71.5 | | 70.5 | 0.5 | 0.5 | Evening |
| 1:00 AM | 57.8 | | 2.0 | 2.5 | | | | | Night |
| 2:00 AM | 55.7 | | | | | | | | |
| 3:00 AM | 56.7 | | | | | | | | |
| 4:00 AM | 60.8 | | | | | | | | |
| 5:00 AM | 67.8 | | | | | | | | |
| 6:00 AM | 66.5 | | | | | | | | |
| 7:00 AM | 69.0 | | | | | | | | |
| 8:00 AM | 70.5 | | | | | | | | |
| 9:00 AM | 69.6 | | | | | | | | |
| 10:00 AM | 68.0 | | | | | | | | |
| 11:00 AM | 67.9 | | | | | | | | |
| Noon | 68.5 | | | | | | | | |
| 1:00 PM | 69.2 | | | | | | | | |
| 2:00 PM | 69.2 | | | | | | | | |
| 3:00 PM | 68.9 | | | | | | | | |
| 4:00 PM | 69.1 | | | | | | | | |
| 5:00 PM | 69.2 | | | | | | | | |
| 6:00 PM | 70.0 | | | | | | | | |
| 7:00 PM | 68.9 | | | | | | | | |
| 8:00 PM | 67.6 | | | | | | | | |
| 9:00 PM | 66.4 | | | | | | | | |
| 10:00 PM | 64.8 | | | | | | | | |
| 11:00 PM | 61.4 | | | | | | | | |




| | |
|---|---|
| Ldn | 71.0 |
| Worst Hour Leq | 70.5 |
| Lowest Hour LEQ | 55.7 |
| 12-hour Leq | 69.2 |

# Ldn/CNEL Calculation Spreadsheet

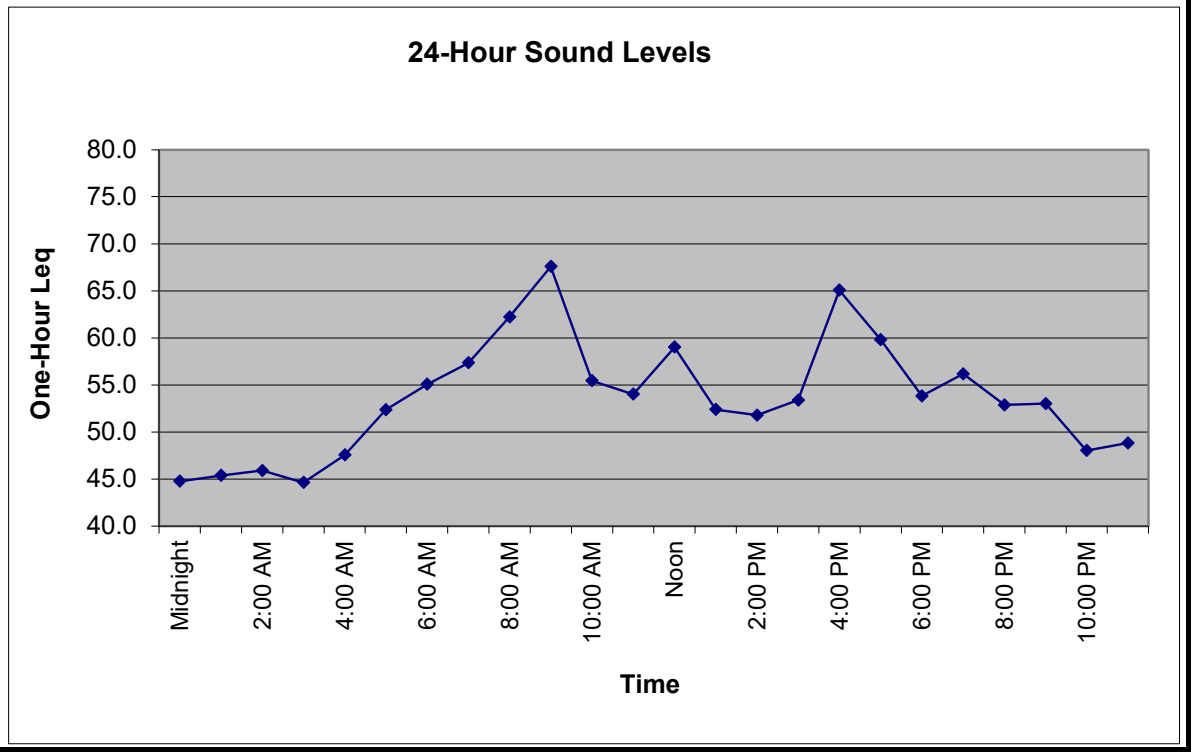
| Project: | | Milpitas TASP | | Date: | 9/15/2021 | Analyst: | Schumaker, N | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | LT-3 | | | | | | | | |
| Time | Wedneday 9/15/2021 | Leq(24) | Ldn | CNEL | Worst Hour Leq | Ldn minus Worst Hour Leq | CNEL minus Ldn | Day |
| Midnight | 63.9 | 67.7 | 71.1 | 71.6 | 71.4 | -0.3 | 0.5 | Evening |
| 1:00 AM | 56.6 | | 2.1 | 2.6 | | | | Night |
| 2:00 AM | 55.7 | | | | | | | |
| 3:00 AM | 56.1 | | | | | | | |
| 4:00 AM | 60.9 | | | | | | | |
| 5:00 AM | 64.7 | | | | | | | |
| 6:00 AM | 67.6 | | | | | | | |
| 7:00 AM | 69.0 | | | | | | | |
| 8:00 AM | 71.2 | | | | | | | |
| 9:00 AM | 68.2 | | | | | | | |
| 10:00 AM | 67.8 | | | | | | | |
| 11:00 AM | 68.8 | | | | | | | |
| Noon | 67.9 | | | | | | | |
| 1:00 PM | 67.7 | | | | | | | |
| 2:00 PM | 69.5 | | | | | | | |
| 3:00 PM | 69.3 | | | | | | | |
| 4:00 PM | 68.9 | | | | | | | |
| 5:00 PM | 70.8 | | | | | | | |
| 6:00 PM | 71.4 | | | | | | | |
| 7:00 PM | 68.7 | | | | | | | |
| 8:00 PM | 67.6 | | | | | | | |
| 9:00 PM | 66.4 | | | | | | | |
| 10:00 PM | 64.5 | | | | | | | |
| 11:00 PM | 63.5 | | | | | | | |




| | |
|---|---|
| Ldn | 71.1 |
| Worst Hour Leq | 71.4 |
| Lowest Hour LEQ | 55.7 |
| 12-hour Leq | 69.4 |

# Ldn/CNEL Calculation Spreadsheet

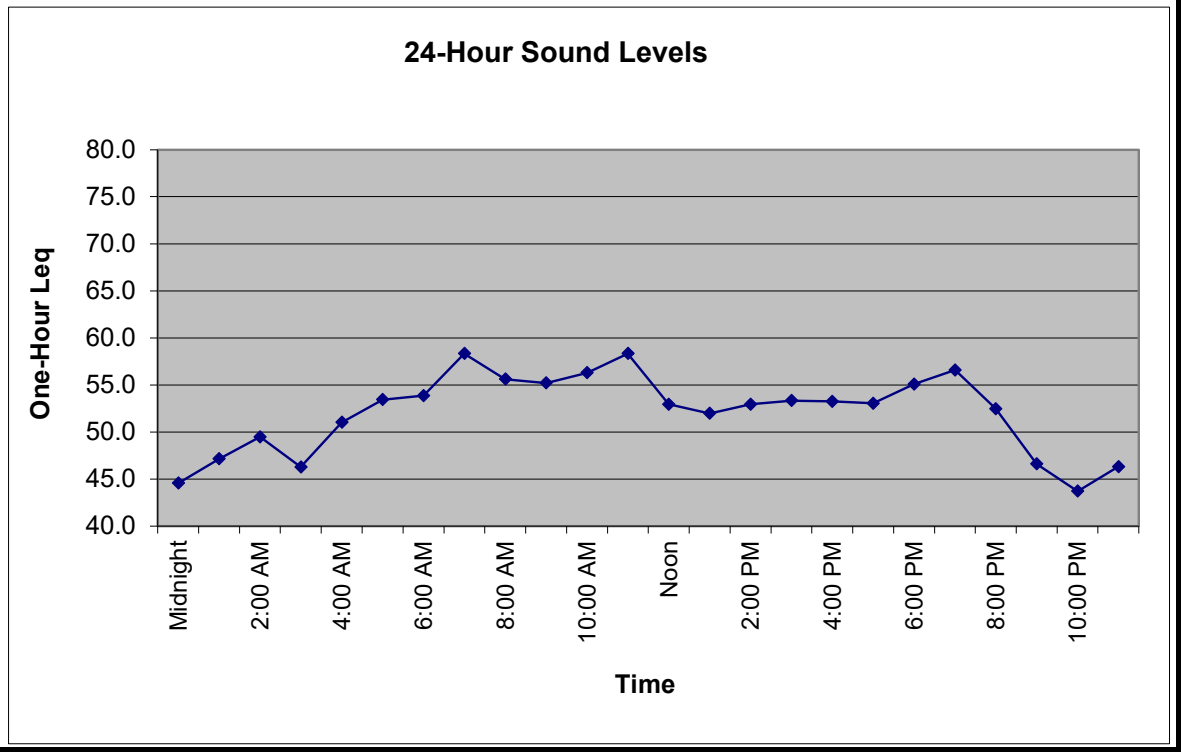
| Project: | | Milpitas TASP | | Date: | 9/14/2021 | Analyst: | Schumaker, N | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | LT-4 | | | | | | | | |
| | Tuesday | | | | | Worst Hour | Ldn minus | CNEL minus | |
| Time | 9/14/2021 | Leq(24) | Ldn | CNEL | | Leq | Worst Hour Leq | Ldn | Day |
| Midnight | 44.8 | 58.2 | 59.9 | 60.2 | | 67.6 | -7.7 | 0.3 | Evening |
| 1:00 AM | 45.4 | | 2.5 | 2.8 | | | | | Night |
| 2:00 AM | 45.9 | | | | | | | | |
| 3:00 AM | 44.6 | | | | | | | | |
| 4:00 AM | 47.6 | | | | | | | | |
| 5:00 AM | 52.4 | | | | | | | | |
| 6:00 AM | 55.1 | | | | | | | | |
| 7:00 AM | 57.3 | | | | | | | | |
| 8:00 AM | 62.2 | | | | | | | | |
| 9:00 AM | 67.6 | | | | | | | | |
| 10:00 AM | 55.4 | | | | | | | | |
| 11:00 AM | 54.0 | | | | | | | | |
| Noon | 59.0 | | | | | | | | |
| 1:00 PM | 52.4 | | | | | | | | |
| 2:00 PM | 51.8 | | | | | | | | |
| 3:00 PM | 53.4 | | | | | | | | |
| 4:00 PM | 65.1 | | | | | | | | |
| 5:00 PM | 59.8 | | | | | | | | |
| 6:00 PM | 53.8 | | | | | | | | |
| 7:00 PM | 56.2 | | | | | | | | |
| 8:00 PM | 52.9 | | | | | | | | |
| 9:00 PM | 53.0 | | | | | | | | |
| 10:00 PM | 48.0 | | | | | | | | |
| 11:00 PM | 48.8 | | | | | | | | |




| | |
|---|---|
| Ldn | 59.9 |
| Worst Hour Leq | 67.6 |
| Lowest Hour LEQ | 44.6 |
| 12-hour Leq | 60.8 |

# Ldn/CNEL Calculation Spreadsheet

| Project: | | Milpitas TASP | | Date: | 9/15/2021 | Analyst: | Schumaker, N | | |
|---|---|---|---|---|---|---|---|---|---|
| Location: | LT-4 | | | | | | | | |
| Time | Wednesday 9/15/2021 | Leq(24) | Ldn | CNEL | Worst Hour Leq | Ldn minus Worst Hour Leq | CNEL minus Ldn | Day |
| Midnight | 44.6 | 53.6 | 57.5 | 57.9 | 58.3 | -0.9 | 0.5 | Evening |
| 1:00 AM | 47.1 | | -0.9 | -0.4 | | | | Night |
| 2:00 AM | 49.5 | | | | | | | |
| 3:00 AM | 46.3 | | | | | | | |
| 4:00 AM | 51.0 | | | | | | | |
| 5:00 AM | 53.4 | | | | | | | |
| 6:00 AM | 53.9 | | | | | | | |
| 7:00 AM | 58.3 | | | | | | | |
| 8:00 AM | 55.6 | | | | | | | |
| 9:00 AM | 55.2 | | | | | | | |
| 10:00 AM | 56.3 | | | | | | | |
| 11:00 AM | 58.3 | | | | | | | |
| Noon | 52.9 | | | | | | | |
| 1:00 PM | 52.0 | | | | | | | |
| 2:00 PM | 52.9 | | | | | | | |
| 3:00 PM | 53.3 | | | | | | | |
| 4:00 PM | 53.2 | | | | | | | |
| 5:00 PM | 53.0 | | | | | | | |
| 6:00 PM | 55.1 | | | | | | | |
| 7:00 PM | 56.6 | | | | | | | |
| 8:00 PM | 52.5 | | | | | | | |
| 9:00 PM | 46.6 | | | | | | | |
| 10:00 PM | 43.7 | | | | | | | |
| 11:00 PM | 46.3 | | | | | | | |




| | |
|---|---|
| Ldn | 57.5 |
| Worst Hour Leq | 58.3 |
| Lowest Hour LEQ | 43.7 |
| 12-hour Leq | 55.2 |

# Noise Appendix

## Short Term Measurement Data

## ST-1 Summary

| | |
|---|---|
| **File Name on Meter** | LxT_Data.019.s |
| **File Name on PC** | LxT_0004004-20210914 132758-LxT_Data.019.ldbin |
| **Serial Number** | 0004004 |
| **Model** | SoundTrack LxT® |
| **Firmware Version** | 2.404 |
| **User** | |
| **Location** | |
| **Job Description** | |
| **Note** | |

### Measurement

| | |
|---|---|
| **Description** | |
| **Start** | 2021-09-14 13:27:58 |
| **Stop** | 2021-09-14 13:42:59 |
| **Duration** | 00:15:01.4 |
| **Run Time** | 00:15:01.4 |
| **Pause** | 00:00:00.0 |
| | |
| **Pre-Calibration** | 2021-09-14 13:24:30 |
| **Post-Calibration** | None |
| **Calibration Deviation** | --- |

### Overall Settings

| | |
|---|---|
| **RMS Weight** | A Weighting |
| **Peak Weight** | Z Weighting |
| **Detector** | Slow |
| **Preamplifier** | PRMLxT1L |
| **Microphone Correction** | Off |
| **Integration Method** | Linear |
| **Overload** | 123.4 dB |

| | **A** | **C** | **Z** |
|---|---|---|---|
| **Under Range Peak** | 80.0 | 77.0 | **82.0** dB |
| **Under Range Limit** | **24.5** | 25.8 | 32.2 dB |
| **Noise Floor** | 15.4 | 16.7 | 23.0 dB |

### Results

| | |
|---|---|
| **LAeq** | 56.2 |
| **LAE** | 85.7 |
| **EA** | 41.563 µPa²h |
| **EA8** | 1.328 mPa²h |
| **EA40** | 6.640 mPa²h |
| **LZpeak (max)** | 2021-09-14 13:34:09 93.0 dB |
| **LASmax** | 2021-09-14 13:34:08 71.1 dB |
| **LASmin** | 2021-09-14 13:28:03 40.4 dB |
| **SEA** | -99.9 dB |
| | |
| **LAS > 85.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |
| **LAS > 115.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |
| **LZpeak > 135.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |
| **LZpeak > 137.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |
| **LZpeak > 140.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |

| **Community Noise** | **Ldn** | **LDay 07:00-22:00** | **LNight 22:00-07:00** | **Lden** | **LDay 07:00-19:00** | **LEvening 19:00-22:00** |
|---|---|---|---|---|---|---|
| | 56.2 | 56.2 | -99.9 | 56.2 | 56.2 | -99.9 |

| | |
|---|---|
| **LCeq** | 66.5 dB |
| **LAeq** | 56.2 dB |
| **LCeq - LAeq** | 10.3 dB |
| **LALeq** | 58.0 dB |
| **LAeq** | 56.2 dB |
| **LALeq - LAeq** | 1.8 dB |

| | **A** | | **C** | | **Z** | |
|---|---|---|---|---|---|---|
| | **dB** | **Time Stamp** | **dB** | **Time Stamp** | **dB** | **Time Stamp** |
| **Leq** | 56.2 | | 66.5 | | | |
| **LS(max)** | 71.1 | 2021/09/14 13:34:08 | | | | |
| **LS(min)** | 40.4 | 2021/09/14 13:28:03 | | | | |
| **LPeak(max)** | | | | | 93.0 | 2021/09/14 13:34:09 |

| | |
|---|---|
| **Overload Count** | 0 |
| **Overload Duration** | 0.0 s |

### Dose Settings

| | | |
|---|---|---|
| **Dose Name** | OSHA-1 | OSHA-2 |
| **Exchange Rate** | 5 | 5 dB |
| **Threshold** | 90 | 80 dB |
| **Criterion Level** | 90 | 90 dB |
| **Criterion Duration** | 8 | 8 h |

| Results | | |
|---|---|---|
| **Dose** | -99.94 | -99.94 % |
| **Projected Dose** | -99.94 | -99.94 % |
| **TWA (Projected)** | -99.9 | -99.9 dB |
| **TWA (t)** | -99.9 | -99.9 dB |
| **Lep (t)** | 41.1 | 41.1 dB |

| Statistics | |
|---|---|
| **LA5.00** | 62.3 dB |
| **LA10.00** | 60.4 dB |
| **LA33.30** | 54.6 dB |
| **LA50.00** | 51.2 dB |
| **LA66.60** | 48.7 dB |
| **LA90.00** | 44.5 dB |

## ST-2 Summary

| | |
|---|---|
| **File Name on Meter** | LxT_Data.018.s |
| **File Name on PC** | LxT_0004004-20210914 124348-LxT_Data.018.ldbin |
| **Serial Number** | 0004004 |
| **Model** | SoundTrack LxT® |
| **Firmware Version** | 2.404 |
| **User** | |
| **Location** | |
| **Job Description** | |
| **Note** | |

### Measurement

| | |
|---|---|
| **Description** | |
| **Start** | 2021-09-14 12:43:48 |
| **Stop** | 2021-09-14 12:58:48 |
| **Duration** | 00:15:00.3 |
| **Run Time** | 00:15:00.3 |
| **Pause** | 00:00:00.0 |
| | |
| **Pre-Calibration** | 2021-09-14 12:39:15 |
| **Post-Calibration** | None |
| **Calibration Deviation** | --- |

### Overall Settings

| | |
|---|---|
| **RMS Weight** | A Weighting |
| **Peak Weight** | Z Weighting |
| **Detector** | Slow |
| **Preamplifier** | PRMLxT1L |
| **Microphone Correction** | Off |
| **Integration Method** | Linear |
| **Overload** | 123.4 dB |

| | **A** | **C** | **Z** |
|---|---|---|---|
| **Under Range Peak** | 80.0 | 77.0 | **82.0** dB |
| **Under Range Limit** | **24.5** | 25.8 | 32.2 dB |
| **Noise Floor** | 15.4 | 16.7 | 23.0 dB |

### Results

| | |
|---|---|
| **LAeq** | 62.6 |
| **LAE** | 92.1 |
| **EA** | 180.143 µPa²h |
| **EA8** | 5.763 mPa²h |
| **EA40** | 28.813 mPa²h |
| **LZpeak (max)** | 2021-09-14 12:51:55 100.4 dB |
| **LASmax** | 2021-09-14 12:47:27 77.0 dB |
| **LASmin** | 2021-09-14 12:55:48 46.2 dB |
| **SEA** | -99.9 dB |
| | |
| **LAS > 85.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |
| **LAS > 115.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |
| **LZpeak > 135.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |
| **LZpeak > 137.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |
| **LZpeak > 140.0 dB (Exceedance Counts / Duration)** | 0 0.0 s |

| **Community Noise** | **Ldn** | **LDay 07:00-22:00** | **LNight 22:00-07:00** | **Lden** | **LDay 07:00-19:00** | **LEvening 19:00-22:00** |
|---|---|---|---|---|---|---|
| | 62.6 | 62.6 | -99.9 | 62.6 | 62.6 | -99.9 |

| | |
|---|---|
| **LCeq** | 70.1 dB |
| **LAeq** | 62.6 dB |
| **LCeq - LAeq** | 7.5 dB |
| **LALeq** | 64.6 dB |
| **LAeq** | 62.6 dB |
| **LALeq - LAeq** | 2.1 dB |

| | **A** | | **C** | | **Z** | |
|---|---|---|---|---|---|---|
| | **dB** | **Time Stamp** | **dB** | **Time Stamp** | **dB** | **Time Stamp** |
| **Leq** | 62.6 | | 70.1 | | | |
| **LS(max)** | 77.0 | 2021/09/14 12:47:27 | | | | |
| **LS(min)** | 46.2 | 2021/09/14 12:55:48 | | | | |
| **LPeak(max)** | | | | | 100.4 | 2021/09/14 12:51:55 |

| | |
|---|---|
| **Overload Count** | 0 |
| **Overload Duration** | 0.0 s |

### Dose Settings

| | | |
|---|---|---|
| **Dose Name** | OSHA-1 | OSHA-2 |
| **Exchange Rate** | 5 | 5 dB |
| **Threshold** | 90 | 80 dB |
| **Criterion Level** | 90 | 90 dB |
| **Criterion Duration** | 8 | 8 h |

| Results | | | |
|---|---|---|---|
| **Dose** | -99.94 | -99.94 | % |
| **Projected Dose** | -99.94 | -99.94 | % |
| **TWA (Projected)** | -99.9 | -99.9 | dB |
| **TWA (t)** | -99.9 | -99.9 | dB |
| **Lep (t)** | 47.5 | 47.5 | dB |

| Statistics | | |
|---|---|---|
| **LA5.00** | 69.3 | dB |
| **LA10.00** | 67.5 | dB |
| **LA33.30** | 59.4 | dB |
| **LA50.00** | 56.0 | dB |
| **LA66.60** | 52.7 | dB |
| **LA90.00** | 48.9 | dB |

## ST-3 Summary

| | |
|---|---|
| **File Name on Meter** | LxT_Data.021.s |
| **File Name on PC** | LxT_0004004-20210914 142200-LxT_Data.021.ldbin |
| **Serial Number** | 0004004 |
| **Model** | SoundTrack LxT® |
| **Firmware Version** | 2.404 |
| **User** | |
| **Location** | |
| **Job Description** | |
| **Note** | |

### Measurement

| | |
|---|---|
| **Description** | |
| **Start** | 2021-09-14 14:22:00 |
| **Stop** | 2021-09-14 14:37:01 |
| **Duration** | 00:15:00.6 |
| **Run Time** | 00:15:00.6 |
| **Pause** | 00:00:00.0 |
| | |
| **Pre-Calibration** | 2021-09-14 14:00:34 |
| **Post-Calibration** | None |
| **Calibration Deviation** | --- |

### Overall Settings

| | |
|---|---|
| **RMS Weight** | A Weighting |
| **Peak Weight** | Z Weighting |
| **Detector** | Slow |
| **Preamplifier** | PRMLxT1L |
| **Microphone Correction** | Off |
| **Integration Method** | Linear |
| **Overload** | 123.4 dB |

| | **A** | **C** | **Z** |
|---|---|---|---|
| **Under Range Peak** | 80.0 | 77.0 | **82.0** dB |
| **Under Range Limit** | **24.5** | 25.8 | 32.2 dB |
| **Noise Floor** | 15.4 | 16.7 | 23.0 dB |

### Results

| | |
|---|---|
| **LAeq** | 51.7 |
| **LAE** | 81.2 |
| **EA** | 14.700 µPa²h |
| **EA8** | 470.082 µPa²h |
| **EA40** | 2.350 mPa²h |
| **LZpeak (max)** | 2021-09-14 14:30:55 93.0 dB |
| **LASmax** | 2021-09-14 14:31:43 62.8 dB |
| **LASmin** | 2021-09-14 14:25:05 44.8 dB |
| **SEA** | -99.9 dB |

| | | |
|---|---|---|
| **LAS > 85.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s |
| **LAS > 115.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s |
| **LZpeak > 135.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s |
| **LZpeak > 137.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s |
| **LZpeak > 140.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s |

| **Community Noise** | **Ldn** | **LDay 07:00-22:00** | **LNight 22:00-07:00** | **Lden** | **LDay 07:00-19:00** | **LEvening 19:00-22:00** |
|---|---|---|---|---|---|---|
| | 51.7 | 51.7 | -99.9 | 51.7 | 51.7 | -99.9 |

| | |
|---|---|
| **LCeq** | 63.2 dB |
| **LAeq** | 51.7 dB |
| **LCeq - LAeq** | 11.5 dB |
| **LALeq** | 53.4 dB |
| **LAeq** | 51.7 dB |
| **LALeq - LAeq** | 1.8 dB |

| | **A** | | **C** | | **Z** | |
|---|---|---|---|---|---|---|
| | **dB** | **Time Stamp** | **dB** | **Time Stamp** | **dB** | **Time Stamp** |
| **Leq** | 51.7 | | 63.2 | | | |
| **LS(max)** | 62.8 | 2021/09/14 14:31:43 | | | | |
| **LS(min)** | 44.8 | 2021/09/14 14:25:05 | | | | |
| **LPeak(max)** | | | | | 93.0 | 2021/09/14 14:30:55 |

| | |
|---|---|
| **Overload Count** | 0 |
| **Overload Duration** | 0.0 s |

### Dose Settings

| | | |
|---|---|---|
| **Dose Name** | OSHA-1 | OSHA-2 |
| **Exchange Rate** | 5 | 5 dB |
| **Threshold** | 90 | 80 dB |
| **Criterion Level** | 90 | 90 dB |
| **Criterion Duration** | 8 | 8 h |

| Results | | |
|---|---|---|
| **Dose** | -99.94 | -99.94 % |
| **Projected Dose** | -99.94 | -99.94 % |
| **TWA (Projected)** | -99.9 | -99.9 dB |
| **TWA (t)** | -99.9 | -99.9 dB |
| **Lep (t)** | 36.6 | 36.6 dB |

| Statistics | |
|---|---|
| **LA5.00** | 56.2 dB |
| **LA10.00** | 54.6 dB |
| **LA33.30** | 51.0 dB |
| **LA50.00** | 49.9 dB |
| **LA66.60** | 48.5 dB |
| **LA90.00** | 46.9 dB |

## ST-4 Summary

| | |
|---|---|
| **File Name on Meter** | LxT_Data.026.s |
| **File Name on PC** | LxT_0004004-20210916 140800-LxT_Data.026.ldbin |
| **Serial Number** | 0004004 |
| **Model** | SoundTrack LxT® |
| **Firmware Version** | 2.404 |
| **User** | |
| **Location** | |
| **Job Description** | |
| **Note** | |

### Measurement

| | |
|---|---|
| **Description** | |
| **Start** | 2021-09-16 14:08:00 |
| **Stop** | 2021-09-16 14:23:01 |
| **Duration** | 00:15:00.7 |
| **Run Time** | 00:15:00.7 |
| **Pause** | 00:00:00.0 |
| | |
| **Pre-Calibration** | 2021-09-16 14:01:40 |
| **Post-Calibration** | None |
| **Calibration Deviation** | --- |

### Overall Settings

| | |
|---|---|
| **RMS Weight** | A Weighting |
| **Peak Weight** | Z Weighting |
| **Detector** | Slow |
| **Preamplifier** | PRMLxT1L |
| **Microphone Correction** | Off |
| **Integration Method** | Linear |
| **Overload** | 123.5 dB |

| | **A** | **C** | **Z** |
|---|---|---|---|
| **Under Range Peak** | 80.1 | 77.1 | **82.1** dB |
| **Under Range Limit** | **24.6** | 25.9 | 32.3 dB |
| **Noise Floor** | 15.4 | 16.7 | 23.1 dB |

### Results

| | | | |
|---|---|---|---|
| **LAeq** | 59.4 | #REF! | *Note: Calculated Leq including the removal of 10 seconds of excessive noise due to a large moving truck |
| **LAE** | 88.9 | | |
| **EA** | 86.197 µPa²h | | |
| **EA8** | 2.756 mPa²h | | |
| **EA40** | 13.781 mPa²h | | |
| **LZpeak (max)** | 2021-09-16 14:09:34 | 106.3 dB | |
| **LASmax** | 2021-09-16 14:09:37 | 83.5 dB | |
| **LASmin** | 2021-09-16 14:13:39 | 42.4 dB | |
| **SEA** | -99.9 dB | | |
| | | | |
| **LAS > 85.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s | |
| **LAS > 115.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s | |
| **LZpeak > 135.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s | |
| **LZpeak > 137.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s | |
| **LZpeak > 140.0 dB (Exceedance Counts / Duration)** | 0 | 0.0 s | |

| **Community Noise** | **Ldn** | **LDay 07:00-22:00** | **LNight 22:00-07:00** | **Lden** | **LDay 07:00-19:00** | **LEvening 19:00-22:00** |
|---|---|---|---|---|---|---|
| | 59.4 | 59.4 | -99.9 | 59.4 | 59.4 | -99.9 |

| | | |
|---|---|---|
| **LCeq** | 66.9 dB | |
| **LAeq** | 59.4 dB | |
| **LCeq - LAeq** | 7.5 dB | |
| **LALeq** | 62.7 dB | |
| **LAeq** | 59.4 dB | |
| **LALeq - LAeq** | 3.3 dB | |

| | **A** | | **C** | | **Z** | |
|---|---|---|---|---|---|---|
| | **dB** | **Time Stamp** | **dB** | **Time Stamp** | **dB** | **Time Stamp** |
| **Leq** | 59.4 | | 66.9 | | | |
| **LS(max)** | 83.5 | 2021/09/16 14:09:37 | | | | |
| **LS(min)** | 42.4 | 2021/09/16 14:13:39 | | | | |
| **LPeak(max)** | | | | | 106.3 | 2021/09/16 14:09:34 |

| | |
|---|---|
| **Overload Count** | 0 |
| **Overload Duration** | 0.0 s |

### Dose Settings

| | | |
|---|---|---|
| **Dose Name** | OSHA-1 | OSHA-2 |
| **Exchange Rate** | 5 | 5 dB |
| **Threshold** | 90 | 80 dB |
| **Criterion Level** | 90 | 90 dB |
| **Criterion Duration** | 8 | 8 h |

| Results | | |
|---|---|---|
| **Dose** | -99.94 | 0.00 % |
| **Projected Dose** | -99.94 | 0.09 % |
| **TWA (Projected)** | -99.9 | 39.5 dB |
| **TWA (t)** | -99.9 | 14.5 dB |
| **Lep (t)** | 44.3 | 44.3 dB |

| Statistics | |
|---|---|
| **LA5.00** | 60.6 dB |
| **LA10.00** | 56.0 dB |
| **LA33.30** | 48.9 dB |
| **LA50.00** | 45.9 dB |
| **LA66.60** | 44.8 dB |
| **LA90.00** | 43.4 dB |

**ST-1 Time History**

| Record # | Record Type | Date | Time | LAeq | LZpeak | LASmax | LASmin | OVLD |
|---|---|---|---|---|---|---|---|---|
| 1 | Calibration Change | 2021-09-14 | 13:24:30 | | | | | |
| 2 | Run | 2021-09-14 | 13:27:58 | | | | | |
| 3 | | 2021-09-14 | 13:27:58 | 44.4 | 85.2 | 49.1 | 40.4 | No |
| 4 | | 2021-09-14 | 13:28:08 | 52.0 | 79.4 | 57.0 | 46.7 | No |
| 5 | | 2021-09-14 | 13:28:18 | 56.6 | 83.2 | 60.2 | 49.9 | No |
| 6 | | 2021-09-14 | 13:28:28 | 48.7 | 77.3 | 51.4 | 45.6 | No |
| 7 | | 2021-09-14 | 13:28:38 | 43.1 | 84.3 | 47.0 | 41.7 | No |
| 8 | | 2021-09-14 | 13:28:48 | 49.5 | 82.0 | 54.6 | 42.3 | No |
| 9 | | 2021-09-14 | 13:28:58 | 41.8 | 75.9 | 43.3 | 41.3 | No |
| 10 | | 2021-09-14 | 13:29:08 | 55.6 | 76.7 | 60.3 | 41.6 | No |
| 11 | | 2021-09-14 | 13:29:18 | 55.2 | 79.6 | 61.0 | 48.3 | No |
| 12 | | 2021-09-14 | 13:29:28 | 57.9 | 81.8 | 61.4 | 49.2 | No |
| 13 | | 2021-09-14 | 13:29:38 | 46.9 | 78.4 | 49.6 | 45.6 | No |
| 14 | | 2021-09-14 | 13:29:48 | 55.2 | 81.8 | 58.3 | 47.8 | No |
| 15 | | 2021-09-14 | 13:29:58 | 49.1 | 80.4 | 53.4 | 44.9 | No |
| 16 | | 2021-09-14 | 13:30:08 | 61.0 | 88.2 | 64.3 | 53.4 | No |
| 17 | | 2021-09-14 | 13:30:18 | 60.2 | 85.8 | 63.6 | 55.4 | No |
| 18 | | 2021-09-14 | 13:30:28 | 60.0 | 86.0 | 63.6 | 53.1 | No |
| 19 | | 2021-09-14 | 13:30:38 | 51.6 | 83.9 | 58.6 | 49.8 | No |
| 20 | | 2021-09-14 | 13:30:48 | 56.2 | 84.6 | 59.6 | 52.5 | No |
| 21 | | 2021-09-14 | 13:30:58 | 54.0 | 82.0 | 56.5 | 49.3 | No |
| 22 | | 2021-09-14 | 13:31:08 | 56.0 | 81.4 | 57.9 | 53.5 | No |
| 23 | | 2021-09-14 | 13:31:18 | 48.8 | 80.4 | 53.5 | 47.0 | No |
| 24 | | 2021-09-14 | 13:31:28 | 50.5 | 83.8 | 52.8 | 46.6 | No |
| 25 | | 2021-09-14 | 13:31:38 | 62.4 | 85.6 | 66.4 | 52.6 | No |
| 26 | | 2021-09-14 | 13:31:48 | 59.0 | 85.9 | 62.4 | 54.5 | No |
| 27 | | 2021-09-14 | 13:31:58 | 48.7 | 77.8 | 54.5 | 47.9 | No |
| 28 | | 2021-09-14 | 13:32:08 | 52.5 | 76.9 | 54.3 | 48.2 | No |
| 29 | | 2021-09-14 | 13:32:18 | 46.0 | 76.3 | 48.1 | 45.6 | No |
| 30 | | 2021-09-14 | 13:32:28 | 46.6 | 85.5 | 48.9 | 45.3 | No |
| 31 | | 2021-09-14 | 13:32:38 | 50.4 | 85.3 | 53.9 | 47.9 | No |
| 32 | | 2021-09-14 | 13:32:48 | 48.8 | 83.5 | 51.6 | 46.4 | No |
| 33 | | 2021-09-14 | 13:32:58 | 53.2 | 80.1 | 57.9 | 46.6 | No |
| 34 | | 2021-09-14 | 13:33:08 | 54.1 | 79.5 | 58.2 | 49.6 | No |
| 35 | | 2021-09-14 | 13:33:18 | 47.2 | 78.8 | 51.5 | 43.0 | No |
| 36 | | 2021-09-14 | 13:33:28 | 50.6 | 78.7 | 53.2 | 48.4 | No |
| 37 | | 2021-09-14 | 13:33:38 | 59.7 | 87.7 | 63.3 | 46.7 | No |
| 38 | | 2021-09-14 | 13:33:48 | 56.5 | 81.1 | 62.4 | 48.4 | No |
| 39 | | 2021-09-14 | 13:33:58 | 64.3 | 92.8 | 71.0 | 47.2 | No |
| 40 | | 2021-09-14 | 13:34:08 | 62.6 | 93.0 | 71.1 | 52.4 | No |
| 41 | | 2021-09-14 | 13:34:18 | 46.6 | 82.6 | 53.1 | 44.2 | No |
| 42 | | 2021-09-14 | 13:34:28 | 51.4 | 82.5 | 55.8 | 44.4 | No |
| 43 | | 2021-09-14 | 13:34:38 | 48.8 | 84.5 | 50.7 | 46.6 | No |
| 44 | | 2021-09-14 | 13:34:48 | 44.2 | 77.2 | 50.2 | 43.1 | No |
| 45 | | 2021-09-14 | 13:34:58 | 53.8 | 90.5 | 57.8 | 43.7 | No |
| 46 | | 2021-09-14 | 13:35:08 | 60.9 | 92.0 | 63.7 | 55.3 | No |
| 47 | | 2021-09-14 | 13:35:18 | 59.3 | 87.2 | 61.3 | 54.6 | No |
| 48 | | 2021-09-14 | 13:35:28 | 52.8 | 85.4 | 58.6 | 49.0 | No |
| 49 | | 2021-09-14 | 13:35:38 | 53.8 | 78.8 | 57.7 | 47.8 | No |
| 50 | | 2021-09-14 | 13:35:48 | 54.1 | 80.7 | 59.3 | 47.4 | No |
| 51 | | 2021-09-14 | 13:35:58 | 48.4 | 75.6 | 51.5 | 44.9 | No |
| 52 | | 2021-09-14 | 13:36:08 | 57.8 | 85.9 | 60.2 | 51.5 | No |
| 53 | | 2021-09-14 | 13:36:18 | 56.2 | 83.8 | 60.1 | 50.7 | No |
| 54 | | 2021-09-14 | 13:36:28 | 52.9 | 79.8 | 56.5 | 48.8 | No |
| 55 | | 2021-09-14 | 13:36:38 | 59.9 | 83.2 | 64.7 | 48.3 | No |
| 56 | | 2021-09-14 | 13:36:48 | 54.6 | 83.9 | 59.3 | 53.4 | No |
| 57 | | 2021-09-14 | 13:36:58 | 59.7 | 81.5 | 63.1 | 51.8 | No |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 58 | | 2021-09-14 | 13:37:08 | 46.2 | 91.6 | 51.8 | 43.3 | No |
| 59 | | 2021-09-14 | 13:37:18 | 49.3 | 77.7 | 52.7 | 43.1 | No |
| 60 | | 2021-09-14 | 13:37:28 | 49.5 | 74.8 | 53.0 | 46.0 | No |
| 61 | | 2021-09-14 | 13:37:38 | 60.3 | 84.2 | 65.7 | 45.4 | No |
| 62 | | 2021-09-14 | 13:37:48 | 48.0 | 76.8 | 54.3 | 44.0 | No |
| 63 | | 2021-09-14 | 13:37:58 | 49.3 | 75.3 | 53.4 | 45.8 | No |
| 64 | | 2021-09-14 | 13:38:08 | 57.6 | 82.0 | 59.3 | 53.4 | No |
| 65 | | 2021-09-14 | 13:38:18 | 56.9 | 80.6 | 60.2 | 54.1 | No |
| 66 | | 2021-09-14 | 13:38:28 | 58.2 | 84.4 | 61.1 | 54.7 | No |
| 67 | | 2021-09-14 | 13:38:38 | 51.1 | 86.8 | 57.4 | 49.2 | No |
| 68 | | 2021-09-14 | 13:38:48 | 52.9 | 79.8 | 57.8 | 47.4 | No |
| 69 | | 2021-09-14 | 13:38:58 | 45.7 | 84.7 | 52.9 | 42.6 | No |
| 70 | | 2021-09-14 | 13:39:08 | 42.7 | 79.7 | 43.3 | 42.1 | No |
| 71 | | 2021-09-14 | 13:39:18 | 47.3 | 74.8 | 52.7 | 42.9 | No |
| 72 | | 2021-09-14 | 13:39:28 | 47.4 | 81.3 | 52.6 | 42.5 | No |
| 73 | | 2021-09-14 | 13:39:38 | 44.4 | 76.4 | 48.7 | 44.1 | No |
| 74 | | 2021-09-14 | 13:39:48 | 48.5 | 83.4 | 53.3 | 44.2 | No |
| 75 | | 2021-09-14 | 13:39:58 | 56.0 | 88.3 | 61.7 | 45.6 | No |
| 76 | | 2021-09-14 | 13:40:08 | 61.6 | 84.3 | 66.1 | 53.2 | No |
| 77 | | 2021-09-14 | 13:40:18 | 58.0 | 78.4 | 61.5 | 50.9 | No |
| 78 | | 2021-09-14 | 13:40:28 | 59.3 | 84.3 | 61.5 | 55.1 | No |
| 79 | | 2021-09-14 | 13:40:38 | 50.5 | 83.1 | 58.7 | 46.3 | No |
| 80 | | 2021-09-14 | 13:40:48 | 53.2 | 82.1 | 57.4 | 45.0 | No |
| 81 | | 2021-09-14 | 13:40:58 | 54.1 | 82.8 | 55.8 | 52.7 | No |
| 82 | | 2021-09-14 | 13:41:08 | 55.7 | 83.4 | 59.9 | 52.3 | No |
| 83 | | 2021-09-14 | 13:41:18 | 63.1 | 88.4 | 64.9 | 59.9 | No |
| 84 | | 2021-09-14 | 13:41:28 | 57.3 | 87.9 | 61.1 | 50.2 | No |
| 85 | | 2021-09-14 | 13:41:38 | 49.7 | 88.6 | 54.7 | 47.3 | No |
| 86 | | 2021-09-14 | 13:41:48 | 61.6 | 88.7 | 67.6 | 45.4 | No |
| 87 | | 2021-09-14 | 13:41:58 | 52.2 | 82.4 | 66.9 | 47.0 | No |
| 88 | | 2021-09-14 | 13:42:08 | 59.5 | 83.9 | 64.6 | 47.0 | No |
| 89 | | 2021-09-14 | 13:42:18 | 54.7 | 83.0 | 58.3 | 49.7 | No |
| 90 | | 2021-09-14 | 13:42:28 | 49.4 | 76.1 | 52.2 | 46.8 | No |
| 91 | | 2021-09-14 | 13:42:38 | 45.2 | 79.8 | 48.9 | 42.2 | No |
| 92 | | 2021-09-14 | 13:42:48 | 50.5 | 79.9 | 55.7 | 42.4 | No |
| 93 | | 2021-09-14 | 13:42:58 | 54.9 | 74.9 | 54.4 | 51.5 | No |
| 94 | Stop | 2021-09-14 | 13:42:59 | | | | | |

**ST-2 Time History**

| Record # | Record Type | Date | Time | LAeq | LZpeak | LASmax | LASmin | OVLD |
|---|---|---|---|---|---|---|---|---|
| 1 | Run | 2021-09-14 | 12:43:47 | | | | | |
| 2 | | 2021-09-14 | 12:43:48 | 55.9 | 80.8 | 57.6 | 52.9 | No |
| 3 | | 2021-09-14 | 12:43:58 | 60.2 | 84.4 | 63.3 | 54.8 | No |
| 4 | | 2021-09-14 | 12:44:08 | 64.5 | 87.0 | 66.3 | 60.9 | No |
| 5 | | 2021-09-14 | 12:44:18 | 62.2 | 86.6 | 65.4 | 59.0 | No |
| 6 | | 2021-09-14 | 12:44:28 | 59.0 | 85.2 | 59.6 | 58.1 | No |
| 7 | | 2021-09-14 | 12:44:38 | 66.0 | 89.5 | 71.3 | 58.2 | No |
| 8 | | 2021-09-14 | 12:44:48 | 53.9 | 83.4 | 60.0 | 50.4 | No |
| 9 | | 2021-09-14 | 12:44:58 | 64.9 | 87.5 | 70.6 | 50.6 | No |
| 10 | | 2021-09-14 | 12:45:08 | 57.4 | 83.3 | 67.0 | 57.2 | No |
| 11 | | 2021-09-14 | 12:45:18 | 56.0 | 83.7 | 58.4 | 51.9 | No |
| 12 | | 2021-09-14 | 12:45:28 | 50.7 | 81.6 | 51.9 | 49.7 | No |
| 13 | | 2021-09-14 | 12:45:38 | 53.2 | 83.6 | 55.3 | 49.9 | No |
| 14 | | 2021-09-14 | 12:45:48 | 53.7 | 83.5 | 55.9 | 51.1 | No |
| 15 | | 2021-09-14 | 12:45:58 | 61.8 | 89.0 | 69.3 | 54.6 | No |
| 16 | | 2021-09-14 | 12:46:08 | 67.7 | 88.7 | 72.9 | 57.1 | No |
| 17 | | 2021-09-14 | 12:46:18 | 65.1 | 87.5 | 70.8 | 54.7 | No |
| 18 | | 2021-09-14 | 12:46:28 | 66.3 | 90.2 | 69.7 | 56.7 | No |
| 19 | | 2021-09-14 | 12:46:38 | 49.5 | 82.3 | 56.7 | 48.8 | No |
| 20 | | 2021-09-14 | 12:46:48 | 51.8 | 81.8 | 54.7 | 49.4 | No |
| 21 | | 2021-09-14 | 12:46:58 | 53.8 | 80.5 | 55.7 | 51.6 | No |
| 22 | | 2021-09-14 | 12:47:08 | 58.1 | 87.6 | 63.8 | 50.4 | No |
| 23 | | 2021-09-14 | 12:47:18 | 70.8 | 94.1 | 77.0 | 60.1 | No |
| 24 | | 2021-09-14 | 12:47:28 | 63.8 | 87.7 | 76.6 | 61.2 | No |
| 25 | | 2021-09-14 | 12:47:38 | 64.9 | 94.8 | 69.1 | 58.4 | No |
| 26 | | 2021-09-14 | 12:47:48 | 66.8 | 86.6 | 70.2 | 58.7 | No |
| 27 | | 2021-09-14 | 12:47:58 | 55.3 | 83.3 | 62.2 | 54.0 | No |
| 28 | | 2021-09-14 | 12:48:08 | 66.2 | 87.0 | 69.4 | 56.2 | No |
| 29 | | 2021-09-14 | 12:48:18 | 65.0 | 96.3 | 72.0 | 59.0 | No |
| 30 | | 2021-09-14 | 12:48:28 | 70.5 | 99.3 | 73.7 | 65.2 | No |
| 31 | | 2021-09-14 | 12:48:38 | 60.7 | 86.1 | 69.9 | 51.0 | No |
| 32 | | 2021-09-14 | 12:48:48 | 49.4 | 82.3 | 51.6 | 47.9 | No |
| 33 | | 2021-09-14 | 12:48:58 | 52.8 | 90.8 | 57.8 | 47.8 | No |
| 34 | | 2021-09-14 | 12:49:08 | 48.4 | 77.8 | 49.2 | 47.6 | No |
| 35 | | 2021-09-14 | 12:49:18 | 56.9 | 82.1 | 59.2 | 49.2 | No |
| 36 | | 2021-09-14 | 12:49:28 | 60.0 | 86.0 | 65.0 | 52.3 | No |
| 37 | | 2021-09-14 | 12:49:38 | 64.9 | 87.2 | 70.2 | 52.7 | No |
| 38 | | 2021-09-14 | 12:49:48 | 50.1 | 82.4 | 58.5 | 47.3 | No |
| 39 | | 2021-09-14 | 12:49:58 | 55.2 | 79.2 | 59.6 | 47.9 | No |
| 40 | | 2021-09-14 | 12:50:08 | 56.9 | 85.9 | 59.4 | 53.4 | No |
| 41 | | 2021-09-14 | 12:50:18 | 50.4 | 79.9 | 57.7 | 47.5 | No |
| 42 | | 2021-09-14 | 12:50:28 | 49.4 | 77.7 | 52.0 | 48.3 | No |
| 43 | | 2021-09-14 | 12:50:38 | 48.4 | 77.2 | 50.1 | 47.2 | No |
| 44 | | 2021-09-14 | 12:50:48 | 67.3 | 89.5 | 71.4 | 47.6 | No |
| 45 | | 2021-09-14 | 12:50:58 | 62.6 | 84.6 | 67.8 | 55.6 | No |
| 46 | | 2021-09-14 | 12:51:08 | 63.2 | 86.4 | 68.9 | 58.7 | No |
| 47 | | 2021-09-14 | 12:51:18 | 64.2 | 85.6 | 69.3 | 59.7 | No |
| 48 | | 2021-09-14 | 12:51:28 | 58.9 | 84.0 | 61.3 | 57.0 | No |
| 49 | | 2021-09-14 | 12:51:38 | 54.5 | 85.2 | 57.1 | 52.8 | No |
| 50 | | 2021-09-14 | 12:51:48 | 68.7 | 100.4 | 74.8 | 54.8 | No |
| 51 | | 2021-09-14 | 12:51:58 | 59.4 | 88.4 | 71.5 | 56.4 | No |
| 52 | | 2021-09-14 | 12:52:08 | 64.7 | 89.6 | 70.6 | 56.4 | No |
| 53 | | 2021-09-14 | 12:52:18 | 68.6 | 100.1 | 72.8 | 62.4 | No |
| 54 | | 2021-09-14 | 12:52:28 | 67.7 | 99.8 | 73.8 | 53.6 | No |
| 55 | | 2021-09-14 | 12:52:38 | 50.5 | 84.3 | 53.6 | 49.4 | No |
| 56 | | 2021-09-14 | 12:52:48 | 54.1 | 81.2 | 58.0 | 49.5 | No |
| 57 | | 2021-09-14 | 12:52:58 | 64.6 | 91.6 | 69.4 | 58.0 | No |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 58 | | 2021-09-14 | 12:53:08 | 55.1 | 84.9 | 62.7 | 49.2 | No |
| 59 | | 2021-09-14 | 12:53:18 | 54.2 | 82.8 | 56.1 | 49.2 | No |
| 60 | | 2021-09-14 | 12:53:28 | 50.9 | 84.0 | 53.9 | 48.9 | No |
| 61 | | 2021-09-14 | 12:53:38 | 49.2 | 81.5 | 50.4 | 48.3 | No |
| 62 | | 2021-09-14 | 12:53:48 | 52.1 | 85.9 | 54.5 | 48.4 | No |
| 63 | | 2021-09-14 | 12:53:58 | 58.4 | 83.5 | 63.8 | 50.2 | No |
| 64 | | 2021-09-14 | 12:54:08 | 47.9 | 78.6 | 50.3 | 46.9 | No |
| 65 | | 2021-09-14 | 12:54:18 | 56.5 | 80.4 | 60.7 | 47.8 | No |
| 66 | | 2021-09-14 | 12:54:28 | 50.1 | 76.0 | 55.0 | 48.2 | No |
| 67 | | 2021-09-14 | 12:54:38 | 64.0 | 87.5 | 70.0 | 51.7 | No |
| 68 | | 2021-09-14 | 12:54:48 | 61.4 | 85.6 | 66.8 | 51.2 | No |
| 69 | | 2021-09-14 | 12:54:58 | 50.7 | 80.6 | 55.3 | 47.6 | No |
| 70 | | 2021-09-14 | 12:55:08 | 53.6 | 80.0 | 57.7 | 48.8 | No |
| 71 | | 2021-09-14 | 12:55:18 | 68.3 | 90.9 | 74.1 | 57.8 | No |
| 72 | | 2021-09-14 | 12:55:28 | 54.2 | 78.8 | 64.4 | 47.9 | No |
| 73 | | 2021-09-14 | 12:55:38 | 46.9 | 80.2 | 50.9 | 46.3 | No |
| 74 | | 2021-09-14 | 12:55:48 | 48.3 | 83.6 | 50.4 | 46.2 | No |
| 75 | | 2021-09-14 | 12:55:58 | 64.0 | 86.9 | 69.9 | 50.4 | No |
| 76 | | 2021-09-14 | 12:56:08 | 50.7 | 79.3 | 62.5 | 48.8 | No |
| 77 | | 2021-09-14 | 12:56:18 | 48.8 | 79.2 | 50.6 | 47.7 | No |
| 78 | | 2021-09-14 | 12:56:28 | 62.9 | 88.6 | 68.9 | 50.6 | No |
| 79 | | 2021-09-14 | 12:56:38 | 49.4 | 79.8 | 57.5 | 48.2 | No |
| 80 | | 2021-09-14 | 12:56:48 | 63.1 | 87.0 | 69.2 | 50.3 | No |
| 81 | | 2021-09-14 | 12:56:58 | 63.5 | 87.2 | 69.9 | 57.1 | No |
| 82 | | 2021-09-14 | 12:57:08 | 67.1 | 91.5 | 69.9 | 60.5 | No |
| 83 | | 2021-09-14 | 12:57:18 | 64.2 | 85.8 | 70.3 | 56.8 | No |
| 84 | | 2021-09-14 | 12:57:28 | 63.9 | 85.1 | 69.7 | 56.8 | No |
| 85 | | 2021-09-14 | 12:57:38 | 54.5 | 82.4 | 60.4 | 49.5 | No |
| 86 | | 2021-09-14 | 12:57:48 | 52.5 | 77.3 | 56.6 | 49.5 | No |
| 87 | | 2021-09-14 | 12:57:58 | 65.0 | 85.0 | 69.3 | 56.6 | No |
| 88 | | 2021-09-14 | 12:58:08 | 52.0 | 79.6 | 58.4 | 47.9 | No |
| 89 | | 2021-09-14 | 12:58:18 | 52.8 | 76.4 | 54.5 | 47.8 | No |
| 90 | | 2021-09-14 | 12:58:28 | 64.8 | 86.9 | 71.1 | 52.2 | No |
| 91 | | 2021-09-14 | 12:58:38 | 62.5 | 83.8 | 68.2 | 52.6 | No |
| 92 | | 2021-09-14 | 12:58:48 | 60.4 | 81.2 | 65.7 | 64.9 | No |
| 93 | Stop | 2021-09-14 | 12:58:49 | | | | | |

**ST-3 Time History**

| Record # | Record Type | Date | Time | LAeq | LZpeak | LASmax | LASmin | OVLD |
|---|---|---|---|---|---|---|---|---|
| 1 | Run | 2021-09-14 | 14:22:00 | | | | | |
| 2 | | 2021-09-14 | 14:22:00 | 53.5 | 85.9 | 57.7 | 49.5 | No |
| 3 | | 2021-09-14 | 14:22:10 | 48.1 | 79.6 | 51.2 | 47.3 | No |
| 4 | | 2021-09-14 | 14:22:20 | 47.2 | 76.9 | 48.5 | 46.4 | No |
| 5 | | 2021-09-14 | 14:22:30 | 45.9 | 77.9 | 46.5 | 45.1 | No |
| 6 | | 2021-09-14 | 14:22:40 | 46.1 | 76.7 | 47.3 | 45.3 | No |
| 7 | | 2021-09-14 | 14:22:50 | 46.3 | 78.0 | 47.5 | 45.5 | No |
| 8 | | 2021-09-14 | 14:23:00 | 50.0 | 85.2 | 54.3 | 46.6 | No |
| 9 | | 2021-09-14 | 14:23:10 | 48.8 | 79.9 | 53.4 | 46.9 | No |
| 10 | | 2021-09-14 | 14:23:20 | 49.8 | 84.1 | 51.0 | 48.2 | No |
| 11 | | 2021-09-14 | 14:23:30 | 53.0 | 84.0 | 55.9 | 51.0 | No |
| 12 | | 2021-09-14 | 14:23:40 | 53.2 | 90.2 | 55.9 | 50.9 | No |
| 13 | | 2021-09-14 | 14:23:50 | 49.9 | 88.9 | 50.9 | 48.8 | No |
| 14 | | 2021-09-14 | 14:24:00 | 47.8 | 92.6 | 50.8 | 46.6 | No |
| 15 | | 2021-09-14 | 14:24:10 | 47.0 | 83.0 | 48.0 | 45.7 | No |
| 16 | | 2021-09-14 | 14:24:20 | 49.1 | 79.9 | 50.9 | 46.8 | No |
| 17 | | 2021-09-14 | 14:24:30 | 50.4 | 81.0 | 52.3 | 48.2 | No |
| 18 | | 2021-09-14 | 14:24:40 | 46.3 | 75.2 | 48.2 | 45.1 | No |
| 19 | | 2021-09-14 | 14:24:50 | 46.7 | 84.6 | 48.0 | 45.6 | No |
| 20 | | 2021-09-14 | 14:25:00 | 46.6 | 77.6 | 48.0 | 44.8 | No |
| 21 | | 2021-09-14 | 14:25:10 | 54.5 | 78.0 | 56.4 | 48.0 | No |
| 22 | | 2021-09-14 | 14:25:20 | 54.4 | 89.6 | 55.5 | 53.3 | No |
| 23 | | 2021-09-14 | 14:25:30 | 52.9 | 85.1 | 54.1 | 51.9 | No |
| 24 | | 2021-09-14 | 14:25:40 | 58.9 | 82.4 | 61.3 | 53.4 | No |
| 25 | | 2021-09-14 | 14:25:50 | 55.2 | 80.3 | 59.8 | 53.0 | No |
| 26 | | 2021-09-14 | 14:26:00 | 49.6 | 89.1 | 53.8 | 47.6 | No |
| 27 | | 2021-09-14 | 14:26:10 | 49.2 | 89.4 | 51.1 | 47.1 | No |
| 28 | | 2021-09-14 | 14:26:20 | 49.6 | 82.1 | 52.0 | 47.6 | No |
| 29 | | 2021-09-14 | 14:26:30 | 48.6 | 80.5 | 50.1 | 47.4 | No |
| 30 | | 2021-09-14 | 14:26:40 | 48.7 | 81.6 | 50.5 | 47.4 | No |
| 31 | | 2021-09-14 | 14:26:50 | 51.4 | 87.2 | 54.4 | 49.5 | No |
| 32 | | 2021-09-14 | 14:27:00 | 47.9 | 82.6 | 49.9 | 47.2 | No |
| 33 | | 2021-09-14 | 14:27:10 | 47.5 | 75.4 | 48.7 | 45.9 | No |
| 34 | | 2021-09-14 | 14:27:20 | 50.2 | 80.3 | 55.0 | 45.6 | No |
| 35 | | 2021-09-14 | 14:27:30 | 47.3 | 76.4 | 52.9 | 46.9 | No |
| 36 | | 2021-09-14 | 14:27:40 | 47.4 | 77.5 | 48.1 | 46.8 | No |
| 37 | | 2021-09-14 | 14:27:50 | 47.9 | 87.1 | 49.3 | 46.8 | No |
| 38 | | 2021-09-14 | 14:28:00 | 49.6 | 86.9 | 50.6 | 48.4 | No |
| 39 | | 2021-09-14 | 14:28:10 | 48.7 | 81.6 | 49.9 | 48.5 | No |
| 40 | | 2021-09-14 | 14:28:20 | 49.9 | 81.0 | 50.5 | 48.8 | No |
| 41 | | 2021-09-14 | 14:28:30 | 48.6 | 91.6 | 50.3 | 47.7 | No |
| 42 | | 2021-09-14 | 14:28:40 | 49.2 | 91.6 | 50.5 | 47.6 | No |
| 43 | | 2021-09-14 | 14:28:50 | 50.7 | 83.2 | 52.1 | 49.0 | No |
| 44 | | 2021-09-14 | 14:29:00 | 49.8 | 90.7 | 52.0 | 48.2 | No |
| 45 | | 2021-09-14 | 14:29:10 | 49.8 | 89.9 | 50.9 | 48.9 | No |
| 46 | | 2021-09-14 | 14:29:20 | 50.2 | 85.4 | 51.3 | 49.4 | No |
| 47 | | 2021-09-14 | 14:29:30 | 50.8 | 89.9 | 51.3 | 50.3 | No |
| 48 | | 2021-09-14 | 14:29:40 | 52.8 | 90.4 | 54.8 | 50.3 | No |
| 49 | | 2021-09-14 | 14:29:50 | 52.3 | 81.2 | 54.5 | 50.3 | No |
| 50 | | 2021-09-14 | 14:30:00 | 57.5 | 85.6 | 59.3 | 54.2 | No |
| 51 | | 2021-09-14 | 14:30:10 | 59.1 | 89.7 | 61.2 | 57.6 | No |
| 52 | | 2021-09-14 | 14:30:20 | 53.1 | 81.1 | 57.7 | 50.4 | No |
| 53 | | 2021-09-14 | 14:30:30 | 51.1 | 81.7 | 52.1 | 50.5 | No |
| 54 | | 2021-09-14 | 14:30:40 | 51.3 | 88.1 | 52.0 | 50.5 | No |
| 55 | | 2021-09-14 | 14:30:50 | 49.2 | 93.0 | 51.5 | 47.2 | No |
| 56 | | 2021-09-14 | 14:31:00 | 48.5 | 86.3 | 50.1 | 46.8 | No |
| 57 | | 2021-09-14 | 14:31:10 | 50.6 | 82.2 | 52.0 | 49.7 | No |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 58 | | 2021-09-14 | 14:31:20 | 53.4 | 80.1 | 56.5 | 49.3 | No |
| 59 | | 2021-09-14 | 14:31:30 | 57.1 | 79.8 | 59.8 | 53.8 | No |
| 60 | | 2021-09-14 | 14:31:40 | 57.8 | 80.1 | 62.8 | 51.5 | No |
| 61 | | 2021-09-14 | 14:31:50 | 52.3 | 81.6 | 54.3 | 50.7 | No |
| 62 | | 2021-09-14 | 14:32:00 | 52.1 | 78.8 | 56.0 | 49.5 | No |
| 63 | | 2021-09-14 | 14:32:10 | 49.7 | 81.7 | 52.6 | 48.4 | No |
| 64 | | 2021-09-14 | 14:32:20 | 47.5 | 82.1 | 48.5 | 46.5 | No |
| 65 | | 2021-09-14 | 14:32:30 | 47.1 | 78.6 | 48.1 | 46.2 | No |
| 66 | | 2021-09-14 | 14:32:40 | 47.5 | 78.6 | 48.1 | 47.0 | No |
| 67 | | 2021-09-14 | 14:32:50 | 46.7 | 82.8 | 47.5 | 46.2 | No |
| 68 | | 2021-09-14 | 14:33:00 | 51.5 | 88.8 | 53.3 | 46.6 | No |
| 69 | | 2021-09-14 | 14:33:10 | 55.3 | 86.0 | 57.3 | 53.1 | No |
| 70 | | 2021-09-14 | 14:33:20 | 55.0 | 82.7 | 56.2 | 53.4 | No |
| 71 | | 2021-09-14 | 14:33:30 | 52.8 | 80.7 | 54.9 | 50.9 | No |
| 72 | | 2021-09-14 | 14:33:40 | 48.8 | 79.0 | 51.4 | 47.5 | No |
| 73 | | 2021-09-14 | 14:33:50 | 49.3 | 78.9 | 51.5 | 47.5 | No |
| 74 | | 2021-09-14 | 14:34:00 | 51.8 | 84.6 | 53.0 | 50.1 | No |
| 75 | | 2021-09-14 | 14:34:10 | 48.5 | 76.8 | 50.6 | 48.1 | No |
| 76 | | 2021-09-14 | 14:34:20 | 49.0 | 86.6 | 50.6 | 47.8 | No |
| 77 | | 2021-09-14 | 14:34:30 | 53.2 | 80.0 | 53.9 | 50.7 | No |
| 78 | | 2021-09-14 | 14:34:40 | 52.3 | 78.7 | 53.2 | 51.5 | No |
| 79 | | 2021-09-14 | 14:34:50 | 51.4 | 80.9 | 53.6 | 49.6 | No |
| 80 | | 2021-09-14 | 14:35:00 | 51.7 | 82.0 | 55.3 | 47.0 | No |
| 81 | | 2021-09-14 | 14:35:10 | 46.8 | 76.6 | 47.4 | 46.0 | No |
| 82 | | 2021-09-14 | 14:35:20 | 48.7 | 77.8 | 50.5 | 47.2 | No |
| 83 | | 2021-09-14 | 14:35:30 | 50.4 | 80.0 | 51.2 | 48.7 | No |
| 84 | | 2021-09-14 | 14:35:40 | 50.9 | 88.3 | 52.2 | 50.0 | No |
| 85 | | 2021-09-14 | 14:35:50 | 54.2 | 90.2 | 55.2 | 52.2 | No |
| 86 | | 2021-09-14 | 14:36:00 | 51.9 | 85.1 | 53.6 | 50.2 | No |
| 87 | | 2021-09-14 | 14:36:10 | 49.7 | 77.4 | 50.8 | 48.4 | No |
| 88 | | 2021-09-14 | 14:36:20 | 48.1 | 80.7 | 50.5 | 47.6 | No |
| 89 | | 2021-09-14 | 14:36:30 | 47.9 | 87.7 | 49.4 | 46.8 | No |
| 90 | | 2021-09-14 | 14:36:40 | 50.7 | 87.9 | 51.3 | 49.4 | No |
| 91 | | 2021-09-14 | 14:36:50 | 50.7 | 91.9 | 52.1 | 49.9 | No |
| 92 | | 2021-09-14 | 14:37:00 | 49.8 | 81.3 | 49.9 | 49.8 | No |
| 93 | Stop | 2021-09-14 | 14:37:01 | | | | | |

| Record # | Record Type | Date | Time | LAeq | LZpeak | LASmax | LASmin | OVLD | Sounds Energy | Calculated Total Leq |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Calibration Change | 2021-09-16 | 14:01:40 | | | | | | | |
| 2 | Run | 2021-09-16 | 14:08:00 | | | | | | | |
| 3 | | 2021-09-16 | 14:08:00 | 56.5 | 82.5 | 61.7 | 53.4 | No | 451199.9 | 52.667 |
| 4 | | 2021-09-16 | 14:08:10 | 53.7 | 82.5 | 57.6 | 49.2 | No | 237127.0 | |
| 5 | | 2021-09-16 | 14:08:20 | 48.6 | 80.4 | 49.9 | 47.5 | No | 72987.2 | |
| 6 | | 2021-09-16 | 14:08:30 | 50.7 | 80.6 | 52.2 | 47.6 | No | 116365.7 | |
| 7 | | 2021-09-16 | 14:08:40 | 53.4 | 86.7 | 57.0 | 49.8 | No | 219243.1 | |
| 8 | | 2021-09-16 | 14:08:50 | 48.9 | 79.5 | 54.5 | 43.3 | No | 77779.7 | |
| 9 | | 2021-09-16 | 14:09:00 | 45.1 | 75.2 | 47.9 | 42.5 | No | 32126.2 | |
| 10 | | 2021-09-16 | 14:09:10 | 52.4 | 80.2 | 55.6 | 47.9 | No | 174798.2 | |
| 11 | | 2021-09-16 | 14:09:20 | 58.6 | 83.5 | 61.7 | 53.4 | No | 725457.5 | |
| 12 | | 2021-09-16 | 14:09:30 | 77.8 | 106.3 | 83.5 | 61.7 | No | 60938533.7 | |
| 13 | | 2021-09-16 | 14:09:40 | 60.7 | 91.5 | 72.1 | 54.8 | No | 1175817.7 | |
| 14 | | 2021-09-16 | 14:09:50 | 46.7 | 76.4 | 56.4 | 45.1 | No | 46969.1 | |
| 15 | | 2021-09-16 | 14:10:00 | 47.5 | 79.0 | 50.2 | 44.3 | No | 55899.5 | |
| 16 | | 2021-09-16 | 14:10:10 | 49.8 | 80.9 | 54.2 | 43.3 | No | 96397.1 | |
| 17 | | 2021-09-16 | 14:10:20 | 53.5 | 92.4 | 61.4 | 44.5 | No | 222275.2 | |
| 18 | | 2021-09-16 | 14:10:30 | 54.2 | 82.0 | 60.1 | 46.5 | No | 260216.0 | |
| 19 | | 2021-09-16 | 14:10:40 | 58.6 | 94.0 | 62.6 | 52.9 | No | 732278.0 | |
| 20 | | 2021-09-16 | 14:10:50 | 52.2 | 79.8 | 53.3 | 50.7 | No | 166621.9 | |
| 21 | | 2021-09-16 | 14:11:00 | 53.5 | 82.4 | 56.7 | 50.6 | No | 221771.1 | |
| 22 | | 2021-09-16 | 14:11:10 | 50.6 | 78.1 | 52.6 | 49.4 | No | 115456.4 | |
| 23 | | 2021-09-16 | 14:11:20 | 48.8 | 82.0 | 52.1 | 46.5 | No | 76351.6 | |
| 24 | | 2021-09-16 | 14:11:30 | 46.1 | 85.3 | 46.8 | 45.3 | No | 41007.5 | |
| 25 | | 2021-09-16 | 14:11:40 | 45.4 | 80.8 | 47.3 | 44.2 | No | 34502.1 | |
| 26 | | 2021-09-16 | 14:11:50 | 43.3 | 76.7 | 44.2 | 42.5 | No | 21227.2 | |
| 27 | | 2021-09-16 | 14:12:00 | 44.7 | 76.9 | 46.9 | 42.5 | No | 29370.3 | |
| 28 | | 2021-09-16 | 14:12:10 | 51.9 | 85.0 | 54.8 | 46.9 | No | 156165.8 | |
| 29 | | 2021-09-16 | 14:12:20 | 45.7 | 83.8 | 48.7 | 43.4 | No | 37572.6 | |
| 30 | | 2021-09-16 | 14:12:30 | 43.4 | 79.5 | 44.2 | 42.8 | No | 21956.1 | |
| 31 | | 2021-09-16 | 14:12:40 | 45.3 | 76.0 | 46.5 | 43.9 | No | 34100.0 | |
| 32 | | 2021-09-16 | 14:12:50 | 46.1 | 80.9 | 49.2 | 43.7 | No | 41063.9 | |
| 33 | | 2021-09-16 | 14:13:00 | 43.5 | 78.8 | 44.1 | 43.1 | No | 22449.1 | |
| 34 | | 2021-09-16 | 14:13:10 | 43.4 | 75.3 | 44.2 | 42.6 | No | 21690.8 | |
| 35 | | 2021-09-16 | 14:13:20 | 43.5 | 81.4 | 44.1 | 42.9 | No | 22632.8 | |
| 36 | | 2021-09-16 | 14:13:30 | 43.5 | 78.3 | 45.0 | 42.4 | No | 22552.4 | |
| 37 | | 2021-09-16 | 14:13:40 | 49.0 | 85.0 | 52.3 | 42.5 | No | 79170.2 | |
| 38 | | 2021-09-16 | 14:13:50 | 58.7 | 88.5 | 62.9 | 50.1 | No | 748710.6 | |
| 39 | | 2021-09-16 | 14:14:00 | 53.0 | 79.4 | 57.7 | 49.6 | No | 199162.7 | |
| 40 | | 2021-09-16 | 14:14:10 | 52.9 | 84.1 | 56.7 | 47.5 | No | 195020.8 | |
| 41 | | 2021-09-16 | 14:14:20 | 54.6 | 85.4 | 58.1 | 51.5 | No | 288214.6 | |
| 42 | | 2021-09-16 | 14:14:30 | 45.9 | 76.9 | 51.5 | 44.4 | No | 38758.9 | |
| 43 | | 2021-09-16 | 14:14:40 | 44.3 | 73.8 | 46.0 | 43.4 | No | 27121.3 | |
| 44 | | 2021-09-16 | 14:14:50 | 42.9 | 74.7 | 44.2 | 42.5 | No | 19609.6 | |
| 45 | | 2021-09-16 | 14:15:00 | 43.5 | 78.5 | 44.4 | 42.8 | No | 22509.6 | |
| 46 | | 2021-09-16 | 14:15:10 | 44.6 | 81.1 | 45.3 | 42.9 | No | 28631.5 | |
| 47 | | 2021-09-16 | 14:15:20 | 43.7 | 73.7 | 45.2 | 42.8 | No | 23679.5 | |
| 48 | | 2021-09-16 | 14:15:30 | 43.1 | 74.9 | 43.5 | 42.5 | No | 20188.3 | |
| 49 | | 2021-09-16 | 14:15:40 | 45.8 | 77.9 | 47.8 | 42.9 | No | 37695.1 | |
| 50 | | 2021-09-16 | 14:15:50 | 49.7 | 77.1 | 52.7 | 46.5 | No | 92508.4 | |
| 51 | | 2021-09-16 | 14:16:00 | 50.7 | 75.5 | 54.5 | 47.7 | No | 117251.7 | |
| 52 | | 2021-09-16 | 14:16:10 | 52.2 | 79.2 | 54.1 | 49.3 | No | 166979.8 | |
| 53 | | 2021-09-16 | 14:16:20 | 50.1 | 78.8 | 52.4 | 48.2 | No | 103201.7 | |
| 54 | | 2021-09-16 | 14:16:30 | 46.6 | 79.7 | 51.3 | 44.0 | No | 46215.9 | |
| 55 | | 2021-09-16 | 14:16:40 | 48.0 | 77.9 | 50.5 | 44.0 | No | 62754.5 | |
| 56 | | 2021-09-16 | 14:16:50 | 56.5 | 82.7 | 61.7 | 47.8 | No | 450114.5 | |
| 57 | | 2021-09-16 | 14:17:00 | 52.5 | 80.9 | 61.7 | 45.6 | No | 179589.5 | |
| 58 | | 2021-09-16 | 14:17:10 | 44.1 | 77.0 | 45.6 | 43.5 | No | 25642.4 | |
| 59 | | 2021-09-16 | 14:17:20 | 43.4 | 74.2 | 44.1 | 43.0 | No | 21896.7 | |
| 60 | | 2021-09-16 | 14:17:30 | 44.2 | 80.0 | 45.4 | 43.0 | No | 26558.3 | |
| 61 | | 2021-09-16 | 14:17:40 | 43.6 | 82.4 | 44.4 | 43.4 | No | 23096.2 | |
| 62 | | 2021-09-16 | 14:17:50 | 43.9 | 80.8 | 44.6 | 43.2 | No | 24729.3 | |
| 63 | | 2021-09-16 | 14:18:00 | 44.3 | 81.2 | 47.7 | 43.3 | No | 26810.3 | |
| 64 | | 2021-09-16 | 14:18:10 | 45.5 | 80.7 | 47.3 | 43.3 | No | 35374.2 | |
| 65 | | 2021-09-16 | 14:18:20 | 61.5 | 91.2 | 66.1 | 46.3 | No | 1407236.2 | |
| 66 | | 2021-09-16 | 14:18:30 | 65.8 | 93.1 | 69.6 | 57.3 | No | 3794075.8 | |
| 67 | | 2021-09-16 | 14:18:40 | 49.6 | 77.9 | 57.2 | 47.8 | No | 91939.9 | |
| 68 | | 2021-09-16 | 14:18:50 | 46.1 | 77.5 | 51.1 | 44.7 | No | 40274.1 | |
| 69 | | 2021-09-16 | 14:19:00 | 44.2 | 81.0 | 45.2 | 43.7 | No | 26515.8 | |
| 70 | | 2021-09-16 | 14:19:10 | 45.4 | 85.7 | 46.1 | 44.9 | No | 35009.5 | |
| 71 | | 2021-09-16 | 14:19:20 | 45.9 | 83.0 | 49.1 | 44.5 | No | 38697.2 | |
| 72 | | 2021-09-16 | 14:19:30 | 45.0 | 83.1 | 45.7 | 44.4 | No | 31832.2 | |
| 73 | | 2021-09-16 | 14:19:40 | 45.2 | 80.5 | 46.4 | 44.5 | No | 33323.4 | |
| 74 | | 2021-09-16 | 14:19:50 | 45.2 | 79.9 | 45.7 | 44.7 | No | 33116.7 | |
| 75 | | 2021-09-16 | 14:20:00 | 45.9 | 76.5 | 46.4 | 45.2 | No | 38824.9 | |
| 76 | | 2021-09-16 | 14:20:10 | 45.7 | 80.2 | 46.4 | 45.1 | No | 37165.1 | |
| 77 | | 2021-09-16 | 14:20:20 | 45.3 | 76.5 | 46.3 | 44.9 | No | 33706.0 | |
| 78 | | 2021-09-16 | 14:20:30 | 45.7 | 77.5 | 46.4 | 45.0 | No | 37415.6 | |
| 79 | | 2021-09-16 | 14:20:40 | 51.9 | 77.6 | 55.5 | 45.2 | No | 155651.7 | |
| 80 | | 2021-09-16 | 14:20:50 | 49.7 | 79.7 | 55.5 | 44.6 | No | 94363.9 | |
| 81 | | 2021-09-16 | 14:21:00 | 49.6 | 96.5 | 56.4 | 43.9 | No | 91799.0 | |
| 82 | | 2021-09-16 | 14:21:10 | 44.1 | 78.3 | 45.1 | 43.8 | No | 25777.0 | |
| 83 | | 2021-09-16 | 14:21:20 | 43.6 | 78.4 | 44.3 | 43.1 | No | 22659.8 | |
| 84 | | 2021-09-16 | 14:21:30 | 43.6 | 83.9 | 44.0 | 43.2 | No | 22845.1 | |

This time period included a large moving truck which passed by and is removed from the calcualted average noise level (Leq)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 85 | | 2021-09-16 | 14:21:40 | 44.5 | 77.8 | 45.9 | 43.8 | No | 28389.6 |
| 86 | | 2021-09-16 | 14:21:50 | 44.7 | 77.9 | 45.4 | 44.3 | No | 29600.2 |
| 87 | | 2021-09-16 | 14:22:00 | 44.4 | 77.1 | 44.8 | 44.0 | No | 27843.5 |
| 88 | | 2021-09-16 | 14:22:10 | 45.7 | 74.1 | 47.0 | 44.3 | No | 36936.4 |
| 89 | | 2021-09-16 | 14:22:20 | 46.3 | 74.8 | 48.3 | 45.1 | No | 42320.5 |
| 90 | | 2021-09-16 | 14:22:30 | 45.2 | 75.9 | 45.9 | 44.8 | No | 32958.6 |
| 91 | | 2021-09-16 | 14:22:40 | 53.9 | 91.9 | 59.2 | 45.1 | No | 243938.9 |
| 92 | | 2021-09-16 | 14:22:50 | 60.7 | 90.8 | 66.2 | 50.7 | No | 1183924.5 |
| 93 | | 2021-09-16 | 14:23:00 | 49.2 | 72.9 | 50.7 | 50.0 | No | 82557.2 |
| 94 | Stop | 2021-09-16 | 14:23:01 | | | | | | |

# Noise Appendix

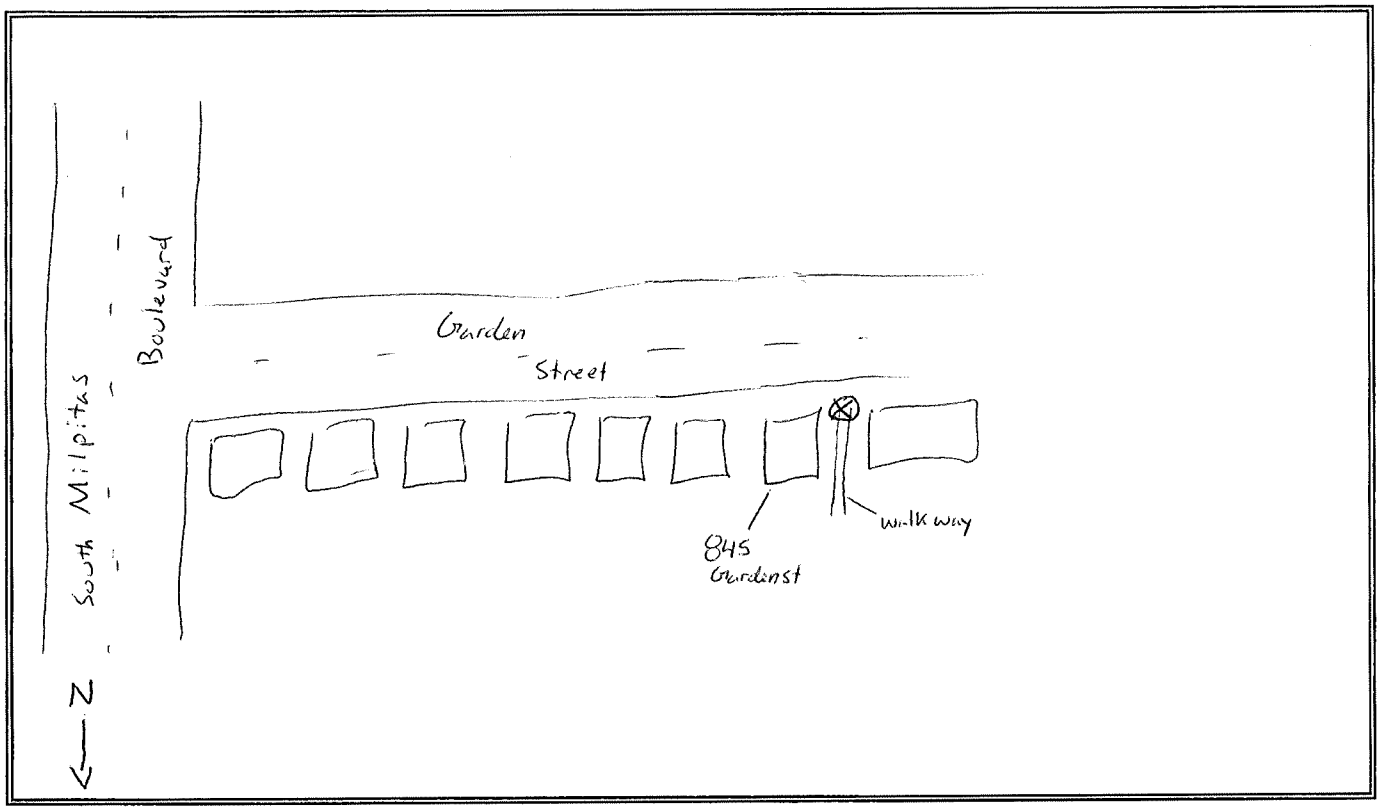
## Field Sheets

# NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Milpitas TASP
PROJECT #:
SITE NUMBER: ST-1
DATE/TIME: 1:29 2021 09 14
LOCATION/ADDRESS: 845 Garden Street
ENGINEERS: Schumaker

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.




WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

88.7° F | 0.9 mph | Blue Skies and Sunny

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LXT

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: 25 mph COMMENTS:

TRAFFIC COUNTS:

| Roadway/Direction | Autos | Medium | Heavy | Speed | Start Time | Duration |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Milpitas TASP
PROJECT #:
SITE NUMBER: ST-1
DATE/TIME: 1:29 2021 09 14
LOCATION/ADDRESS: 845 Garden St.
ENGINEERS: Schumaker

| # | Minute Starting | Measured Leq (dBA) | O or X | Autos | Medium Trucks | Heavy Trucks | Other Noise Sources/Comments (include SLM equipment, Calibration Data) |
|---|---|---|---|---|---|---|---|
| 1 | 1:29 | | | | | | |
| 2 | 1:30 | | | | | | |
| 3 | 1:31 | | | | | | |
| 4 | 1:32 | | | | | | ups truck bay-door closed |
| 5 | 1:33 | | | | | | |
| 6 | 1:34 | | | | | | ups truck passes by |
| 7 | 1:35 | | | | | | |
| 8 | 1:36 | | | | | | |
| 9 | 1:37 | | | | | | |
| 10 | 1:38 | | | | | | Plane fly by |
| 11 | 1:39 | | | | | | |
| 12 | 1:40 | | | | | | |
| 13 | 1:41 | | | | | | |
| 14 | 1:42 | | | | | | |
| 15 | 1:43 | | | | | | |
| 16 | | | | | | | LXT_Data.019 |
| 17 | | | | | | | constant traffic on Milpitas Ave |
| 18 | | | | | | | Like traffic on Garden St. |
| 19 | | | | | | | |
| 20 | | | | | | | |

| | |
|---|---|
| Leq | 56.2 |
| Lmax | 71.1 |
| Lmin | 40.4 |
| L10 | 60.4 |
| L33 | 54.6 |
| L50 | 51.2 |
| L90 | 44.5 |

Overall Leq (Include "O" minutes, Exclude "X" minutes) = _____ **dBA**

Subset Leq (Exclude "O" and "X" minutes) = _____ **dBA**

*"O" = other characteristic sources that contributed to the Leq*

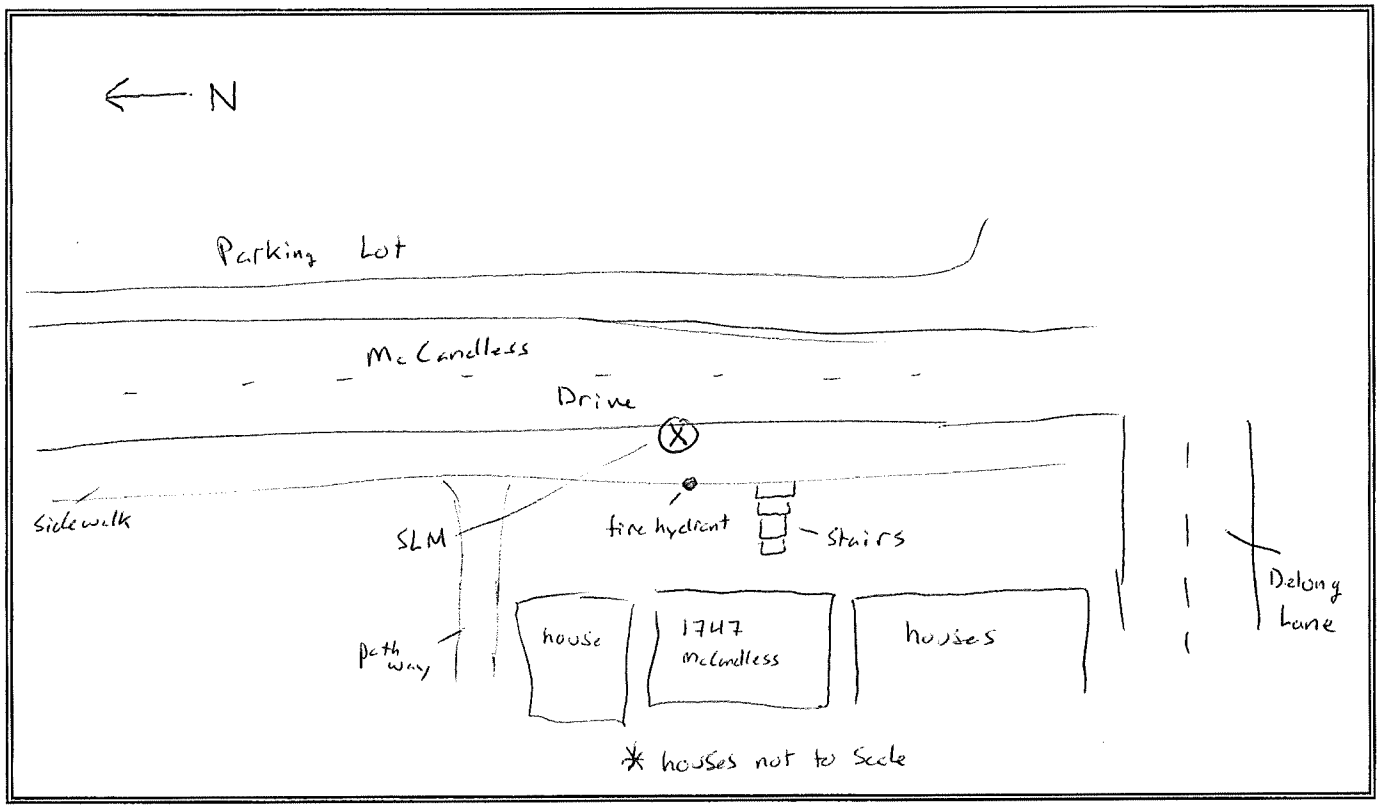
*"X" = exclude from Leq calculation; a non-typical source contaminated the measurement*

# NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Milpitas TASP
PROJECT #:
SITE NUMBER: ST-2
DATE/TIME: 12:43 2021 09 14
LOCATION/ADDRESS: 1747 McCandless Dr.
ENGINEERS: Schumaker

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.




WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

96° F | 0.8 mph | Blue skies and sunny

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LXT

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: 25 mph COMMENTS:

TRAFFIC COUNTS:

| Roadway/Direction | Autos | Medium | Heavy | Speed | Start Time | Duration |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Milpitas TASP
PROJECT #:
SITE NUMBER: ST-2
DATE/TIME: 12:43 2021 09 14
LOCATION/ADDRESS: 1747 McCandless Drive
ENGINEERS: Schumacher

| # | Minute Starting | Measured Leq (dBA) | O or X | Autos | Medium Trucks | Heavy Trucks | Other Noise Sources/Comments (include SLM equipment, Calibration Data) |
|---|---|---|---|---|---|---|---|
| 1 | 12 43 | | | | | | |
| 2 | 12 44 | | | | | | |
| 3 | 12 45 | | | | | | |
| 4 | 12 46 | | | | | | |
| 5 | 12 47 | | | | | | Loud banging from construction far across McCandless Dr. |
| 6 | 12 48 | | | | | | |
| 7 | 12 49 | | | | | | Small Plane fly by |
| 8 | 12:50 | | | | | | |
| 9 | 12:51 | | | | | | |
| 10 | 12:52 | | | | | | back up beeping more construction bang |
| 11 | 12:53 | | | | | | |
| 12 | 12:54 | | | | | | |
| 13 | 12:55 | | | | | | |
| 14 | 12:56 | | | | | | Baby crying |
| 15 | 12:57 | | | | | | |
| 16 | | | | | | | LXT_Data.018 |
| 17 | | | | | | | nearby home had chatty birds |
| 18 | | | | | | | Swells in measurements from cars passing by. |
| 19 | | | | | | | |
| 20 | | | | | | | |

| | |
|---|---|
| Leq | 62.6 |
| Lmax | 77.0 |
| Lmin | 46.2 |
| L10 | 67.5 |
| L33 | 59.4 |
| L50 | 56.0 |
| L90 | 48.9 |

Overall Leq (Include "O" minutes, Exclude "X" minutes) = dBA

Subset Leq (Exclude "O" and "X" minutes) = dBA

*"O" = other characteristic sources that contributed to the Leq*

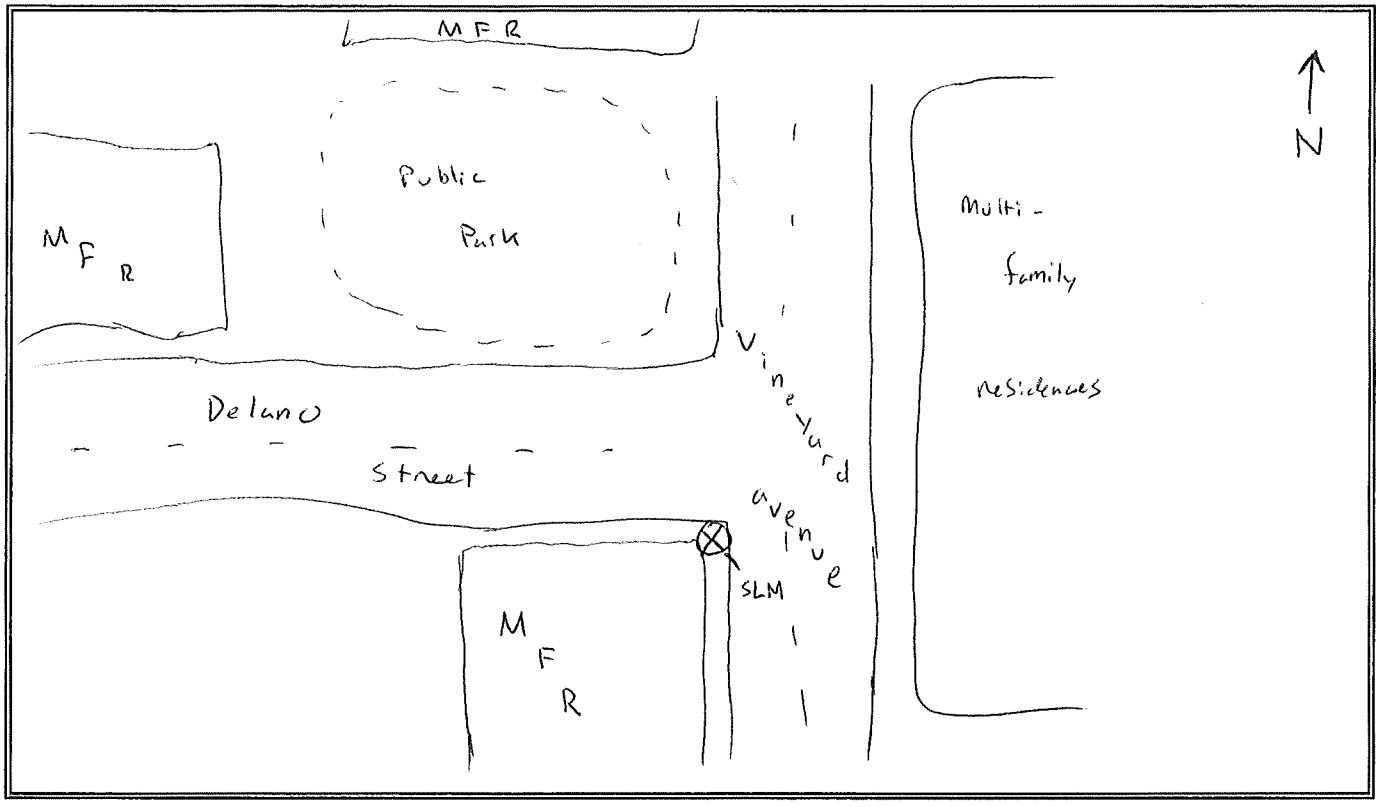
*"X" = exclude from Leq calculation; a non-typical source contaminated the measurement*

# NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Milpitas TASP
PROJECT #:
SITE NUMBER: ST-3
DATE/TIME: 2:22 2021 09 14
LOCATION/ADDRESS: 422 vineyard Ave
ENGINEERS: Schumaker

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.




WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

83.4 (weather meter in shade) | 1.6 mph | Blu skies and Sunny

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LXT

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: 25 mph COMMENTS:

TRAFFIC COUNTS:

| Roadway/Direction | Autos | Medium | Heavy | Speed | Start Time | Duration |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Milpitas TASP
PROJECT #:
SITE NUMBER: ST-3
DATE/TIME: 2:22 2021 04 14
LOCATION/ADDRESS: 422 vineyard Ave
ENGINEERS: Schumaker

| # | Minute Starting | Measured Leq (dBA) | O or X | Autos | Medium Trucks | Heavy Trucks | Other Noise Sources/Comments (include SLM equipment, Calibration Data) |
|---|---|---|---|---|---|---|---|
| 1 | 2:22 | | | | | | |
| 2 | 2:23 | | | | | | |
| 3 | 2:24 | | | | | | car goes through intersection plane overhead |
| 4 | 2:25 | | | | | | bird in nearby tree |
| 5 | 2:26 | | | | | | loud car on Capitol Ave |
| 6 | 2:27 | | | | | | |
| 7 | 2:28 | | | | | | |
| 8 | 2:29 | | | | | | plane fly by car through intersection. |
| 9 | 2:30 | | | | | | Plane fly by |
| 10 | 2:31 | | | | | | car through intersection |
| 11 | 2:32 | | | | | | more cars through intersection. |
| 12 | 2:33 | | | | | | |
| 13 | 2:34 | | | | | | plane overhead. |
| 14 | 2:35 | | | | | | |
| 15 | 2:36 | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | | LXT_Data.021 |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |

| | |
|---|---|
| Leq | 51.7 |
| Lmax | 62.8 |
| Lmin | 44.8 |
| L10 | 54.6 |
| L33 | 51.0 |
| L50 | 48.5 |
| L90 | 46.9 |

Overall Leq (Include "O" minutes, Exclude "X" minutes) = _____ **dBA**

Subset Leq (Exclude "O" and "X" minutes) = _____ **dBA**

*"O" = other characteristic sources that contributed to the Leq*

*"X" = exclude from Leq calculation; a non-typical source contaminated the measurement*

# NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: Milpitas TACP

PROJECT #:

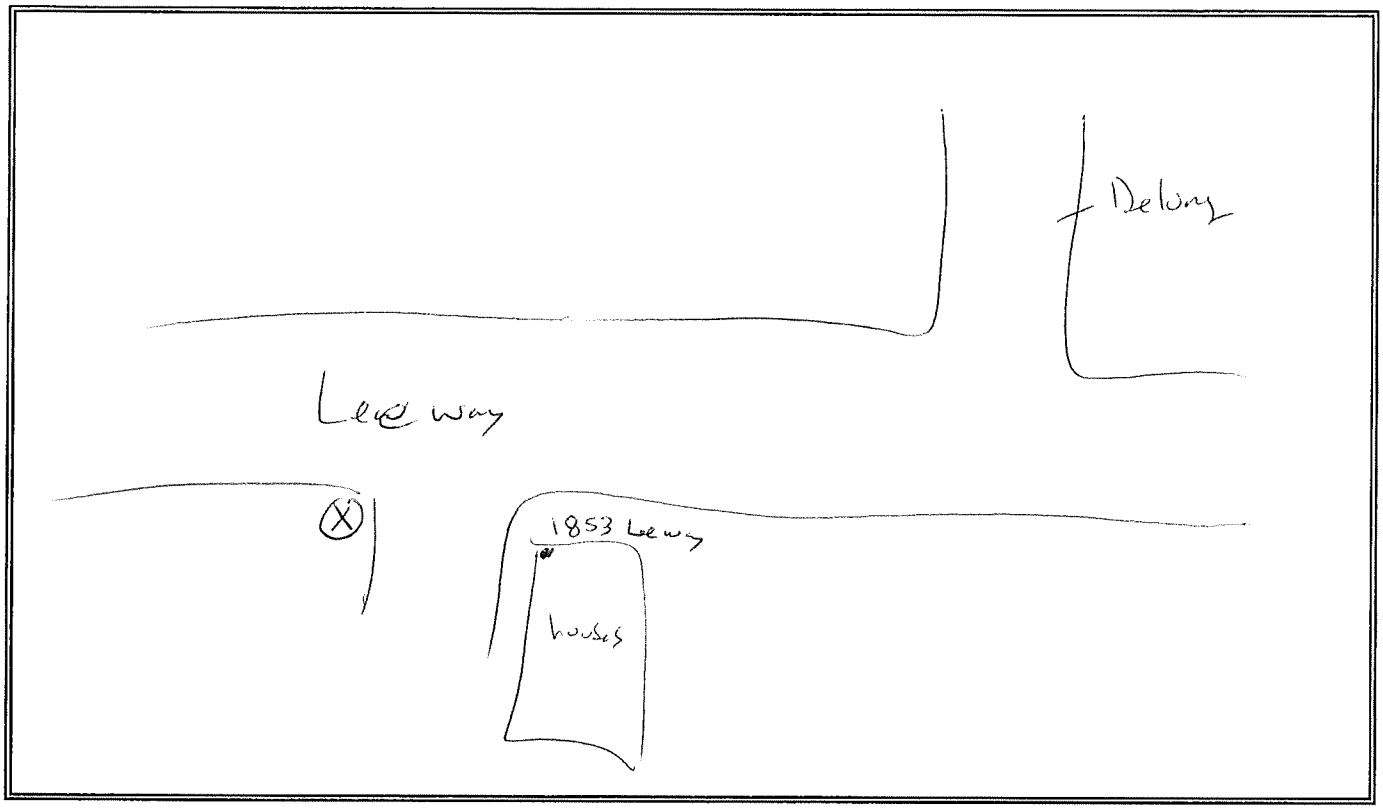
SITE NUMBER: St4

DATE/TIME: 2021 09 16

LOCATION/ADDRESS: Lee Way / Delong

ENGINEERS: Schumake

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.




WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

72.2°F | 1.5 mph | Blue and Sunny

Cin Shed

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

LXT

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: _____ COMMENTS:

TRAFFIC COUNTS:

| Roadway/Direction | Autos | Medium | Heavy | Speed | Start Time | Duration |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: Milpitas TASP
PROJECT #:
SITE NUMBER: ST 4
DATE/TIME: 2021 09 16 2:08
LOCATION/ADDRESS: across ~~Lundy~~ street from 1900 Lee Way
ENGINEERS: Schumacher

| # | Minute Starting | Measured Leq (dBA) | O or X | Autos | Medium Trucks | Heavy Trucks | Other Noise Sources/Ccmments (include SLM equipment, Calibration Data) |
|---|---|---|---|---|---|---|---|
| 1 | 2:08 | | | | | | wind chime Plane overhead car pulls into parkit |
| 2 | 2:09 | | | | | | Dogs Big Truck car door shut ~ 200ft away |
| 3 | 2:10 | | | | | | Plane overhead car door opens car starts |
| 4 | 2:11 | | | | | | car Passby Plane overhead odd impact sound (far away) |
| 5 | 2:12 | | | | | | motor cycle high RPM far O cars Passby |
| 6 | 2:13 | | | | | | |
| 7 | 2:14 | | | | | | Plane overhead |
| 8 | 2:15 | | | | | | |
| 9 | 2:16 | | | | | | |
| 10 | 2:17 | | | | | | Toyota Taco rips thru Lee way |
| 11 | 2:18 | | | | | | |
| 12 | 2:19 | | | | | | car pulls past door closes and car lock Lady walks past |
| 13 | 2:20 | | | | | | |
| 14 | 21 | | | | | | |
| 15 | 22 | | | | | | mini van busting |
| 16 | | | | | | | |
| 17 | | | | | | | LXT_Data.026 |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |

| | |
|---|---|
| Leq | 59.4 |
| Lmax | 83.5 |
| Lmin | 42.4 |
| L10 | ~~57~~ 56.0 |
| L33 | ~~56~~ 48.9 |
| L50 | 45.9 |
| L90 | 43.4 |

Overall Leq (Include "O" minutes, Exclude "X" minutes) = dBA
Subset Leq (Exclude "O" and "X" minutes) = dBA

remove Big Truck (and?) Taco Ma

*"O" = other characteristic sources that contributed to the Leq*

*"X" = exclude from Leq calculation; a non-typical source contaminated the measurement*

# Noise Appendix

## Field Pictures

Noise Monitoring Site LT-1
Location: North of Century 20 Great Mall and XD, on Great Mall Drive

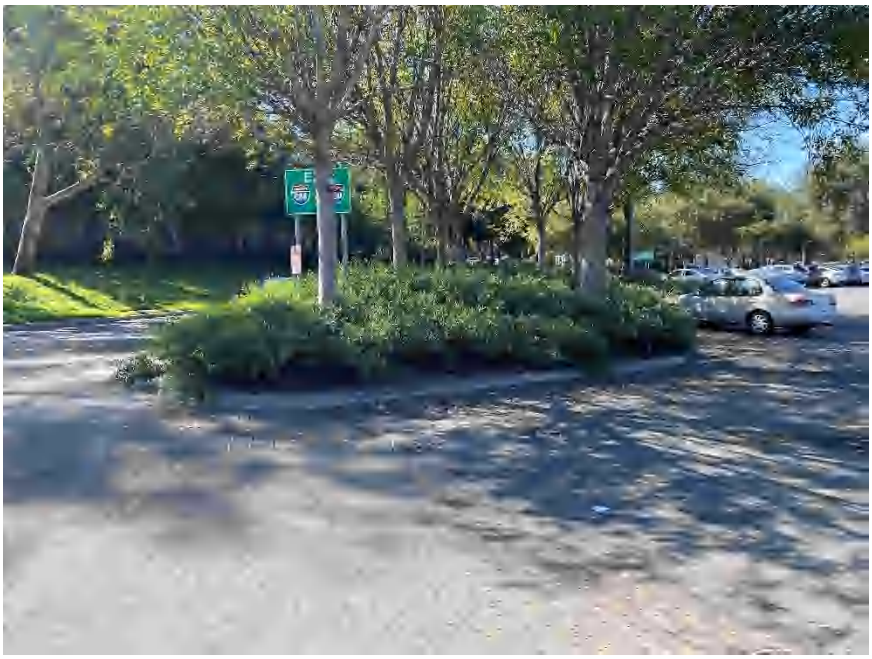
On Great Mall Drive, looking West, SLM off camera to the right.

On Great Mall Drive, looking Northwest, ~270 feet East of Great Mall Drive/Comet Drive intersection.

On Great Mall Drive, SLM off camera to the left, looking East.

On Great Mall Drive, looking northwest.

Noise Monitoring Site LT-2
Location: Group of trees North of TownePlace Suites by Marriott, on Great Mall Drive



In parking lot off of Great Mall Drive, looking South

Looking Northeast towards Great Mall Drive, SLM behind camera.

On Great Mall Drive, looking West, ~280 feet northeast of Great Mall Drive/Falcon Drive intersection.

On Great Mall Drive, looking Southeast. TownePlace Suites by Marriott across the Great Mall Drive to the left.

Noise Monitoring Site LT-3
Location: Across the street from 1400 S Main Street

On the southbound side of South Main Street, looking North. SLM behind camera.

Looking West, ~330 feet south of South Abel Street/South Main Street intersection.

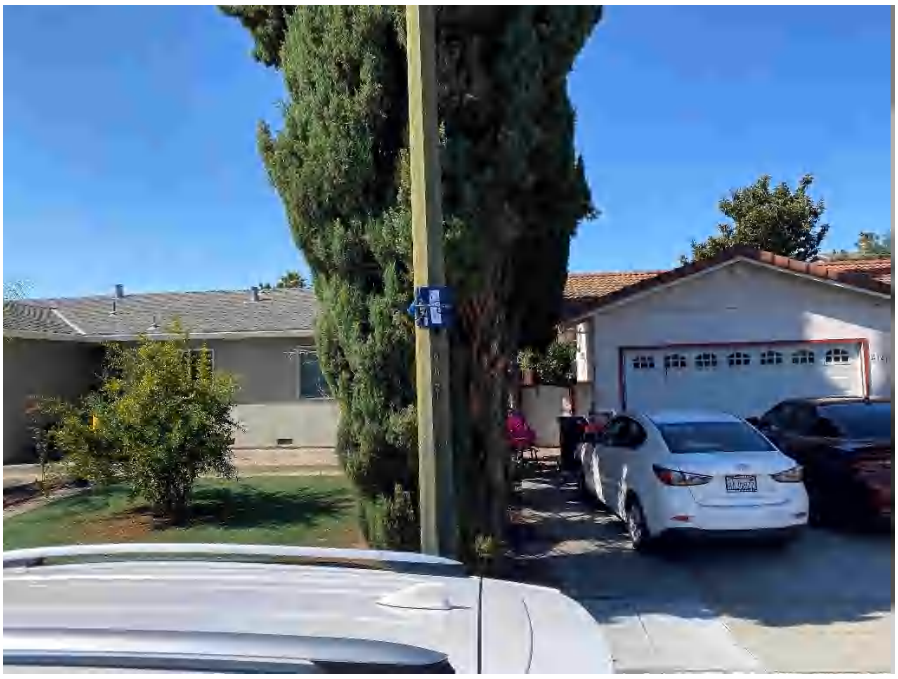
Looking south on South Main Street, ~780 feet north of South Main Street/Cedar Way intersection.

Looking North, 1400 South Main Street is across the street to the right of the SLM.

Noise Monitoring Site LT-4
Location: 2141 Muirwood Court

On Muirwood Court, looking northwest. SLM behind camera.

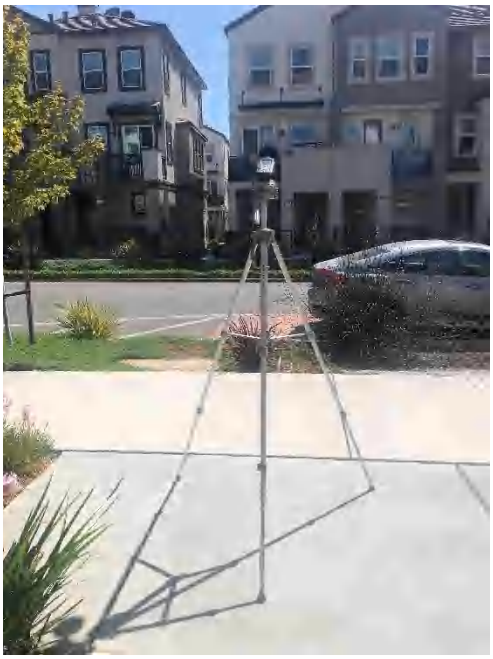
Looking south towards Trimble Road.



Looking west, 2141 Muirwood Court is to the right of the SLM.

Looking south, ~150 feet from Muirwood Court/Trimble Road intersection.

Noise Monitoring Site ST-1
Location: 845 Garden Street



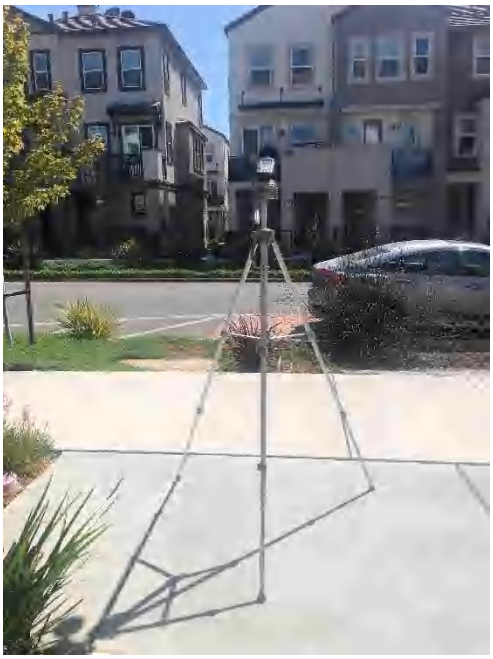
On Garden Street, looking south.

On Garden Street looking east, ~200 feet west of South Milpitas Boulevard.

Looking north, 845 Garden Street on the right of SLM.

Looking west towards Garden Street/Merry Loop intersection.

Noise Monitoring Site ST-1
Location: 845 Garden Street



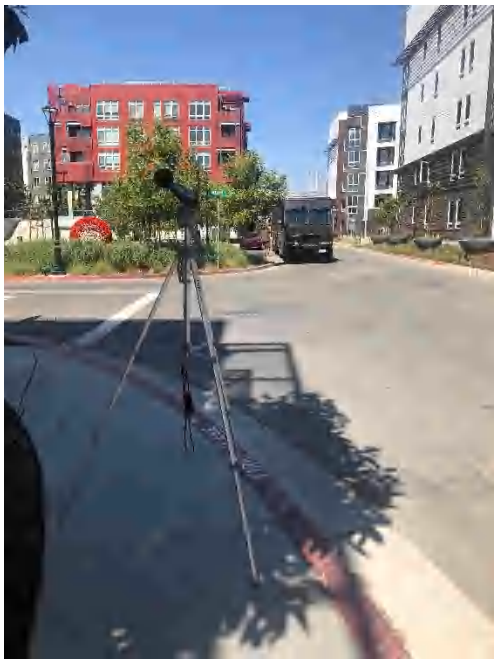
On Garden Street, looking south.

On Garden Street looking east, ~200 feet west of South Milpitas Boulevard.

Looking north, 845 Garden Street on the right of SLM.

Looking west towards Garden Street/Merry Loop intersection.

Noise Monitoring Site ST-3
Location: 422 Vineyard Ave



Looking north on Vineyard Avenue , ~410 feet south of East Capitol Avenue.

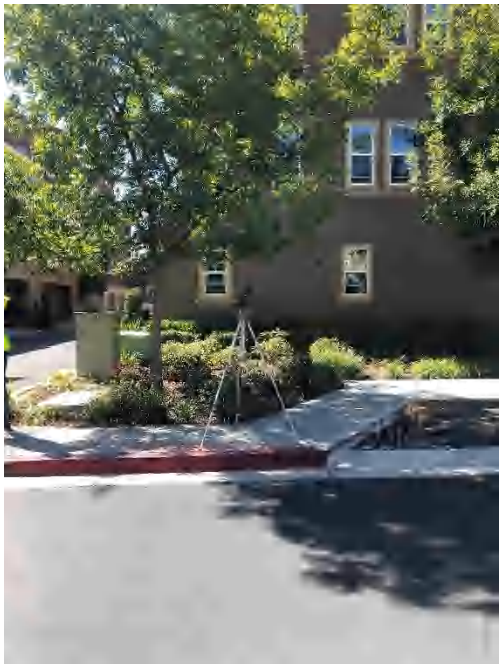
Standing on Vineyard Avenue, looking west to Delano Street.

On Delano Street, looking east towards Vineyard Avenue.

Looking south from the Vineyard Avenue/Delano Street intersection.

Noise Monitoring Site ST-4
Location: Across the Street from 1900 Lee Way

On Lee Way looking south towards DeLong Lane.



Looking west, ~110 feet north of DeLong Lane.

Looking North on Lee Way, 1900 Lee Way is off camera to the right

Appendix F

# Utilities and Service Systems Information

# Milpitas Metro Specific Plan Water Supply Assessment

FINAL REPORT | NOVEMBER 2021

# Milpitas Metro Specific Plan
# Water Supply Assessment

**PREPARED FOR**

City of Milpitas

**PREPARED BY**

WEST YOST
Water. Engineered.

# Milpitas Metro Specific Plan
# Water Supply Assessment

**Prepared for**

## City of Milpitas

**Project No. 977-60-21-01**

| | |
|---|---|
| Project Manager: Elizabeth Drayer, PE | November 2, 2021<br>Date |
| QA/QC Review: Jim Connell, PE | November 2, 2021<br>Date |

WEST YOST
Water. Engineered.

FINAL REPORT | NOVEMBER 2021

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Appendix A. SFPUC Memo: Regional Water System Supply Reliability and UWMP 2020
Appendix B. Valley Water Memo: Urban Water Management Plan Retailer Talking Points


## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 2021 WMP | 2021 Water Master Plan |
| AF | Acre-feet |
| AFY | Acre-feet Per Year |
| BART | Bay Area Rapid Transit |
| BAWSCA | Bay Area Water Supply and Conservation Agency |
| City | City of Milpitas |
| CVP | Central Valley Project |
| CWC | California Water Code |

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| | |
|---|---|
| Delta | Sacramento-San Joaquin Delta |
| DSS Model | Decision Support System Demand Model |
| DWR | California Department of Water Resources |
| EIR | Environmental Impact Report |
| ETo | Evapotranspiration |
| FERC | Federal Energy Regulatory Commission |
| GMP | Groundwater Management Plan |
| gpcd | Gallons Per Capita Per Day |
| gpd | Gallons Per Day |
| gsf | Gross Square Feet |
| HTWTP | Harry Tracy Water Treatment Plant |
| ISG | Individual Supply Guarantee |
| MG | Million Gallons |
| MGSP | Milpitas Gateway-Main Street Specific Plan |
| MGY | Million Gallons per Year |
| MID | Modesto Irrigation District |
| Proposed Project | Milpitas Metro Specific Plan |
| R&D | Research and Development |
| RWS | SFPUC Regional Water System |
| SB | Senate Bill |
| SBWR | South Bay Water Recycling |
| sf | Square Feet |
| SFPUC | San Francisco Public Utilities Commission |
| SGMA | Sustainable Groundwater Management Act |
| SVAWPC | Silicon Valley Advanced Water Purification Center |
| SVWTP | Sunol Valley Water Treatment Plant |
| SWP | State Water Project |
| SWRCB | State Water Resources Control Board |
| TID | Turlock Irrigation District |
| USEPA | United States Environmental Protection Agency |
| UWMP | Urban Water Management Plan |
| VTA | Santa Clara Valley Transit Authority |
| WQC | Water Quality Certification |
| WSA | Water Supply Assessment |
| WSAP | Water Shortage Allocation Plan |
| WSCP | Water Shortage Contingency Plan |
| WSIP | Water System Improvement Plan |
| WTP | Water Treatment Plant |
| WUF | Water Use Factor |

# EXECUTIVE SUMMARY

## Overview

West Yost has prepared this Water Supply Assessment (WSA) for the City of Milpitas (City) in accordance with California Water Code (CWC) sections 10910 through 10915 and in connection with the proposed Milpitas Metro Specific Plan (Proposed Project). This WSA has been prepared using information on the City's available water supplies and projected water demands as documented in the City's 2020 Urban Water Management Plan (UWMP) and the City's 2021 Water Master Plan (2021 WMP). Information on the Proposed Project has been provided by Urban Field Studio and M-Group, the planning consultants responsible for the development of the Milpitas Metro Specific Plan.

The Proposed Project is located in the southern portion of the City, directly adjacent to City limits. Currently an industrial district, the Proposed Project area encompasses an approximately 3/4-mile radius centered around the City's Transit Center, which is located at the intersection of Montague Expressway and Capitol Avenue. The Proposed Project area was previously included in the City's 2008 Transit Area Specific Plan (TASP) which planned for 7,577 residential units, 2,240,000 square feet of retail space, and 1,050,000 square feet of office space to be built by 2020. Over the last 12 years, much of the TASP vision has become a reality, including the newly opened BART station and VTA Transit Center, new housing, parks, a grocery store, and other shops under development. By 2019, 92 percent of the planned residential units were under development.

As the area neared residential capacity as planned for in the TASP, the City began the process to update the Specific Plan governing development in the area. The plan area boundaries were adjusted to include a research and development subdistrict adjacent to Highway 680 (referred to as the Innovation District) and opportunities for additional housing development along Main Street. The area was renamed "Milpitas Metro" to reflect its vibrancy, urban nature, and excellent transit connections.

The Proposed Project, to be developed over the next 20 years, includes 7,000 units of new, multi-family residential development (approximately 14,000 new residents) located near transit that maximizes transit ridership and creates a vibrant residential community. New non-residential development in the Proposed Project area is expected to include office, retail, research and development (R&D), light manufacturing, and hotel uses. These uses are concentrated in the Great Mall subdistrict and the Innovation District, with the greatest amount of retail and commercial development occurring along Great Mall Parkway and Montague Expressway and office development being concentrated along Montague Expressway and South Milpitas Boulevard. R&D and light manufacturing will be concentrated in the Innovation District on the east side of the Proposed Project area. The Proposed Project is expected to create approximately 12,284 new jobs, stemming from approximately 3,000,000 square feet (sf) of office space, 300,000 sf of retail space, and 700 hotel rooms.

# Projected Water Demands

Consistent with policies established in the 2008 TASP, the Proposed Project will be served with potable water for domestic uses and recycled water for landscape irrigation uses.

Potable water demand for the Proposed Project was estimated using proposed development information from M-Group and water use factors (WUF) developed for similar projects and locations. A WUF is defined as the estimated water use per unit of a given land use type. WUFs in this WSA are presented in gallons per day (gpd) per dwelling unit (du, for residential land uses), sf (for office and retail land uses), or room (for hotels).

The estimated potable water demand for the Proposed Project is approximately 500 million gallons per year (MGY). Actual potable demands for the Proposed Project may be lower, because WUFs were developed from existing water users that may have less efficient plumbing fixtures than what will be provided for the Proposed Project. Newer developments like the Proposed Project are required to have ultra-low flow plumbing fixtures and encouraged to incorporate water collection and retention devices (e.g., rain barrels) into building design to allow for water reuse.

Recycled water will be provided for landscape irrigation purposes within the Proposed Project area. The estimated recycled water demand for the Proposed Project is approximately 53 MGY. The City purchases recycled water from South Bay Water Recycling (SBWR) and operates and maintains the recycled water distribution facilities within City boundaries. For parcels that do not have current access to a recycled water main, a recycled water main will be required to be installed up to and across the frontage of the parcel. The cost of extending the main, not including the length across the frontage, will be funded using the development impact fees to be collected. It is anticipated that adequate recycled water supplies will be available to meet the landscape irrigation demands within the Proposed Project area.

While projected water demands for the Proposed Project were not specifically identified in the City's 2020 UWMP, the City's 2020 UWMP references the Proposed Project in the City's future land use projections, and future projected water connections associated with the Proposed Project were incorporated into the Decision Support System Model (DSS Model) used to project the City's future water demands. Therefore, the City's 2020 UWMP does include the Proposed Project in its water demand projections.

# Water Supply Availability and Reliability

As discussed in this WSA, the City purchases all its potable water supplies from the San Francisco Public Utilities Commission (SFPUC) and Valley Water. In emergencies, the City can also pump groundwater, but groundwater is not part of the City's active water supply portfolio. Therefore, the availability and reliability of the City's water supply is largely dependent on its water supply contracts with the SFPUC and Valley Water and their respective water supply reliability, which is detailed in each agency's 2020 UWMP.

## *SFPUC Regional Water System Reliability*

The Bay Area Water Supply and Conservation Agency (BAWSCA) represents the SFPUC's 26 Wholesale Customers (including the City). In February 2015, BAWSCA published the Long-Term Reliable Water Supply Strategy Phase II Final Report (Phase II Final Report), which quantifies the water supply reliability needs of its member agencies through 2040 and identifies water management actions that could be developed to meet those needs. BAWSCA is currently implementing the strategy recommendations from the Phase II Final Report in coordination with its member agencies.

The SFPUC is improving the reliability of its Regional Water System (RWS) by implementing the Water System Improvement Plan (WSIP) and Alternative Water Supply Program. The WSIP is forecast to be completed in December 2021 and aims to meet customer water needs in non-drought and drought conditions through defined projects that improve seismic, delivery, water quality, and water supply reliability for the RWS. In contrast, the Alternative Water Supply Program is in its early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change.

One major factor in RWS supply reliability is an amendment to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment), which was adopted by the State Water Resources Control Board (SWRCB) in December 2018. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. Actual implementation details of the Bay-Delta Plan Amendment (as adopted by the SWRCB) remain uncertain, but its requirements would mean that the SFPUC could only meet the projected water demands presented in its 2020 UWMP in normal hydrologic years and not in single dry years or multiple dry years.

Procedures to allocate RWS supplies during SFPUC system shortages are specified in agreements between the SFPUC and the Wholesale Customers. In 2019, the Wholesale Customers and the SFPUC adopted the November 2018 Amended and Restated Water Supply Agreement, which included a Water Shortage Allocation Plan (WSAP) to allocate RWS water to retail and wholesale customers during system-wide shortages of 20 percent or less. For water shortages greater than 20 percent, the SFPUC will meet with the Wholesale Customers to determine if an allocation methodology can be agreed upon by the SFPUC and the Wholesale Customers.

### *Valley Water Reliability*

Valley Water maintains diverse water supply sources to meet demands in Santa Clara County, including groundwater recharge, local surface water, imported water from State and federal projects, and recycled/purified water. While the City's supplies from Valley Water consist exclusively of imported water from the State Water Project and Central Valley Project, the reliability of Valley Water's overall supply portfolio remains relevant. For example, if Valley Water's groundwater supply reliability decreased significantly, it would strain Valley Water's remaining supplies, including imported water.

Valley Water's supplies are constrained by hydrologic variability, with other constraints specific to each source. Imported water is conveyed through the Sacramento-San Joaquin Delta (Delta), which is threatened by levee failures, sea level rise, climate change, and declining populations of protected fish species. Natural recharge is insufficient to meet Valley Water's groundwater demands, so Valley Water's managed recharge program is critical to maintaining groundwater supply. Groundwater quality, specifically nitrate, is also a concern. Lastly, Valley Water's local surface water supplies are vulnerable to regulatory requirements, including reservoir operating rules and supporting instream flow needs.

### *City of Milpitas Water Supply Reliability*

The City's 2020 UWMP assumes the Bay-Delta Plan Amendment is implemented, which significantly reduces SFPUC supplies during dry years. Furthermore, supplies from Valley Water may have drought shortages of up to 20 percent in the future if some of Valley Water's Water Supply Master Plan 2040 (WSMP) projects are not implemented, or provide less benefits than expected, and imported supplies are reduced by 25 percent or severe allocation cuts occur during droughts as have been experienced during

this drought and the previous drought. As a result, the City's 2020 UWMP assumes three groundwater wells (each pumping at 1.2 million gallons per day) will be online by 2030, with a fourth online by 2035. These new groundwater wells are triggered by future development projected in the City's service area and shall be funded through associated development impact fees. It should also be noted that the City's 2021 WMP identifies infrastructure improvements needed to serve proposed new development within the City's service area. These include supply (e.g., a new Valley Water turnout) and storage capacity improvements that are also triggered by future development projected in the City's service area and shall be funded through associated development impact fees.

During normal hydrologic years the City's water supplies can meet projected demands (including demands for the Proposed Project) through 2045. During a single dry year in 2025 or a five-year drought starting in 2025, City supplies are insufficient to meet projected demands. As described in Sections 7 and 8 of this WSA and Chapter 7 of the City's 2020 UWMP, supply shortfalls in prolonged droughts will either require significant measures to be implemented to reduce water use, as outlined in the City's 2020 Water Shortage Contingency Plan (WSCP) (included in Chapter 8 of the City's 2020 UWMP), or the City may supplement some or most of the supply shortfall through groundwater pumping. Once the City's groundwater wells come online (assumed in 2030), and assuming that the wells produce sufficient flow while meeting water quality standards, the City's dry year supplies can better meet projected demands in single dry and multiple dry years. There are small supply shortfalls starting in the third year of a five-year drought starting in 2030 and the fourth year of a five-year drought starting in 2045. To address these supply shortfalls, the City expects to implement its WSCP and reduce water demands as needed.

Pursuant to CWC section 10910(c)(4) and based on the technical analyses described in this WSA, the City finds that the total projected water supplies determined to be available for the Proposed Project during a 20-year projection will meet the projected water demand associated with the Proposed Project, in addition to existing and planned future uses.

# 1.0 INTRODUCTION

The City of Milpitas Metro Specific Plan (Proposed Project) seeks to transform approximately 400 acres of an industrial district into a transit-oriented community. Located in the southern portion of the City of Milpitas (City) surrounding the Milpitas Bay Area Rapid Transit (BART) and Santa Clara Valley Transit Authority (VTA) light rail stations, the Proposed Project consists of approximately 7,000 dwelling units, 3,000,000 gross square feet (gsf) of office space, 300,000 gsf or retail space, and 700 hotel rooms.

This Water Supply Assessment (WSA) supports the Environmental Impact Report (EIR) for the Proposed Project. The following sections describe the legal requirement for the WSA and the Proposed Project background.

## 1.1 Legal Requirement for a Water Supply Assessment

California Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 were companion measures which sought to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to city and county decision-makers prior to approval of specified large development projects. The purpose of this coordination is to ensure that prudent water supply planning has been conducted, and that planned water supplies are adequate to meet existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

SB 610 amended California Water Code (CWC) sections 10910 through 10915 (inclusive) to require land use lead agencies to:

- Identify any public water purveyor that may supply water for a proposed development project
- Request a WSA from the identified water purveyor

The purpose of the WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the proposed project, while still meeting the water purveyor's existing and planned future uses. CWC sections 10910 through 10915 delineate the specific information that must be included in the WSA.

SB 221 amended State law (California Government Code Section 66473.7) to require that approval by a city or county of certain residential subdivisions[1] requires an affirmative written verification of sufficient water supply. SB 221 was intended as a fail-safe mechanism to ensure that collaboration on finding the needed water supplies to serve a new large residential subdivision occurs before construction begins.

[1] Per California Government Code Section 66473.7(a)(1), subdivision means a proposed residential development of more than 500 dwelling units.

## 1.2 Need for and Purpose of Water Supply Assessment

The purpose of this WSA is to perform the evaluation required by SB 610 (CWC sections 10910 through 10915) in connection with the Proposed Project. This WSA does not reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see CWC section 10914), nor is it intended to meet the requirements of SB 221. The provision of water service will continue to be undertaken in a manner consistent with applicable City policies and procedures, consistent with existing law.

This WSA for the Proposed Project has been prepared by West Yost, as requested by the City, the responsible water purveyor for the Proposed Project.

## 1.3 Water Supply Assessment Preparation, Format, and Organization

The format of this WSA is intended to follow CWC sections 10910 through 10915 to clearly delineate compliance with the specific requirements for a WSA. This WSA includes the following sections:

Section 1: Introduction
Section 2: Description of the Proposed Project
Section 3: Required Determinations
Section 4: City of Milpitas Municipal Water System
Section 5: City of Milpitas Municipal Water Demands
Section 6: City of Milpitas Municipal Water Supplies
Section 7: Water Supply Reliability
Section 8: Determination of Water Supply Sufficiency Based on the Requirements of SB 610
Section 9: Water Supply Assessment Approval Process
Section 10: References

Relevant citations of CWC sections 10910 through 10915 are included throughout this WSA to demonstrate compliance with the specific requirements of SB 610.

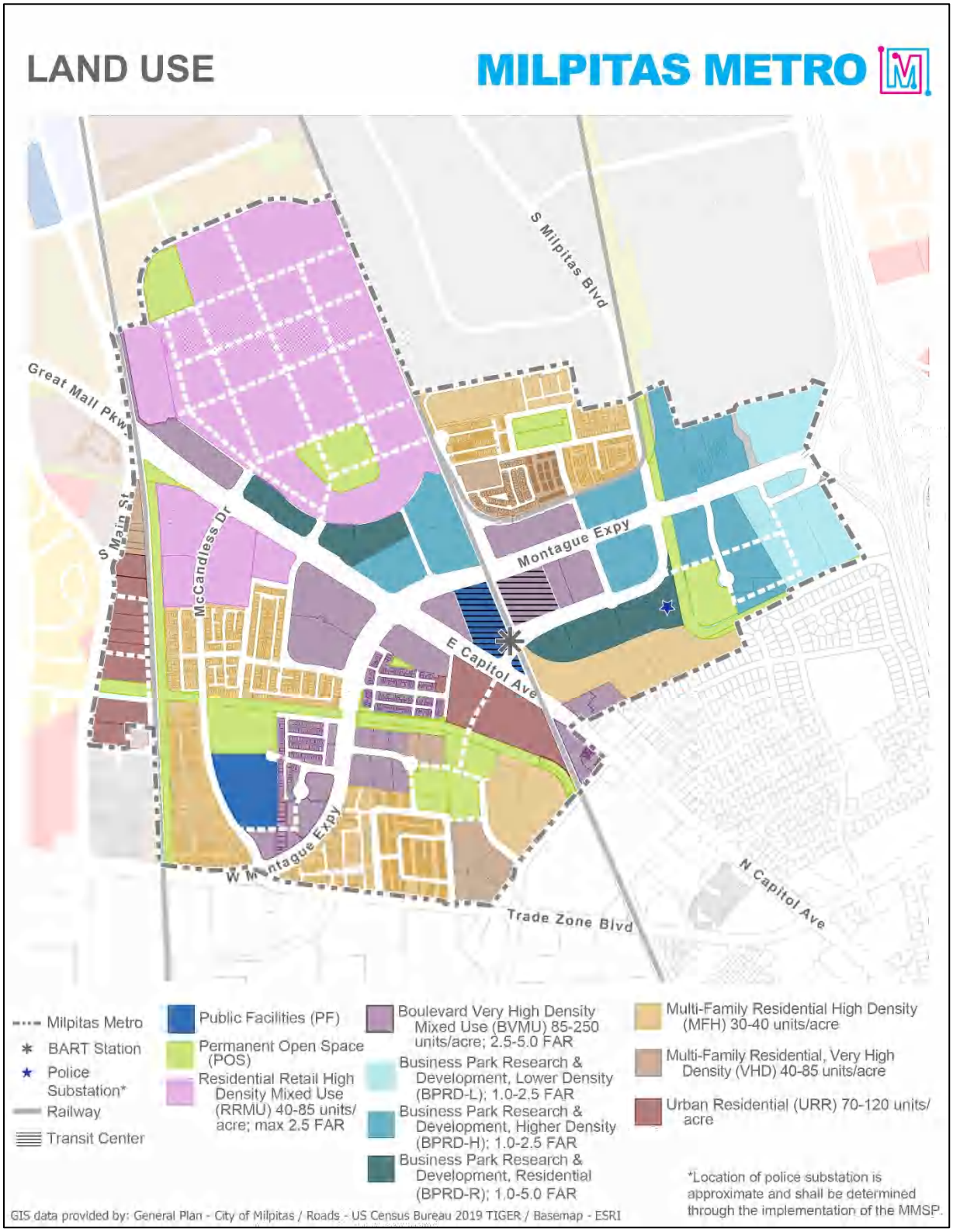
## 1.4 Proposed Project Location and Overview

The Proposed Project is located in the southern portion of the City, directly adjacent to City limits. Currently an industrial district, the Proposed Project area encompasses an approximately 3/4-mile radius centered around the City's Transit Center, which is located at the intersection of Montague Expressway and Capitol Avenue. Figure 1-1 shows the Proposed Project site.

The Proposed Project seeks to create a vibrant mix lifestyle retail, high-density housing, and/or offices along the major streets of Great Mall Parkway, Montague Expressway, and East Capitol Avenue. Near the Transit Center, the Proposed Project will have high- to very high-density housing and/or high-intensity office and employment uses. Figure 1-2 presents the land uses for the Proposed Project, and Figure 1-3 presents the five subdistricts, each with its own character based on the allocated mix of land uses and development densities, parks placement, street grid, pedestrian connections, and proximity to the BART station.

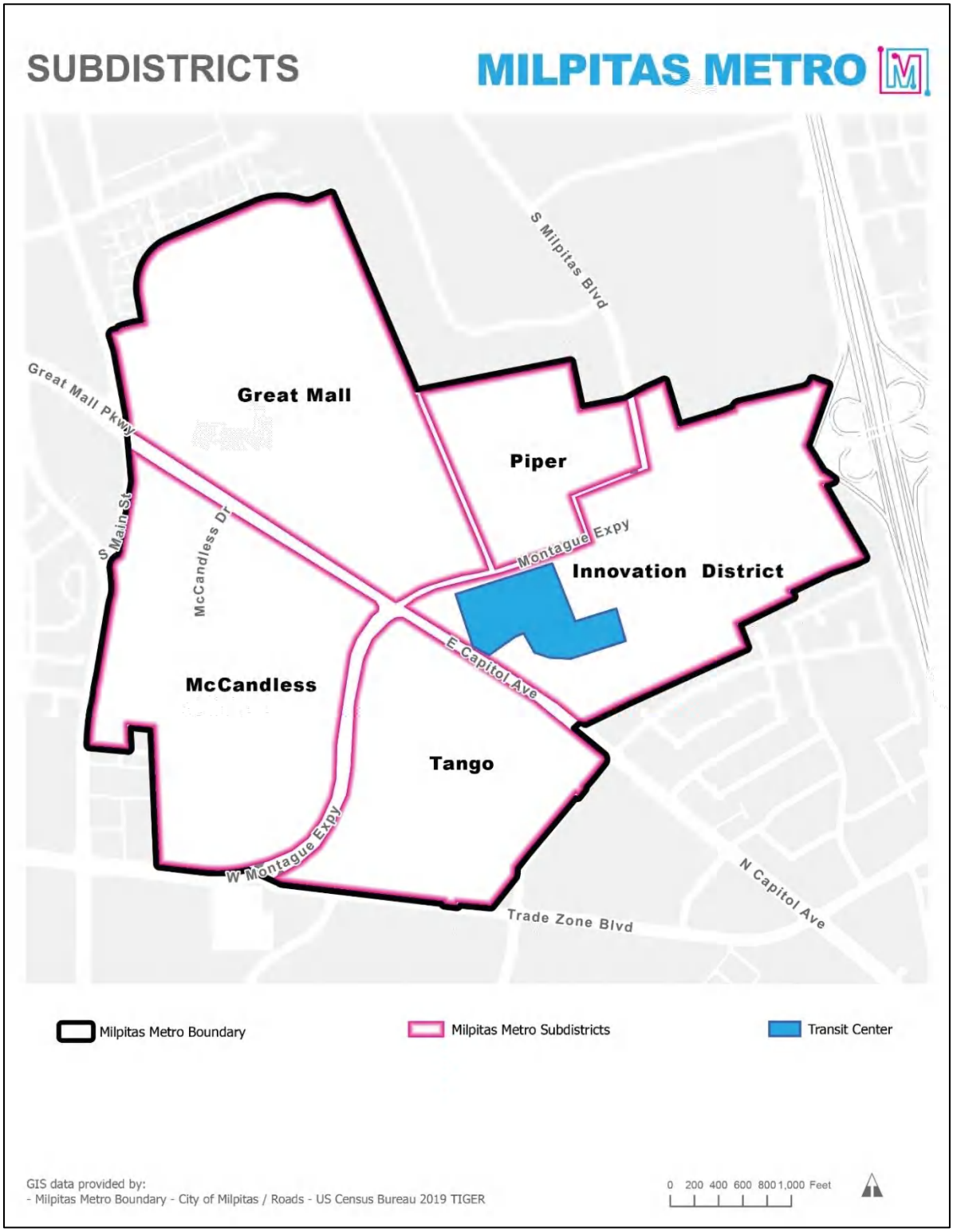
*Source: Figure 2.1-2, Milpitas Metro Specific Project Description, prepared by Urban Field Studio, dated April 2021.*

**Figure 1-1. Proposed Project Location**




*Source: M-Group (October 2021)*

**Figure 1-2. Proposed Project Land Use**




*Source: M-Group (October 2021)*

**Figure 1-3. Proposed Project Subdistricts**

# 2.0 DESCRIPTION OF THE PROPOSED PROJECT

The following sections describe the Proposed Project, including its location, proposed land uses, and projected water demand.

## 2.1 Project Description and Proposed Land Uses

In the late 2000's, the Milpitas Metro area was largely an industrial area characterized by wide, fast-moving arterial streets, rail crossings, culverted streams, and the presence of the Great Mall, a regional shopping center located in a former Ford manufacturing plant. An opportunity for change was envisioned, catalyzed by major transit connections through the VTA light rail and planned BART station, along with the on-going growth of Silicon Valley and the broader Bay Area. The Transit Area Specific Plan (TASP) was developed in 2008 and planned for 7,577 residential units, 2,240,000 square feet of retail space, and 1,050,000 square feet of office space to be built by 2020.

Over the last 12 years, much of the TASP vision has become a reality, including the newly opened BART station and VTA Transit Center, new housing, parks, a grocery store, and other shops under development. By 2019, 92 percent of the planned residential units were under development.

As the area neared residential capacity as planned for in the TASP, the City began the process to update the Specific Plan governing development in the area. The plan area boundaries were adjusted to include a research and development subdistrict adjacent to Highway 680 (referred to as the Innovation District) and opportunities for additional housing development along Main Street. The area was renamed "Milpitas Metro" to reflect its vibrancy, urban nature, and excellent transit connections.

The Proposed Project, to be developed over the next 20 years, assumes 7,000 units of new residential development, all of which will be in multi-family structures, with approximately 14,000 new residents, with a high level of residential density near transit that maximizes transit ridership and creates a vibrant residential community. New non-residential development in the Proposed Project area is expected to include office, retail, research and development (R&D), light manufacturing, and hotel uses. These uses are concentrated in the Great Mall subdistrict and the Innovation District, with the greatest amount of retail and commercial development occurring along Great Mall Parkway and Montague Expressway and office development being concentrated along Montague Expressway and South Milpitas Boulevard. Hotels are expected to add approximately 700 rooms. R&D and light manufacturing will be concentrated in the Innovation District on the east side of the Proposed Project area.

The Proposed Project is expected to create approximately 12,284 new jobs, stemming from approximately 3,000,000 square feet (sf) of office space, 300,000 sf of retail space, and 700 hotel rooms. Of the 3,000,000 sf of anticipated office space, 2,500,000 sf is projected to be accommodated in the Innovation District. Within the Innovation District, 20 percent of this space is expected to be developed for industrial uses, and 80 percent will be developed for office uses.

It should be noted that the estimate of new jobs does not reflect the number of jobs lost by the demolition of existing buildings for new development. The Proposed Project area currently consists of predominantly residential, mixed-use, and commercial uses. There are 63.5 acres of industrial, light industrial, and research and development (R&D) uses. The Proposed Project would redevelop approximately 23.6 acres of industrial and R&D land uses into residential uses and an additional 24 acres of industrial into office space and is expected to displace approximately 952 existing industrial jobs. However, the redevelopment

of the Innovation District is expected to generate 1,111 industrial jobs, resulting in a net gain of 159 industrial jobs.

## 2.2 Projected Water Demand for the Proposed Project

Consistent with policies established in the 2008 TASP, the Proposed Project will be served with potable water for domestic uses and recycled water for landscape irrigation uses.

Potable water demand for the Proposed Project was estimated using projected development data from M-Group and water use factors (WUF) developed for similar projects and locations. A WUF is defined as the estimated water use per unit of a given land use type. The WUFs used in the WSA were different than the WUFs used in the City's 2021 Water Master Plan (2021 WMP) as the development data for the Proposed Project was more refined for this WSA. The WUFs used in the 2021 WMP were based on gallons per day per acre of development, while the WUFs used in this WSA were based on gallons per day (gpd) per dwelling unit (du, for residential land uses), sf (for office and retail land uses), or room (for hotels).

Table 2-1 presents the estimated potable water demand for the Proposed Project, which is approximately 500 million gallons per year (MGY). The estimated total potable water demand for the Proposed Project presented in Table 2-1 is likely conservative. Actual potable demands for the Proposed Project may be lower, because WUFs were developed from existing water users that may have less efficient plumbing fixtures than what will be provided for the Proposed Project. Newer developments like the Proposed Project are required to have ultra-low flow plumbing fixtures and encouraged to incorporate water collection and retention devices (e.g., rain barrels) into building design to allow for water reuse.

Recycled water will be provided for landscape irrigation purposes within the Proposed Project area. As shown in Table 2-1, the estimated recycled water demand for the Proposed Project is 53 MGY. This demand estimate is based on the Proposed Project's approximate landscaped area (43.7 acres or 1.90 million sf, per M-Group) and the Maximum Applied Water Allowance equation in the Model Water Efficient Landscape Ordinance (MWELO).

The City purchases recycled water from South Bay Water Recycling (SBWR) and operates and maintains the recycled water distribution facilities within City boundaries. For parcels which do not have current access to a recycled water main, a recycled water main will be required to be installed up to and across the frontage of the parcel. The cost of extending the main, not including the length across the frontage, will be funded using the development impact fees to be collected. It is anticipated that adequate recycled water supplies will be available to meet the landscape irrigation demands within the Proposed Project area.

**Table 2-1. Estimated Water Demand for the Proposed Project**

| Land Use Designation[a] | Projected Development[a] | Water Use Factor[b] | Potable Water Demand, MGY |
|---|---|---|---|
| Residential | 7,000 du | 135 gpd/du | 344.9 |
| Retail | 300,000 sf | 0.14 gpd/sf | 15.3 |
| Office | 3,000,000 sf | 0.1 gpd/sf | 109.5 |
| Hotel | 700 rooms | 115 gpd/room | 29.4 |
| | | **Total Potable Water Demand** | **499.1** |
| | | **Total Recycled Water Demand for Irrigation[c]** | **53.0** |

(a) Source: M-Group Milpitas Metro Specific Project Description (Table 2.2-1)

(b) WUFs developed for similar municipalities based on actual consumption.

(c) Consistent with policies established in the 2008 TASP, irrigation demands within the Proposed Project area will be met with recycled water. Irrigation demand for the Proposed Project is estimated based on landscaped area (provided by M-Group in October 2021) and the Maximum Applied Water Allowance per MWELO. Actual irrigation demand may be less based on proposed landscaping and planting plans which have not yet been developed.

With an estimated 14,000 new residents, the Proposed Project's potable water use is approximately 98 gallons per capita per day (gpcd). This is slightly lower than the City's actual per capita water use in 2020 (108 gpcd), as presented in its 2020 UWMP and would therefore be expected to help lower the City's overall per capita water demand.

# 3.0 REQUIRED DETERMINATIONS

The following sections describe the required determinations for a WSA.

## 3.1 Does SB 610 Apply to the Proposed Project?

*10910 (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.*

*10912 (a) "Project" means any of the following:*

*(1) A proposed residential development of more than 500 dwelling units.*

*(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*

*(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*

*(4) A proposed hotel or motel, or both, having more than 500 rooms.*

*(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.*

*(6) A mixed-use project that includes one or more of the projects specified in this subdivision.*

*(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.*

As shown in Table 3-1, the Proposed Project meets the definition of a "Project" as specified in CWC Section 10912(a). The Proposed Project has not been the subject of a previously adopted WSA and has not been included in an adopted WSA for a larger project. Therefore, according to CWC section 10910(a), a WSA is required for the Proposed Project.

**Table 3-1. Does the Proposed Project Meet the SB 610 Definition of a "Project"?**

| SB 610 Project Definition Components | Proposed Project Quantity | Meets the SB 610 Definition of a "Project"? |
|---|---|---|
| Residential > 500 dwelling units | 7,000 | YES |
| Retail > 1,000 employees or > 500,000 sf | 857 employees<br>300,000 sf | NO |
| Commercial Office Building > 1,000 employees or > 250,000 sf | 9,615 employees<br>3,000,000 sf | YES |
| Hotel/Motel > 500 rooms | 700 | YES |
| Industrial Plant/Park > 1,000 employees or > 40 acres or > 650,000 sf | N/A | NO |
| Mixed Use Project that includes one or more of the above | Yes | YES |
| A Project that would demand the amount of water required by a 500-dwelling unit project | Yes | YES |
| **SB 610 Required?** | -- | **YES** |

## 3.2 Does SB 221 Apply to the Proposed Project?

In 2001, SB 221 amended State law to require that approval by a city or county of certain residential subdivisions requires an affirmative written verification of sufficient water supply. Per California Government Code section 66473.7(a)(1), a subdivision means a proposed residential development of more than 500 dwelling units. The Proposed Project includes 7,000 residential dwelling units and is therefore subject to the requirements of SB 221. A verification of sufficient water supply (SB 221) report will be required prior to final approvals.

## 3.3 Who is the Identified Public Water System?

> *10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project*
>
> *10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections…*

Since the Proposed Project is located within City limits, the City is the identified public water system for the Proposed Project.

## 3.4 Does the Identified Water Supplier have an adopted UWMP and does the UWMP include the projected water demand for the Proposed Project?

> *10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).*

The City's 2020 UWMP was adopted in June 2021. While projected water demands for the Proposed Project were not specifically identified in the City's 2020 UWMP, the City's 2020 UWMP references the Proposed Project in the City's future land use projections, and future projected water connections associated with the Proposed Project were incorporated into the Decision Support System Model (DSS Model) used to project the City's future water demands. Therefore, the City's 2020 UWMP does include the Proposed Project in its water demand projections.

# 4.0 CITY OF MILPITAS MUNICIPAL WATER SYSTEM

The following sections describe the City's existing water service area, including population and climate information.

## 4.1 Water Service Area

Located in Santa Clara County at the southern tip of the San Francisco Bay, the City is bordered by the City of Fremont to the north and the City of San Jose to the south. The City's water service area is approximately 12 square miles and is generally coincident with City limits, except for some areas in the Calaveras Hills along the City's eastern edge. The City can be divided into two distinct topographical areas: the relatively flat "valley floor" on the western side and the steeper "hillside" area within the Calaveras Hills.

As of December 2020, the City had 16,360 active service connections, including recycled water and fire accounts. Of the City's existing developed land, the primary land uses are residential, commercial, and industrial.

## 4.2 Population

The City expects significant population growth due to redevelopment associated with two major development areas, the Proposed Project and the Milpitas Gateway-Main Street Specific Plan (MGSP). Table 4-1 shows the City's projected population as presented in the City's 2020 UWMP. The population projections include the projected population for the Proposed Project, approximately 14,000 new residents, as well as other proposed development projects in the City's service area. As shown in Table 4-1, the City's population is projected to increase from approximately 78,000 in 2020 to over 120,000 by 2045.

**Table 4-1. City of Milpitas Existing and Projected Population**

| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Population Served | 77,961 | 90,400 | 98,100 | 106,000 | 113,200 | 120,400 |

*Source: City of Milpitas 2020 UWMP (Table 3-1).*

## 4.3 Climate

The City is in a region with a Mediterranean climate, characterized by mild, wet winters and warm, dry summers. The rainy season typically begins in October and ends in May, and the area experiences an average annual precipitation of approximately 14.6 inches. Average temperatures in the area range from a minimum of 40.9°F in January to a maximum of 81.8°F in July.

The average annual reference evapotranspiration (ETo) for the City's service area is approximately 45 inches per year. ETo is a standardized measurement of water lost as evaporation from soil and transpiration from a reference crop. The water demand of different landscaping and crops can be approximated as the difference between precipitation and ETo. As shown in Table 4-2, monthly ETo is greater than the monthly precipitation from March through November. Annual ETo is over three times greater than annual precipitation, resulting in high irrigation demands during the dry season.

Climate data for the City's service area is shown in Table 4-2.

**Table 4-2. City of Milpitas Service Area Monthly Climate Data[a]**

| Month | Average ETo, inches | Average Total Precipitation, inches | Average Temperature, °F | |
|---|---|---|---|---|
| | | | Min | Max |
| January | 1.37 | 2.88 | 40.9 | 58.1 |
| February | 2.00 | 2.69 | 43.5 | 61.9 |
| March | 3.30 | 2.31 | 45.2 | 65.4 |
| April | 4.43 | 1.20 | 46.9 | 69.5 |
| May | 5.43 | 0.44 | 50.5 | 74.2 |
| June | 6.08 | 0.10 | 53.8 | 79.0 |
| July | 6.26 | 0.02 | 56.1 | 81.8 |
| August | 5.57 | 0.07 | 56.2 | 81.3 |
| September | 4.36 | 0.19 | 55.2 | 80.4 |
| October | 3.10 | 0.76 | 51.3 | 74.3 |
| November | 1.69 | 1.50 | 45.3 | 65.2 |
| December | 1.31 | 2.41 | 41.5 | 58.5 |
| **Total/Average** | **44.9** | **14.6** | **48.9** | **70.8** |

(a) Source: Reference evapotranspiration data for Union City station #171 are from the Department of Water Resources, California Irrigation Management Information System. Temperature and precipitation data are from the Western Regional Climate Center for Station #047821 San Jose from 1 January 1893 to 9 June 2016.

# 5.0 CITY OF MILPITAS MUNICIPAL WATER DEMANDS

*10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).*

The descriptions provided below for the City's water demands are based on the City's 2020 UWMP (adopted in June 2021) and its 2021 Water Master Plan (2021 WMP). This section covers historical and existing (2020) water demand, future water demand, and dry year water demand.

## 5.1 Historical and Existing Water Demand

Table 5-1 shows the City's water demand (based on water production) from 2016 through 2020. Over that period, the City's water demand grew steadily from approximately 2,800 MGY to nearly 3,100 MGY, an increase of approximately 9 percent.

**Table 5-1. City of Milpitas Historical Water Demand**

| | Demand, MGY | | | | |
|---|---|---|---|---|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 |
| Potable Water Demand[(a)] | 2,816 | 2,900 | 2,962 | 3,040 | 3,073 |
| Recycled Water Demand[(b)] | 257 | 277 | 410 | 342 | 357 |
| **Total Water Demand** | **3,073** | **3,177** | **3,372** | **3,382** | **3,430** |

(a) Source: City of Milpitas 2021 WMP (Table 5-1) and 2020 UWMP (Table 4-3).
(b) Source: City data provided for the 2021 WMP for 2016-2019 and 2020 UWMP (Table 4-3) for 2020.

## 5.2 Future Water Demand

Table 5-2 shows the City's projected normal water year demands through 2045, as presented in the City's 2020 UWMP. Potable water projections are based on the Decision Support System demand model (DSS Model), which breaks down historical water use by water service account type (e.g., single-family residential, multi-family residential, commercial) and specific end uses (e.g., toilets, faucets, showers, irrigation). To project future demands, the DSS Model incorporates the projected growth and end-use water consumption for each water service account type, as well as water savings from potential water conservation measures and plumbing and appliance codes. Based on these projections, potable water demands are projected to increase more in the next 5 years (approximately 850 MGY from 2020 to 2025) than in the following 20 years (2025-2045). As shown in Table 5-2, the City's water demand is projected to increase by approximately 600 MGY between 2025 and 2045.

| Table 5-2. City of Milpitas Projected Future Water Demand – Normal Hydrologic Years | | | | | |
|---|---|---|---|---|---|
| | Projected Water Demand, MGY | | | | |
| | 2025 | 2030 | 2035 | 2040 | 2045 |
| Potable Water Demand[(a)] | 3,925 | 4,075 | 4,226 | 4,376 | 4,517 |
| Recycled Water Demand[(a)] | 400 | 400 | 400 | 400 | 400 |
| **Total Water Demand** | **4,325** | **4,475** | **4,626** | **4,776** | **4,917** |
| (a) Source: City of Milpitas 2020 UWMP (Table 4-3). | | | | | |

## 5.3 Dry Year Water Demand

As part of its 2020 UWMP, the City updated its Water Shortage Contingency Plan (WSCP), which the City uses to respond to water shortages caused by drought or other emergencies. Water shortages occur when available supplies are insufficient to meet normally expected, or unconstrained, water demands. As presented in Table 5-3, the City's WSCP identifies six standard water shortage levels (besides Level 0), each corresponding to an estimated shortage range compared to the normal condition. A "Level 0 Shortage" corresponds to the normal supply condition; under a "Level 0 Shortage" the City does not anticipate any supply reductions but still enforces permanent water waste prohibitions and proceeds with planned water efficiency best practices.

| Table 5-3. City of Milpitas Water Shortage Levels | |
|---|---|
| Water Shortage Level | Percent Supply Reduction |
| 0 | 0 |
| 1 | Up to 10 percent |
| 2 | 11 – 20 percent |
| 3 | 21 – 30 percent |
| 4 | 31 – 40 percent |
| 5 | 41 – 50 percent |
| 6 | More than 50 percent |
| *Source: City of Milpitas 2020 WSCP (Table 3-1)* | |

During dry water years, the City's water supplies may be reduced. The City anticipates implementing the demand reduction measures outlined in its WSCP as needed to reduce water demands to a level that can be met with available water supplies. However, both the City's 2020 UWMP and this WSA conservatively assume that additional water conservation that may occur in single or multiple dry years will not happen. In other words, demands in future single or multiple dry years are unconstrained. Table 5-4 presents the projected future single and multiple dry year water demands, per the City's 2020 UWMP.

**Table 5-4. City of Milpitas Projected Future Water Demand – Dry Years**

| Hydrologic Condition | Demand Reduction[a] | Projected Demand, MGY | | | | |
|---|---|---|---|---|---|---|
| | | 2025 | 2030 | 2035 | 2040 | 2045 |
| Single Dry Year[b] | 0% | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| Multiple Dry Years[c] | 0% | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |

(a) This WSA conservatively assumes no demand reduction in dry years. Demands may be reduced in dry years if the City implements its Water Shortage Contingency Plan; however, such a demand reduction is not assumed or relied upon for the purposes of the Single Dry Year and Multiple Dry Year evaluations for this WSA.

(b) Source: City of Milpitas 2020 UWMP (Table 7-3).

(c) Represents demands for each year of the five-year multiple dry year period. Source: City of Milpitas 2020 UWMP (Table 7-4).

# 6.0 CITY OF MILPITAS MUNICIPAL WATER SUPPLIES

*10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).*

*10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system…under the existing water supply entitlements, water rights, or water service contracts.*

*10910(e) If no water has been received in prior years by the public water system…under the existing water supply entitlements, water rights, or water service contracts, the public water system…shall also include in its water supply assessment…an identification of the other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system.*

*10910(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment.*

*(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.*

*(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most recent bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.*

*(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.*

*(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.*

*(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.*

The descriptions provided below for the City's water supplies are based on the City's 2020 UWMP (adopted in June 2021), the San Francisco Public Utilities Commission's (SFPUC) 2020 UWMP (June 2021), and Valley Water's 2020 UWMP (June 2021). This section covers the City's potable water supplies from the SFPUC and Valley Water, groundwater from the Santa Clara Valley Subbasin, and recycled water from South Bay Water Recycling (SBWR).

## 6.1 Water Supply Overview

Under normal conditions, imported water currently comprises the City's entire potable water supply. The City purchases treated water from the SFPUC and Valley Water, and these supplies are normally separated within the City's distribution system. According to the City's 2020 UWMP, beginning in 2030 the City plans to augment imported water supplies with groundwater pumped from the local Santa Clara Valley Subbasin.

Recycled water is produced at the San José-Santa Clara Regional Wastewater Facility and delivered to the City by SBWR, a division within the City of San Jose's Environmental Services Department.

## 6.2 Water Supply from SFPUC

The SFPUC is a department of the City and County of San Francisco, which owns and operates the San Francisco Regional Water System (RWS). The RWS spans from Hetch Hetchy Valley in Yosemite National Park to the City of San Francisco and consists of over 280 miles of pipeline, 11 reservoirs, five pump stations, and two water treatment plants. RWS elements include:

- Hetch Hetchy Watershed and System
- Bay Area System (consisting of the Alameda Watershed and System and the Peninsula Watershed and System)
- Water Treatment
- Water Storage

Each of these elements is described further below.

### *6.2.1 Hetch Hetchy Watershed and System*

Approximately 85 percent of the water supply to the RWS originates in the Hetch Hetchy watershed, located in Yosemite National Park, and flows down the Tuolumne River into the Hetch Hetchy Reservoir. Water from the Hetch Hetchy watershed is managed through the Hetch Hetchy Water and Power Project (Hetch Hetchy Project). The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System.

In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

### *6.2.2 Bay Area System*

Approximately 15 percent of the water supply to the SFPUC RWS originates locally in the Alameda and Peninsula watersheds. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of Alameda East Portal, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water treatment plants, and the distribution system that delivers water to retail and wholesale customers.

#### 6.2.2.1 Alameda Watershed and System

The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The Bay Division Pipelines (BDPLs) cross the South Bay to the Peninsula System, delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.

#### 6.2.2.2 Peninsula Watershed and System

The Peninsula System includes conveyance facilities connecting the BDPLs to the City of San Francisco distribution system and other customers on the Peninsula. Two reservoirs, Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which serves the City of Half Moon Bay), along with delivering water to the Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the City of San Francisco distribution system.

### *6.2.3 Water Treatment*

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast and one of only a few large unfiltered municipal water supplies in the nation. The water originates from spring snow melt flowing down the Tuolumne River to Hetch Hetchy Reservoir, where it is stored. This high-quality water source comes from well-protected wilderness areas in Yosemite National Park and meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area and only requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the State Water Resources Control Board (SWRCB) Division of Drinking Water determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and further enhances the Hetch Hetchy System's high-quality water. The facility has a capacity of 315 million gallons per day (mgd), making it the third largest ultraviolet drinking water disinfection facility in the United States.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, and disinfection. Fluoridation, chloramination, and corrosion control treatment are provided for the combined Hetch Hetchy System and SVWTP water at the Sunol chloramination and fluoridation facilities. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

### *6.2.4 Water Storage*

Most of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd, and Lake Eleanor. A "water bank" in Don Pedro Reservoir is integrated into system operations.2 Don Pedro Reservoir is jointly owned and operated by Modesto Irrigation District (MID) and Turlock Irrigation District (TID) and is located on the Tuolumne River downstream of the Hetch Hetchy System.

Table 6-1 displays the storage capacity of the RWS as presented in SFPUC's 2020 UWMP.

As a by-product of water delivery and water supply management, hydroelectric power is also generated by the Hetch Hetchy Project. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to MID and TID downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System is comprised of three major hydroelectric powerhouses along the Tuolumne River (Holm, Kirkwood, and Moccasin) that have a collective generating capacity of nearly 400 megawatts.

Downstream of the Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. The Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed. In Alameda County, the Calaveras and San Antonio Reservoirs capture local runoff in the Alameda watershed. In addition to using these facilities to capture local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for the Hetch Hetchy System and, along with Calaveras Reservoir, are important water supply sources in the event of an interruption to Hetch Hetchy System deliveries.

[2] MID and TID have senior water rights to the SFPUC for the Tuolumne River water and are entitled to the first increment of flow in the basin. Water bank provides a credit and debit system which allows the SFPUC to divert water upstream while meeting its obligations to TID and MID. Through this mechanism the SFPUC may pre-deliver the TID and MID entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while TID and MID debit the water bank.

The SFPUC recently completed the Calaveras Dam Replacement Project, which replaced the seismically vulnerable 93-year-old old dam with a New Calaveras Dam. Prior to the dam replacement, the Calaveras Reservoir was operating at one-third of its capacity due to restrictions imposed by the Department of Water Resources (DWR) Division of Safety of Dams. The SFPUC began impounding water behind the new dam in the winter of 2018/2019 and continued the initial fill of the reservoir during the 2019/2020 winter season.

**Table 6-1. Regional Water System Storage Capacity**

| Reservoir | Storage Capacity | |
|---|---|---|
| | Acre-Feet, AF | Billions of Gallons, BG |
| Up-Country[a] | | |
| Hetch Hetchy | 360,360 | 117.4 |
| Lake Lloyd[b] | 273,300 | 89.1 |
| Lake Eleanor | 27,100 | 8.8 |
| **Subtotal** | **660,760** | **215.3** |
| Local | | |
| Calaveras (East Bay)[c] | 96,800 | 31.5 |
| San Antonio (East Bay) | 50,500 | 16.5 |
| Crystal Springs (Peninsula)[d] | 69,300 | 22.6 |
| San Andreas (Peninsula) | 19,000 | 6.2 |
| Pilarcitos (Peninsula) | 3,100 | 1.0 |
| **Subtotal** | **238,700** | **77.8** |
| **Total Regional Water System[e]** | **899,460** | **293.1** |

*Source: SFPUC 2020 UWMP (Table 3-1).*

(a) Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.

(b) Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.

(c) Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC has held the maximum water level at approximately 37,800 AF (roughly 40 percent of its maximum capacity). The construction of a new replacement dam downstream was completed in 2019 to restore the dam's full storage capacity, and the dam was continuing to be filled over the 2019/2020 winter season.

(d) Crystal Springs Reservoir has a maximum storage capacity of 22.1 BG (at 291.8 feet). Based on permit conditions, the reservoir is currently operated at 287.8 feet (4 feet below capacity).

(e) This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

## 6.3 Water Supply from Valley Water

Formerly known as the Santa Clara Valley Water District, Valley Water is a special district that manages water resources for all of Santa Clara County, including 142 miles of raw and treated water pipelines, 101 groundwater recharge ponds, more than 275 miles of jurisdictional streams, 10 dams and surface water reservoirs, three water treatment plants, an advanced recycled water purification center, and a state-of-the-art water quality laboratory. Local surface water and groundwater comprise approximately half of Valley Water's supply, with the remainder imported from the State Water Project (SWP), the Central Valley Project (CVP), and the SFPUC.

Per the City's contract with VW, potable water deliveries consist of SWP and CVP water only. SWP and CVP water is treated at either the Penitencia or Santa Teresa Water Treatment Plant (WTP) before delivery to the City. Valley Water also operates the Rinconada WTP, but it primarily serves the west side of Santa Clara County. The Penitencia and Santa Teresa WTPs began operations in 1974 and 1989, respectively. In 2006, disinfection facilities at each WTP were upgraded to use ozone instead of chlorine. Not only is ozone a strong disinfectant, but it can also improve taste and odor while also reducing the formation of disinfection byproducts. At both WTPs, raw water is treated via coagulation/flocculation (to remove silt and particles), ozone disinfection, and granular activated carbon filtration (to remove dissolved chemicals). Filtered water is then treated with chloramine to maintain a disinfection residual through the distribution system.

## 6.4 Groundwater Supply

Currently, the City does not use groundwater to meet customer demands under normal conditions but may use it if water supplies from the SFPUC or Valley Water are interrupted. The City has one existing well, Pinewood Well, which is fully developed and currently permitted as a standby source (i.e., to be used only for short-term emergencies). The SWRCB Division of Drinking Water allows standby sources like Pinewood Well to be used no more than five consecutive days and no more than 15 calendar days per year.

Two other wells are either planned or in construction. Curtis Well was completed in 2003 but remains unequipped. Construction of the McCandless Well was completed in 2020. Equipping of the Curtis Well as a production well and the McCandless Well as a standby (emergency) well are anticipated to be completed by 2024.

### *6.4.1 Groundwater Basin Description*

The City overlies the Santa Clara Valley Subbasin (DWR Basin Number 2-009.02), which is managed by Valley Water. The Santa Clara Valley Subbasin (subbasin) is not adjudicated, nor has DWR identified it to be in overdraft. However, as part of the implementation of the Sustainable Groundwater Management Act (SGMA), the subbasin was identified as high priority based on overlying population, projected growth, number of wells, irrigation acreage, groundwater reliance, and groundwater impacts. As such, the subbasin is subject to the requirements of SGMA.

To comply with SGMA, Valley Water developed a Groundwater Management Plan (GMP), which DWR approved as an alternative to a Groundwater Sustainability Plan. Valley Water's GMP identifies two overall goals for managing the subbasin: (1) optimizing groundwater supply reliability and minimizing land subsidence; and (2) protecting groundwater from existing and potential contamination, including saltwater intrusion. To achieve these goals, Valley Water's strategies include conjunctive management of surface water and groundwater, maintaining and developing adequate groundwater models and monitoring systems, and working with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.

### *6.4.2 Future Well Operation*

Groundwater can supplement reduced supplies from the SFPUC or Valley Water during prolonged droughts. As presented in its 2020 UWMP, the City expects to rely on groundwater to augment supplies and meet demands during future dry years. The Pinewood, Curtis, and McCandless wells, in addition to other future wells described in the City's 2020 UWMP that are triggered by future development in the City's service area, are critical components of the City's future water supply portfolio. As described in the

City's 2021 WMP, the City may also use groundwater storage credits to offset some of the aboveground emergency storage requirements triggered by future development.

## 6.5 Recycled Water Supply from SBWR

SBWR is the regional permit holder for recycled water in the City (as well as other locations), ensuring compliance with State regulations for recycled water quality and use. The City purchases recycled water from SBWR and sells it to end users within its service area. In 2020, the City delivered recycled water to over 220 customers, mainly for landscape irrigation.

Tertiary treated recycled water is produced at the San José-Santa Clara Regional Wastewater Facility, one of the largest such treatment facilities in California. SBWR's recycled water system consists of over 150 miles of pipeline, five pump stations, and 10 million gallons (MG) of storage in reservoirs. SBWR delivers more than four billion gallons of recycled water per year to more than 900 commercial customers, an average of 11 mgd.

## 6.6 Summary of Existing and Additional Planned Future Water Supplies

Table 6-2 summarizes the City's current and projected future (normal hydrologic year) supplies by source, as presented in the City's 2020 UWMP.

**Table 6-2. City of Milpitas Current and Projected Future Water Supplies**

| Water Source | Supply, MGY | | | | | |
|---|---|---|---|---|---|---|
| | 2020, Actual[a] | 2025[a] | 2030[b] | 2035[b] | 2040[b] | 2045[b] |
| Purchased from SFPUC | 2,159 | 2,410 | 2,470 | 2,570 | 2,660 | 2,750 |
| Purchased from Valley Water | 914 | 1,445 | 1,505 | 1,536 | 1,586 | 1,637 |
| Recycled Water from SBWR | 357 | 400 | 400 | 400 | 400 | 400 |
| Active Conservation[c] | 0 | 70 | 100 | 120 | 130 | 130 |
| **Total** | **3,430** | **4,325** | **4,475** | **4,626** | **4,776** | **4,917** |

(a) Source: City of Milpitas 2020 UWMP (Table 6-8).
(b) Source: City of Milpitas 2020 UWMP (Table 6-9).
(c) The City participates in Valley Water's conservation program and assumes the associated water savings are part of the future water supply portfolio.

# 7.0 WATER SUPPLY RELIABILITY

*10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*

*10911(a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:*

*(1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.*

*(2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.*

*(3) Based on the consideration set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to able to acquire additional water supplies.*

The reliability of the City's water supply is largely dependent on its water supply contracts with the SFPUC and Valley Water and their respective water supply reliability. This section is based largely on 2020 UWMPs developed by the City, SFPUC, and Valley Water, all three of which were adopted by the respective agencies in June 2021.

## 7.1 BAWSCA's Long-Term Reliable Water Supply Strategy

The City is a member of the Bay Area Water Supply and Conservation Agency (BAWSCA), which represents the SFPUC's 26 Wholesale Customers and coordinates each of their water conservation programs. In February 2015, BAWSCA published the Long-Term Reliable Water Supply Strategy Phase II Final Report (Phase II Final Report), which quantifies the water supply reliability needs of its member agencies through 2040 and identifies water management actions that could be developed to meet those needs. Key findings of the Phase II Final Report include the following:

- There is no longer a regional normal hydrologic year supply shortfall.
- There is a regional drought year supply shortfall of up to 43 mgd.
- Water transfers score consistently high across the various performance measures and within various portfolio constructs and thus represent a high-priority element of the strategy.
- Desalination also potentially provides substantial yield, but its high costs and intensive permitting requirements make it a less attractive drought-year supply alternative. However, given the limited options for generating significant yield for the region, desalination warrants further investment in information as a hedge against the loss of local or other imported supplies.

- The other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

BAWSCA is implementing the strategy recommendations in coordination with its member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the strategy are met efficiently and cost-effectively.

Due to the size of the supply and reliability need and the uncertainty regarding the yield of some strategy projects, BAWSCA will need to pursue multiple actions and projects to increase water supply reliability for its member agencies. On an annual basis, BAWSCA will reevaluate strategy recommendations and results in conjunction with development of the work plan for the following year. In this way, actions can be modified to accommodate changing conditions and new developments.

## 7.2 SFPUC RWS Reliability

This section details the reliability of the SFPUC RWS, including its WSIP, dry-year water supply projects, Alternative Water Supply Program, and projected reliability.

### *7.2.1 Water System Improvement Program*

Approved on October 31, 2008, the SFPUC's WSIP is a $4.8 billion, multi-year capital program that seeks to improve the delivery reliability of the RWS. The WSIP consists of 87 projects spread over seven counties and is forecast to be completed in December 2021. The objectives of the WSIP related to water supply include:

- Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands
- Meeting dry-year delivery needs with no greater than 20 percent system-wide rationing in any one year
- Reducing vulnerability of the water system to damage from earthquakes
- Providing the redundancy needed to accommodate outages
- Diversifying water supply options during non-drought and drought periods
- Improving use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers

The WSIP benefits the City by improving the reliability of wholesale water purchased from the SFPUC, especially during periods of drought. While WSIP projects help meet customer water needs in non-drought and drought conditions, it also includes projects that specifically augment water supplies during droughts. These dry-year supply projects are discussed below.

### *7.2.2 Dry-Year Water Supply Projects*

The following projects are part of the WSIP and will help meet water demand during dry years, as well as help to improve the seismic, delivery, water quality, and water supply reliability for the RWS:

- Calaveras Dam Replacement Project
- Alameda Creek Recapture Project
- Lower Crystal Springs Dam Improvements
- Regional Groundwater Storage and Recovery Project
- Dry-Year Water Transfer

To achieve its target of meeting at least 80 percent of its customer demand during droughts at 265 mgd, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP and described in detail in the following sections. Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 mgd for instream flows on average. When this commitment is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 mgd, the net loss of water supply is 3.5 mgd. The SFPUC's participation in regional water supply reliability efforts, such as the Bay Area Regional Desalination Project (BARDP), additional water transfers, and other projects may help to make up for this shortfall.

#### 7.2.2.1 Calaveras Dam Replacement Project

Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. The EIR was certified by the San Francisco City Planning Commission in 2011. Construction of the new dam was completed in September 2018, and the overall project was completed in July 2019.

#### 7.2.2.2 Alameda Creek Recapture Project

The Alameda Creek Recapture Project will recapture the water system yield lost due to instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as Surface Mining Permit-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the SVWTP or to San Antonio Reservoir.

The San Francisco Planning Department published the Draft EIR for the project in November 2016, and the San Francisco Planning Commission certified the Final EIR in June 2017. However, in response to an appeal on the certification action, additional analysis was required and sections of the Draft EIR were recirculated for public review and comment in late 2019. The revised Final EIR was certified in April 2020. Construction of the project will occur from spring 2021 to spring 2023.

#### 7.2.2.3 Lower Crystal Springs Dam Improvements

The Lower Crystal Springs Dam Improvements were substantially completed in May 2012. While the project has been completed, significant environmental permitting issues remain. After lowering the reservoir elevation due to Division of Safety of Dams restrictions, habitat for the Fountain Thistle, an endangered plant, was discovered. Before the reservoir elevation can be raised, new plant populations

must be restored incrementally. The result is that it may be several years before the original reservoir storage volume can be realized.

#### 7.2.2.4 Regional Groundwater Storage and Recovery Project

The Regional Groundwater Storage and Recovery Project is a strategic partnership between the SFPUC and three San Mateo County agencies: the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City of San Bruno. The project seeks to balance the management of groundwater and surface water resources to safeguard supplies during droughts. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County, allowing them to reduce the amount of groundwater that they pump from the South Westside Groundwater Basin. Over time, the reduced pumping would allow the aquifer to recharge and result in increased groundwater storage of up to 20 billion gallons. In dry years, when less surface water is available, the saved water will be pumped from up to 16 new groundwater well recovery facilities.

The project's Final EIR was certified in August 2014. Phase 1 of this project consists of construction of 13 well sites and is over 99 percent complete (as of February 2021). Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Design work for Phase 2 began in early 2020, and the 100 percent design package is currently being drafted.

A new but related project called the Regional Groundwater Treatment Improvements was approved in the SFPUC's 10-Year Water Enterprise Capital Improvement Program for fiscal years 2021-2030 and includes treatment facilities to address groundwater qualities at several of the wells constructed as part of the Regional Groundwater Storage and Recovery Project. This treatment project will be initiated in 2021.

#### 7.2.2.5 Dry-Year Water Transfers

In 2012, a dry-year transfer was proposed between the MID and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement for 2 mgd. No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize the SFPUC's continued interest, and the SFPUC will continue to pursue transfers as part of its Alternative Water Supply Program.

### *7.2.3 Alternative Water Supply Program*

The SFPUC continues to investigate acquiring additional water supplies and increasing its overall water supply reliability through the Alternative Water Supply Program, which is driven by:

- Amendments to the Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment, described further in Section 7.2.4.1), which may reduce RWS supply during dry years
- A net supply shortfall following implementation of the WSIP
- The SFPUC's perpetual obligation to supply 184 mgd to the Wholesale Customers
- The adopted goal to limit rationing to no more than 20 percent system-wide during droughts
- The potential need to identify water supplies required to offer permanent status to interruptible customers

This program is in its early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges (both known and unknown) the SFPUC is considering this suite of diverse, non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The capital projects under consideration in the Alternative Water Supply Program are still in the early feasibility or conceptual planning stages. These water supply projects would take 10 to 30 years to implement, and each option has its own challenges and uncertainties that may hinder implementation. Even if all the projects identified through the current planning process could be implemented, there would still be a supply shortfall to meet projected needs.

The SFPUC will prepare an Alternative Water Supply Plan by July 2023, which will include a planning framework that will consider water supply needs and related tradeoffs, guide the decisions to proceed with environmental review, and continue the development of projects that can best meet anticipated water supply needs. In the meantime, the SFPUC has been preparing quarterly reports to update the status of planning efforts regarding the regional and local water supply, storage, and related infrastructure projects.

### *7.2.4 Projected RWS Supply Reliability*

This section discusses the considerations for projecting future RWS supply reliability, including factors affecting future RWS supplies and procedures for allocating RWS supplies during shortages.

#### 7.2.4.1 Factors Affecting Future RWS Supplies

##### *7.2.4.1.1 Adoption of the 2018 Bay-Delta Plan Amendment*

In December 2018, the SWRCB adopted the Bay-Delta Plan Amendment to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay Delta-Plan Amendment requires the release of 30 to 50 percent of the “unimpaired flow” on the three tributaries from February through June in every year type (i.e., wet, normal, dry, and critically dry). In SFPUC modeling of the new flow standard, it is assumed that the required release is 40 percent of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in its 2020 UWMP in normal hydrologic years but not in single dry years or multiple dry years. For single dry years, wholesale supply shortfalls (relative to wholesale demand) range from approximately 36 percent in 2025 to almost 46 percent in 2045. For multiple dry years, wholesale supply shortfalls reach almost 54 percent in the fourth and fifth years of a five-year drought starting in 2045.

By comparison, without the Bay-Delta Plan Amendment the SFPUC can meet wholesale demands during all single dry years between 2025 and 2045 and all multiple dry years except for the fourth and fifth years of a five-year drought starting in 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Bay-Delta Plan Amendment is uncertain for several reasons:

- Since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages, and there have been no dispositive court rulings to date.
- The Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in Section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's (FERC) licensing proceedings for the Don Pedro and La Grange hydroelectric projects.
- On January 15, 2021, the SWRCB released the Clean Water Act Section 401 Water Quality Certification for the TID and MID Don Pedro Hydroelectric Project and La Grange Hydroelectric Project, FERC Project Nos. 2299 and 14581 (WQC). The WQC includes the 40 percent unimpaired flow objective from the Bay-Delta Plan Amendment, as well as additional conditions that, if incorporated into FERC licenses for the Don Pedro and La Grange Projects, would severely impact SFPUC's water supply; the WQC's requirements differ significantly from the recommended flows and conditions that FERC has analyzed in the Staff Alternative of its Final Environmental Impact Statement for the licenses. To date, FERC has not taken action to incorporate the WQC into the licenses or to finalize the licenses for issuance. At this time, it is highly uncertain whether the WQC will be implemented by either the State or federal government.

In June 2021, in response to various comments from wholesale customers regarding the reliability of the RWS as described in the SFPUC's 2020 UWMP, the SFPUC provided a memorandum[3] (June 2021 Memo) describing its efforts to remedy the potential effects of the Bay-Delta Plan Amendment. As described in the June 2021 Memo (included in Appendix A of this WSA), the SFPUC's efforts include:

- Pursuing a Tuolumne River Voluntary Agreement
- Evaluating the drought planning scenario in light of climate change
- Pursuing alternative water supplies
- In litigation with the State over the Bay-Delta Plan Amendment
- In litigation with the State over the proposed Don Pedro FERC Water Quality Certification

[3] San Francisco Public Utilities Commission, June 2021. *Regional Water System Reliability and UWMP 2020*.

#### *7.2.4.1.2 Potential State and Federal Regulations*

The SFPUC's operation of the RWS is subject to numerous State and federal agency permits designed to protect drinking water quality and the environment. These existing permits, as well as permitting for future projects, may increase the releases from or bypasses of SFPUC facilities. Changes to instream flow requirements or flow schedules may impact the water supply reliability of the RWS. For example, the re-licensing of the Don Pedro Reservoir by FERC may require additional water released from the reservoir to preserve aquatic species in the lower Tuolumne River.

#### *7.2.4.1.3 Additional Water Supply Decisions*

The SFPUC is evaluating two decisions that would impact water supplies:

- Whether to make the cities of San Jose and Santa Clara, which are currently supplied on a temporary and interruptible basis, permanent customers
- Whether to increase the Wholesale Customer Supply Assurance above 184 mgd to meet future demands

The SFPUC initially committed to make these decisions by the end of 2018, but this deadline was deferred to 2028 to allow the SFPUC to conduct additional supply reliability studies and environmental reviews.

### 7.2.4.2 Water Shortage Allocation Procedures

Procedures to allocate RWS supplies during SFPUC system shortages are specified in agreements between the SFPUC and the Wholesale Customers. Water shortage allocation procedures are described below.

In 2019, the Wholesale Customers and the SFPUC adopted the November 2018 Amended and Restated Water Supply Agreement, which included a Water Shortage Allocation Plan (WSAP) to allocate RWS water to retail and wholesale customers during system-wide shortages of 20 percent or less. The WSAP has two tiers, which are described below.

- The Tier One Plan allocates water between the SFPUC and the Wholesale Customers collectively based on the level of the shortage (up to 20 percent). This plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under CWC Section 350. The SFPUC may also opt to request voluntary cutbacks from San Francisco and the Wholesale Customers to achieve necessary water use reductions during drought periods. The allocations outlined in the Tier One Plan are provided in Table 7-1.

**Table 7-1. Tier One Plan Water Shortage Allocations**

| System-Wide Reduction Required | Share of Available Water | |
|---|---|---|
| | SFPUC | Wholesale Customers |
| ≤ 5% | 35.5% | 64.5% |
| 6% to 10% | 36.0% | 64.0% |
| 11% to 15% | 37.0% | 63.0% |
| 16% to 20% | 37.5% | 62.5% |

- The Tier Two Plan allocates the collective Wholesale Customer share among the Wholesale Customers based on a formula that accounts for each Wholesale Customer's Individual Supply Guarantee (ISG), seasonal use of all available water supplies, and residential per capita use. The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, which is the weighted average of the Wholesale Customer's ISG and the Base/Seasonal Component. The Allocation Basis is used as the numerator over the sum of all Wholesale Customers' Allocation Bases to calculate each Wholesale Customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers collectively over the Tier One Plan by the individual Wholesale Customer's Allocation Factor. BAWSCA calculates each wholesale customer's Allocation Factors annually in preparation for a potential water shortage emergency.

For water shortages greater than 20 percent, the SFPUC will meet with the Wholesale Customers to determine if modifications to the Tier One Plan can be agreed upon by the SFPUC and the Wholesale Customers. If an agreement cannot be reached, the SFPUC may allocate water at its discretion, subject to challenge by the Wholesale Customers, unless all the Wholesale Customers direct that a particular Tier Two allocation methodology be used. The City is susceptible to these modifications to its purchased water supply since it is a Wholesale Customer of the SFPUC.

## 7.3 Valley Water Reliability

While the City's supplies from Valley Water consist exclusively of imported water from the SWP and CVP, the reliability of Valley Water's overall supply portfolio remains relevant. For example, if Valley Water's groundwater supply reliability decreased significantly, it would strain Valley Water's remaining supplies, including imported water.

In a 2021 memo to its retailers (included in Appendix B of this WSA), Valley Water noted that DWR is very prescriptive about the UWMP and has specific requirements per its guidebook on what to report and how to report it. As a result, Valley Water's 2020 UWMP shows that there would be no water supply shortage, even during droughts. The water supply analysis in Valley Water's 2020 UWMP represents long-term projections that were based on modeling analysis, and therefore depend on the input data and modeling assumptions, including the following:

- **Higher imported water delivery** – DWR provided the Delivery Capability Report (DCR) 2019 for contractors to use in their UWMPs. The DCR 2019 dataset does not include future regulations that may result in up to a 25 percent reduction of imported water deliveries.
- **Lower demand projection** - The Valley Water demands are based on the 2020 Monitoring and Assessment Plan projection, which are significantly lower than what was used in previous UWMPs and Valley Water's Water Supply Master Plan (note: Valley Water's demands are within 1 to 5 percent difference with retailer demands from 2025 to 2040, and 10 percent for 2045).
- **Planned water supply projects** – Valley Water's 2020 UWMP includes the Water Supply Master Plan recommended projects per Board direction.

Given these assumptions, Valley Water's water supply analysis should be interpreted as providing a more optimistic picture than will likely occur with future water deliveries which are likely to be impacted by future regulations and climate change. If some Water Supply Master Plan 2040 projects are not implemented, or provide less benefit than expected, and imported supplies are reduced by 25 percent or severe allocation cuts occur during droughts as have been experienced during this drought and the previous drought, then Valley Water does expect to have drought shortages of up to 20 percent in the future.

Valley Water maintains diverse water supply sources to meet demands in Santa Clara County, including groundwater recharge, local surface water, imported water from State and federal projects, and recycled/purified water. The following presents the constraints on each supply source, as presented in Valley Water's 2020 UWMP.

### *7.3.1 Imported Water*

Imported water supplies are subject to hydrologic variability, regulatory requirements to protect fisheries and water quality, and conveyance limitations. Local and out-of-county storage can help mitigate the impacts of hydrologic variability, but drought conditions also exacerbate water quality concerns in the Sacramento-San Joaquin Delta (Delta), which supplies the SWP and CVP. Valley Water addresses water quality variations by blending sources and/or switching sources to its WTPs.

Delta-conveyed supplies are also at risk from Delta levee failures (due to seismic threats and flooding), sea level rise, climate change, and declining populations of protected fish species. Valley Water continues to evaluate the costs and benefits of participating in the Delta Conveyance Project relative to other water supply options, including developing additional local supplies, securing and optimizing Valley Water's existing water system, and expanding water conservation.

### *7.3.2 Groundwater*

Valley Water's groundwater supply is constrained by hydrologic variability, the operational storage capacity within the Santa Clara and Llagas subbasins, and managed and natural recharge. Natural recharge is insufficient to meet Valley Water's groundwater demands, so Valley Water's managed recharge program is critical to maintaining groundwater supply. The estimated operational storage capacity within the Santa Clara and Llagas subbasins is approximately 548,000 acre-feet (AF, about 179,000 MG), while Valley Water has about 144,000 acre-feet per year (AFY, about 47,000 MGY) of managed recharge capacity.

Groundwater quality is also a concern. While the Santa Clara and Llagas subbasins generally have high quality groundwater, elevated nitrate levels are found in some wells in the Coyote Valley and Llagas areas. Nitrate concentrations are generally stable or declining, and Valley Water has several programs to reduce nitrate in groundwater and protect groundwater quality overall.

### *7.3.3 Local Surface Water*

Valley Water's local surface water supplies are vulnerable to hydrologic variability and regulatory requirements, including reservoir operating rules and supporting instream flow needs. Both wetter and drier years present challenges to Valley Water. In wetter years, Valley Water cannot capture all available supply due to reservoir capacity constraints and flood protection needs. In drier years, Valley Water is challenged to maintain its groundwater recharge program due to reduced storage in local reservoirs, reduced imported water allocations, and regulations and permit conditions that require Valley Water to maintain environmental stream flows.

### 7.3.4 Recycled and Purified Water

Recycled and purified water are growing supply sources for Santa Clara County. Both recycled and purified water are developed from wastewater, but purified water is further treated through proven multistage and multibarrier processes (e.g., microfiltration, reverse osmosis, and ultraviolet disinfection) to produce water of sufficient quality to supplement existing potable water supplies (i.e., potable reuse). Valley Water produces up to 8 mgd of purified water at its Silicon Valley Advanced Water Purification Center (SVAWPC). SVAWPC-produced purified water is currently blended with tertiary treated recycled water to improve the quality and allow for non-potable use by a wider variety of customers.

Recycled water constraints mainly consist of treatment and distribution capacities. Also, as Valley Water develops potable reuse capacity, there may be less wastewater available to produce recycled water for traditional non-potable uses like irrigation. Potential constraints for potable reuse of purified water include reverse osmosis concentrate disposal, source water availability, public acceptance, permitting, hydrogeologic conditions, and cost.

## 7.4 Dry Year Water Supply

The City's 2020 UWMP assumes the Bay-Delta Plan Amendment is implemented, which significantly reduces SFPUC supplies. Furthermore, as described above, supplies from Valley Water may have drought shortages of up to 20 percent in the future if some of Valley Water's Water Supply Master Plan 2040 (WSMP) projects are not implemented, or provide less benefits than expected, and imported supplies are reduced by 25 percent or severe allocation cuts occur during droughts as have been experienced during this drought and the previous drought. As a result, the City's 2020 UWMP assumes three groundwater wells (each pumping at 1.2 mgd) will be online by 2030, with a fourth online by 2035. These new groundwater wells are triggered by future development projected in the City's service area and shall be funded through associated development impact fees.

Table 7-2 presents the City's projected supplies during single and multiple dry years from 2025 through 2045.

**Table 7-2. City of Milpitas Projected Water Supplies – Dry Years**

| Hydrologic Condition | Supply, MGY | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 |
| Single Dry Year[a] | 3,460 | 4,475 | 4,626 | 4,776 | 4,917 |
| Multiple Dry Years – Year 1[b] | 3,450 | 4,475 | 4,626 | 4,776 | 4,917 |
| Multiple Dry Years – Year 2[b] | 3,230 | 4,475 | 4,626 | 4,776 | 4,917 |
| Multiple Dry Years – Year 3[b] | 2,940 | 4,370 | 4,626 | 4,776 | 4,917 |
| Multiple Dry Years – Year 4[b] | 2,940 | 4,370 | 4,626 | 4,776 | 4,870 |
| Multiple Dry Years – Year 5[b] | 2,940 | 4,370 | 4,626 | 4,776 | 4,870 |

(a) Source: City of Milpitas 2020 UWMP (Table 7-3).
(b) Source: City of Milpitas 2020 UWMP (Table 7-4).

# 8.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 610

> *10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*
>
> *10911 (a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies.*

Pursuant to CWC section 10910(c)(4) and based on the technical analyses described in this WSA, the City finds that the total projected water supplies determined to be available for the Proposed Project during a 20-year projection will meet the projected water demand associated with the Proposed Project, in addition to existing and planned future uses.

As discussed in this WSA, the City is a member of agency of BAWSCA and purchases water from the SFPUC RWS. BAWSCA is investigating projects and implementing strategies to continuously improve the reliability of the water supplies to its member agencies. Additionally, as indicated in the SFPUC's June 2021 Memo to its wholesale customers (included in Appendix A of this WSA), the SFPUC is actively pursuing all options to resolve the potential effects of the Bay-Delta Plan Amendment and remains committed to creating benefits for the Tuolumne River while meeting water supply level of service goals and objectives for its retail and wholesale customers.

Table 8-1 summarizes the projected availability of the City's existing and planned future water supplies and demands in normal, single dry, and multiple dry years through 2045. For the purposes of this WSA, no demand reductions are assumed during dry years. As shown in Table 8-1, during normal hydrologic years the City's water supplies can meet projected demands through 2045. During a single dry year in 2025 or a five-year drought starting in 2025, City supplies are insufficient to meet projected demands. There is a 20 percent supply shortfall for a single dry year in 2025 and a supply shortfall between 20 and 32 percent for five dry years starting in 2025. Supply shortfalls in prolonged droughts will either require significant measures to be implemented to reduce water use, as outlined in the City's 2020 WSCP (included in Chapter 8 of the City's 2020 UWMP), or the City may supplement some or most of the supply shortfall through groundwater pumping.

Once the City's groundwater wells come online (assumed in 2030), assuming that the wells produce sufficient flow while meeting water quality standards, the City's dry year supplies can better meet projected demands in single dry and multiple dry years. As shown in Table 8-1, there are small supply shortfalls starting in the third year of a five-year drought starting in 2030 (approximately 2 percent) and the fourth year of a five-year drought starting in 2045 (1 percent). To address these supply shortfalls, the City expects to implement its WSCP and reduce water demands as needed.

It should be noted that the City's 2021 WMP identifies infrastructure improvements needed to serve proposed new development within the City's service area. These include supply (e.g., a new Valley Water

turnout) and storage capacity improvements that are triggered by future development projected in the City's service area and shall be funded through associated development impact fees.

**Table 8-1. Summary of City of Milpitas Water Supply Sufficiency**

| Hydrologic Condition | | Volume, MGY | | | | |
|---|---|---|---|---|---|---|
| | | 2025 | 2030 | 2035 | 2040 | 2045 |
| Normal Hydrologic Year | | | | | | |
| Available Water Supply[(a)] | | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| Total Water Demand[(b)] | | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Potential Surplus (Deficit) | - | - | - | - | - |
| | Supply Shortfall, percent | - | - | - | - | - |
| Single Dry Year | | | | | | |
| Available Water Supply[(c)] | | 3,460 | 4,475 | 4,626 | 4,776 | 4,917 |
| Total Water Demand[(d)] | | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Potential Surplus (Deficit) | (865) | - | - | - | - |
| | Supply Shortfall, percent | 20% | - | - | - | - |
| Multiple Dry Years | | | | | | |
| Multiple-Dry Year 1 | Available Water Supply[(c)] | 3,450 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Total Water Demand[(d)] | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Potential Surplus (Deficit) | (875) | - | - | - | - |
| | Supply Shortfall, percent | 20% | - | - | - | - |
| Multiple-Dry Year 2 | Available Water Supply[(c)] | 3,230 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Total Water Demand[(d)] | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Potential Surplus (Deficit) | (1,095) | - | - | - | - |
| | Supply Shortfall, percent | 25% | - | - | - | - |
| Multiple-Dry Year 3 | Available Water Supply[(c)] | 2,940 | 4,370 | 4,626 | 4,776 | 4,917 |
| | Total Water Demand[(d)] | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Potential Surplus (Deficit) | (1,385) | (105) | - | - | - |
| | Supply Shortfall, percent | 32% | 2% | - | - | - |
| Multiple-Dry Year 4 | Available Water Supply[(c)] | 2,940 | 4,370 | 4,626 | 4,776 | 4,870 |
| | Total Water Demand[(d)] | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Potential Surplus (Deficit) | (1,385) | (105) | - | - | (47) |
| | Supply Shortfall, percent | 32% | 2% | - | - | 1% |
| Multiple-Dry Year 5 | Available Water Supply[(c)] | 2,940 | 4,370 | 4,626 | 4,776 | 4,870 |
| | Total Water Demand[(d)] | 4,325 | 4,475 | 4,626 | 4,776 | 4,917 |
| | Potential Surplus (Deficit) | (1,385) | (105) | - | - | (47) |
| | Supply Shortfall, percent | 32% | 2% | - | - | 1% |

(a) From Table 6-2 of this WSA.
(b) From Table 5-2 of this WSA.
(c) From Table 7-2 of this WSA.
(d) From Table 5-4 of this WSA.

# 9.0 WATER SUPPLY ASSESSMENT APPROVAL PROCESS

> *10910 (g)(1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.*

The City of Milpitas City Council must approve this WSA at a regular or special meeting. Furthermore, this WSA must be included in the Draft EIR being prepared for the Proposed Project.

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Appendix A

# SFPUC Memo: Regional Water System Supply Reliability and UWMP 2020

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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TO: SFPUC Wholesale Customers

FROM: Steven R. Ritchie, Assistant General Manager, Water

DATE: June 2, 2021

RE: Regional Water System Supply Reliability and UWMP 2020

---

This memo is in response to various comments from Wholesale Customers we have received regarding the reliability of the Regional Water System supply and San Francisco's 2020 Urban Water Management Plan (UWMP).

As you are all aware, the UWMP makes clear the potential effect of the amendments to the Bay-Delta Water Quality Control Plan adopted by the State Water Resources Control Board on December 12, 2018 should it be implemented. Regional Water System-wide water supply shortages of 40-50% could occur until alternative water supplies are developed to replace those shortfalls. Those shortages could increase dramatically if the State Water Board's proposed Water Quality Certification of the Don Pedro Federal Energy Regulatory Commission (FERC) relicensing were implemented.

We are pursuing several courses of action to remedy this situation as detailed below.

**Pursuing a Tuolumne River Voluntary Agreement**

The State Water Board included in its action of December 12, 2018 a provision allowing for the development of Voluntary Agreements as an alternative to the adopted Plan. Together with the Modesto and Turlock Irrigation Districts, we have been actively pursuing a Tuolumne River Voluntary Agreement (TRVA) since January 2017. We believe the TRVA is a superior approach to producing benefits for fish with a much more modest effect on our water supply. Unfortunately, it has been a challenge to work with the State on this, but we continue to persist, and of course we are still interested in early implementation of the TRVA.

**Evaluating our Drought Planning Scenario in light of climate change**

Ever since the drought of 1987-92, we have been using a Drought Planning Scenario with a duration of 8.5 years as a stress test of our Regional Water System supplies. Some stakeholders have criticized this methodology as being too conservative. This fall we anticipate our Commission convening a workshop

**London N. Breed**
Mayor

**Sophie Maxwell**
President

**Anson Moran**
Vice President

**Tim Paulson**
Commissioner

**Ed Harrington**
Commissioner

**Newsha Ajami**
Commissioner

**Michael Carlin**
Acting
General Manager

regarding our use of the 8.5-year Drought Planning Scenario, particularly in light of climate change resilience assessment work that we have funded through the Water Research Foundation. We look forward to a valuable discussion with our various stakeholders and the Commission.

**Pursuing Alternative Water Supplies**

The SFPUC continues to aggressively pursue Alternative Water Supplies to address whatever shortfall may ultimately occur pending the outcome of negotiation and/or litigation. The most extreme degree of Regional Water System supply shortfall is modeled to be 93 million gallons per day under implementation of the Bay-Delta Plan amendments. We are actively pursuing more than a dozen projects, including recycled water for irrigation, purified water for potable use, increased reservoir storage and conveyance, brackish water desalination, and partnerships with other agencies, particularly the Turlock and Modesto Irrigation Districts. Our goal is to have a suite of alternative water supply projects ready for CEQA review by July 1, 2023.

**In litigation with the State over the Bay-Delta Plan Amendments**

On January 10, 2019, we joined in litigation against the State over the adoption of the Bay-Delta Water Quality Control Plan Amendments on substantive and procedural grounds. The lawsuit was necessary because there is a statute of limitations on CEQA cases of 30 days, and we needed to preserve our legal options in the event that we are unsuccessful in reaching a voluntary agreement for the Tuolumne River. Even then, potential settlement of this litigation is a possibility in the future.

**In litigation with the State over the proposed Don Pedro FERC Water Quality Certification**

The State Water Board staff raised the stakes on these matters by issuing a Water Quality Certification for the Don Pedro FERC relicensing on January 15, 2021 that goes well beyond the Bay-Delta Plan amendments. The potential impact of the conditions included in the Certification appear to virtually double the water supply impact on our Regional Water System of the Bay-Delta Plan amendments. We requested that the State Water Board reconsider the Certification, including conducting hearings on it, but the State Water Board took no action. As a result, we were left with no choice but to once again file suit against the State. Again, the Certification includes a clause that it could be replaced by a Voluntary Agreement, but that is far from a certainty.

I hope this makes it clear that we are actively pursuing all options to resolve this difficult situation. We remain committed to creating benefits for the Tuolumne River while meeting our Water Supply Level of Service Goals and Objectives for our retail and wholesale customers.

cc.: SFPUC Commissioners
Nicole Sandkulla, CEO/General Manager, BAWSCA

# Appendix B

## Valley Water Memo: Urban Water Management Plan Retailer Talking Points

# Valley Water's Urban Water Management Plan
# Retailer Talking Points

The Urban Water Management Plan (UWMP) is a long-range planning document that is developed to meet state requirements. At request of our retailers, Valley Water provides below talking points for our 2020 UWMP. We hope these talking points provide consistent messaging and can help address some of the questions that the retailers may have at their own UWMP hearing.

**Water Supply Reliability**

Department of Water Resources (DWR) is very prescriptive about the plan and has specific requirements per its guidebook on what to report and how to report it. As a result, Valley Water's UWMP shows that there would be no water supply shortage, even during droughts. The water supply analysis in this plan represents long-term projections that were based on modeling analysis, and therefore depend on the input data and modeling assumptions:

1. **Higher imported water delivery -** DWR provided the Delivery Capability Report (DCR) 2019 for contractors to use in their UWMPs. The DCR 2019 dataset does not include future regulations that may result in up to a 25% reduction of imported water deliveries.
2. **Lower demand projection -** The demands are based on the 2020 Monitoring and Assessment Plan (MAP) projection, which are significantly lower than what was used in previous UWMPs and the Water Supply Master Plan (WSMP).
    - **Note:** Valley Water's demands are within 1- 5% difference with retailer demands from 2025 to 2040, and 10% for 2045.
3. **Planned water supply projects** - This year's UWMP includes the WSMP recommended projects per Board direction.

Given these assumptions, the water supply analysis should be interpreted as providing a more optimistic picture than will likely occur with future water deliveries likely impacted by regulations and climate change. If some WSMP projects are not implemented or provide less benefits than expected and imported supplies are reduced by 25% or severe allocation cuts occur during droughts as we have experienced during this drought and the previous, then Valley Water **does** expect to have drought shortages of up to 20% in the future.

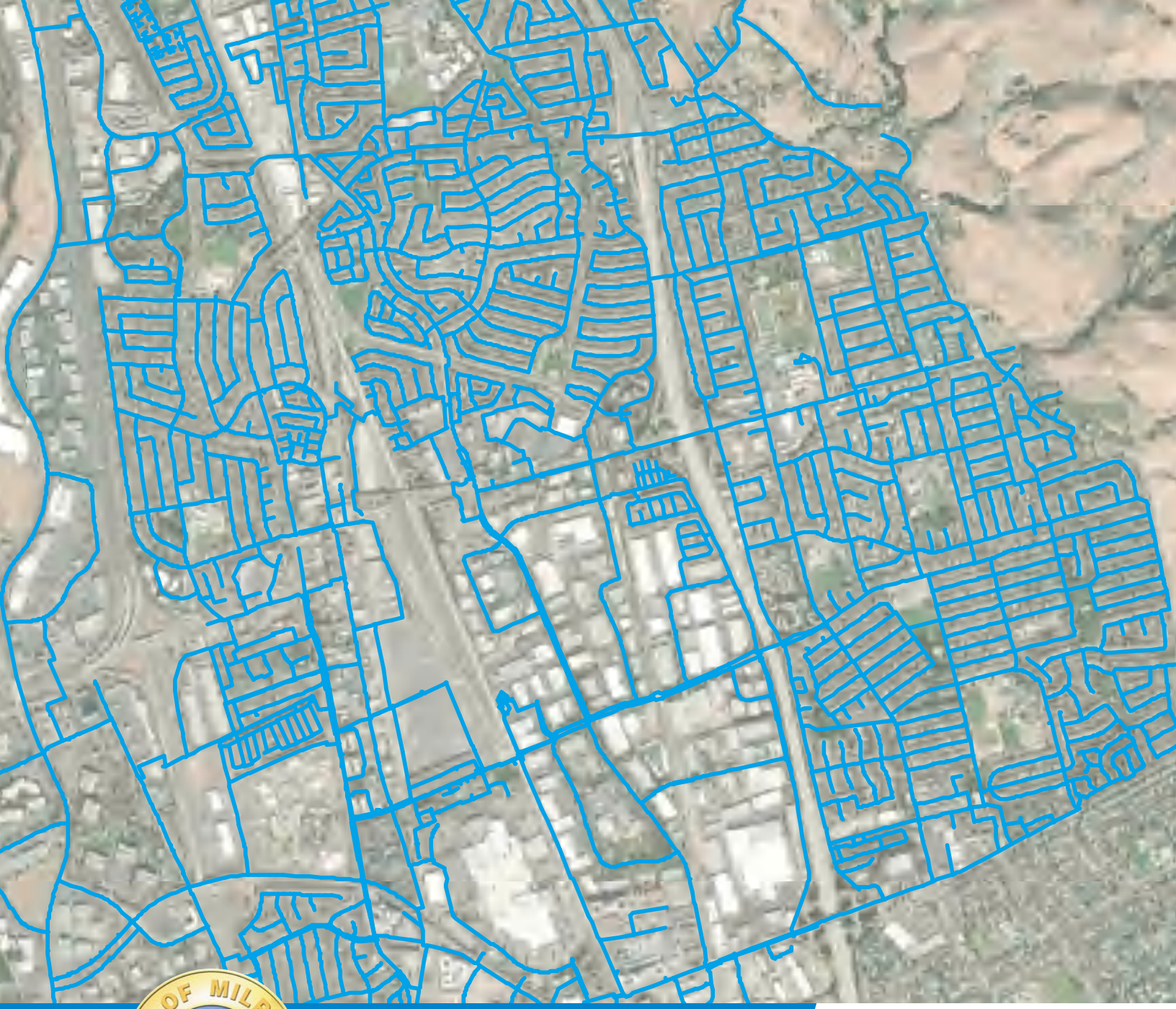
**Drought Risk Analysis**

Valley Water used the 1988-1992 drought for water supply analysis and Drought Risk Analysis, because the model DWR used to develop their delivery projections for use in the UWMP does not go beyond 2003. For the 1988-1992 drought, the lowest total annual imported water delivery in the DCR 2019 dataset is 83,200AF, with 48% of CVP allocation. Yet Valley Water's current CVP allocation is 25%, showcasing the disconnect between data provided by DWR and current conditions. The UWMP effort is a modeling analysis evaluation and the results are reflective of the input data and modeling assumptions.

**Valley Water's Next Steps**

The UWMP provides an opportunity for Valley Water to work with its retailers and other agencies to understand their water supply planning for the next 25 years. However, the current DWR dataset isn't reflective of the climate of uncertainty within our water supplies and therefore, Valley Water will continue to use its WSMP and annual MAP framework to guide its long-term water supply planning efforts and inform the Board on investment decisions. This process includes monitoring projects costs and benefits, demands, climate change science, policy or regulatory actions, and making adjustments to the water supply investment strategy as needed to ensure reliability. The next annual MAP Board update is scheduled for Fall 2021.

# City of Milpitas Water Master Plan



CITY OF MILPITAS

# Water Master Plan

MARCH 2021

FINAL DRAFT REPORT

WEST YOST
Water. Engineered.

FINAL DRAFT REPORT | MARCH 2021

# Water Master Plan

**PREPARED FOR**

City of Milpitas

**PREPARED BY**

WEST YOST
Water. Engineered.

# Water Master Plan

**Prepared for**

## City of Milpitas

**Project No. 270-60-19-16**

| | |
|---|---|
| Project Manager: Elizabeth Drayer, PE | 03-02-21<br>Date |
| QA/QC Review: Polly Boissevain, PE | 03-02-21<br>Date |

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 2009 Update/2009 WMPU | 2009 Water Master Plan Update |
| 2020 WMP | 2020 Water Master Plan |
| AB 1668 | Assembly Bill 1668 |
| AC | Asbestos Cement |
| ACWD | Alameda County Water District |
| ADD | Average Day Demand |
| af | Acre-Feet |
| af/yr | Acre-Feet Per Year |
| AMI | Advanced Metering Infrastructure |
| APN | Assessor's Parcel Number |
| AWIA | America's Water Infrastructure Act |
| AWWA | American Water Works Association |
| BART | Bay Area Rapid Transit |
| BAWSCA | Bay Area Water Supply And Conservation Agency |
| CIP | Capital Improvement Program |
| CIP ID | Capital Improvement Program ID |
| City | City of Milpitas |
| COF | Consequence Of Failure |
| County | Santa Clara County |
| CVP | Central Valley Project |
| CY | Calendar Year |
| DDW | Division of Drinking Water |
| Delta | Sacramento-San Joaquin Delta |
| DIP | Ductile Iron Pipe |
| DWR | Department of Water Resources |
| EIR | Environmental Impact Report |
| EPRV | Emergency Pressure Reducing Valve |
| ERP | Emergency Response Plan |
| Ft/kft | Feet Per 1,000 Feet |
| Ft/s | Feet Per Second |
| GIS | Geographical Information System |
| gpcd | Gallons Per Capita Per Day |
| gpd | Gallons Per Day |
| HGL | Hydraulic Grade Line |
| HPR | Hydrant Pressure Recorder |
| HydroScience | HydroScience Engineers, Inc. |
| I-680 | Interstate 680 |
| I-880 | Interstate 880 |
| ISG | Individual Supply Guarantee |
| Legislature | California State Legislature |

| | |
|---|---|
| LOF | Likelihood of Failure |
| LUA Report | Land Use Alternatives Report |
| LWU | Large Water Users |
| Maddaus | Maddaus Water Management, Inc. |
| MDD | Maximum Day Demand |
| MG | Million Gallons |
| mgd | Million Gallons Per Day |
| msl | Mean Sea Level |
| MSP | Midtown Specific Plan |
| MWELO | Model Water Efficient Landscape Ordinance |
| NRW | Non-Revenue Water |
| PG&E | Pacific Gas and Electric |
| PHD | Peak Hour Demand |
| PM | Preventative Maintenance |
| PRVs | Pressure Reducing Valves |
| PS | Pump Station |
| Psi | Pounds Per Square Inch |
| PVC | Polyvinyl Chloride |
| R&R | Rehabilitation and Replacement |
| RMC | Raines, Melton & Carella |
| RRA | Risk and Resilience Assessment |
| RWS | Regional Water System |
| SB X7-7 | Water Conservation Act of 2009 |
| SBWR | South Bay Water Recycling |
| SCADA | Supervisory Control and Data Acquisition |
| SCVWD | Santa Clara Valley Water District |
| SFPUC | San Francisco Public Utilities Commission |
| SJW | San Jose Water |
| SOI | Sphere of Influence |
| SWRCB | State Water Resources Control Board |
| TASP | Transit Area Specific Plan |
| TDH | Total Dynamic Head |
| UPC | Uniform Plumbing Code |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |
| UWMP | Urban Water Management Plan |
| VTA | Valley Transit Authority |
| VW | Valley Water |
| WTP | Water Treatment Plant |
| WUF | Water Use Factors |

## WATER MASTER PLAN PURPOSE

The purpose of this Water Master Plan for the City of Milpitas (City) is to evaluate the existing system infrastructure and incorporate impacts of short-term and long-term planned growth to develop a comprehensive road map for the City's Water System Capital Improvement Program (CIP). The City's last Water Master Plan was completed in 2002 and was then updated in 2009 to incorporate an analysis of the impacts of the City's Milpitas Metro Specific Plan (then known as the Transit Area Specific Plan). The City is continuing to experience significant growth and is currently in the process of updating its General Plan and two key specific plans, Milpitas Gateway-Main Street Specific Plan (formerly known as the Midtown Specific Plan) and Milpitas Metro Specific Plan.

Since the completion of the 2009 Water Master Plan Update (2009 WMPU), the State endured five years of drought starting in 2012, including the driest four consecutive years in California history (2012-2015). These unprecedented conditions led to statewide mandated water conservation, significant surface water supply reductions and curtailments, and legislation establishing new statewide water efficiency standards and contributing to new water use patterns and trends.

These factors make it critical to both reassess the City's water needs, priorities, and strategies and reevaluate water system infrastructure improvements, with a goal of ensuring a safe and reliable water supply for the City's residents and businesses.

## WATER MASTER PLAN OBJECTIVES

The primary objectives of this Water Master Plan are to:

- Evaluate historical and existing water demands to understand current water use patterns, trends, and unit water use factors and develop future water demand projections based on current updates being made to the General Plan
- Review and refine performance and planning criteria used to evaluate the water system and formulate recommendations for future facilities
- Perform a condition assessment of the City's water assets, including evaluating criticality and likelihood of failure, consequence of failure, and business risk exposure for horizontal assets (e.g., pipes, valves) and vertical assets (e.g., reservoirs, pump stations)
- Prepare a water utility asset renewal and replacement study to provide priorities for asset renewal and replacement
- Develop and calibrate the City's water system hydraulic model using InfoWater modeling software to provide an accurate tool for evaluating various water system scenarios
- Evaluate the need for new backbone water facilities (including pipelines, storage facilities and pumping facilities) to serve buildout of the City's General Plan (estimated by the year 2040)
- Evaluate existing and projected source capacity (per Section 64558, Title 22, of the California Code of Regulations) to ensure that adequate storage is provided throughout the City's water system to meet existing and future needs and requirements
- Develop a capital improvement program for recommended potable water system facilities

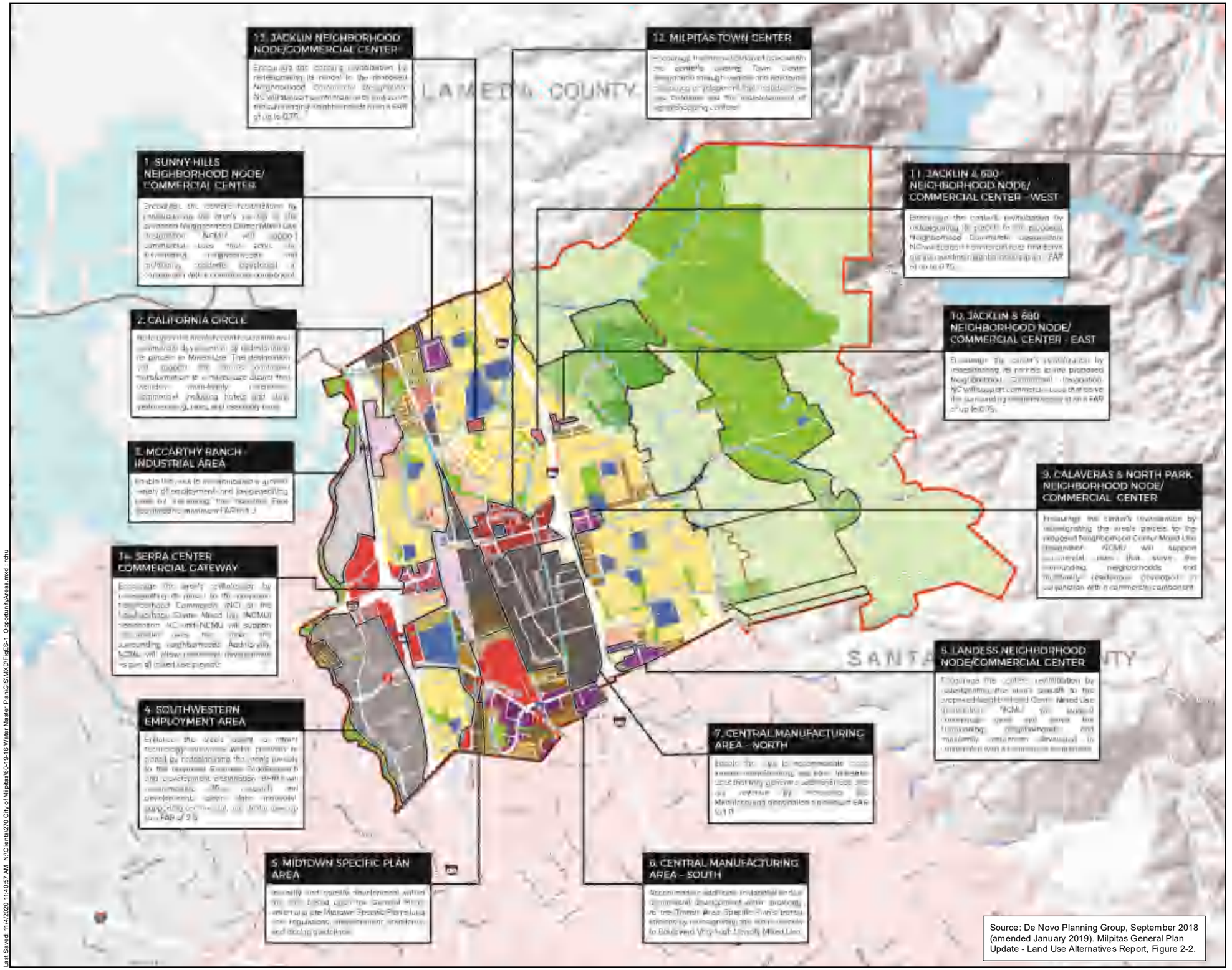
# EXISTING AND PROJECTED FUTURE LAND USE

Most of the City's existing land use is single family residential, which is located primarily in the north and the east. Industrial and commercial land uses comprise much of the City's southern and western regions. The City anticipates future growth in the form of smaller development projects identified in several Opportunity Areas located throughout the City and significant new development in two large planning areas (Gateway-Main Street and Metro Plan areas). Opportunity Areas were previously defined by the City's Planning and Economic Development departments and represent locations throughout the City that can accommodate future growth and support economic development while protecting natural resources and open space.

Figure ES-1 shows the locations of each Opportunity Area and briefly describes the land use plan for that area. Growth strategies and goals are outlined in the City's General Plan and detailed for Gateway-Main Street and the Metro Plan Area in their respective specific plans.

Since updates to the General Plan, Milpitas Gateway-Main Street Specific Plan, and Milpitas Metro Specific Plan are currently in progress, West Yost coordinated with the City's Planning Department and HydroScience Engineers, Inc. (HydroScience), who is developing the City's Sewer Master Plan, to develop land use planning assumptions for use in the Water and Sewer Master Plans. These future land use assumptions are preliminary but represent conservative estimates of future development.

Table ES-1 summarizes buildout land use assumptions used in this report to model potential future growth. This Water Master Plan conservatively assumes the high end of the dwelling unit range will be constructed, and that areas shown in Table ES-1 are additional new development (not redevelopment). While this "new development" assumption may double-count some existing demands in growth areas where redevelopment occurs, it was necessary based on limited data. Parcel-specific development data was not available, so West Yost could not identify whether a future development was replacing an existing development (and replacing existing water use) or in addition to existing development (with additional water use).




* Proposed Land Use Designation

Source: De Novo Planning Group, September 2018 (amended January 2019). Milpitas General Plan Update - Land Use Alternatives Report, Figure 2-2.

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**Figure ES-1**

**Opportunity Areas**

City of Milpitas
2020 Water Master Plan

**Table ES-1. Potential New Growth at Buildout[a]**

| Development | Land Use Designation[b] | Total Acres | Range of Potential New Dwelling Units | | New Non-Residential Building Square Footage |
|---|---|---|---|---|---|
| | | | Low | High | |
| Opportunity Areas - Residential | | | | | |
| Sunny Hills Neighborhood Node/Commercial Center | NCMU | 19.92 | 275 | 350 | 569,573 |
| California Circle | NCMU | 54.10 | 248 | 360 | 551,816 |
| California Circle | HDR | 18.26 | 252 | 365 | 551,816 |
| Landess Neighborhood Node/Commercial Center | NCMU | 38.03 | 450 | 625 | 521,274 |
| Calaveras & North Park Neighborhood Node/Commercial Center | NCMU | 28.28 | 325 | 425 | 416,836 |
| Milpitas Town Center | HDR[c] | 38.07 | 400 | 525 | 434,872 |
| | Subtotal | 196.66 | 1,950 | 2,650 | 3,046,187 |
| Opportunity Areas - Non-Residential | | | | | |
| McCarthy Ranch Industrial Area | INP | 192.29 | - | - | 3,049,301 |
| Southwestern Employment Area | BPRD | 488.26 | - | - | 5,126,097 |
| Central Manufacturing Area - North | MFG | 492.14 | - | - | 2,602,882 |
| Jacklin & 680 Neighborhood Node/Commercial Center - East | NC | 7.95 | - | - | 152,321 |
| Jacklin & 680 Neighborhood Node/Commercial Center - West | NC | 6.42 | - | - | 75,502 |
| Jacklin Neighborhood Node/Commercial Center | NC | 9.79 | - | - | 99,629 |
| | Subtotal | 1,196.85 | - | - | 11,105,732 |
| Milpitas Gateway-Main Street Specific Plan | | | | | |
| HDR Subset of Gateway-Main Street | HDR[c] | 46.70 | 478 | 637 | - |
| VHDR Subset of Gateway-Main Street | VHDR[e] | 74.58 | 781 | 1,041 | - |
| MDR Subset of Gateway-Main Street | MDR[f] | 62.70 | 242 | 322 | 483,391 |
| Non-Residential Subset of Gateway-Main Street | MFG[g] | 300.30 | - | - | 954,012 |
| | Subtotal | 484.28 | 1,500 | 2,000 | 1,437,403 |
| Milpitas Metro Specific Plan | | | | | |
| VHDR Subset of Metro Plan Area | VHDR | 99.00 | 2,000 | 4,000 | - |
| HDR Subset of Metro Plan Area | HDR | 113.52 | 3,000 | 3,000 | - |
| NC Subset of Metro Plan Area[h] | NC | 85.35 | - | - | 2,087,075 |
| | Subtotal | 297.87 | 5,000 | 7,000 | 2,087,075 |
| | **Total** | **2,176** | **8,450** | **11,650** | **17,676,397** |

(a) Source: City of Milpitas - Buildout Land Use Condition Assumptions, HydroScience Engineers, August 3, 2020.

(b) Land Use Designations based on Preferred Land Use Map (PLUM), Figure 2-3.

(c) Originally Multifamily High Density (MFH), which has been renamed High Density Residential (HDR) in the PLUM.

(d) Originally Boulevard Very High Density Mixed Use (BVMU), which has been renamed Very High Density Mixed Use (VHDMU) in the PLUM.

(e) Originally Multi-Family Very High Density (VHD), which has been renamed Very High Density Residential (VHDR) in the PLUM.

(f) Originally Mixed Use (MXD), which has been retired in the PLUM. This subset has been recategorized as Medium Density Residential (MDR) based on housing density. MDR is the updated name for Multi-Family Medium Density (MFM).

(g) Originally multiple land uses, Manufacturing (MFG) selected because it is the most conservative (i.e., highest water use).

(h) Includes the "Central Manufacturing Area - South" Opportunity Area, which has been combined with MMSP.

## EXISTING WATER SYSTEM FACILITIES

The City's existing potable water system includes the following major facilities: five turnouts, one emergency groundwater well, three emergency interties, five storage reservoirs, five pump stations, 17 pressure reducing valves (PRVs), and approximately 183 miles of pipelines.

There are six main pressure zones within the City's water service area, four served by the San Francisco Public Utilities Commission (SFPUC) (Zones SF1 through SF4), and two served by Valley Water (VW) (Zones VW1 and VW2), which was previously known as the Santa Clara Valley Water District. Under normal conditions, the City operates its potable water system such that the SFPUC and VW supplies remain separate. Isolation valves prevent mixing and create two distinct water service areas.

## EXISTING AND PROJECTED FUTURE WATER SUPPLIES

The City's existing water supplies include imported water, groundwater, recycled water, and interties with neighboring agencies. Under normal conditions, imported water comprises the City's entire water supply. The City currently receives water supplies from the following sources:

- Treated surface water from the SFPUC
- Treated surface water from VW
- Tertiary treated recycled water from South Bay Water Recycling (SBWR)
- During emergencies, groundwater pumped from one well (Pinewood Well) within the City
- Emergency interties with San Jose Water (SJW) and the Alameda County Water District (ACWD)

In 2009, the SFPUC and Bay Area Water Supply and Conservation Agency (BAWSCA) members (including the City) entered into a Water Supply Agreement (WSA), a 25-year contract that allocates 184 million gallons per day (mgd) among BAWSCA members. The City's share of SFPUC supply is 9.23 mgd. Per the City's contract with VW, the City submits a request every three years detailing its desired annual supplies from VW. In each of the three years after submitting the request, the City is obligated to purchase at least 95 percent of the maximum annual amount listed on the schedule.

Based on the City's 2015 Urban Water Management Plan (2015 UWMP), the City expects to meet future water demands with the existing imported surface water supplies described above. As a result, there are no plans to develop new supply sources. However, the City hopes to increase future supply reliability by expanding its groundwater capabilities. Two new wells, the Curtis Well and the McCandless Well, are expected to come online during the City's buildout horizon (i.e., by 2040). To further improve supply reliability, this Water Master Plan also recommends that the City construct an additional VW turnout.

# EXISTING AND PROJECTED FUTURE WATER DEMANDS

In 2019, the City served approximately 78,000 residents and used approximately 8.33 mgd of water. This translates to approximately 107 gallons per capita per day (gpcd), continuing a trend of lower per capita water use following the recent drought and subsequent mandatory water reduction measures. The City is on track to comply with its 2020 per capita water use target of 146 gpcd.

Buildout water demands equal the sum of existing demands and projected future demands as a result of new development. Demand projections are typically calculated based on land use, with expected land area multiplied by a water use factor (WUF). The WUFs are developed from recent historical consumption data and vary by land use type. In other words, the WUFs recognize that a 10-acre industrial processing plant would use more water than a similarly sized office park

West Yost developed preliminary WUFs for each General Plan land use designation based on existing demands (from billing data) and parcel acreages. These preliminary WUFs were refined by examining water use on a per capita basis and for representative developments (e.g., a typical office park or apartment complex), as identified by the City. Water demand projections were developed by applying finalized WUFs to future land use acreages summarized in Table ES-1.

Table ES-2 summarizes the buildout water demand projection. The City's projected water production required at buildout is approximately 13.9 mgd, or 15,600 acre feet per year (af/yr). This is an increase of approximately 5.6 mgd, or 67 percent, over existing (2019) production (8.3 mgd).

The land use-based water demand projection presented above is significantly lower than projections from the 2009 WMPU and the City's 2015 UWMP. At buildout (2040), the land use-based water demand projection is approximately 3.5 mgd and 7.0 mgd lower than projections from the 2009 WMPU and 2015 UWMP, respectively. In contrast, demand projections in this Water Master Plan are generally consistent with demand projections developed by Maddaus Water Management, Inc. (Maddaus) to help BAWSCA member agencies prepare for their 2020 UWMPs.

**Table ES-2. Buildout Potable Water Demand Projection**

| Development | Land Use Designation[a] | Total Acres[a] | WUF[b], gpd/ac | Demand, mgd |
|---|---|---|---|---|
| Opportunity Areas - Residential | | | | |
| Sunny Hills Neighborhood Node/Commercial Center | NCMU | 19.92 | 2,100 | 0.04 |
| California Circle | NCMU | 54.10 | 2,100 | 0.11 |
| California Circle | HDR | 18.26 | 4,500 | 0.08 |
| Landess Neighborhood Node/Commercial Center | NCMU | 38.03 | 2,100 | 0.08 |
| Calaveras & North Park Neighborhood Node/Commercial Center | NCMU | 28.28 | 2,100 | 0.06 |
| Milpitas Town Center | HDR | 38.07 | 4,500 | 0.17 |
| | | | Subtotal | 0.55 |
| Opportunity Areas - Non-Residential | | | | |
| McCarthy Ranch Industrial Area | INP | 192.29 | 400 | 0.08 |
| Southwestern Employment Area | BPRD | 488.26 | 400 | 0.20 |
| Central Manufacturing Area - North | MFG | 492.14 | 2,000 | 0.98 |
| Jacklin & 680 Neighborhood Node/Commercial Center - East | NC | 7.95 | 1,400 | 0.01 |
| Jacklin & 680 Neighborhood Node/Commercial Center - West | NC | 6.42 | 1,400 | 0.01 |
| Jacklin Neighborhood Node/Commercial Center | NC | 9.79 | 1,400 | 0.01 |
| | | | Subtotal | 1.29 |
| Milpitas Gateway-Main Street Specific Plan | | | | |
| HDR Subset of Gateway-Main Street | HDR | 46.70 | 4,500 | 0.21 |
| VHDR Subset of Gateway-Main Street | VHDR | 74.58 | 9,000 | 0.67 |
| MDR Subset of Gateway-Main Street | MDR | 62.70 | 2,300 | 0.14 |
| Non-Residential Subset of Gateway-Main Street | MFG | 300.30 | 2,000 | 0.60 |
| | | | Subtotal | 1.63 |
| Milpitas Metro Specific Plan (MMSP) | | | | |
| VHDR Subset of Metro Plan Area | VHDR | 99.00 | 9,000 | 0.89 |
| HDR Subset of Metro Plan Area | HDR | 113.52 | 4,500 | 0.51 |
| NC Subset of Metro Plan Area | NC | 85.35 | 1,400 | 0.12 |
| | | | Subtotal | 1.52 |
| | | | Total New Demand | 4.99 |
| | | | NRW (11%) | 0.62 |
| | | | New Water Production Required | 5.60 |
| | | | Existing (2019) Water Production | 8.33 |
| | | | **Buildout Water Production Required** | **13.9** |

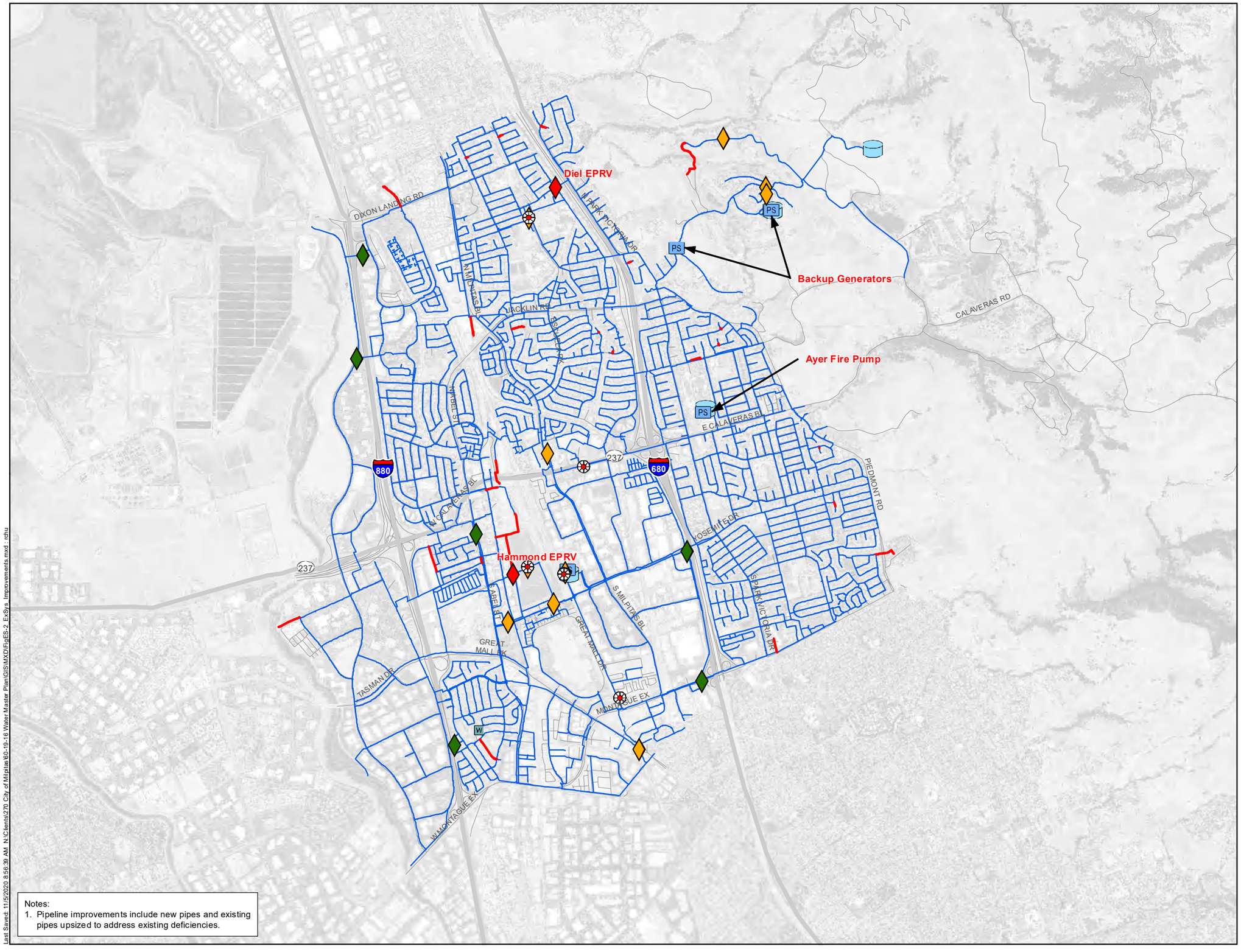
(a) Refer to Table ES-1.

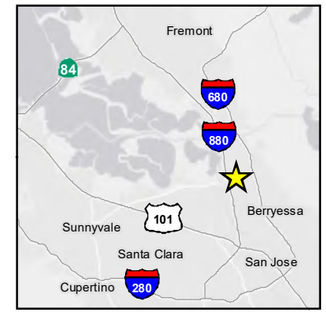
(b) Refer to Table 5-8.

# EVALUATION OF EXISTING WATER SYSTEM

The City's existing water system was evaluated based on supply, storage, and pumping capacities, as well as its ability to meet recommended performance and operational criteria under various demand and emergency scenarios. Below is a summary of findings and recommendations from the existing system evaluation. Figure ES-2 shows the recommended improvements from the existing system analysis.

- Supply Capacity
  - Existing firm supplies (i.e., largest turnout offline in each service area) exceed maximum day demand. While the VW service area has a firm supply deficit, it can be met by the surplus in the SFPUC service area. While supplies from SFPUC and VW are normally segregated, the City can intermix supply sources if necessary. No additional supply facilities are recommended based on existing demands and normal operating conditions.
- Storage Capacity
  - There is sufficient storage in the SFPUC service area and a deficit of 0.45 million gallons (MG) in the VW service area. This deficit is not considered critical, as the Zone SF1 storage surplus can cover the shortfall in Zones VW1 and VW2. No additional storage is recommended based on existing demands and normal operating conditions.
- Pumping Capacity
  - Each pressure zone has a pumping capacity surplus. No additional pumping facilities are recommended based on existing demands and normal operating conditions.
- Distribution System
  - The existing distribution system meets all minimum pressure criteria under average day, peak hour, and maximum day demand conditions.
  - Based on fire flow analysis, West Yost identified potential projects to improve overall distribution system flows. These mainly consist of upsizing existing 6-inch and 8-inch diameter pipelines, though some PRV and isolation valve improvements are also recommended.
  - To comply with the City's design guidelines and improve fire flow capacity, the City should consider upsizing any 4-inch diameter pipelines that serve hydrants to 8-inch diameter pipelines.
  - Should SFPUC turnouts go offline, most of Zone SF2 has reduced fire flow capacity. As a result, West Yost recommends installing a pump at the Ayer Pump Station with a capacity of 4,000 gallons per minute (gpm).
  - The existing system is well equipped to handle a power outage or a VW supply outage. No additional significant impacts arise in either emergency scenario.
  - To evaluate system performance during a PRV outage, PRVs normally allowing flow from Zone 2 to Zone 1 were simulated to be disabled one at a time. The Sunnyhills and Parc Metro PRVs are the most critical, as outages at either of these PRVs results in new locations not meeting recommended fire flows. Recommended improvements include a new emergency PRV (EPRV), new pipelines, and pipeline upsizing.




N

0 1,500 3,000

Scale in Feet

**Recommended Improvements**

- Emergency PRV
- Improved Pipeline

**Existing Facilities**

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

Notes:
1. Pipeline improvements include new pipes and existing pipes upsized to address existing deficiencies.

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**Figure ES-2**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

# EVALUATION OF FUTURE WATER SYSTEM

The City's buildout water system was evaluated based on supply, storage, and pumping capacities, as well as its ability to meet recommended performance and operational criteria under various demand and emergency scenarios. At buildout, it is assumed that Curtis Well and McCandless Well would be available in emergencies. While the City does not currently anticipate any other major water system changes, buildout analyses assume that the infrastructure recommendations from the existing system evaluations have been implemented.

Below is a summary of findings and recommendations from the buildout system evaluation. Appendix G shows the locations of and provides details for each recommended improvement.

- Supply Capacity
  - Buildout firm supplies fall short of maximum day demands. The firm supply surplus in the SFPUC service area cannot make up for the deficit in the VW service area. Thus, West Yost recommends constructing a new VW turnout near the intersection of Piper Drive and Garden Street with the same capacity as the existing Gibraltar turnout.
- Storage Capacity
  - Buildout storage capacity is insufficient. The storage capacity surplus in the SFPUC service area cannot make up for the deficit in the VW service area. West Yost recommends constructing a new 2 MG storage reservoir in the VW service area.
  - To deliver water from this new storage reservoir, West Yost recommends constructing a new pump station with a firm capacity of 4,000 gpm.
- Pumping Capacity
  - Each pressure zone has a pumping capacity surplus. No additional pumping facilities are recommended to meet buildout demands.
- Distribution System
  - The buildout distribution system meets the minimum pressure criterion under a peak hour demand condition.
  - To address locations not meeting recommended fire flows, West Yost recommends installing a new EPRV near the intersection of Cedar Way and South Main Street. The Cedar EPRV would allow flows from Zone SF1 to Zone VW1 should pressures in Zone VW1 drop significantly.

# ASSET RENEWAL AND REPLACEMENT

For assets in the City's water distribution system, West Yost performed a condition assessment that focused on risk, a combination of an asset's likelihood of failure and consequence of failure. Assets were then grouped according to three risk levels: A (Watch), B (Investigate), and C (Act). Level A is the initial action level, representing the point at which an asset or facility depicts aging or performance that requires increased attention, health checks, or predictive maintenance efforts. Assets in Level B should undergo detailed condition assessments, while assets in Level C are targets for renewal activities (e.g., inclusion in a mid-range capital improvement plan or more immediate design efforts).

Recommendations were identified based on asset classification and consist of both capital and non-capital projects. Capital projects include pipeline condition assessment, detailed facility condition assessment, and developing a water meter test program. Non-capital projects (i.e., operational improvement measures) include collecting asset performance data, developing a valve and hydrant exercising program, and reviewing the existing maintenance program to identify additional asset monitoring opportunities.

## RECOMMENDED CAPITAL IMPROVEMENT PROGRAM

The recommended CIP for the City's existing and future water system includes recommendations from the existing system evaluation, the future system evaluation, the asset renewal and replacement study, and the AWIA risk and resilience assessment. Table ES-3 summarizes the proposed CIP phasing and cost in 2020 dollars. Improvements are grouped according to their "source" (e.g., Renewal and Replacement Study), and their costs are assigned to a five-year CIP period. The total CIP cost through 2051 is approximately $78.7 million (2020 dollars).

## Table ES-3. Recommended Capital Improvement Program

| Improvement | Capital Cost, $M[a,b] | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2021-2025 | 2026-2030 | 2031-2035 | 2036-2040 | 2041-2045 | 2046-2051[c] | Total |
| Improvements from Renewal and Replacement Study (Chapter 10) | | | | | | | |
| Pipeline Condition Assessment | $0.5 | - | - | - | - | - | $0.5 |
| Detailed Facility Condition Assessment | $2.2 | - | - | - | - | - | $2.2 |
| Water Meter Test Program | $0.1 | - | - | - | - | - | $0.1 |
| Asset Renewal and Replacement | $17.1 | $1.4 | $1.6 | $3.3 | $17.0 | $10.1 | $50.5 |
| Subtotal | $20.0 | $1.4 | $1.6 | $3.3 | $17.0 | $10.1 | $53.4 |
| Improvements from Existing System Analysis (Chapter 8) | | | | | | | |
| Hammond EPRV and Corning Isolation Valve | $0.5 | - | - | - | - | - | $0.5 |
| Pipeline Improvements - Fire Flow | $2.6 | - | - | - | - | - | $2.6 |
| Fire Pump at Ayer Pump Station | - | $2.1 | - | - | - | - | $2.1 |
| Diel EPRV | - | $0.5 | - | - | - | - | $0.5 |
| Pipeline Improvements and New Pipelines - Fire Flow (Outage) | - | $0.1 | - | - | - | - | $0.1 |
| Backup Generators at Country Club and Tularcitos Pump Stations | - | $0.7 | - | - | - | - | $0.7 |
| Hydrant Service Pipeline Improvements | - | $0.2 | - | - | - | - | $0.2 |
| Subtotal | $3.1 | $3.5 | $0.0 | $0.0 | $0.0 | $0.0 | $6.6 |
| Improvements from Future System Analysis (Chapter 9) | | | | | | | |
| Piper Turnout | - | - | - | $0.5 | - | - | $0.5 |
| VW Storage Reservoir | - | - | $5.5 | - | - | - | $5.5 |
| Pump Station for VW Storage Reservoir | - | - | $4.1 | - | - | - | $4.1 |
| Curtis Well | - | - | $6.0 | - | - | - | $6.0 |
| Cedar EPRV | - | - | $0.5 | - | - | - | $0.5 |
| Subtotal | $0.0 | $0.0 | $16.1 | $0.5 | $0.0 | $0.0 | $16.6 |
| Improvements from Risk and Resilience Assessment[d] | | | | | | | |
| Perimeter Fencing | $0.030 | - | - | - | - | - | $0.030 |
| Site Security Protocols | $0.020 | - | - | - | - | - | $0.020 |
| Replace Isolation Valves | $2.0 | - | - | - | - | - | $2.0 |
| ShakeAlert Participation | $0.085 | - | - | - | - | - | $0.085 |
| Subtotal | $2.1 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $2.1 |
| **Total** | **$25.2** | **$4.9** | **$17.7** | **$3.8** | **$17.0** | **$10.1** | **$78.7** |

(a) Costs shown are in 2020 dollars.

(b) Costs include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

(c) Includes forecasted renewal and replacement costs for the year 2051.

(d) Costs were only developed for four projects recommended in the Risk and Resilience Assessment.

# CHAPTER 1
# Introduction

## 1.1 WATER MASTER PLAN PURPOSE

The purpose of this Water Master Plan for the City of Milpitas (City) is to evaluate the existing system infrastructure and incorporate impacts of short-term and long-term planned growth to develop a comprehensive road map for the City's Water System Capital Improvement Program. The City's last Water Master Plan was completed in 2002 and was then updated in 2009 to incorporate an analysis of the impacts of the City's Milpitas Metro Specific Plan (then known as the Transit Area Specific Plan). The City is continuing to experience significant growth and is currently in the process of updating its General Plan and two key specific plans, Milpitas Gateway-Main Street Specific Plan (formerly known as the Midtown Specific Plan) and Milpitas Metro Specific Plan.

Since the completion of the 2009 Water Master Plan Update, the State endured five years of drought starting in 2012, including the driest four consecutive years in California history (2012-2015). These unprecedented conditions led to statewide mandated water conservation, significant surface water supply reductions and curtailments, and legislation establishing new statewide water efficiency standards and contributing to new water use patterns and trends.

These factors make it critical to both reassess the City's water needs, priorities, and strategies and reevaluate water system infrastructure improvements, with a goal of ensuring a safe and reliable water supply for the City's residents and businesses.

## 1.2 WATER MASTER PLAN OBJECTIVES

The primary objectives of this Water Master Plan are to:

- Evaluate historical and existing water demands to understand current water use patterns, trends, and unit water use factors and develop future water demand projections based on current updates being made to the General Plan
- Review and refine performance and planning criteria used to evaluate the water system and formulate recommendations for future facilities
- Perform a condition assessment of the City's water assets, including evaluating criticality and likelihood of failure, consequence of failure, and business risk exposure for horizontal assets (e.g., pipes, valves) and vertical assets (e.g., reservoirs, pump stations)
- Prepare a water utility asset renewal and replacement study to provide priorities for asset renewal and replacement
- Develop and calibrate the City's water system hydraulic model using InfoWater modeling software to provide an accurate tool for evaluating various water system scenarios
- Evaluate the need for new backbone water facilities (including pipelines, storage facilities and pumping facilities) to serve buildout of the City's General Plan (estimated by the year 2040)

- Evaluate existing and projected source capacity to ensure that adequate storage is provided throughout the City's water system to meet existing and future needs and requirements[1]
- Develop a capital improvement program for recommended potable water system facilities

## 1.3 PREVIOUS AND ON-GOING STUDIES

### 1.3.1 Previous Water Master Plans

The City's last Water Master Plan, the 2009 Water Master Plan Update (2009 Update, 2009 WMPU), was an update of the City's 2002 Water Master Plan (2002 Master Plan). The 2002 Master Plan defined the water system improvements necessary to meet the City's 2002 water demand and future demand associated with future development plans for 2008, 2018 and build-out year of 2021. The 2009 Update provided a re-evaluation of the City's water system capacity based on updated land use information from several near-term and long-term development projects, including the Transit Area Specific Plan, that were in the planning process at that time. The 2009 Update provided information required for the City's planning and financial efforts and defined the necessary water supply system improvements to accommodate the City's buildout land use.

The 2009 Update used baseline information, flow factors, and other information from the 2002 Master Plan and did not include any re-evaluation of flow factors or model calibration steps. Revised water demands were developed based on updated land use information and flow factors from the 2002 Master Plan. **In the 2009 Update, each water supply area (i.e., San Francisco Public Utilities Commission and Valley Water) was evaluated independently**. The demand conditions analyzed were peak hour demand and maximum day demand plus fire flow.

As noted above, this Water Master Plan provides a comprehensive review and evaluation of the City's existing and future water system needs through an independent evaluation in lieu of building on the 2002 Master Plan or the 2009 Update. The evaluation incorporates updates to unit water demand factors based on recent and projected water use trends and patterns to develop future demand projections, includes an update of the City's water system hydraulic model to evaluate system capacity, and reflects updates to future development plans to provide an updated and comprehensive review and evaluation of future water system needs. **Rather than evaluating each water supply area independently, this Water Master Plan better matches actual water system operations by evaluating them together as a single, citywide water system.**

### 1.3.2 Sewer and Storm Drain Master Plans

In parallel with this Water Master Plan, the City is also preparing a Sewer Master Plan (last updated in 2009) and a Storm Drain Master Plan (last updated in 2013). Unit water use factors, wastewater generation factors, and land use planning assumptions used in the new master plans have been coordinated for consistency as appropriate.

[1] Analyses from this Water Master Plan are referenced in the City's Source Capacity Planning Study (per Section 64558, Title 22, of the California Code of Regulations), which is being prepared as a separate deliverable.

### 1.3.3 City of Milpitas General Plan and Specific Plans

The City's current General Plan was adopted in December 1994 and last amended in April 2015. In May 2016, the City initiated a General Plan Update, which is a comprehensive effort to incorporate City growth and changes since 1994, as well as new laws passed, emerging social and environmental issues, and recently developed planning strategies and practices. The General Plan Update and associated Environmental Impact Report are anticipated to be completed in early 2021.

The City has two major development planning areas, the Milpitas Gateway-Main Street Specific Plan area (or Gateway-Main Street Area, formerly known as the Midtown Specific Plan area) and the Milpitas Metro Specific Plan area (or Metro Plan Area, formerly known as the Transit Area Specific Plan area). These areas have been in development over recent years, and development plans continue to be refined. Specific plans for both planning areas were last revised in 2010 (Gateway-Main Street Area, then known as Midtown) and 2011 (Metro Plan Area, then known as Transit Area) and are currently being updated to reflect current development opportunities and constraints.

Proposed future land use associated with the General Plan Update and updated Milpitas Gateway-Main Street and Milpitas Metro Specific Plans has been incorporated into this Water Master Plan and is discussed further in Chapter 2.

### 1.3.4 Emergency Response Plan

Also, in conjunction with this Water Master Plan, the City's Emergency Response Plan, last updated in 2010, is being updated to reflect current conditions and comply with requirements of America's Water Infrastructure Act of 2018 (AWIA). AWIA requires the City's completion of a water system Risk and Resilience Assessment (RRA) by December 31, 2020 and an updated Emergency Response Plan (ERP) by June 30, 2021. The City's RRA and ERP are prepared as separate deliverables.

## 1.4 REPORT ORGANIZATION

This Water Master Plan is organized into the following chapters:

| | |
|---|---|
| Chapter 1: Introduction | Describes the purpose and objectives for the Water Master Plan, its relationship to other on-going studies, report organization and acknowledgments |
| Chapter 2: Water Service Area and Land Use | Describes the City's existing water service area and land uses as well as projected future land uses based on information provided by the City Planning Department on planned future development |
| Chapter 3: Existing Water System Facilities | Provides background information on the City's existing water system (including pressure zones, supply turnouts, groundwater wells and emergency interties) and distribution system facilities (including storage reservoirs, pump stations, pipelines, pressure reducing valves and isolation valves) |

| | |
|---|---|
| Chapter 4: Water Supply Sources | Provides an overview of the City's available water supplies, including supplies from the San Francisco Public Utilities Commission, Valley Water, City groundwater wells, and recycled water provided by South Bay Water Recycling |
| Chapter 5: Water Demand | Presents historical, current and projected future water demands based on the planned future development described in Chapter 2 |
| Chapter 6: Hydraulic Model Update and Calibration | Describes the update and calibration of the City's water distribution system hydraulic model used to analyze the City distribution system performance |
| Chapter 7: System Planning and Performance Criteria | Defines the recommended planning and performance criteria for the City water system, including supply, storage and pumping capacity, fire flow requirements, minimum and maximum system pressures, and maximum pipeline velocity and head loss |
| Chapter 8: Evaluation of Existing Water System | Describes the evaluation of the City's existing water system in comparison to the criteria developed in Chapter 7 and provides recommendations for existing system improvements |
| Chapter 9: Evaluation of Future Water System | Describes the evaluation of the City's water system and its ability to meet projected future water demands in comparison to the criteria developed in Chapter 7 and provides recommendations for future system improvements |
| Chapter 10: Asset Renewal and Replacement | Presents a summary of the findings of Water Utility Condition Assessment included in Appendix D and provides a discussion of risk management guidelines and asset profiling and recommends projects and activities to manage infrastructure risk |
| Chapter 11: Recommended Capital Improvement Program | Based on the evaluations described in Chapters 8, 9 and 10, provides a detailed summary of recommended capital improvements for the City's water system to meet existing and projected future demands, along with estimated construction costs |
| Chapter 12: References | Lists reference documents used in the preparation of this Water Master Plan |

The following appendices to this Water Master Plan contain additional technical information, assumptions and calculations:

| | |
|---|---|
| Appendix A: Water System Schematic Profile | Provides a schematic profile of the City's existing water system as referenced in Chapter 3 |
| Appendix B: System Operations Narratives | Includes system narratives referenced in Chapter 3 describing normal and emergency operations protocols as prepared by Glen Campi, Public Works Maintenance Manager for Utilities |
| Appendix C: Hydrant Testing and HPR Placement Plan | Outlines the hydrant testing that was performed in March 2020 and the associated collection of water distribution system pressure data using hydrant pressure recorders needed to calibrate the City's water system hydraulic model as described in Chapter 6 |
| Appendix D: Water Utility Condition Assessment | Provides the Water Utility Condition Assessment performed for the City's water system and referenced in Chapter 10; includes assessment methodologies, asset valuations, likelihood and consequence of failure factors and risk scores |
| Appendix E: Seismic Risk Assessment | Provides the Seismic Risk Assessment performed as part of the City's RRA and referenced in Chapter 10; includes an estimate of the consequences associated with an earthquake event affecting the City water system |
| Appendix F: Cost Estimating Assumptions | Describes cost estimating assumptions used to estimate construction costs for recommended water system improvements as described in Chapter 11 |
| Appendix G: Capital Improvement Program Mapbook and Project Summary Sheets | Provides figures showing the location of recommended water system improvements and, for some larger projects (e.g., EPRVs and new Ayer pump), single-page project summaries as referenced in Chapter 11 |

As noted above, the City's RRA and ERP are prepared as separate deliverables.

## 1.5 ACKNOWLEDGMENTS

The development of this Water Master Plan would not have been possible without the focused involvement and assistance of City staff. In particular, the following staff provided comprehensive information, significant input and important insights throughout development of this Water Master Plan:

Tony Ndah, Public Works Director

Harris Siddiqui, Principal Engineer (Project Manager for the Water Master Plan)

Glen Campi, Public Works Maintenance Manager for Utilities

Sophia Wendt, Assistant Engineer

Ned Thomas, Planning Director

Jessica Garner, Planning Manager

Kevin Riley, Milpitas Metro Specific Plan Manager

# CHAPTER 2
# Water Service Area and Land Use

This chapter describes the City's existing water service area and existing and future land uses. Future land use designations are based on discussions with the City Planning Department and City-provided data, reports, and maps.

## 2.1 WATER SERVICE AREA

### 2.1.1 Location and Description

Located in Santa Clara County, the City is bordered by the City of Fremont to the north and the City of San Jose to the south. Major transportation corridors connecting to the City include Highway 237, Interstate 880 (I-880), I-680, and Montague Expressway. The City is currently served by Valley Transit Authority (VTA) light rail and, as of June 2020, Bay Area Rapid Transit (BART).

As shown on Figure 2-1, the City's water service area is supplied by the San Francisco Public Utilities Commission (SFPUC) and Valley Water (VW, formerly known as the Santa Clara Valley Water District)[2]. The overall water service area is approximately 12 square miles and is generally coincident with City limits, except for some areas in the Calaveras Hills along the City's eastern edge. The City can be divided into two distinct topographical areas: the relatively flat "valley floor" on the western side and the steeper "hillside" area within the Calaveras Hills. Service elevations within the City range from near sea level in the west to almost 900 feet above mean sea level (msl) in the east.

Within its limits, the City has authority over land use and is responsible for providing public services. Figure 2-1 also shows the City's Urban Growth Boundary, the result of a voter-approved initiative that restricts development and the extension of public services and infrastructure in the eastern hill areas. In November 2016, the City voted to extend this development moratorium to December 31, 2038.

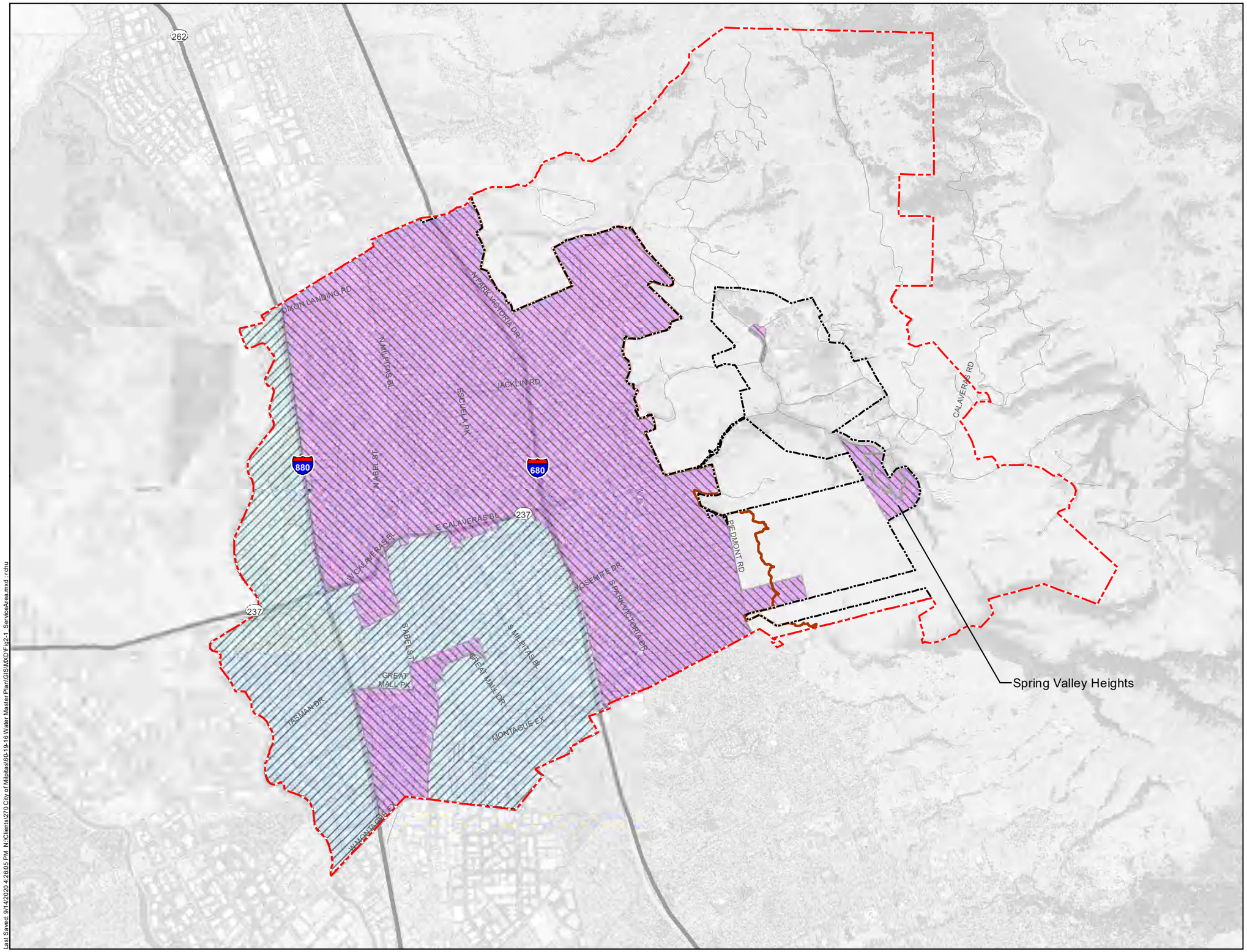
One exception to the moratorium is the Spring Valley Heights community, which is located outside the Urban Growth Boundary but served by City infrastructure. In 2005, after its groundwater supply became inadequate, the Spring Valley Heights community entered into an agreement with the City to receive potable water from its SFPUC service area. The Spring Valley Heights Association's private water system (CA Water System No. CA4300856) connects to the City's municipal supply through a master meter and is operated by the Spring Valley Heights Mutual Water Company.

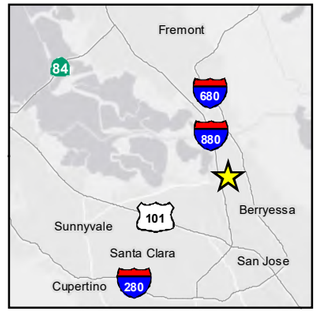
### 2.1.2 Population Served and Service Connections

The City was incorporated in 1954, then spanning approximately 3 square miles with a population of 825. Manufacturing, assembly, and high-tech industries have since spurred steady expansion and population growth. The California Department of Finance estimates the City's January 1, 2020 population at 77,961, which this report will use as the "existing" population for 2019. Historical population is detailed in Chapter 5 of this report.

The City has nine customer billing codes, which West Yost has organized into three categories (residential, commercial, and public) and up to three connection types (water, fire, and irrigation). Table 2-1 presents a summary of historical potable water service connections by customer and connection type. Service connection counts are based on bimonthly billing data from 2013 through 2019 provided by the City in January 2020. In calendar year (CY) 2019, the City had 16,394 metered water service connections. Almost 89 percent of connections were residential, which includes multi-family connections. Note, one multi-family connection can serve as little as two or as many as hundreds of units.

[2] In 2019, the Santa Clara Valley Water District (SCVWD) changed its name to Valley Water (VW).




N

0 1,750 3,500

Scale in Feet

**Water Service Area**

- SFPUC
- VW
- City Limits
- Urban Growth Boundary
- Sphere of Influence

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**Figure 2-1**

**Existing Water Service Area**

City of Milpitas
2020 Water Master Plan

**Table 2-1. Historical Water Service Connections[a, b]**

| Customer Type | Billing Code | CY 2013 | | CY 2014 | | CY 2015 | | CY 2016 | | CY 2017 | | CY 2018 | | CY 2019 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Number of Connections | Percent of Total | Number of Connections | Percent of Total | Number of Connections | Percent of Total | Number of Connections | Percent of Total | Number of Connections | Percent of Total | Number of Connections | Percent of Total | Number of Connections | Percent of Total |
| Residential | | | | | | | | | | | | | | | |
| Water | WRES | 14,197 | 86.6% | 14,244 | 86.8% | 14,257 | 86.9% | 14,259 | 87.0% | 14,264 | 87.1% | 14,280 | 87.2% | 14,287 | 87.1% |
| Fire | FRES | 108 | 0.7% | 109 | 0.7% | 109 | 0.7% | 110 | 0.7% | 110 | 0.7% | 110 | 0.7% | 110 | 0.7% |
| Irrigation | IRP | 119 | 0.7% | 120 | 0.7% | 120 | 0.7% | 120 | 0.7% | 119 | 0.7% | 121 | 0.7% | 124 | 0.8% |
| Subtotal Residential | | 14,424 | 88.0% | 14,473 | 88.2% | 14,486 | 88.3% | 14,489 | 88.4% | 14,493 | 88.5% | 14,511 | 88.6% | 14,521 | 88.6% |
| Commercial | | | | | | | | | | | | | | | |
| Water | WCOMM | 974 | 5.9% | 963 | 5.9% | 958 | 5.8% | 954 | 5.8% | 940 | 5.7% | 938 | 5.7% | 943 | 5.8% |
| Fire | FAO | 462 | 2.8% | 455 | 2.8% | 446 | 2.7% | 444 | 2.7% | 438 | 2.7% | 436 | 2.7% | 449 | 2.7% |
| Irrigation | IP | 351 | 2.1% | 346 | 2.1% | 341 | 2.1% | 331 | 2.0% | 326 | 2.0% | 320 | 2.0% | 312 | 1.9% |
| Subtotal Commercial | | 1,787 | 10.9% | 1,764 | 10.7% | 1,745 | 10.6% | 1,729 | 10.5% | 1,704 | 10.4% | 1,694 | 10.3% | 1,704 | 10.4% |
| Public | | | | | | | | | | | | | | | |
| Water - City | WCITY | 44 | 0.3% | 44 | 0.3% | 44 | 0.3% | 44 | 0.3% | 45 | 0.3% | 45 | 0.3% | 46 | 0.3% |
| Water - County | WSCC | 1 | 0.0% | 1 | 0.0% | 1 | 0.0% | 1 | 0.0% | 1 | 0.0% | 1 | 0.0% | 1 | 0.0% |
| Irrigation - City | ICP | 130 | 0.8% | 128 | 0.8% | 129 | 0.8% | 129 | 0.8% | 129 | 0.8% | 123 | 0.8% | 122 | 0.7% |
| Subtotal Public | | 175 | 1.1% | 173 | 1.1% | 174 | 1.1% | 174 | 1.1% | 175 | 1.1% | 169 | 1.0% | 169 | 1.0% |
| **Total** | | **16,386** | **100.0%** | **16,410** | **100.0%** | **16,405** | **100.0%** | **16,392** | **100.0%** | **16,372** | **100.0%** | **16,374** | **100.0%** | **16,394** | 100.0% |

(a) Source: Billing data provided by City in January 2020.
(b) Includes potable water service connections only. Recycled water connections are excluded.

## 2.2 EXISTING LAND USE

Most of the City's existing land use is single family residential, which is located primarily in the north and east. Industrial and commercial land uses comprise much of the City's southern and western regions. Figure 2-2 shows the City's existing land use, while Table 2-2 summarizes key land use statistics.

**Table 2-2. Existing Land Use[a]**

| Population[b] | Dwelling Units | Non-Residential Square Footage | Jobs[c] | Jobs per Housing Unit[d] |
|---|---|---|---|---|
| 77,961 | 22,215 | 28,007,888 | 53,000 | 2.39 |

(a) Unless otherwise noted, data is from the Draft Environmental Impact Report - Milpitas General Plan, Table 2.0-3, received January 2020.
(b) Source: CA Department of Finance, E-1 Population Estimates (May 1, 2020).
(c) Source: Estimate provided by the City in February 2021.
(d) Calculated based on dwelling units and jobs estimate.

The City classifies customers (excluding hotels and schools) using at least 30,000 gallons per day (gpd) as Large Water Users. To update the list of Large Water Users, West Yost reviewed City-provided billing data[3] from 2013 through 2019. Users were identified according to the "LOCATION_NO" field provided in billing records. In general, each "LOCATION_NO" corresponds to a single water meter. In CY 2019, there were 19 Large Water Users; they are ranked in Table 2-3.

**Table 2-3. Large Water Users[a]**

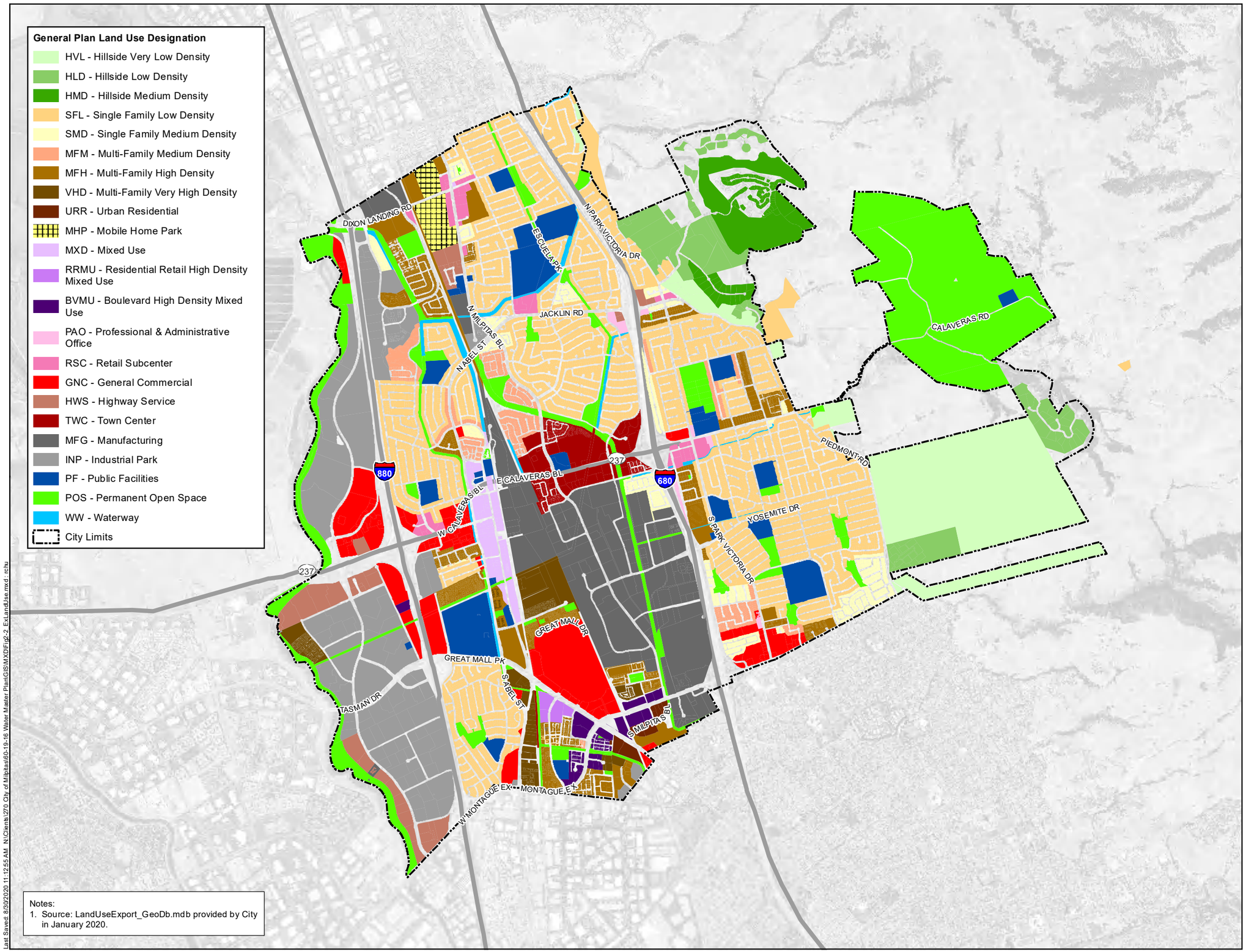
| Rank | Location ID[b] | Customer | CY 2019 Consumption, gpd |
|---|---|---|---|
| 1 | 3015659 | Linear Technology | 179,606 |
| 2 | 3015510 | Evoqua Water Technologies LLC | 177,956 |
| 3 | 3014575 | SCC GSA Fiscal Bldg3 | 110,257 |
| 4 | 3015655 | Headway Technologies Inc | 92,605 |
| 5 | 3016862 | Essex Management Corporation | 92,074 |
| 6 | 3014546 | Milpitas Mills LP | 77,853 |
| 7 | 3015553 | T Marzetti Company-West | 73,949 |
| 8 | 3014577 | SCC GSA Fiscal Bldg3 | 49,960 |
| 9 | 3014598 | Milpitas Housing Assoc | 47,336 |
| 10 | 3013322 | City of Milpitas | 39,712 |
| 11 | 3015908 | Jefferson Smurfit Corp #200585 | 39,378 |
| 12 | 3015754 | Fairfield Murphy Road LLC | 38,397 |
| 13 | 3016857 | Cisco Systems | 35,091 |
| 14 | 3001280 | Evoqua Water Technologies LLC | 34,175 |
| 15 | 3015508 | 555 Apartments LLC | 33,945 |
| 16 | 3010133 | Spinnaker Pointe LLC | 32,972 |
| 17 | 3003005 | Spring Valley Apartments | 31,851 |
| 18 | 3017196 | Corwil Technology | 31,291 |
| 19 | 3001229 | KLA-Tencor | 29,969 |
| | | **Total** | **1,248,376** |

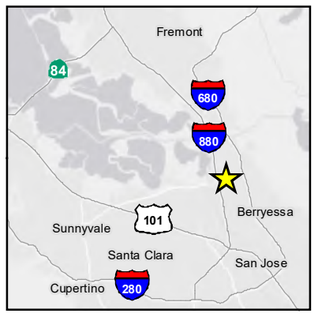
(a) Customer meters using at least 30,000 gpd based on City-provided billing data in January 2020. Large water users were identified based on the "LOCATION_NO" field in City billing records. Each "LOCATION_NO" generally corresponds to a single water meter.
(b) "LOCATION_NO" from City billing data.

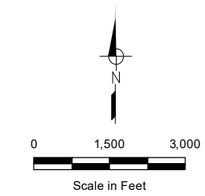
[3] Billing data was bimonthly. Usage was grouped into calendar years based on the ending date of the billing period. As a result, annual consumption may not match other sources.

**General Plan Land Use Designation**

- HVL - Hillside Very Low Density
- HLD - Hillside Low Density
- HMD - Hillside Medium Density
- SFL - Single Family Low Density
- SMD - Single Family Medium Density
- MFM - Multi-Family Medium Density
- MFH - Multi-Family High Density
- VHD - Multi-Family Very High Density
- URR - Urban Residential
- MHP - Mobile Home Park
- MXD - Mixed Use
- RRMU - Residential Retail High Density Mixed Use
- BVMU - Boulevard High Density Mixed Use
- PAO - Professional & Administrative Office
- RSC - Retail Subcenter
- GNC - General Commercial
- HWS - Highway Service
- TWC - Town Center
- MFG - Manufacturing
- INP - Industrial Park
- PF - Public Facilities
- POS - Permanent Open Space
- WW - Waterway
- City Limits




Notes:
1. Source: LandUseExport_GeoDb.mdb provided by City in January 2020.

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**Figure 2-2**

**Existing Land Use**

City of Milpitas
2020 Water Master Plan

## 2.3 FUTURE LAND USE

The City anticipates future growth in the form of smaller development projects located throughout the City and larger, more significant new development in two planning areas (Gateway-Main Street and Metro Plan). Growth strategies and goals are outlined in the City's General Plan and detailed for the Gateway-Main Street and the Metro Plan areas in their respective specific plans. These documents, which are currently being updated, are discussed further in the following sections.

### 2.3.1 City of Milpitas General Plan

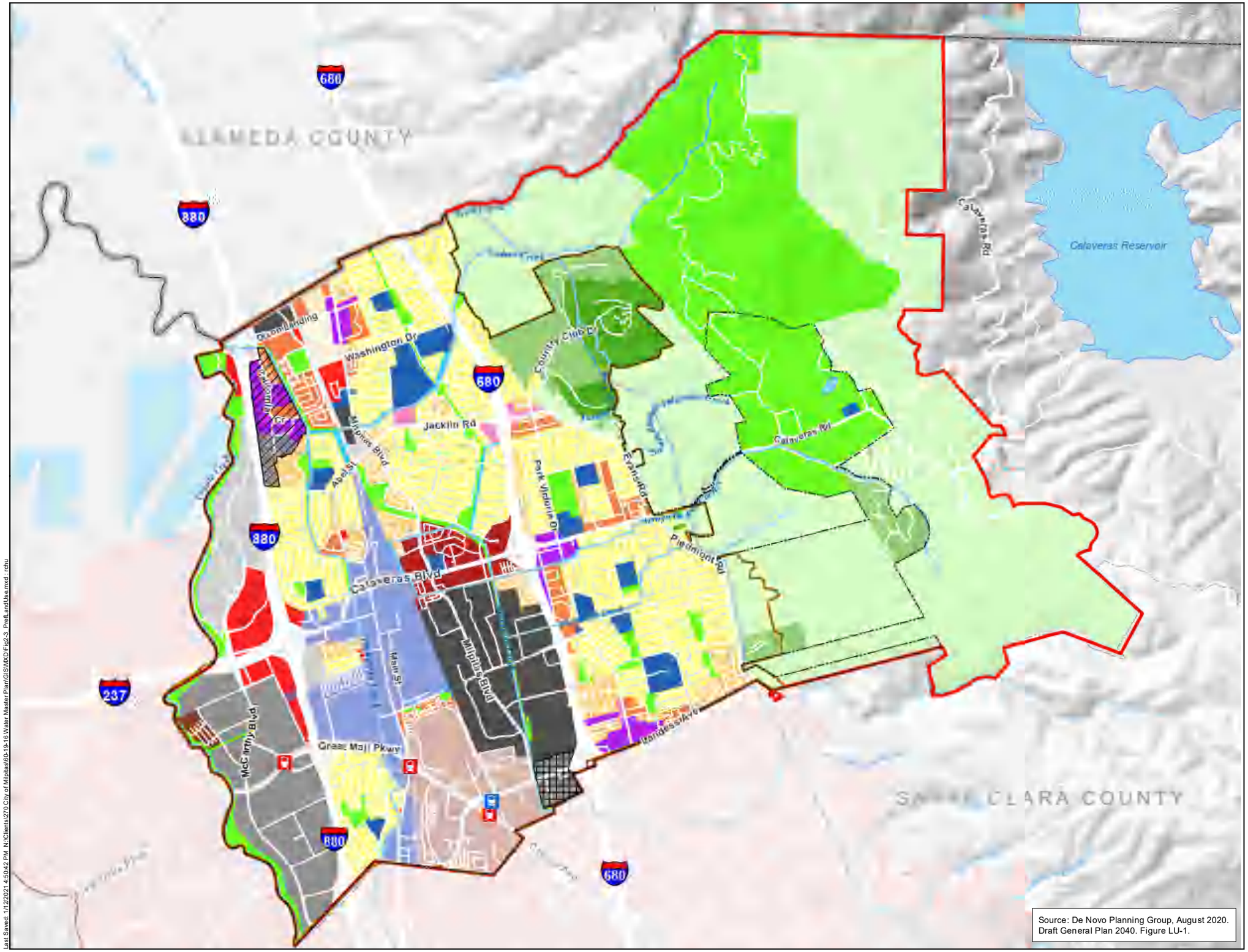
The City's General Plan details the land use plan and policies within the City's incorporated limits and Sphere of Influence (SOI), which includes incorporated and unincorporated territory that is assumed to represent the City's final boundaries and service area. The SOI is bordered by the Santa Clara-Alameda county line to the north, and the City of San Jose to the west and south.

The most recent General Plan was adopted in December 1994 and last amended in April 2015. In May 2016, the City initiated a General Plan Update, a comprehensive effort to incorporate City growth and changes since 1994, as well as new laws passed, emerging social and environmental issues, and recently developed planning strategies and practices. The General Plan Update and associated Environmental Impact Report (EIR) are currently in progress. Figure 2-3 shows the City's preferred land uses based on the Draft General Plan.

As part of the General Plan Update, De Novo Planning Group authored a Land Use Alternatives Report (LUA Report), which evaluates locations throughout the City that can "accommodate future growth, support economic development, maintain fiscal sustainability, and ensure adequate protection of natural resources and open space" (LUA Report). These "Opportunity Areas" are shown on Figure 2-4 of this report, which is adapted from Figure 2-2 of the LUA Report.

West Yost coordinated with the City's Planning Department and HydroScience Engineers, Inc. (HydroScience), who is developing the City's Sewer Master Plan, to develop land use planning assumptions for future residential dwelling units and non-residential square footage for use in the Water and Sewer Master Plans. Table 2-4 summarizes the buildout land use assumptions used in this report. In addition to assigning a preferred land use designation to each Opportunity Area, Table 2-4 breaks down the proposed Milpitas Gateway-Main Street Specific Plan (Gateway Specific Plan) and Milpitas Metro Specific Plan areas into specific land use components. For the purposes of developing and analyzing future system facility and capacity needs, the proposed residential developments have been assigned a range of potential new dwelling units based on coordination with the City's Planning Department.

To remain conservative, this Master Plan assumes the high end of the dwelling unit range will be constructed. In addition, this Master Plan assumes areas listed in Table 2-4 represent new development and not replacing existing developed areas. As detailed in Section 5.3.3 of this report, this means that water demands from growth areas will be in addition to (and not replacing) any existing water demands in those areas. Lastly, land use assumptions in Table 2-4 are preliminary and will be refined as the City updates the General Plan, Gateway Specific Plan, and Milpitas Metro Specific Plan.




Source: De Novo Planning Group, August 2020. Draft General Plan 2040. Figure LU-1.

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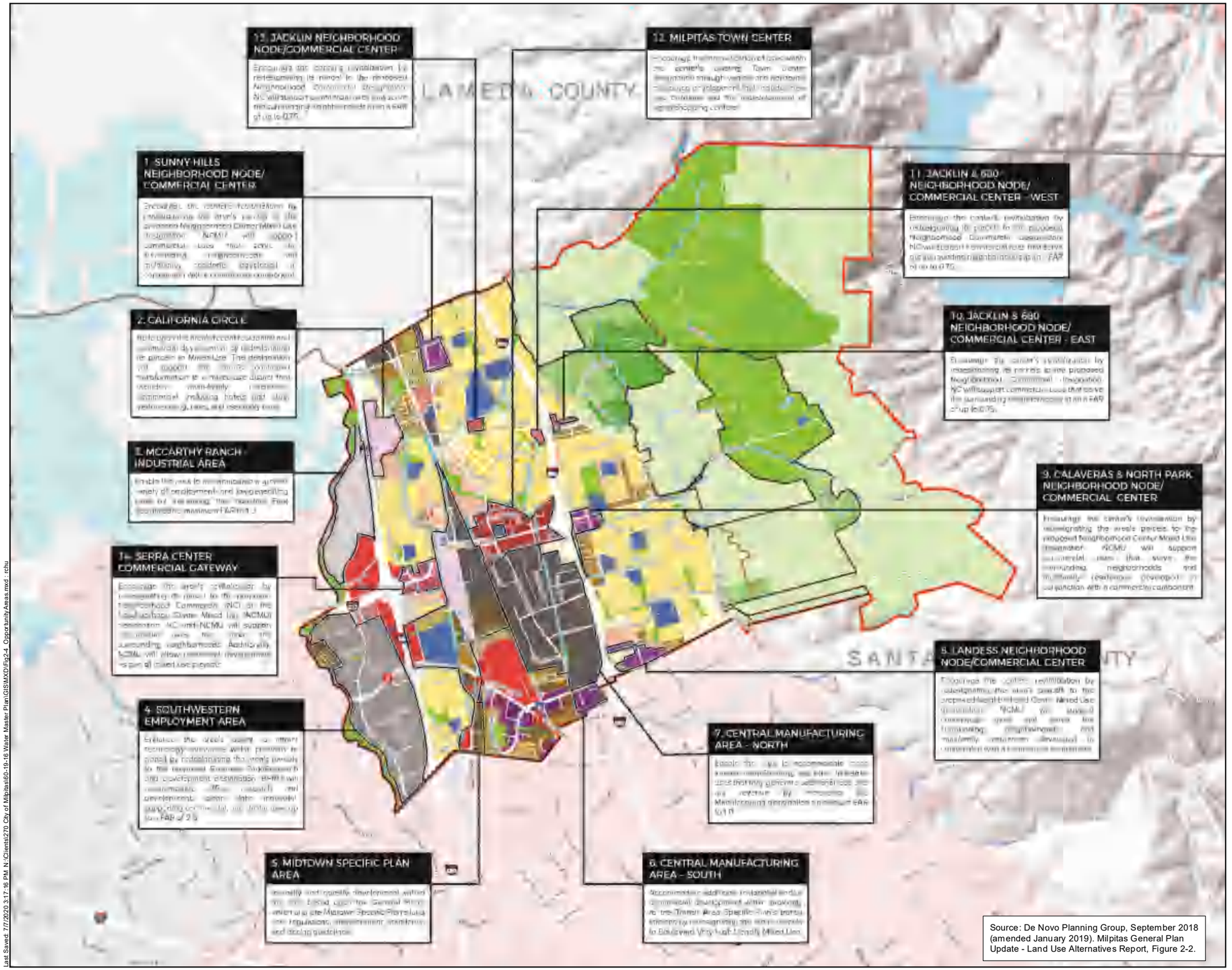
**Figure 2-3**

**Preferred Land Use**

City of Milpitas
2020 Water Master Plan




* Proposed Land Use Designation

Source: De Novo Planning Group, September 2018 (amended January 2019). Milpitas General Plan Update - Land Use Alternatives Report, Figure 2-2.

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**Figure 2-4**

**Opportunity Areas**

City of Milpitas
2020 Water Master Plan

**Table 2-4. Potential New Growth at Buildout[a]**

| Development | Land Use Designation[b] | Total Acres | Range of Potential New Dwelling Units | | New Non-Residential Building Square Footage |
|---|---|---|---|---|---|
| | | | Low | High | |
| Opportunity Areas - Residential | | | | | |
| Sunny Hills Neighborhood Node/Commercial Center | NCMU | 19.92 | 275 | 350 | 569,573 |
| California Circle | NCMU | 54.10 | 248 | 360 | 551,816 |
| California Circle | HDR | 18.26 | 252 | 365 | 551,816 |
| Landess Neighborhood Node/Commercial Center | NCMU | 38.03 | 450 | 625 | 521,274 |
| Calaveras & North Park Neighborhood Node/Commercial Center | NCMU | 28.28 | 325 | 425 | 416,836 |
| Milpitas Town Center | HDR[c] | 38.07 | 400 | 525 | 434,872 |
| | Subtotal | 196.66 | 1,950 | 2,650 | 3,046,187 |
| Opportunity Areas - Non-Residential | | | | | |
| McCarthy Ranch Industrial Area | INP | 192.29 | - | - | 3,049,301 |
| Southwestern Employment Area | BPRD | 488.26 | - | - | 5,126,097 |
| Central Manufacturing Area - North | MFG | 492.14 | - | - | 2,602,882 |
| Jacklin & 680 Neighborhood Node/Commercial Center - East | NC | 7.95 | - | - | 152,321 |
| Jacklin & 680 Neighborhood Node/Commercial Center - West | NC | 6.42 | - | - | 75,502 |
| Jacklin Neighborhood Node/Commercial Center | NC | 9.79 | - | - | 99,629 |
| | Subtotal | 1,196.85 | - | - | 11,105,732 |
| Milpitas Gateway-Main Street Specific Plan | | | | | |
| HDR Subset of Gateway-Main Street | HDR[c] | 46.70 | 478 | 637 | - |
| VHDR Subset of Gateway-Main Street | VHDR[e] | 74.58 | 781 | 1,041 | - |
| MDR Subset of Gateway-Main Street | MDR[f] | 62.70 | 242 | 322 | 483,391 |
| Non-Residential Subset of Gateway-Main Street | MFG[g] | 300.30 | - | - | 954,012 |
| | Subtotal | 484.28 | 1,500 | 2,000 | 1,437,403 |
| Milpitas Metro Specific Plan | | | | | |
| VHDR Subset of Metro Plan Area | VHDR | 99.00 | 2,000 | 4,000 | - |
| HDR Subset of Metro Plan Area | HDR | 113.52 | 3,000 | 3,000 | - |
| NC Subset of Metro Plan Area[h] | NC | 85.35 | - | - | 2,087,075 |
| | Subtotal | 297.87 | 5,000 | 7,000 | 2,087,075 |
| | **Total** | **2,176** | **8,450** | **11,650** | **17,676,397** |

(a) Source: City of Milpitas - Buildout Land Use Condition Assumptions, HydroScience Engineers, August 3, 2020.

(b) Land Use Designations based on Preferred Land Use Map (PLUM), Figure 2-3.

(c) Originally Multifamily High Density (MFH), which has been renamed High Density Residential (HDR) in the PLUM.

(d) Originally Boulevard Very High Density Mixed Use (BVMU), which has been renamed Very High Density Mixed Use (VHDMU) in the PLUM.

(e) Originally Multi-Family Very High Density (VHD), which has been renamed Very High Density Residential (VHDR) in the PLUM.

(f) Originally Mixed Use (MXD), which has been retired in the PLUM. This subset has been recategorized as Medium Density Residential (MDR) based on housing density. MDR is the updated name for Multi-Family Medium Density (MFM).

(g) Originally multiple land uses, Manufacturing (MFG) selected because it is the most conservative (i.e., highest water use).

(h) Includes the "Central Manufacturing Area - South" Opportunity Area, which has been combined with MMSP.

## 2.3.2 Specific Plans

Specific Plan areas, including the Milpitas Metro Specific Plan (formerly the Transit Area Specific Plan or TASP) and the Milpitas Gateway-Main Street Specific Plan (formerly the Midtown Specific Plan or MSP), are designated by the General Plan Land Use Map (see Figure 2-3). These areas have been designated as Special Planning Areas and each has an adopted or soon to be updated Specific Plan to facilitate comprehensive planning of the large strategic areas. The City is planning significant redevelopment in these Specific Plan areas, each of which had previously completed Specific Plans that are currently being updated.

The following subsections detail land use objectives for each area, based on discussions with the City Planning staff.

### *2.3.2.1 Milpitas Gateway-Main Street Specific Plan (Gateway Specific Plan)*

Originally known as the Midtown Area, the Gateway-Main Street Area has an existing Specific Plan (Midtown Specific Plan, adopted by the City in March 2002) that was last updated in 2010. The Gateway-Main Street Area spans 589 acres and is set between I-880, I-680, Calaveras Boulevard, and the Montague Expressway in the western portion of the City. Per the 2010 plan, the overall strategy for the area is to create a mixed-use community with high-density, transit-oriented housing, a central gathering place, and necessary industrial, service, and commercial uses. Significant development has already occurred within the Gateway-Main Street Area, including new housing units and reinvestment in the Great Mall (which is outside the Gateway-Main Street Area but encompasses its vision) to expand entertainment activities.

While the City is currently updating the Milpitas Gateway-Main Street Specific Plan (henceforth known as the Gateway Specific Plan), the overall strategy is expected to remain generally the same.

As shown in Table 2-4, preliminary projections estimate an additional 1,500 to 2,000 residential dwelling units and approximately 1.4 million square feet of non-residential development at buildout within the Gateway-Main Street Area. These projections are subject to change as the Gateway Specific Plan is updated.

### *2.3.2.2 Milpitas Metro Specific Plan*

The City adopted the current Milpitas Metro Specific Plan (then known as Transit Area Specific Plan) in June 2008, amending it in December 2011. The Metro Plan Area spans approximately 370 acres in southern Milpitas and includes two light rail stations, the new BART station, and the Great Mall. While the Metro Plan Area is within the area covered by the Gateway Specific Plan (except for a 40-acre area between Piper Drive and Milpitas Boulevard and the Great Mall, which was already outside the Gateway-Main Street Area), the Gateway Specific Plan called for the creation of a separate, detailed plan for the area near the BART station.

The Milpitas Metro Specific Plan fulfills that requirement and is independent of the Gateway Specific Plan. Currently an older industrial area in the City, the Metro Plan Area is re-envisioned in the Milpitas Metro Specific Plan as a high-density, mixed -se neighborhood that encourages walking, biking, and use of public transit. The Milpitas Metro Specific Plan is currently being updated and is expected to maintain this Metro Plan Area vision.

As shown in Table 2-4, preliminary projections estimate an additional 5,000 to 7,000 residential dwelling units, approximately 2.1 million square feet of commercial development within the Milpitas Metro Specific Plan area. These projections are subject to change as the Milpitas Metro Specific Plan is updated.

# CHAPTER 3
# Existing Water System Facilities

This chapter provides a summary of the City's existing key water facilities, which are shown on Figure 3-1. To provide context and understanding of the City's water system, a summary of the current water system configuration and pressure zones is provided before detailing the City's water supply and distribution facilities.

## 3.1 EXISTING WATER SYSTEM CONFIGURATION, OPERATIONS, AND PRESSURE ZONES

As described further in Chapter 4, the City receives water supplies from SFPUC and VW. Under normal conditions, the City operates its potable water system such that the SFPUC and VW supplies remain separate. Isolation valves prevent mixing and create two distinct water service areas. The SFPUC service area includes the City's valley floor and hillside areas, while the VW service area only encompasses the City's valley floor area. Under emergency conditions (e.g., a loss of supply from either SFPUC or VW), the City can open isolation valves that normally separate the SFPUC and VW service areas to move water between the service areas (see further discussion in Section 3.3.4).

The City's valley floor area is generally served directly from SFPUC or VW turnouts, with pressure reducing valves (PRVs) reducing pressures for lower elevation customers. Storage reservoirs and their associated pump stations in the valley floor area help supply peak demands and meet emergency conditions. Additional pump stations deliver water from the valley floor area to the hillside areas and are operated based on hillside storage reservoir levels. A water system schematic profile is provided in Appendix A, along with a detailed operations narrative in Appendix B.

There are six main pressure zones within the City's water service area, four served by the SFPUC (Zones SF1 through SF4), and two served by VW (Zones VW1 and VW2)[4]. Water purchased from SFPUC enters the distribution system through Zone SF2 (directly) or Zone SF1 (via PRV). Zones SF3 and SF4, in the hillside areas, are supplied water from Zone SF2 through a pump station. Significant elevation differences in Zone SF4 require reducing pressures for the lower portions of the zone. As a result, Zone SF4 is split into two subzones: Zone SF4-2 (unregulated) and Zone SF4-1 (regulated via three PRVs).

VW water is regulated through a PRV before entering Zone VW2 and through additional PRVs into Zone VW1. The key characteristics of each pressure zone are summarized in Table 3-1.

[4] Note that the pressure zone designations have been renamed based on the Santa Clara Valley Water District agency name change to Valley Water. Zones VW1 and VW2 were previously known as SC1 and SC2, respectively. The rest of this Water Master Plan will use these updated pressure zone designations.

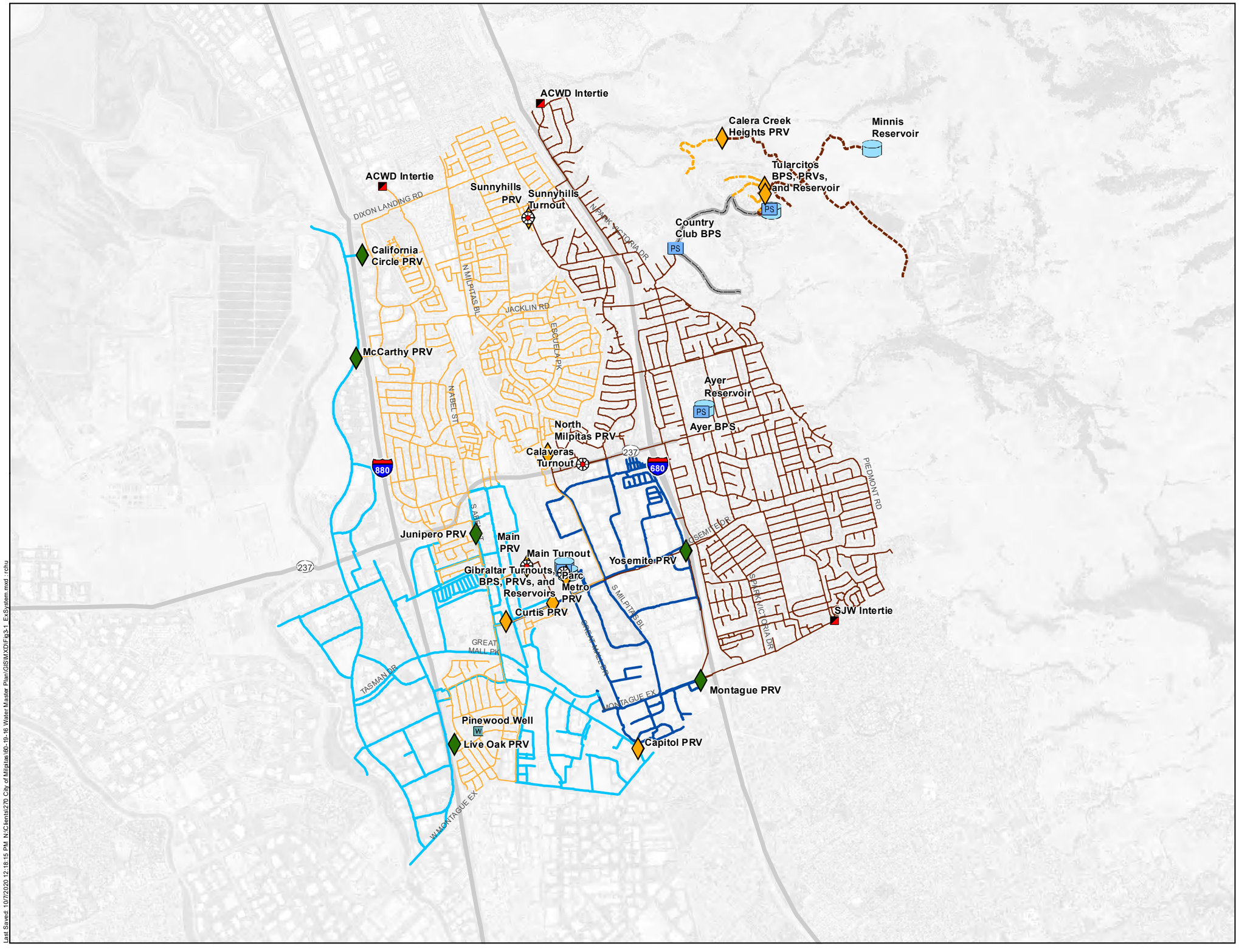


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**Figure 3-1**

**Existing Water Distribution System**

City of Milpitas
2020 Water Master Plan

**Table 3-1. Existing Pressure Zones**

| Pressure Zone | Range of Service Elevations[a], feet msl | Nominal HGL[b], feet msl | Static Service Pressure[c], psi | Water Supply Source(s) |
|---|---|---|---|---|
| SF1 | 10 – 112 | 200 | 38 - 82 | Intertie Turnout via the Gibraltar Pump Station (PS) and Zone SF2 via PRVs (Main, North Milpitas, and Sunnyhills) |
| SF2 | 17 – 212 | 340 | 55 - 140 | SFPUC BDPL No. 3 & 4 Turnouts (Sunnyhills, Calaveras, and Main Street) |
| SF3 | 233 – 456 | 545 | 38 - 135 | Zone SF2 via Country Club PS and Tularcitos Tank |
| SF4-1[d] | 477 – 638 | 740 | 44 - 114 | Tularcitos Tank, PS, and PRVs; Minnis Tank via Zone SF4-2 and Calera Creek Heights PRV |
| SF4-2[d] | 493 – 715 | 885 | 74 - 170 | Minnis Tank (filled by Tularcitos PS) |
| VW1 | 11 – 54 | 200 | 63 - 82 | Zone VW2 via Capitol, Curtis (East and West), and Parc Metro PRVs |
| VW2 | 22 – 75 | 325 | 108 - 131 | VW Milpitas Pipeline Gibraltar Turnout and Gibraltar PRV |

(a) Source: Valley Water LiDAR contours covering the City water service area.
(b) Source: City of Milpitas Water Distribution System Plan Schematic Profile (HydroScience Engineers) unless otherwise noted.
(c) Calculated by subtracting the highest or lowest customer service elevations within the zone from the HGL, and converting from pressure head in feet, to pressure in psi.
(d) Elevation differences in Zone SF4 require breaking pressure and splitting the zone into Zones SF4-1 and SF4-2. Zone SF4-2 is unregulated, while Zone SF4-1 is regulated by the Tularcitos North, Tularcitos South, and Calera Creek Heights PRVs.

## 3.2 EXISTING SUPPLY FACILITIES

The City's existing supply facilities include the following:

- Five turnouts
- One emergency groundwater well
- Three emergency interties

Normally, the City obtains all of its potable water from SFPUC and VW turnouts. However, in emergencies, it can also pump groundwater and receive water from San Jose Water (SJW) and the Alameda County Water District (ACWD) through emergency interties shown on Figure 3-1.

## 3.2.1 Turnouts

The City receives wholesale potable water through five turnouts, four from SFPUC Bay Division Pipelines Nos. 3 and 4, and one from VW's Milpitas Pipeline[5]. Under normal operations, water from these turnouts comprises the City's entire potable water supply. Total SFPUC turnout capacity is approximately 37 million gallons per day (mgd), while VW turnout capacity is 14.4 mgd. The SFPUC supply enters the City's system at a hydraulic grade line (HGL) of 340 feet, while VW supply enters the City's system at an HGL of 425 feet. The source, location, pressure zone(s) served, and capacity for each turnout is summarized in Table 3-2.

**Table 3-2. Existing Turnouts**

| Name | Location | Meter Type | Meter ID(s) | Pressure Zone(s) Served | Capacity, mgd[(a)] |
|---|---|---|---|---|---|
| SFPUC Service Area | | | | | |
| Sunnyhills | 405 Washington Drive | 2-8" Neptune High Performance Turbo | 4572810858<br>4572810888 | SF1, SF2 | 10.1 |
| Calaveras | 584 East Calaveras Blvd. | 2-8" Neptune High Performance Turbo | 5000000628<br>5000000975 | SF1, SF2 | 13.0 |
| Main | 534 Hammond Way | 1-8" and 1-6" Neptune High Performance Turbo | 9338710434<br>9338710803 | SF1, SF2 | 7.9 |
| Intertie | 641 Gibraltar Court | 1-10" Neptune High Performance Turbo | 3117952820 | SF1[(b)] | 5.8 |
| | | | | **SFPUC Total** | **36.8** |
| VW Service Area | | | | | |
| Gibraltar | 641 Gibraltar Court | 1-20" WaterMaster Electromagnetic | 3K220000195183 | VW2[(c)] | 14.4 |
| | | | | **VW Total** | **14.4** |
| | | | | **City Total** | **51.2** |

(a) Source: 2009 WMPU, Table 4-1.
(b) Turnout can be reconfigured to deliver SFPUC water directly to Zone VW2.
(c) Zone VW2 serves Zone VW1 via four PRVs. Refer to Table 3-1.

## 3.2.2 Emergency Groundwater Wells

The City currently maintains one groundwater well, the Pinewood Well, for use in emergencies. It is connected to Zone SF1 but is not used as an active potable water supply source. The Pinewood Well is permitted as an emergency well, so it cannot be operated more than 15 calendar days per year, and not more than five consecutive days each year. The Pinewood Well can produce approximately 1.7 mgd (per the 2009 WMPU) and is equipped with a chlorination facility and a plug-in adapter and transfer switch to receive power from a portable generator.

[5] Also known as the East Pipeline.

The City anticipates adding two additional wells, Curtis Well and McCandless Well, to its supply portfolio in the future. These future wells are discussed in Chapter 4 of this report.

### 3.2.3 Emergency Interties

The City has three interties with two partner agencies, SJW and ACWD, for a total capacity of approximately 7.1 mgd. These emergency interties are all manually activated with mutual agreement between the City and the partner agency with at least two hours' notice. The 8-inch intertie with SJW is located at Landess Avenue and Corktree Lane and can serve Zones SF2, SF3, and SF4. Per City operations staff, the SJW intertie has no flushing points and needs to be upgraded to allow routine operation and flushing. There are two 8-inch interties with ACWD, with one serving Zone SF1 and the other serving Zone SF2. However, the City and ACWD water systems normally operate under significantly different pressures. Key information for all three emergency interties is summarized in Table 3-3. The SJW intertie has not been used, while the Milmont and Green Valley Road interties were last used in May 2010 and January 2016, respectively.

**Table 3-3. Existing Emergency Interties**

| Partner Agency | Location | Pressure Zone(s) Served | Intertie Type | Intertie Diameter, in | Pressure Difference[(a)], psi | Capacity, mgd[(b)] |
|---|---|---|---|---|---|---|
| SJW[(c)] | Landess Avenue and Corktree Lane | SF2, SF3, SF4 | Hard piped, closed valve | 8 | 20 | 2.60 |
| ACWD[(c)] | Milmont Drive | SF1 | Hard piped, closed valve | 8 | 10 | 2.25 |
| | Park Victoria Drive/ Green Valley Road | SF2 | Hard piped, closed valve | 8 | 20 | 2.25 |
| | | | | | **City Total** | **7.1** |

(a) Modeled City pressure minus partner agency pressure. Typical partner agency pressures provided by City in February and March 2021.
(b) Source: 2009 WMPU, Table 4-3. It is assumed that each ACWD intertie has equal capacity.
(c) Intertie can be opened with mutual agreement and at least two hours' notice.

## 3.3 EXISTING DISTRIBUTION FACILITIES

The City's distribution facilities include:

- Five storage reservoirs
- Five pump stations
- 17 PRVs (including six emergency PRVs)
- 49 isolation valves
- 964,000 linear feet (LF) (approximately 183 miles) of pipelines

Under normal operations, the City separates its water system by source water zone (SFPUC vs. VW), meaning that Zones SF1 through SF4 are isolated from Zones VW1 and VW2. During emergencies, the City can open isolation valves to allow supply mixing. Emergency PRVs are also set to automatically operate and allow SFPUC water to flow to VW zones if pressures in the VW zones drop significantly. This emergency supply is unidirectional; it can only flow from SFPUC zones to VW zones.

The City's Gibraltar facility has storage, pumping, and pressure regulating facilities for both SFPUC and VW supplies. To distinguish between the pumps and storage reservoirs, references in the following sections will append parenthetical notes specifying the facility's service area/source (e.g., SF or VW). The PRVs at the station are uniquely named, so no disambiguation is necessary.

## 3.3.1 Storage Reservoirs

The City has five storage reservoirs, totaling approximately 16 million gallons (MG) of capacity. Four storage reservoirs serve the SFPUC service area, with Tularcitos and Minnis serving customers in the hillside areas (Zones SF3 and SF4) and Gibraltar (SF) and Ayer serving customers in the valley area (Zones SF1 and SF2). The remaining storage reservoir, Gibraltar (VW), serves Zone VW2 directly and Zone VW1 indirectly (via the Capitol, Curtis, and Parc Metro PRVs). The supply source, location, and key operational information for each storage reservoir is listed in Table 3-4.

Additional disinfection and deliberate reservoir operation help ensure stored water quality remains high. At each storage reservoir, chlorine liquid/tablets and liquid ammonia are added to create a chloramine residual.

**Table 3-4. Existing Storage Reservoirs**

| Storage Reservoir | Location | Pressure Zone(s) Served | Year Built | Tank Material | Tank Diameter, ft | Tank Floor Elevation, ft msl | Normal Operating Level Range[(a)], ft | Capacity, MG[(b)] |
|---|---|---|---|---|---|---|---|---|
| SFPUC Service Area | | | | | | | | |
| Gibraltar (SF) | 641 Gibraltar Court | SF1 | 1993 | Concrete | 181 | 22 | 15 - 24.5 | 5.0 |
| Ayer | 1429 East Calaveras Boulevard | SF2 | 1995 | Concrete | 158 | 47 | 31.2 - 36 | 5.6 |
| Tularcitos | 1328 Tularcitos Drive | SF3 | 1982 | Steel | 48 | 544.2 | 15 - 21.5 | 0.30 |
| Minnis | 901B Downing Road | SF4 | 1982 | Steel | 51 | 885.5 | 15 - 21.5 | 0.34 |
| | | | | | | | **SFPUC Total** | **11.2** |
| VW Service Area | | | | | | | | |
| Gibraltar (VW) | 641 Gibraltar Court | VW2 | 1993 | Concrete | 181 | 22 | 15 - 24.5 | 5.0 |
| | | | | | | | **VW Total** | **5.0** |
| | | | | | | | **City Total** | **16.2** |

(a) Source: City SCADA data (Gibraltar reservoirs) and City-provided circle charts (Ayer, Tularcitos, and Minnis).
(b) Source: As-builts provided by City in November 2019.

## 3.3.2 Pump Stations

Of the City's five pump stations, four serve the SFPUC service area, with the remaining pump station serving Zone VW2. Besides drawing from the Gibraltar (VW) reservoir to serve Zone VW2, the Gibraltar (VW) PS also has emergency pumps to increase delivery pressures from the Gibraltar turnout if pressures are not sufficient. While these pumps have been used sparingly, they provide valuable redundancy during peak summer periods or emergencies.

In the SFPUC service area, the Gibraltar (SF) PS delivers stored water from the Gibraltar (SF) reservoir to Zone SF1. Similarly, both the Ayer PS and the Tularcitos PS draw water from their respective storage reservoirs (Ayer and Tularcitos). The Ayer PS serves Zone SF2, while the Tularcitos PS serves Zone SF4. The Country Club PS draws from Zone SF2 to serve Zone SF3 and also fills the Tularcitos reservoir. Pump station service area, pump types and capacity, and backup power features are summarized in Table 3-5.

**Table 3-5. Existing Pump Stations**

| Pump Station | Pressure Zone Served | Number of Pumps and Capacity[a], gpm | Pump Type[b] | Pump Drive Type[c] | Backup Generator? |
|---|---|---|---|---|---|
| Gibraltar (SF) | SF1 | 2 @ 5,500 | SCHC | 1 Electric, 1 Diesel | Yes |
| Ayer | SF2 | 3 @ 1,800 | MVT | Electric | Yes |
| Country Club | SF3 | 2 @ 250 | Submersible MVT | Electric | No |
| Tularcitos | SF4 | 2 @ 250 | Submersible MVT | Electric | No |
| Gibraltar (VW) | VW2 | 2 @ 5,500[d] | SCHC | 1 Electric, 1 Diesel | Yes |
| | VW2[e] | 1 @ 5,000<br>1 @ 4,000<br>1 @ 2,000<br>1 @ 2,000 | MVT<br>MVT<br>MVT<br>SCHC | Diesel<br>Electric<br>Electric<br>Electric | Yes (all) |

(a) Source: City-provided asset spreadsheet (Master List 4.0) and pump curves.
(b) SCHC = split case horizontal centrifugal; MVT = multistage vertical turbine.
(c) All pumps are variable speed except for those at the Country Club and Tularcitos pump stations.
(d) One pump can be valved for either Zone SF1 or VW2.
(e) Emergency backup pumps located at VW turnout, activated when delivery pressures fall below 120 psi.

## 3.3.3 Pressure Reducing Valves

Eleven PRVs ensure that the City's water system pressures remain within acceptable operating range. Since SFPUC and VW supplies have an HGL of 340 feet and 425 feet, respectively, the City must reduce pressures when serving customers at lower elevations. Any inter-zone pipeline connections (e.g., between Zones VW2 and VW1) must also include PRVs or closed valves. Four PRVs serve Zone SF1, and three PRVs serve Zone SF4-1, a small sub-zone within Zone SF4. There are four PRVs in the VW service area, one serving Zone VW2 and three serving Zone VW1. The location, set points, HGL, and associated pressure zones for each PRV are shown in Table 3-6.

The City also has six emergency PRVs set to automatically operate if pressures in the VW service area fall below an HGL of 125 feet in Zone VW1 or 175 feet in Zone VW2. As a result, SFPUC supply can supplement VW supply when needed. Four emergency PRVs serve Zone VW1, and two serve Zone VW2. Emergency PRV locations and key operational information are summarized in Table 3-7.

**Table 3-6. Existing Pressure Reducing Valves**

| PRV | Location | Set Point[a], psi | Hydraulic Grade Line[b], ft | From Zone | To Zone |
|---|---|---|---|---|---|
| Calera Creek Heights | Near 163 Calera Creek Heights Drive | 70 | 787 | SF4-2 | SF4-1 |
| Capitol | North Capitol Avenue b/w Montague Expressway and City Limits | 68 | 201 | VW2 | VW1 |
| Curtis East & West | West Curtis Avenue b/w Main Street and Abel Street | 80 | 202 | VW2 | VW1 |
| Gibraltar 21 & 21A | 641 Gibraltar Court | 136 | 325 | VW[c] | VW2 |
| Gibraltar 24 | 641 Gibraltar Court | 76 | 194[d] | SFPUC[c] | SF1 |
| Main | Hammond Way | 80 | 207 | SF2 | SF1 |
| North Milpitas | North Milpitas/Calaveras | 79 | 207 | SF2 | SF1 |
| Parc Metro | East Curtis Avenue/East Lane | 82 | 218[d] | VW2 | VW1 |
| Sunnyhills | Washington/Escuela | 67 | 199 | SF2 | SF1 |
| Tularcitos North Vault | Near 1475 Pinehurst Court | 67 | 707 | SF4-2 | SF4-1 |
| Tularcitos South Vault | Near 1486 Tularcitos Drive | 68 | 762 | SF4-2 | SF4-1 |

(a) Source: City-provided data in June 2020.
(b) Source: City of Milpitas Water Distribution System Plan Schematic Profile (HydroScience Engineers).
(c) PRV located immediately downstream of turnout.
(d) Estimated from set point (converted to pressure head in feet) and approximate elevation from as-builts.

**Table 3-7. Existing Emergency Pressure Reducing Valves**

| Emergency PRV | Location | Upstream Setting[a], psi | Downstream Setting[a], psi | Hydraulic Grade Line[b], ft | From Zone | To Zone |
|---|---|---|---|---|---|---|
| Junipero | Junipero & South Abel Street | --[c] | --[c] | 169 | SF1 | VW1 |
| Live Oak | Live Oak Court and I-880 | 75 | 70 | 125 | SF1 | VW1 |
| McCarthy | South of Cadillac Court | 82 | 72 | 73 | SF1 | VW1 |
| California Circle | California Circle and I-880 | 82 | 72 | 71 | SF1 | VW1 |
| Montague | Montague Expressway and I-680 | 118 | 110 | 216 | SF2 | VW2 |
| Yosemite | Sinclair Frontage Road and Yosemite Drive | 118 | 110 | 211 | SF2 | VW2 |

(a) Source: City-provided data in February 2021.
(b) Source: City of Milpitas Water Distribution System Plan Schematic Profile (HydroScience Engineers).
(c) PRV is offline.

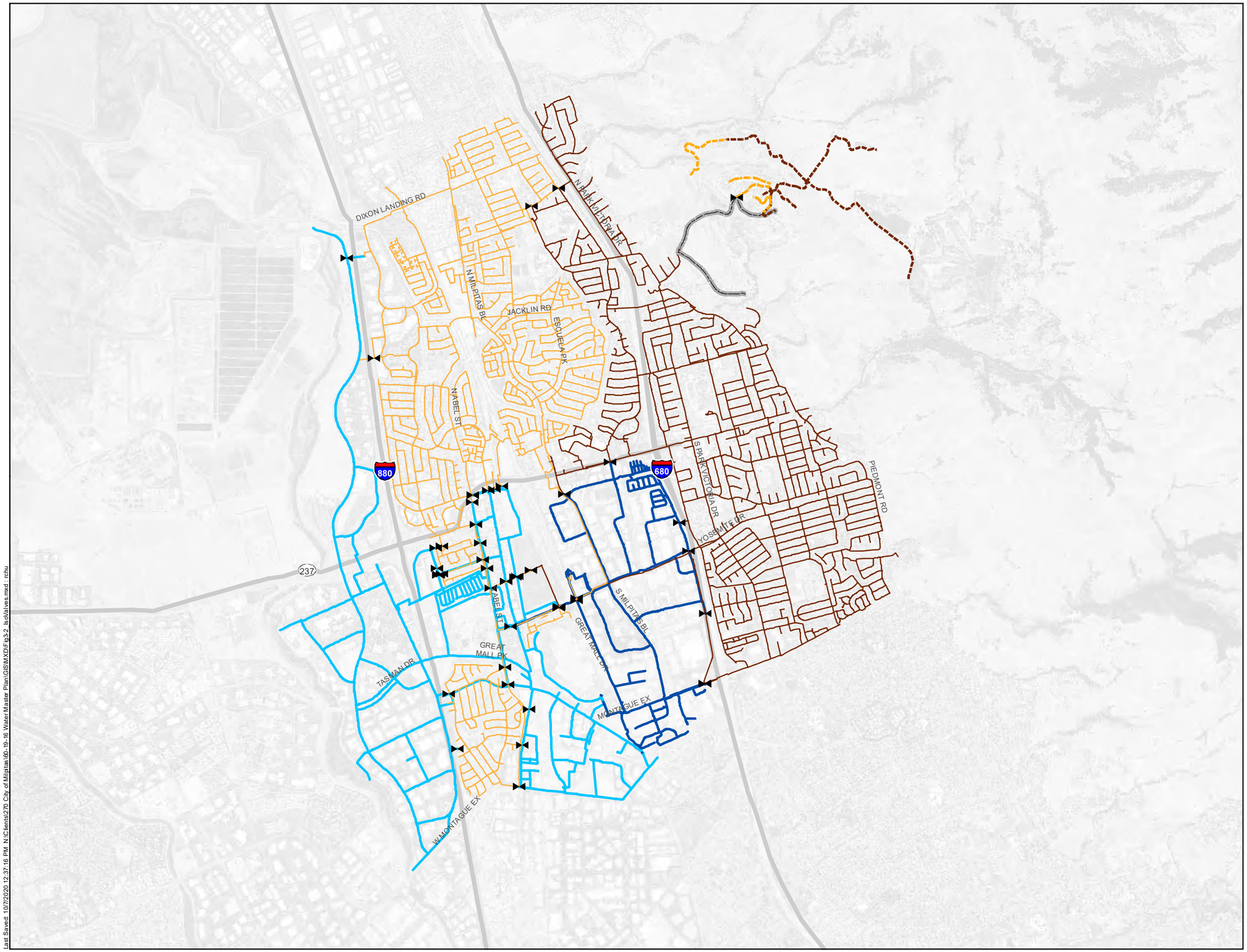
## 3.3.4 Isolation Valves

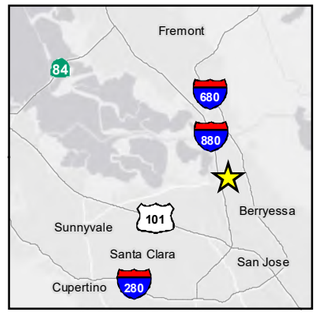
To prevent blending of the two water sources (SFPUC and VW) and better control water quality, the City has installed 49 isolation valves throughout the distribution system. Thirty-one are in Zone 1 (i.e., separating zones SF1 and VW1), and nine are in Zone 2. The remaining nine isolation valves separate pressure zones within the same service area (e.g., Zones SF1 and SF2) but do not have facilities to regulate flow (i.e., PRVs or booster pumps). Therefore, these nine valves should always remain closed.

Isolation valves increase supply reliability, as they can be opened during long-term water shortages from either SFPUC or VW. Existing isolation valves are shown on Figure 3-2 and listed in Table 3-8. Previous modeling performed for the 2009 WMPU demonstrated that the City does not have to open every valve to supply the entire system using one supply source. Per the 2009 WMPU, opening only four "key" valves allowed a single supply source to serve the City service area (refer to Chapters 8 and 9 of this Water Master Plan for updated recommendations). Current City emergency operations procedures are detailed in Appendix B.

## 3.3.5 Pipelines

The existing water distribution system consists of approximately 183 miles of pipeline with diameters ranging from 2 inches to 30 inches. By length, approximately 85 percent of the City's water pipelines are between 6 inches and 12 inches in diameter, and just over 73 percent are asbestos cement (AC). The diameter and material distributions of the City's water system pipelines are summarized in Table 3-9 and Table 3-10, respectively.




N

0 1,500 3,000

Scale in Feet

Isolation Valve

**Pipeline Pressure Zone**

- VW1
- VW2
- SF1
- SF2
- SF3
- SF4-1
- SF4-2

**Figure 3-2**

**Existing Water System Isolation Valves**

City of Milpitas
2020 Water Master Plan

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**Table 3-8. Existing Isolation Valves**

| Valve Number | Valve Size, in | Location | Classification[(a)] |
|---|---|---|---|
| Pressure Zone 1 (between SF1 and VW1) | | | |
| 1 | 14 | End of Live Oak Court | None |
| 2 | 12 | Starlite Dr/Capitol Avenue | None |
| 2A | 10 | 150 feet east of Evening Star Court | None |
| 3 | 8 | S. Main Street/S. Abel Street | None |
| 4 | 12 | S. Abel Street/Capitol Avenue | None |
| 5 | 12 | S. Abel Street/Capitol Avenue | None |
| 5A | 6 | S. Main Street/Cedar Way | None |
| 6 | 8 | S. Main Street/Montague Expwy. | None |
| 7 | 10 | S. Main Street/Montague Expwy. | None |
| 12X | 14 | South end of Rio Verde Place | None |
| 13 | 12 | S. Abbott Avenue near Economy Inn | None |
| 13A | 8 | North end of Rio Verde Place | None |
| 14 | 8 | S. Abel Street/Corning Avenue | None |
| 14A | 6 | Corning Ave/Palmer Avenue | None |
| 15 | 8 | S. Abel Street/Junipero Drive | None |
| 18 | 12 | S. Abel Street/Serra Way | None |
| 18A | 12 | S. Abel Street south of Calaveras Boulevard | None |
| 20 | 8 | S. Main Street/Carlo Street | None |
| 20A | 6 | Carlo Street/Calaveras Boulevard | None |
| 20B | 12 | Carlo Street/Calaveras Boulevard | None |
| 24 | 6 | End of E. Carlo Street | None |
| 25 | 8 | South end of Railroad Avenue | None |
| 26 | 6 | S. Abel Street/Sylvia Avenue | None |
| 27 | 8 | Hammond Way near SFPUC Pipeline | None |
| 28 | 8 | Hammond Way near SFPUC Pipeline | None |
| 30 | 12 | S. Main Street near SFPUC Pipeline | None |
| 31 | 24 | S. Abel Street near SFPUC Pipeline | None |
| 35 | 8 | End of Corning Avenue | None |
| 32045 | 14 | End of Cadillac Court | None |
| 32523 | 14 | N. McCarthy Boulevard | None |
| 35100 | 8 | End of Corning Avenue | None |
| Pressure Zone 2 (between SF2 and VW2) | | | |
| 8 | 8 | Montague Expwy/Southbound 680 offramp | None |
| 8A | 10 | Montague Expwy/Southbound 680 offramp | None |
| 9 | 24 | Sinclair Frontage Road/Yosemite Drive | Key |
| 10 | 12 | Sinclair Frontage Road south of Wrigley Way | None |
| 23C | 16 | S. Milpitas Boulevard north of Los Coches Street | Key |
| 32 | 24 | S. Hillview Drive/Calaveras Boulevard | Key |
| 137 | 16 | 650 feet west of Gibraltar Drive/Yosemite Drive | Key |
| 174 | 12 | 650 feet west of Gibraltar Drive/Yosemite Drive | None |
| 31219 | 12 | Sinclair Frontage Road/Montague Court | None |
| Between Pressure Zones in the Same Service Area | | | |
| 79 | 12 | Near Main PRV (between SF1 and SF2) | Always Closed |
| 99A | 18 | Curtis Avenue near Curtis PRV (between VW1 and VW2) | Always Closed |
| 31660 | 8 | Country Club Drive/Tularcitos Drive (between SF3 and SF4-1) | Always Closed |
| 32818 | 8 | Coelho Street/Diel Drive (between SF1 and SF2) | Always Closed |
| 33788 | 8 | Coelho Street/Roger Street (between SF1 and SF2) | Always Closed |
| 34357 | 8 | E. Curtis Avenue near Parc Metro PRV (between SF1 and SF2) | Always Closed |
| 34358 | 8 | E. Curtis Avenue near Parc Metro PRV (between SF1 and SF2) | Always Closed |
| 34359 | 8 | E. Curtis Avenue near Parc Metro PRV (between SF1 and SF2) | Always Closed |
| 35727 | 12 | S. Main Street near Tom Evatt Park (between SF1 and SF2) | Always Closed |

(a) Isolation valves are normally closed to separate SFPUC and VW supplies. Per the 2009 WMPU, opening only the four key valves allows a single source (SFPUC or VW) to supply the entire system. Valves located between pressure zones shall remain closed at all times.

**Table 3-9. Summary of Existing Pipelines by Diameter[a]**

| Pipe Diameter, inches | Total Pipeline Length, feet | Total Pipeline Length, miles | Percent of Water System |
|---|---|---|---|
| 2 | 107 | 0.0 | 0.0% |
| 4 | 11,542 | 2.2 | 1.2% |
| 6 | 243,314 | 46.1 | 25.2% |
| 8 | 246,992 | 46.8 | 25.6% |
| 10 | 81,940 | 15.5 | 8.5% |
| 12 | 242,814 | 46.0 | 25.2% |
| 14 | 59,695 | 11.3 | 6.2% |
| 16 | 32,961 | 6.2 | 3.4% |
| 18 | 38,419 | 7.3 | 4.0% |
| 20 | 320 | 0.1 | 0.0% |
| 24 | 5,696 | 1.1 | 0.6% |
| 30 | 216 | 0.0 | 0.0% |
| **Total** | **964,015** | **183** | **100%** |

(a) Source: City GIS pipeline shapefile and as-builts provided February and March 2020.

**Table 3-10. Summary of Existing Pipelines by Material[a]**

| Pipe Material | Abbreviation | Total Pipeline Length, feet | Total Pipeline Length, miles | Percent of Water System |
|---|---|---|---|---|
| Asbestos Cement | AC / ACP | 704,997 | 133.5 | 73.1% |
| Concrete Cylinder | CCP | 887 | 0.2 | 0.1% |
| Cast Iron | CIP | 5,002 | 0.9 | 0.5% |
| Ductile Iron | DIP | 80,772 | 15.3 | 8.4% |
| Polyvinyl Chloride | PVC | 144,474 | 27.4 | 15.0% |
| Steel | STL | 27,883 | 5.3 | 2.9% |
| | **Total** | **964,015** | **183** | **100%** |

(a) Source: City GIS pipeline shapefile and as-builts provided February and March 2020.

# CHAPTER 4
# Water Supply Sources

This chapter summarizes the City's existing and future water supply sources. A reliable water supply is critical for ensuring the City can meet water demands through buildout and during emergency outages. The evaluation of water supply availability and reliability begins with understanding the City's supply sources and agreements, as well as the water quality associated with those supply sources. The City's historical and projected future use of its available water supplies is further described in Chapter 5 of this report.

## 4.1 EXISTING WATER SUPPLIES

The City's existing water supplies include imported water, groundwater, recycled water, and interties with neighboring agencies.

Under normal conditions, imported water comprises the City's entire water supply. The City purchases treated surface water from two agencies: the SFPUC and VW, which was previously known as the Santa Clara Valley Water District. In 2019, water supplies from SFPUC totaled 6,146 acre-feet (af) and represented about 59 percent of the City's total water supplies, while water supplies from VW totaled 3,182 af and represented about 31 percent of the City's total water supplies.

Recycled water is produced at the San José-Santa Clara Regional Wastewater Facility and delivered to the City by South Bay Water Recycling (SBWR). In 2019, the City used approximately 1,049 af of recycled water, mainly for landscape irrigation. This represented about 10 percent of the City's total 2019 water use.

In emergencies, the City can activate interties with SJW and the ACWD and/or pump groundwater. The City overlies the Santa Clara Valley Groundwater Sub-basin and currently has one groundwater well (Pinewood Well).

Each of the City's existing water supplies is described further below.

### 4.1.1 San Francisco Public Utilities Commission (SFPUC)

The SFPUC is a department of the City and County of San Francisco, which owns and operates the Hetch Hetchy Regional Water System (RWS). The RWS spans from Hetch Hetchy Valley in Yosemite National Park to the City of San Francisco and consists of over 280 miles of pipeline, eleven reservoirs, five pump stations, and two water treatment plants.

The Hetch Hetchy watershed, an area located in Yosemite National Park, is the major source of water for all of San Francisco's retail and wholesale water needs. Spring snowmelt runs down the Tuolumne River and fills Hetch Hetchy Reservoir, the largest reservoir in the Hetch Hetchy water system. This surface water in the Hetch Hetchy Reservoir is treated, but not filtered because it is of such high quality.

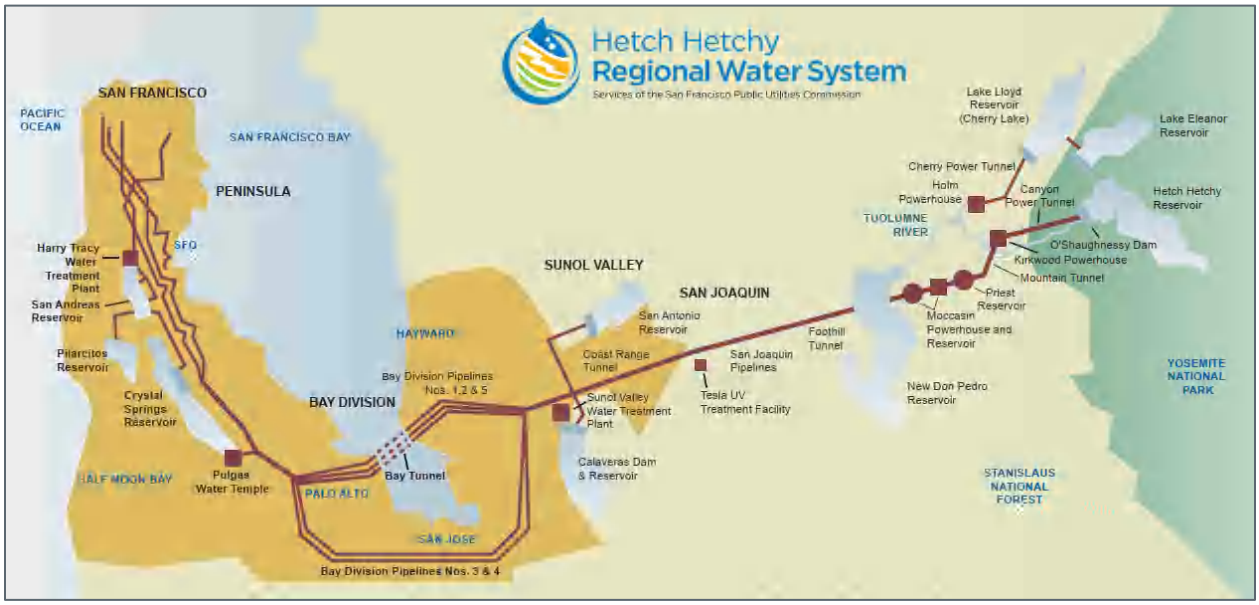
The Alameda and Peninsula watersheds produce the rest of the total water supply. The Alameda watersheds (the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds) located in Alameda and Santa Clara Counties, contribute surface water supplies captured and stored in two reservoirs: Calaveras and San Antonio. The Sunol Filter Galleries located near the Town of Sunol, are a groundwater source supplying less than one percent of San Francisco's water. The Peninsula watersheds (the San Mateo Creek and Pilarcitos Creek watersheds) in San Mateo County contribute surface water supplies captured and stored in lower and upper Crystal Springs and San Andreas Reservoirs and in two smaller reservoirs, Pilarcitos and Stone Dam. The six reservoirs in the Alameda and Peninsula watersheds

capture rain and local runoff. Some also store Hetch Hetchy water for use by San Francisco. These local water sources and groundwater from the Sunol filter galleries are treated and filtered before delivery.

Although most of the SFPUC water deliveries originate from the Tuolumne River, typically comprising approximately 85 percent of SFPUC water deliveries, the SFPUC prioritizes local surface water supplies. However, in dry years, when local surface water supply is often decreased, Tuolumne River diversions can exceed 90 percent of SFPUC supplies.

The RWS serves the City of San Francisco as well as 25 wholesale customers located throughout Alameda, Santa Clara, and San Mateo Counties, including the City of Milpitas. Overall, the RWS serves approximately 2.7 million residential, commercial, and industrial customers throughout the San Francisco Bay Area.

A schematic of the RWS is provided on Figure 4-1.




*Source: SFPUC website*

**Figure 4-1. SFPUC Regional Water System**

### *4.1.1.1 City Supplies from SFPUC*

The Bay Area Water Supply and Conservation Agency (BAWSCA) represents the interests of the 25 wholesale customers (who together manage 27 water systems), including the City of Milpitas. In 2009, the SFPUC and BAWSCA members entered into a Water Supply Agreement, a 25-year contract outlining the relationship between the two entities. A key component of the Water Supply Agreement is that it continued the "Supply Assurance," a maximum supply of 184 mgd to be allocated among BAWSCA members, established by the Water Supply Agreement's predecessor (the 1984 Settlement Agreement and Master Water Sales Contract). Though the Supply Assurance can be reduced due to drought, maintenance, or emergencies, the Water Supply Agreement established the 184 mgd delivery ceiling in perpetuity.

The Supply Assurance is allocated between 22 wholesale customers in the form of Individual Supply Guarantees (ISGs)[6]. ISGs are specified in the Water Supply Agreement and subject to change following the Water Supply Agreement's expiration in 2034. The City's ISG is 9.23 mgd, which is delivered through Bay Division Pipelines Nos. 3 and 4.

#### *4.1.1.2 SFPUC Water Quality*

The RWS delivers high quality water that meets all Federal and State requirements. Most of the water originates in the Tuolumne River, which is fed by spring snowmelt in a well-protected watershed in Yosemite National Park. Diverted water is stored in the Hetch Hetchy Reservoir and transported to the Bay Area in pipes and tunnels. According to the SFPUC's 2019 Water Quality Report, Hetch Hetchy water meets Federal and State drinking water quality standards by providing the following treatment: pH adjustment (to control corrosion), disinfection (including ultraviolet light and chlorination), fluoridation (for dental health protection), and chloramination (for maintaining disinfectant residual and minimizing disinfection byproducts). Filtration is not required due to the high water quality.

Local surface water supplies, which typically comprise about 15 percent of SFPUC supplies, require more typical treatment, including coagulation, flocculation, sedimentation, filtration, and disinfection. Most wholesale customers, including the City, receive a blend of Hetch Hetchy and local surface water supplies. The SFPUC does not anticipate any future degradation of water quality.

### 4.1.2 Valley Water (VW)

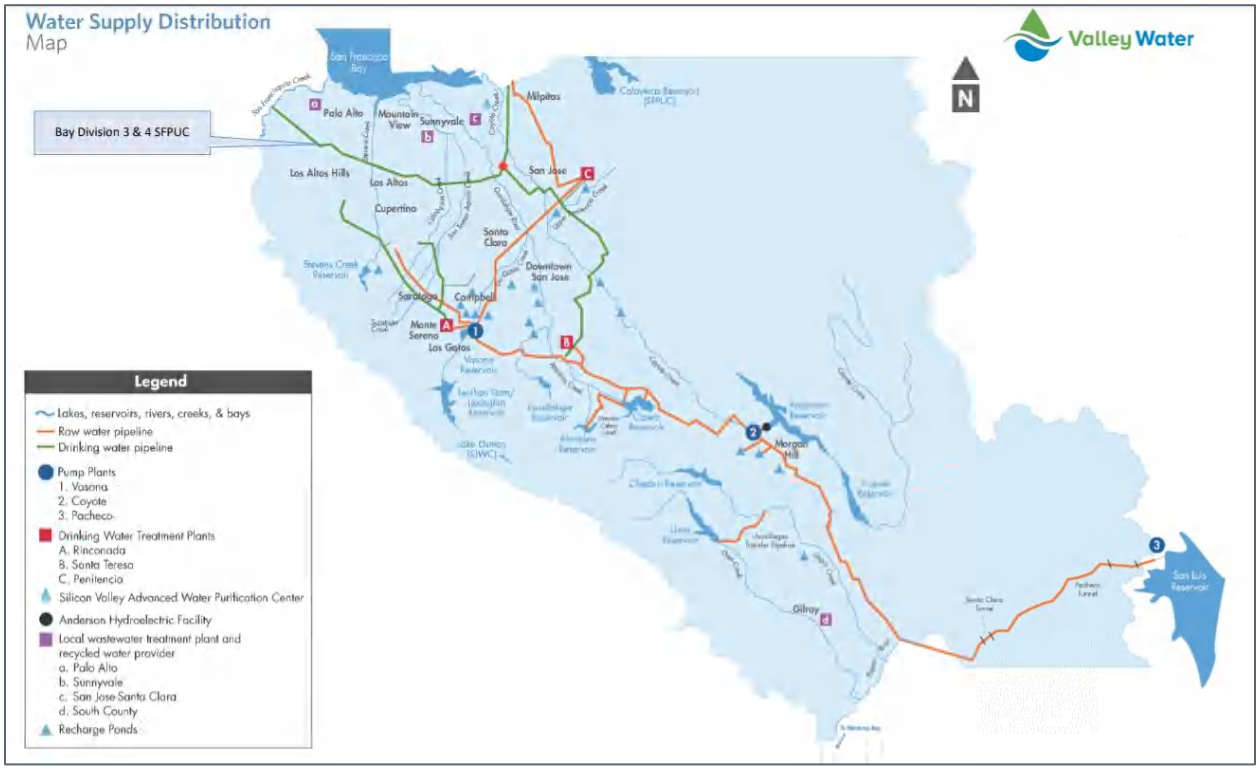
Valley Water, previously known as the Santa Clara Valley Water District, is an independent special district that provides wholesale water supply, groundwater management, flood protection and stream stewardship. Its service area includes all of Santa Clara County, which is located at the southern end of San Francisco Bay. Valley Water was formed as the Santa Clara Valley Water Conservation District in 1929 in response to groundwater overdraft and significant land subsidence. In 1954, it annexed the Central Santa Clara Valley Water District. In 1968, it merged with the countywide flood control district to form one agency to manage the water supply and flood programs for most of the county. The Gavilan Water District in southern Santa Clara County was annexed in 1987 and now Valley Water provides services for the entire county. Valley Water is governed by an elected seven-member Board of Directors following the District Act and its own Board Governance Policies.

Valley Water has been a leader in conjunctive use in California for decades, utilizing imported and local surface water to supplement groundwater and to maintain reliability in dry years. Conjunctive use helps protect local subbasins from overdraft, land subsidence, and saltwater intrusion and provides critical groundwater storage reserves for use during droughts or outages. After it was formed to address declining groundwater levels and land subsidence, Valley Water constructed reservoirs to capture more local water. However, local supplies were insufficient to meet the county's growing population. Valley Water began importing water from the State Water Project in 1965 and from the Central Valley Project's San Felipe Division in 1987. These investments, along with water recycling and conservation, have resulted in sustainable groundwater subbasins and reliable water supplies for the county.

[6] Three wholesale customers do not have ISGs: the cities of San Jose, Santa Clara, and Hayward. The cities of San Jose and Santa Clara are supplied on a temporary and interruptible basis and thus do not have an allocated share of the Supply Assurance. The City of Hayward has an unspecified allocation, equal to the difference between 184 mgd and the sum of the ISGs.

About half of the county's water supply currently comes from local sources and about half comes from imported water sources. Local sources include natural groundwater recharge and surface water supplies, including surface water rights held by Valley Water, San Jose Water, and Stanford University. Imported water includes Valley Water's State Water Project and Central Valley Project contract supplies (100,000 acre-feet per year [af/yr] from the SWP and 152,500 af/yr from the Central Valley Project [CVP]), as well as supplies delivered by the SFPUC to cities in northern Santa Clara County.

A schematic of the VW water supply system is provided on Figure 4-2.




*Source: Valley Water, Water Supply Master Plan 2040, November 2019.*

**Figure 4-2. Valley Water Water Supply System**

### *4.1.2.1 City Supplies from VW*

VW delivers treated surface water to the City via the Milpitas Pipeline. Per the City's contract with VW, potable water deliveries consist of SWP and CVP water only, with amounts based on an annual request the City submits every three years. In each of the three years after submitting the request, the City is obligated to purchase at least 95 percent of the maximum amount listed on the schedule. Every month, VW guarantees the City can receive at least 15 percent of the annual delivery schedule.

#### *4.1.2.2 VW Water Quality*

The SWP and CVP convey water through the Sacramento-San Joaquin Delta (Delta). Delta supplies are threatened by sea level rise and climate change, with elevated nutrient concentrations (causing algal blooms and reducing dissolved oxygen) and disinfection byproducts presenting a more immediate challenge. The Central Valley Regional Water Quality Control Board is also focused on controlling pesticide and herbicide discharges into the Delta.

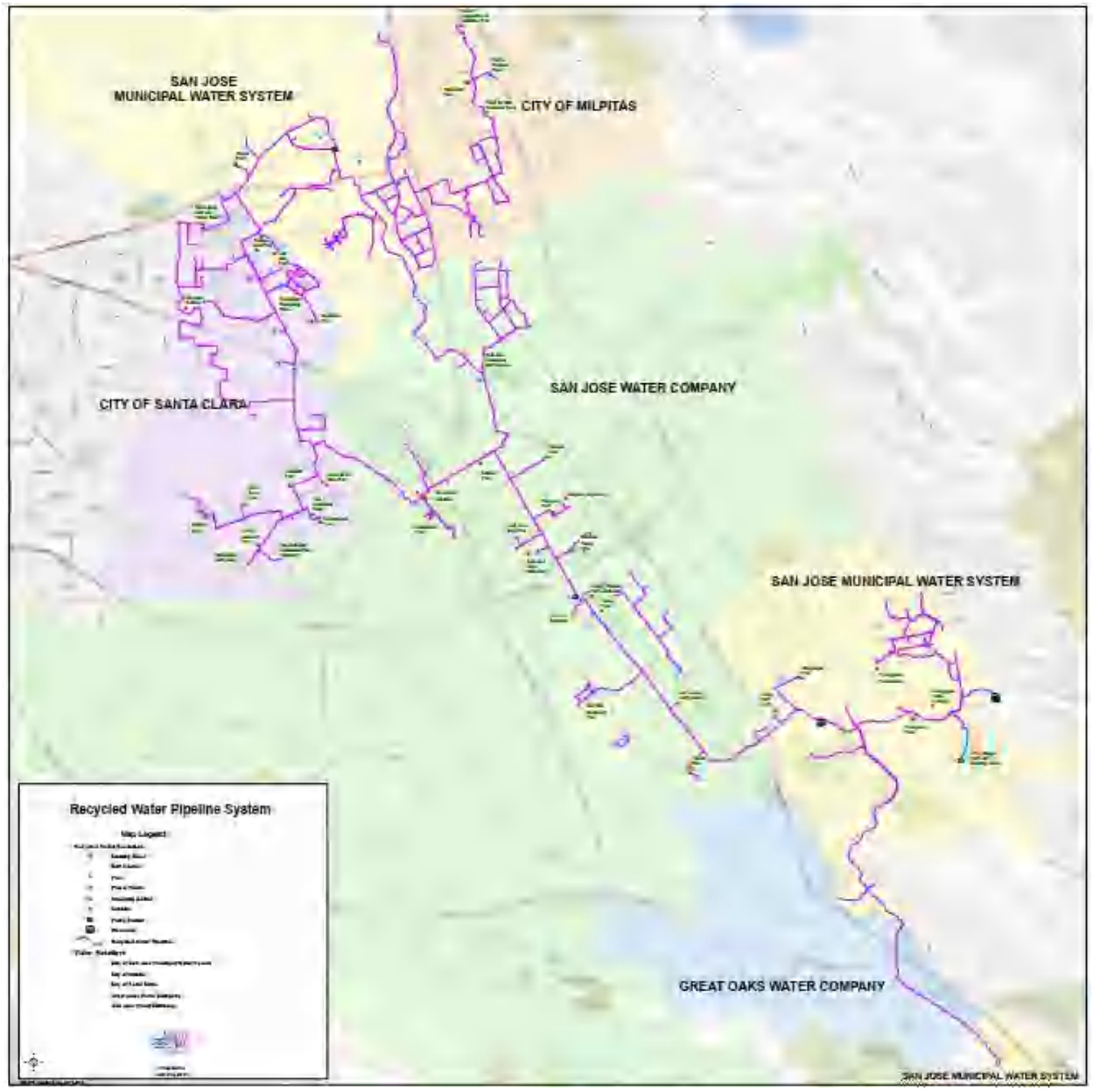
Surface water is treated at either the Penitencia or Santa Teresa Water Treatment Plants (WTPs) before delivery to the City. It should be noted that VW also operates a third WTP, the Rinconada WTP, but it primarily serves the west side of Santa Clara County, which does not include the City. The Penitencia and Santa Teresa WTPs began operations in 1974 and 1989, respectively. In 2006, disinfection facilities at each WTP were upgraded to use ozone instead of chlorine. Not only is ozone a strong disinfectant, but it can also improve taste and odor while also reducing the formation of disinfection byproducts. At both WTPs, raw water is treated via coagulation/flocculation (to remove silt and particles), ozone disinfection, and granular activated carbon filtration (to remove dissolved chemicals). Filtered water is then treated with chloramine to maintain a disinfection residual through the distribution system.

## 4.1.3 Recycled Water

South Bay Water Recycling (SBWR), a division within the City of San Jose's Environmental Services Department, is the regional permit holder for recycled water in San José, Santa Clara and Milpitas, ensuring compliance with State regulations for recycled water quality and use. SBWR is a recycled water wholesaler to four retailers: San Jose Water, San José Municipal Water, City of Santa Clara, and City of Milpitas. Customers buy recycled water from the retailer in their location.

Tertiary treated recycled water is produced at the San José-Santa Clara Regional Wastewater Facility, one of the largest such treatment facilities in California. SBWR's recycled water system consists of over 150 miles of pipeline, five pump stations, and 10 million gallons of storage in reservoirs. SBWR delivers more than four billion gallons of recycled water per year to more than 900 commercial customers, an average of 11 mgd.

A schematic of the SBWR system is provided on Figure 4-3.




*Source: SBWR website*

**Figure 4-3. South Bay Water Recycling System**

The use of recycled water is a priority for the City, which has adopted an ordinance that prohibits using potable water for irrigation if recycled water is available. While SBWR owns the distribution system, the City is responsible for operation and maintenance of any facilities within City boundaries.

In 2019, the City used approximately 1,049 af of recycled water, mainly for landscape irrigation. This represented about 10 percent of the City's total 2019 water use. According to the City's 2015 Urban Water Management Plan (UWMP), continued growth in landscape irrigation and industrial use, along with expansion to golf course irrigation, should increase recycled water use to approximately 2,690 af by 2040. In addition, the City is seeking to improve recycled water reliability via interties with SJW, also a SBWR retailer.

### 4.1.4 Emergency Groundwater Wells

The City overlies the Santa Clara Groundwater Subbasin, which is managed by VW. In its 2019 Basin Prioritization project, DWR identified the Santa Clara Groundwater Subbasin as a high priority basin for sustainable management. Overdraft and land subsidence have been challenges in the past, and VW actively manages surface recharge to alleviate subsidence.

Groundwater is not part of the City's normal water supply portfolio. Should SFPUC and/or VW supplies be interrupted, the City can activate the Pinewood Well, which draws water from an aquitard-protected area in the southwestern part of the City. While the Pinewood Well is currently permitted for emergency use only, the City may consider permitting it as an active, fully operational well in the future. The State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) defines emergency or standby water sources as not operating more than 15 calendar days nor more than five consecutive days in a year.

Per the 2009 WMPU, the Pinewood Well has a capacity of 1.7 mgd. Pump production testing would be required to confirm this capacity, but that is outside the scope of this master plan. Therefore, this master plan assumes the Pinewood Well capacity remains at 1.7 mgd. Pumped water meets primary drinking water standards; however, there are taste and odor concerns. In 2016, Water Solutions, Inc. conducted a Groundwater Well Evaluation that examined the Pinewood Well and potential sites for a new well. This Groundwater Well Evaluation recommended using ozone and surface water blending to control taste and odor. As discussed previously in Section 3.2.2, the Pinewood Well is equipped with a plug-in adapter and transfer switch to receive power from a portable generator. The City anticipates completing treatment and operational improvements at the Pinewood Well soon.

The City also has two other planned wells, the Curtis Well and the McCandless Well, which are described in Section 4.2 below.

### 4.1.5 Emergency Interties

The City has one intertie with SJW and two interties with ACWD. With a 2-hour notice and mutual consent, the City can receive water from either source. The ACWD intertie is a two-way intertie, allowing the City to either receive or provide water supplies, while the City can only receive water from SJW.

## 4.2 FUTURE WATER SUPPLIES

Based on the City's 2015 UWMP, the City expects to meet future water demands with the existing imported surface water supplies described above. As a result, there are no plans to develop new supply sources.

However, the City hopes to increase future supply reliability by expanding its groundwater capabilities. Two new wells, the Curtis Well and the McCandless Well, are expected to come online during the City's buildout horizon (i.e., by 2040). The Curtis Well was drilled in 2003, but the well was not equipped with above-grade infrastructure required for a functioning well, and the facility was never completed. As a result, bringing the Curtis Well online requires significant effort, including installing a submersible pump, piping, and treatment components, as well as conducting testing and permitting. Design for the Curtis Well improvements began in 2020. Construction of the McCandless Well began in 2020 and is anticipated to be completed by 2022.

# CHAPTER 5
# Water Demand

This chapter reviews the City's existing potable water demands and develops future water demand projections based on refined Water Use Factors (WUFs) described in this chapter and planned future development (described in Chapter 2). Having accurate and thorough water demands allows for:

- Developing and calibrating the potable water system hydraulic model
- Identifying existing and potential future water system deficiencies and recommending improvements

## 5.1 HISTORICAL WATER PRODUCTION AND CONSUMPTION

As described in Chapter 4, the City imports surface water from SFPUC and VW. During normal operation, water production consists exclusively of water imports. Water consumption is defined as metered water use and is based on actual billing data provided by the City. The difference between water production and water consumption is non-revenue water (NRW).

The following subsections detail the City's historical production and consumption to help determine appropriate NRW, per capita water use, and peaking factors. This information, along with future land use plans, will serve as the foundation for future water demand projections.

### 5.1.1 Water Production

Table 5-1 summarizes annual water production from 2009 through 2019 and breaks down deliveries by source (SFPUC and VW). Total production decreased between 2014 and 2017 due to the drought and associated water conservation efforts. Production increased in 2018 and held steady in 2019 but remains below pre-drought levels. In recent years SFPUC imports have comprised approximately 60 to 66 percent of the City's total production, though recent production volume has dropped due to increased use of recycled water. VW imports have comprised about 34 to 40 percent of the City's total production in recent years.

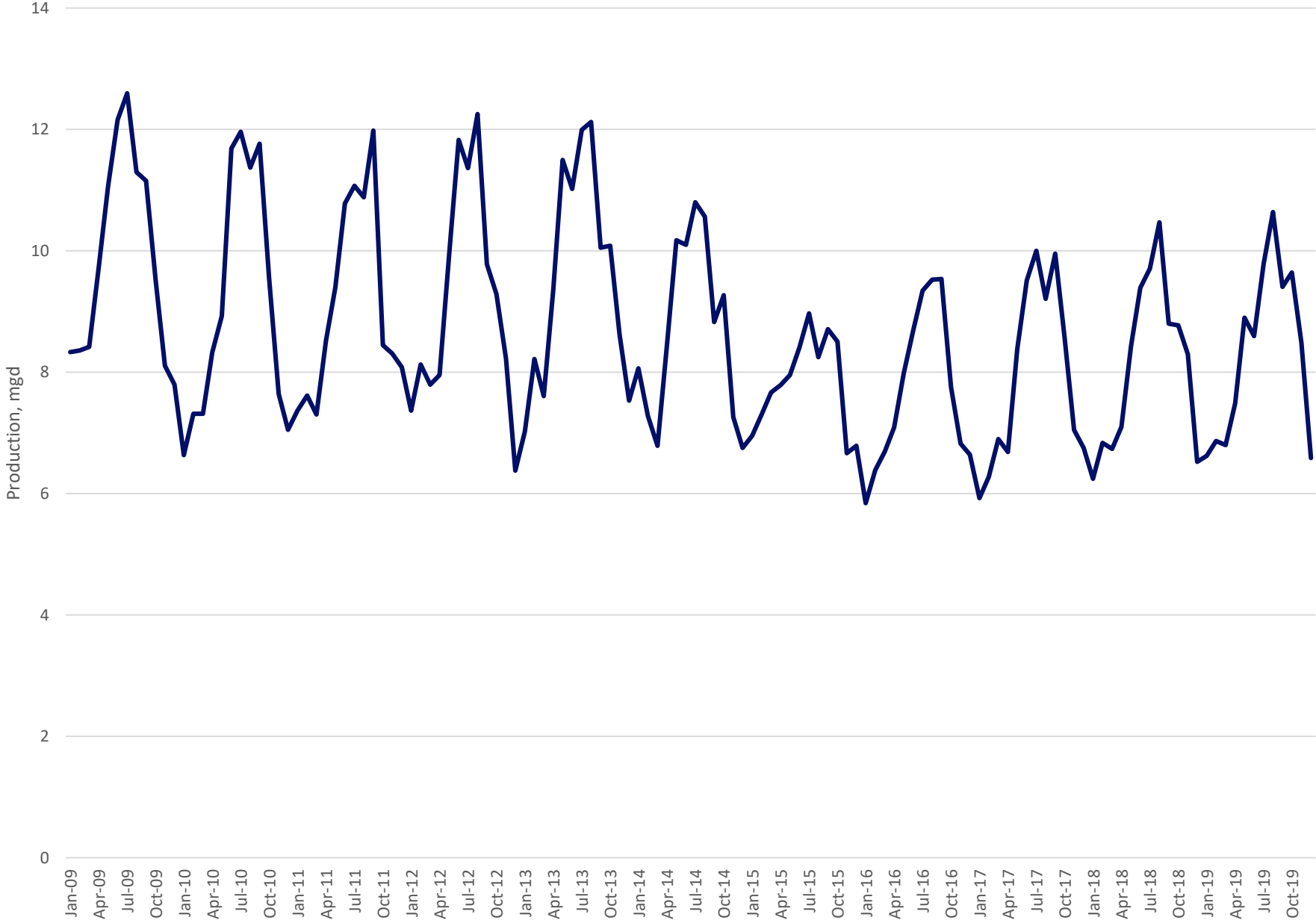
Figure 5-1 shows the City's monthly water production from January 2009 through December 2019. As expected, the City's highest water production has occurred in the summer months (June through September), when temperatures are high and rainfall is minimal. Over this 10-year period, the lowest water production has most frequently occurred in December and March.

**Table 5-1. Historical Water Production[(a)]**

| Calendar Year | SFPUC | | VW | | Total Production, af | Average Day Production, mgd |
|---|---|---|---|---|---|---|
| | Volume, af | Percent of Total Production | Volume, af | Percent of Total Production | | |
| 2009 | 7,563 | 68 | 3,509 | 32 | 11,072 | 9.9 |
| 2010 | 6,748 | 66 | 3,483 | 34 | 10,231 | 9.1 |
| 2011 | 6,855 | 67 | 3,395 | 33 | 10,250 | 9.2 |
| 2012 | 6,984 | 68 | 3,342 | 32 | 10,326 | 9.2 |
| 2013 | 7,506 | 70 | 3,251 | 30 | 10,758 | 9.6 |
| 2014 | 6,418 | 66 | 3,330 | 34 | 9,748 | 8.7 |
| 2015 | 5,288 | 60 | 3,487 | 40 | 8,774 | 7.8 |
| 2016 | 5,270 | 61 | 3,372 | 39 | 8,642 | 7.7 |
| 2017 | 5,707 | 64 | 3,191 | 36 | 8,898 | 7.9 |
| 2018 | 5,776 | 64 | 3,315 | 36 | 9,091 | 8.1 |
| 2019 | 6,146 | 66 | 3,182 | 34 | 9,328 | 8.3 |
| **Average** | **6,387** | **66** | **3,351** | **34** | **9,738** | **8.7** |

(a) Historical production data provided by City in January 2020.

**Figure 5-1. Monthly Water Production**



## 5.1.2 Water Consumption

Table 5-2 summarizes historical water consumption (2013 through 2019) by customer type and was developed from City-provided billing data[7]. Over this 7-year period, residential customers averaged about 55 percent of the total City consumption. Commercial users averaged about 40 percent of total consumption, with Public (City and County) users making up the remainder (just over 4 percent). The overall consumption trend follows the City's production and is consistent across residential and commercial customers.

**Table 5-2. Historical Metered Water Consumption[(a)]**

| Customer Type | CY 2013, mgd | CY 2014, mgd | CY 2015, mgd | CY 2016, mgd | CY 2017, mgd | CY 2018, mgd | CY 2019, mgd |
|---|---|---|---|---|---|---|---|
| Residential | | | | | | | |
| Water | 4.39 | 4.08 | 3.82 | 3.74 | 3.97 | 4.31 | 3.92 |
| Fire | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| Irrigation | 0.36 | 0.32 | 0.21 | 0.24 | 0.29 | 0.31 | 0.34 |
| Subtotal Residential | 4.75 | 4.40 | 4.03 | 3.98 | 4.31 | 4.62 | 4.26 |
| Commercial | | | | | | | |
| Water | 2.95 | 2.68 | 2.73 | 2.57 | 2.65 | 2.71 | 2.43 |
| Fire | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Irrigation | 0.64 | 0.53 | 0.38 | 0.37 | 0.44 | 0.47 | 0.51 |
| Subtotal Commercial | 3.59 | 3.21 | 3.11 | 2.94 | 3.10 | 3.19 | 2.94 |
| Public | | | | | | | |
| Water - City | 0.04 | 0.03 | 0.02 | 0.03 | 0.03 | 0.03 | 0.04 |
| Water - County | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Irrigation - City | 0.38 | 0.23 | 0.58 | 0.17 | 0.28 | 0.23 | 0.18 |
| Subtotal Public | 0.42 | 0.26 | 0.61 | 0.20 | 0.32 | 0.27 | 0.22 |
| **Total** | **8.76** | **7.87** | **7.75** | **7.12** | **7.72** | **8.09** | **7.43** |

(a) Based on billing data provided by City in January 2020.

[7] Billing data was bi-monthly. Usage was grouped into calendar years based on the ending date of the billing period. As a result, annual consumption may not match other sources depending on how year-end water use is accounted for.

#### *5.1.2.1 Large Water Users*

Refer to Chapter 2 (Table 2-3) for the list of the Large Water Users in CY 2019 (those using more than 30,000 gpd).

## 5.1.3 Non-Revenue Water

NRW is the difference between the volume of water produced and the volume of water consumed or metered. Though there are many reasons why production may exceed consumption, the most common include system losses including, but not limited to, leakage, measurement errors, and unauthorized use. While water utilities try to minimize NRW, it is difficult to eliminate entirely.

Table 5-3 summarizes the City's historical NRW between 2013 and 2019. NRW is calculated from production and consumption data (Table 5-1 and Table 5-2, respectively) except where available from validated American Water Works Association (AWWA) water audits. NRW falls generally between 9 and 11 percent, though it peaked at 15.4 percent in 2016. The average NRW from 2013 to 2019 is approximately 10.9 percent.

West Yost recommends using a NRW of 11 percent to calculate the City's total future water production requirement.

**Table 5-3. Historical Non-Revenue Water[a]**

| Calendar Year | Total Production, mgd | Total Consumption, mgd | Water Loss, mgd | Non-Revenue Water, % |
|---|---|---|---|---|
| 2013 | 9.60 | 8.76 | 0.84 | 8.8 |
| 2014 | 8.70 | 7.87 | 0.84 | 9.6 |
| 2015 | 7.83 | 7.75 | 0.08 | 10.5[b] |
| 2016 | 7.69 | 7.12 | 0.57 | 15.4[b] |
| 2017 | 7.94 | 7.72 | 0.22 | 9.6[b] |
| 2018 | 8.12 | 8.09 | 0.03 | 11.2[b] |
| 2019 | 8.33 | 7.43 | 0.90 | 10.8 |
| **Average** | **8.32** | **7.82** | **0.50** | **10.9** |

(a) Refer to Table 5-1 and Table 5-2. Non-revenue water (NRW) equals Water Loss divided by Total Production, unless otherwise noted.
(b) NRW equals "Non-revenue water as percent by volume of Water Supplied" from City's water audits, received August 2020.

## 5.1.4 Per Capita Water Use

The City's historical per capita water use is presented in Table 5-4. While population continued to grow through the drought, per capita water use fell dramatically in 2015 and remained low in 2016 due to water conservation and mandatory water reduction measures implemented during the drought. Per capita water use rebounded slightly in 2017 and is holding steady but remains well below 2013 levels.

| Table 5-4. Historical Per Capita Water Use[a] | | | |
|---|---|---|---|
| Calendar Year | Population[b] | Total Production, mgd | Per Capita Water Use, gpcd |
| 2013 | 68,622 | 9.60 | 140 |
| 2014 | 70,701 | 8.70 | 123 |
| 2015 | 73,632 | 7.83 | 106 |
| 2016 | 74,766 | 7.69 | 103 |
| 2017 | 74,922 | 7.94 | 106 |
| 2018 | 75,083 | 8.12 | 108 |
| 2019 | 77,961 | 8.33 | 107 |
| | | **Average** | **113** |
| | | **Average (excluding 2015 and 2016)[c]** | **117** |

(a) Refer to Table 5-1.
(b) Population for 2013 through 2018 is from CA Department of Finance, E-4 Population Estimates (May 1, 2020). Population for 2019 is based on January 1, 2020 population from CA Department of Finance, E-1 Population Estimates (May 1, 2020).
(c) Data from 2015 and 2016 were excluded due to mandatory water restrictions implemented by the State Water Resources Control Board during these two years.
gpcd = gallons per capita per day

As described in Section 5.2.1 below, the City's per capita water use in 2015 was well below (in compliance with) the City's 2015 per capita water use goal (164 gpcd) as required by the Water Conservation Act of 2009 and is on track to be in compliance with the City's 2020 per capita water use goal (146 gpcd).

## 5.1.5 Peaking Factors

Peak demands are used to evaluate and size water system pipelines and storage facilities and define water supply and capacity requirements. Projecting peak demands typically involves applying a multiplier, or peaking factor, to average day demand (ADD), which is calculated by dividing a year's total water production by the number of days in that year (refer to Table 5-1).

Recent water use data help refine peaking factors for key demand conditions. To account for NRW, production totals are used. This subsection describes the methodologies utilized to update the City's maximum day demand (MDD) and peak hour demand (PHD) peaking factors and presents their revised values.

### *5.1.5.1 Maximum Day Demand Peaking Factor*

The MDD peaking factor is calculated by dividing the calendar year's largest single day demand by the ADD of the same year. Under normal conditions, the City's water demands are served by supplies from either turnouts or pumped storage. As a result, determining daily demands requires data for both turnout flows and storage reservoir levels. Detailed historical reservoir information was unavailable, so West Yost reviewed daily flows from SFPUC and VW turnouts as a proxy for daily demands. Turnout flows are a valid substitute for demands if, as is assumed in this master plan, storage reservoir inflows are similar to pumped outflows over a 24-hour period.

Due to the different customer types in each service area, separate MDD peaking factors have been developed for the SFPUC and VW systems. The 2002 WMP (and the 2009 WMPU, which used the same peaking factors as in 2002) also acknowledged the impact of customer type on water use, going so far as to develop separate peaking factors for residential (1.9) and industrial/commercial (1.5) users. Data limitations preclude calculating land use-based peaking factors for this master plan. However, the portion of the City served by the SFPUC system has more residential customers, while the portion of the City served by the VW system has more industrial/commercial customers.

Based on daily turnout flows from 2016 through 2019, the recommended MDD peaking factor for the SFPUC system is 1.6. Table 5-5 summarizes the historical MDD peaking factors by calendar year, including the date and magnitude of maximum daily production. In 2019, the maximum day production was significantly higher than in previous years. On this date (June 20, 2019), VW turnout flows were less than 2,000 gallons, so it is assumed SFPUC turnouts were supplying the entire City (i.e., both SFPUC and VW service areas). Thus, the 2019 MDD peaking factor is excluded when determining the recommended MDD peaking factor for this master plan.

The City has observed especially high daily water use in Zones SF3 and SF4, so the MDD peaking factor will be doubled for those customers. As a result, the MDD peaking factor will be 1.6 for customers in Zones SF1 and SF2 and 3.2 for customers in Zones SF3 and SF4.

The recommended MDD peaking factor for the VW system is 1.9. This is based on daily turnout flows from 2017 through 2019, as 2016 data had some extreme outliers and thus was deemed less reliable. Maximum daily production was relatively consistent from 2017 to 2018 before jumping up significantly in 2019.

**Table 5-5. SFPUC Historical Maximum Day Demand Peaking Factors**

| Calendar Year | Maximum Day Demand Date[a] | Average Day Production[b], mgd | Maximum Day Production[c], mgd | Maximum Day Demand Peaking Factor |
|---|---|---|---|---|
| 2016 | August 12 | 4.71 | 7.10 | 1.51 |
| 2017 | October 15 | 5.10 | 8.25 | 1.62 |
| 2018 | November 15 | 5.16 | 8.09 | 1.57 |
| 2019 | June 20 | 5.48 | 9.59 | 1.75 |
| | **Average** | **5.11** | **8.26** | **1.61** |
| | **Average (excluding 2019)[d,e]** | **4.99** | **7.81** | **1.56** |

(a) SFPUC turnout flows used as a proxy for customer demands in Zones SF1 through SF4.
(b) Refer to Table 5-1.
(c) SFPUC daily production data provided by City in January 2020.
(d) Data from 2019 excluded due to minimal VW flows on date of maximum SFPUC production (June 20, 2019).
(e) Due to high peak water use in Zones SF3 and SF4, the maximum day demand peaking factor will be doubled for those pressure zones.

**Table 5-6. VW Historical Maximum Day Demand Peaking Factors**

| Calendar Year | Maximum Day Demand Date[a] | Average Day Production[b], mgd | Maximum Day Production[c], mgd | Maximum Day Demand Peaking Factor |
|---|---|---|---|---|
| 2016[d] | -- | 3.00 | -- | -- |
| 2017 | June 30 | 2.84 | 4.90 | 1.73 |
| 2018 | April 25 | 2.96 | 5.26 | 1.78 |
| 2019 | October 10 | 2.84 | 6.64 | 2.34 |
| | **Average** | **2.91** | **5.60** | **1.95** |

(a) VW turnout flows used as a proxy for customer demands in Zones VW1 and VW2.
(b) Refer to Table 5-1.
(c) VW daily production data provided by City in May 2020.
(d) 2016 data incomplete.

### *5.1.5.2 Peak Hour Demand Peaking Factor*

The PHD peaking factor is calculated by dividing the calendar year's largest single hour demand by the ADD of the same year. In the absence of hourly customer water use data for an entire year, the PHD peaking factor is typically estimated by applying diurnal curves during a maximum day demand. A diurnal curve reflects variations in water use over a 24-hour period and often has two demand peaks, one in the morning before residents leave home and another in the evening when they return home.

The City does not have the monitoring and reporting infrastructure in place to provide hourly water use data that would be required to develop a diurnal curve, so the recommended PHD peaking factor is based on West Yost's recent experience and typical PHD peaking factors determined for similar water systems. West Yost recommends a PHD peaking factor of 1.8 times MDD, which is slightly lower than the 2.0 peaking factor utilized in the 2009 WMPU. The recommended PHD peaking factor translates to 2.9 times ADD (1.6 x 1.8) for Zones SF1 and SF2, 5.8 times ADD (3.2 x 1.8) for Zones SF3 and SF4, and 3.4 times ADD (1.9 x 1.8) for the VW service area.

### *5.1.5.3 Summary of Recommended Peaking Factors*

Table 5-7 summarizes the recommended peaking factors for each service area. As shown, the peaking factors represent multipliers applied to average day demands.

**Table 5-7. Recommended Peaking Factors**

| Service Area | Pressure Zones | Maximum Day Demand Peaking Factor[a] | Peak Hour Demand Peaking Factor[a,b] |
|---|---|---|---|
| SFPUC | SF1, SF2 | 1.6 | 2.9 |
| SFPUC | SF3, SF4[c] | 3.2 | 5.8 |
| VW | VW1, VW2 | 1.9 | 3.4 |

(a) Peaking factors shown are applied to average day demand.
(b) The Peak Hour Demand (PHD) peaking factor is calculated by multiplying the Maximum Day Demand (MDD) peaking factor by 1.8 as described in Section 5.1.5.2.
(c) Due to high peak water use in Zones SF3 and SF4, peaking factors are doubled for those pressure zones.

## 5.2 WATER CONSERVATION

Water conservation is a key component of water demands. Discussions regarding existing and potential future water conservation in the City are presented below. Additional detail regarding the City's conservation efforts are documented in the City's 2020 Urban Water Management Plan, which is currently being prepared.

### 5.2.1 Water Conservation Act of 2009

In February 2008, the Governor called for a statewide 20 percent reduction in urban per capita water use by 2020 and asked state and local agencies to develop a more aggressive water conservation plan to achieve that goal. A team of state and federal agencies (the 20x2020 Agency Team) was formed to develop a statewide implementation plan.

Subsequently, the Water Conservation Act of 2009 (Senate Bill [SB] X7-7) was enacted in November 2009 as part of a comprehensive set of new Delta and water policy legislation requiring all water suppliers to increase their efficiency. Overall, the objective of SB X7-7 was to reduce statewide urban water use by 20 percent by the year 2020. SB X7-7 required water retailers to establish and adopt per capita water use targets (an interim target for 2015 and a final target for 2020) using defined methodologies. Adopted per capita water use targets were required to be included in the 2010 UWMPs and could be updated as part of the 2015 UWMPs. The City's adopted per capita water use targets are as follows:

- 2015 Interim Per Capita Water Use Target: 164 gpcd
- 2020 Final Per Capita Water Use Target: 146 gpcd

Compliance with the 2015 per capita water use target was required to be reported in the City's 2015 UWMP. In 2015, the City's actual per capita water use was 106 gpcd (refer to Table 5-4), well below (and in compliance with) the City's interim target for 2015. This was due in large part to the on-going drought conditions and associated mandatory water use restrictions in place in 2015. Based on recent water use trends, the City is expected to be in compliance with its 2020 (final) SB X7-7 per capita water use target.

### 5.2.2 "Making Water Conservation a California Way of Life"

In May 2016, Governor Brown signed Executive Order B-37-16, instructing state agencies to help Californians adopt permanent changes to use water more wisely. The Executive Order laid out a framework for moving the state from temporary, emergency water conservation measures to a more lasting approach customized to the unique conditions of each local water agency.

In May 2018, the California State Legislature (Legislature) enacted two policy bills (SB 606 and Assembly Bill (AB) 1668) targeting long-term improvements in water conservation and drought planning that could withstand longer and more intense droughts resulting from climate change. These two bills expanded authorities and requirements to enable permanent changes and improve the state's water future. SB 606 and AB 1668 are direct outcomes of Governor Brown's Executive Order B-37-16.

The recommendations in the April 2017 report entitled "Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16" and subsequent extensive legislative outreach efforts informed the development of SB 606 and AB 1668. The new laws focus on establishing water use objectives and long-term water efficiency standards that apply to urban retail water suppliers, including:

- **Indoor Residential Water Use:** Although not all standards have been developed, the indoor residential water use efficiency standard has been set by the Legislature. Until January 1, 2025, the standard is set at 55 gpcd, then it drops to the greater of 52.5 gpcd or a standard developed by the Department of Water Resources (DWR) between January 2, 2025 and January 1, 2030; and then the greater of 50 gpcd or a standard developed by DWR after January 1, 2030.
- **Outdoor Residential Water Use and Commercial, Industrial and Institutional (CII) Irrigation with Dedicated Meters**: Per SB 606 and AB 1668, the State Water Resources Control Board (SWRCB) is required to adopt long-term standards for outdoor irrigation of landscape areas by June 30, 2022. The standards to be set shall incorporate the principles of the Model Water Efficient Landscape Ordinance (MWELO), which considers evapotranspiration adjustment factors, landscape areas, maximum applied water allowance, reference evapotranspiration, and special landscape area.
- **Water Loss (due to leaks in water system pipes):** SB 555, passed in October 2015, requires the SWRCB to develop water loss performance standards for urban retail water suppliers. The SWRCB is required to evaluate the life-cycle cost of achieving these standards. The standards will incorporate local and operational conditions to determine economically achievable water loss reduction for each urban retail water supplier.

The recently passed water efficiency legislation only provides a "provisional standard" for indoor residential water use and does not currently provide specific information on what the water efficiency standards will be for outdoor residential water use and non-residential water uses. These standards will be developed in the coming years and should be further evaluated in subsequent planning studies. Also, there are no guarantees that urban retail water suppliers will meet the water efficiency standards to be set, so West Yost recommends that the City continue to consider more conservative water demand projections based on historical water use for their future water supply and system planning.

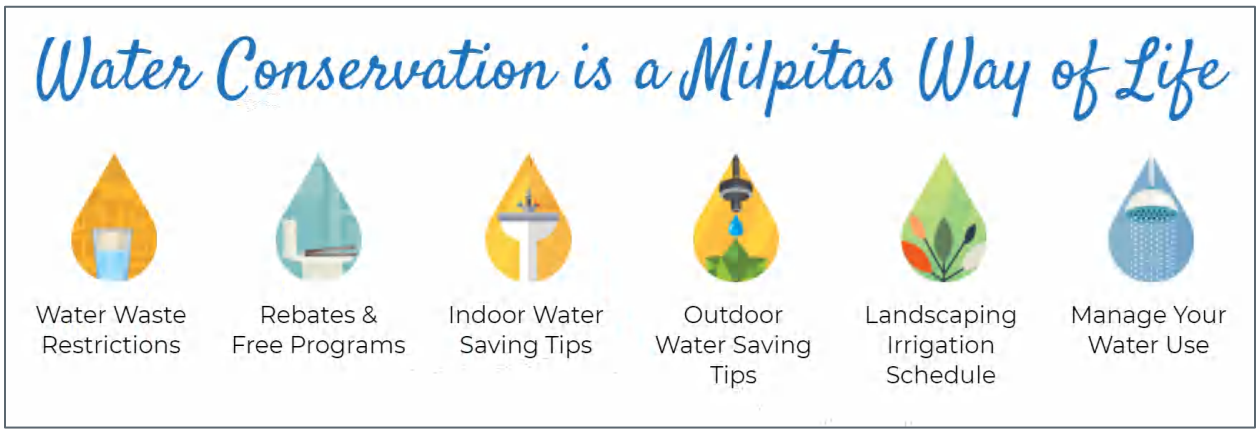
## 5.2.3 Current Water Conservation Programs

The City's 2015 UWMP describes the water conservation measures that have been implemented by the City. A Water Waste Ordinance (Ordinance 240.4) was in effect during the recent drought, along with a Water Conservation Program to facilitate reporting of water waste. The City also implemented the following measures:

- Conservation pricing
- Public education and outreach in conjunction with Valley Water and the BAWSCA
- Residential water surveys
- Free low-flow plumbing fixtures
- Irrigation submeter rebates
- Landscape water surveys and conversion rebates
- High-efficiency clothes washer rebates

- Rebates for process, technology, and equipment retrofits that save water
- High-efficiency toilet and urinal valve replacement rebates

These water conservation measures continue to be implemented in the City.




*From savewatermilpitas.org*

Current information on the City's water use restrictions and water conservation and rebate programs is posted on the City's water conservation webpage (savewatermilpitas.org). In addition, the City's water customers have access to MyWater Milpitas which is an on-line tool that allows customers to track and manage their water consumption.

*From MyWater Milpitas*

# 5.3 FUTURE WATER DEMAND PROJECTION

Future City water demands were projected based on land use data, the preferred method for water system master planning and hydraulic modeling. Population-based methods are appropriate for estimating overall water demands, but they fail to account for spatial variations in water use. In contrast, land-use based demand projections geographically allocate water use based on existing consumption and future development.

This section details the demand projection methodology and presents the associated results.

## 5.3.1 Demand Projection Methodology

Buildout water demands equal the sum of existing demands and projected future demands as a result of new development. Demand projections are typically calculated based on land use, with expected land area multiplied by a WUF. WUFs are developed from recent historical consumption data and vary by land use type. In other words, WUFs recognize that a 10-acre industrial processing plant would use more water than a similarly sized office park.

Establishing appropriate WUFs is a critical step in forming reliable water demand projections. The adopted factors will be used to calculate future demands for growth areas in the City, as defined by the City's General Plan and other on-going planning efforts. Future demands will then be adjusted for NRW to determine the required future water production.

## 5.3.2 Water Use Factors

A WUF is defined as the estimated water use per unit area of a given land use type. The following data was used to update WUFs:

- 2019 consumption data with service addresses (per billing records)
- Service address-Assessor's Parcel Number (APN) database
- General Plan land use parcel map with APNs (GIS file)

Water consumption was linked with spatially located land use based on customer service address and APN. Using a City-provided spreadsheet of customer service addresses and APNs, the 2019 water meter billing records were first linked to APNs using customer service addresses. Water usage could then be linked to land use via APN. Successfully assigning land use to a water billing record required a match for both service address and APN. Approximately 64 percent of 2019 demand could be linked.

West Yost developed preliminary WUFs for each existing General Plan land use designation by dividing the total linked water use by the total corresponding acreage. Due to the lower demand linkage rate, preliminary WUFs were refined by examining specific developments and estimated per capita water use based on estimated dwelling units per acre and people per dwelling unit. The City provided West Yost with a list of representative developments of various land uses (e.g., office park, apartment complex, commercial) to verify whether a development's actual consumption was in line with its WUF-based demand estimate. In addition, West Yost used General Plan density standards to compare per capita water use across residential and mixed use land use types and to the 2009 WMPU. Any WUFs that resulted in unusually high or low per capita consumption were adjusted accordingly. Most of the preliminary WUFs calculated from actual usage were only adjusted slightly to their recommended values. A handful of

preliminary WUFs (e.g., Urban Residential) were unusually low, likely due to limited linked water use for that land use, and increased to their recommended values.

Recommended WUFs are summarized in Table 5-8, along with a comparison to 2009 WMPU values (where available). WUFs are generally lower than in the 2009 WMPU, which is consistent with conservation efforts and efficiency improvements implemented over the last decade. For some land uses, limited data prevented updating WUFs, so the 2009 WMPU values were used. This is a conservative approach, as actual WUFs have likely decreased.

## 5.3.3 Water Demand Projection

West Yost developed water demand projections by applying the recommended WUFs to the future land use acreages detailed in Chapter 2. Total buildout demand is the sum of existing demands and new demands from future planned growth in Opportunity Areas and the Gateway and Milpitas Metro Specific Plan areas. Based on available data and to be conservative, growth was assumed to be new development, not redevelopment of existing developed areas, so future demands were added to existing demands. The land use-based demand projections are based on preliminary land use estimates that are subject to change as the City refines its planning documents.

Table 5-9 summarizes the buildout water demand projection. After adjusting for NRW, the City's projected water production required at buildout is approximately 13.9 mgd, or 15,600 af/yr. This is an increase of approximately 5.6 mgd, or 67 percent, over existing (2019) production (8.3 mgd).

The buildout water demand projection accounts for existing recycled water use but not additional recycled water use in either existing or future development areas. As discussed in Section 5.3.2, WUFs were based on actual potable water consumption, which reflects any existing recycled water use that would offset potable water use. However, the buildout water demand projection does not include any expanded recycled water use for irrigation or other non-potable uses. Increased recycled water use would mean that actual buildout water demands should be lower than the current projection. Since information on future development remains conceptual, the location and magnitude of future recycled water use are difficult to estimate. As a result, West Yost recommends proceeding with this conservative demand projection.

On a per capita basis, the projected future water use equates to 119 gpcd, slightly higher than the City's 2019 per capita water use (107 gpcd). Using U.S. Census data from 2014 to 2018, the City's household population density averages approximately 3.33 people per dwelling unit (DU). Assuming future housing densities will be similar to existing densities, adding 11,650 new DUs translates to approximately 38,794 new residents, for a total buildout population of approximately 116,755. Dividing the projected buildout demand (13.9 mgd) by the projected future population yields an overall per capita water use of approximately 119 gpcd, similar to the City's recent per capita water use average for the last several years (117 gpcd, see Table 5-4).

In the absence of specific timing for future development, required water production for intermediate planning years was linearly interpolated. Table 5-10 summarizes the land use-based water production projections in five-year increments through buildout (2040).

**Table 5-8. Recommended Water Use Factors**

| Category | Existing General Plan Land Use[a] | Abbreviation[a] | Recommended WUF, gpd/ac | 2009 WMPU WUF, gpd/ac | Percent Difference from 2009 WMPU |
|---|---|---|---|---|---|
| Residential | Hillside Very Low Density | HVL | 300 | 800 | -63 |
| | Hillside Low Density | HLD | 300 | 800 | -63 |
| | Hillside Medium Density | HMD | 600 | 800 | -25 |
| | Single Family Low Density | SFL/LDR | 1,300 | 2,240 | -42 |
| | Single Family Medium Density | SMD | 2,400 | NA[b] | -- |
| | Multi-Family Medium Density | MFM/MDR | 2,300 | NA[b] | -- |
| | Multi-Family High Density | MFH/HDR | 4,500 | 5,310 | -15 |
| | Multi-Family Very High Density | VHD/VHDR | 9,000 | 9,720 | -7 |
| | Urban Residential | URR | 4,500 | NA[b] | -- |
| | Mobile Home Park | MHP | 825 | NA[b] | -- |
| Mixed Use | Mixed Use | MXD | 10,890 | 10,890 | 0[c] |
| | Residential Retail High Density Mixed Use | RRMU | 10,890 | NA[b] | -- |
| | Boulevard Very High Density Mixed Use | BVMU/ VHDMU | 10,890 | NA[b] | -- |
| | Neighborhood Commercial Mixed Use | NCMU | 2,100 | NA[b] | -- |
| Commercial | Professional & Administrative Office | PAO | 3,200 | 3,200 | 0[c] |
| | Retail Subcenter | RSC | 2,800 | 4,290 | -35 |
| | General Commercial | GNC | 1,400 | 2,400 | -42 |
| | Highway Service | HWS | 2,000 | NA[b] | -- |
| | Town Center | TWC | 2,100 | NA[b] | -- |
| | Neighborhood Commercial | NC | 1,400 | NA[b] | -- |
| Industrial | Manufacturing | MFG | 2,000 | 2,000 | 0[c] |
| | Industrial Park | INP | 400 | 1,250 | -68 |
| | Business Park/Research & Development | BPRD | 400 | NA[b] | -- |
| Public | Public Facilities | PF | 600 | 1,000 | -40 |
| | Permanent Open Space | POS | 1,300 | 1,300 | 0[c] |
| | Waterway | WW | 1,300 | NA[b] | -- |

(a) Categories and abbreviations based on land use information provided by the City in January 2020. Multiple abbreviations reflect existing and future iterations of the same land use category. The future abbreviation is listed second.
(b) NA = not applicable. WUF for this land use was not specified in the 2009 WMPU.
(c) WUF was not updated due to limited data.

**Table 5-9. Buildout Potable Water Demand Projection**

| Development | Land Use Designation[a] | Total Acres[a] | WUF[b], gpd/ac | Demand, mgd |
|---|---|---|---|---|
| Opportunity Areas - Residential | | | | |
| Sunny Hills Neighborhood Node/Commercial Center | NCMU | 19.92 | 2,100 | 0.04 |
| California Circle | NCMU | 54.10 | 2,100 | 0.11 |
| California Circle | HDR | 18.26 | 4,500 | 0.08 |
| Landess Neighborhood Node/Commercial Center | NCMU | 38.03 | 2,100 | 0.08 |
| Calaveras & North Park Neighborhood Node/Commercial Center | NCMU | 28.28 | 2,100 | 0.06 |
| Milpitas Town Center | HDR | 38.07 | 4,500 | 0.17 |
| | | | Subtotal | 0.55 |
| Opportunity Areas - Non-Residential | | | | |
| McCarthy Ranch Industrial Area | INP | 192.29 | 400 | 0.08 |
| Southwestern Employment Area | BPRD | 488.26 | 400 | 0.20 |
| Central Manufacturing Area - North | MFG | 492.14 | 2,000 | 0.98 |
| Jacklin & 680 Neighborhood Node/Commercial Center - East | NC | 7.95 | 1,400 | 0.01 |
| Jacklin & 680 Neighborhood Node/Commercial Center - West | NC | 6.42 | 1,400 | 0.01 |
| Jacklin Neighborhood Node/Commercial Center | NC | 9.79 | 1,400 | 0.01 |
| | | | Subtotal | 1.29 |
| Milpitas Gateway-Main Street Specific Plan | | | | |
| HDR Subset of Gateway-Main Street | HDR | 46.70 | 4,500 | 0.21 |
| VHDR Subset of Gateway-Main Street | VHDR | 74.58 | 9,000 | 0.67 |
| MDR Subset of Gateway-Main Street | MDR | 62.70 | 2,300 | 0.14 |
| Non-Residential Subset of Gateway-Main Street | MFG | 300.30 | 2,000 | 0.60 |
| | | | Subtotal | 1.63 |
| Milpitas Metro Specific Plan (MMSP) | | | | |
| VHDR Subset of Metro Plan Area | VHDR | 99.00 | 9,000 | 0.89 |
| HDR Subset of Metro Plan Area | HDR | 113.52 | 4,500 | 0.51 |
| NC Subset of Metro Plan Area | NC | 85.35 | 1,400 | 0.12 |
| | | | Subtotal | 1.52 |
| | | | Total New Demand | 4.99 |
| | | | NRW (11%) | 0.62 |
| | | | New Water Production Required | 5.60 |
| | | | Existing (2019) Water Production | 8.33 |
| | | | **Buildout Water Production Required** | **13.9** |

(a) Refer to Table 2-4.

(b) Refer to Table 5-8.

**Table 5-10. Land Use-Based Water Demand Projection for Intermediate Planning Years**

| Year | Required Water Production | |
|---|---|---|
| | mgd | af/yr |
| 2020 | 8.33 | 9,334 |
| 2025 | 9.73 | 10,904 |
| 2030 | 11.1 | 12,474 |
| 2035 | 12.5 | 14,044 |
| 2040[a] | 13.9 | 15,614 |

(a) Refer to Table 5-9.

## 5.3.4 Comparison with Other Demand Projections

### *5.3.4.1 2009 WMPU and 2015 UWMP*

Table 5-11 compares current projections with the 2009 WMPU and the 2015 UWMP. At buildout (2040), the land use-based water demand projection presented above is approximately 3.5 mgd lower than projections from the 2009 WMPU. This represents a decrease of approximately 20 percent. The 2009 WMPU did not specify a growth timeline or buildout year, so intermediate planning year demands are blank in the table. Further, it was assumed the 2009 WMPU "future" coincides with the year 2040.

Demand projections in the 2015 UWMP follow the same timeline as this master plan. Throughout the planning horizon, the demand projections from this master plan are significantly lower than demand projections from the 2015 UWMP. At buildout (2040), demand projections are 4.6 mgd (about 25 percent) lower than the 2015 UWMP. Based on the available information, it is not clear why the demand projections in the 2015 UWMP were so high.

**Table 5-11. Land Use-Based Water Demand Projection Comparison with Previous City Reports**

| Source | Projected Demand, mgd | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 |
| 2020 Water Master Plan[a] | 8.33 | 9.73 | 11.1 | 12.5 | 13.9 |
| 2009 WMPU[b] | --[c] | --[c] | --[c] | --[c] | 17.4 |
| Difference vs. 2009 WMPU | NA[d] | NA[d] | NA[d] | NA[d] | -3.5 |
| 2015 UWMP[e] | 10.0 | 12.1 | 14.3 | 16.4 | 18.5 |
| Difference vs. 2015 UWMP | -1.7 | -2.4 | -3.2 | -3.9 | -4.6 |

(a) Refer to Table 5-10.
(b) Source: 2009 WMPU, Table 3-6 (Scenario 3). It is assumed future demand in the 2009 WMPU equals demand in year 2040.
(c) 2009 WMPU did not specify a timeline for demands.
(d) NA = not applicable.
(e) Source: 2015 UWMP, Table 4-2.

### 5.3.4.2 BAWSCA Regional Water Demand and Conservation Projections Demand Forecast for 2020 UWMP

Maddaus Water Management, Inc. (Maddaus) prepared a Regional Water Demand and Conservation Projections Project for the BAWSCA to support each member agency's preparation of their 2020 UWMPs. In February 2020, Maddaus prepared a technical memorandum (Technical Memorandum #2) to present the following: (1) the demand projection analysis methodology; (2) the demand analysis results including each BAWSCA member agency demand projections through 2045; and (3) the projections verification process to be completed and signed by each member agency to accept the demand projections.

The demand projection update for each BAWSCA member agency uses a combination of two different analytic models – the Econometric Model and the Least Cost Planning Decision Support System (DSS Model). The purpose of using two tools is to leverage the strengths of each tool to obtain a suite of demand recovery scenarios through the year 2045.

- The Econometric Model estimates the impact of various conditions on service area water demand. The model uses historical patterns to project the future rebound in demand associated with post-drought recovery, while taking into account other factors such as economy, rate increases, conservation activity, and weather. Since the Econometric Model is calibrated using historical data, its reliability depends on the historical relationship between water demand and its influencing factors remaining unchanged from the calibration period to the forecasting period.
- The DSS Model can accommodate historical and projected information reflecting how future service area and water use characteristics may differ from the past in each of the BAWSCA member service areas. Further into the future, changes in demographics, living patterns, housing stock, and industrial structure can alter the historical relationship with water demand. To accommodate all of these considerations, a number of scenarios were generated to model the post-drought demand recovery, including one scenario per member agency generated by each agency's respective Econometric Model. The DSS Model also has a conservation component that quantifies savings from plumbing codes and active conservation programs.

The Econometric Model for each BAWSCA member agency was used to generate water demand forecasts to the year 2023. The Econometric Model assumes temporary behavioral changes encouraged during the drought return to pre-drought norms. However, the water savings emanating from historical water rate increases and active conservation programs (e.g., non-behavior-based programs such as rebates) achieved through 2018 are assumed to be permanent and therefore do not rebound. The model assumes that the predicted demand recovery will occur gradually over an additional five years (2019-2023), based on BAWSCA's historical experience of the 1987-1992 drought.

The DSS Model was used to generate long-term demand forecasts for each BAWSCA member agency for 2019 to 2045. The DSS Model also includes a conservation component that quantifies savings from passive conservation (e.g., plumbing codes) and active conservation programs. The DSS Model's conservation component covers the entire forecast period of 2019-2045.

The City provided historical water use data and confirmed population and employment projections to be used by Maddaus for the demand projections. The resulting demand projections for the City, which include both potable and non-potable (i.e., recycled water) uses, are presented in Table 5-12.

**Table 5-12. City of Milpitas Demand Projections as Calculated by Maddaus[a]**

| Demand Forecast Scenario[b] | Demand Projections, mgd | | | | | |
|---|---|---|---|---|---|---|
| | 2023 | 2025 | 2030 | 2035 | 2040 | 2045 |
| Pre-Recession and Pre-Drought Demand Level Recovery | 11.4 | 12.0 | 12.3 | 12.8 | 13.1 | 13.5 |
| Pre-Drought Demand Level Recovery | 10.7 | 11.1 | 11.4 | 11.9 | 12.3 | 12.6 |
| Partial Rebound – Normal Economy, Weather Normalized | 11.3 | 11.9 | 12.4 | 13.0 | 13.5 | 14.0 |
| Current Water Demand Profile – Normal Economy, Weather Normalized | 9.4 | 9.5 | 9.5 | 10.3 | 10.7 | 11 |

*Source: Technical Memorandum #2 BAWSCA Regional Water Demand and Conservation Projection Demand Forecast, prepared for Bay Area Water Supply & Conservation Agency, prepared by Maddus Water Management, Inc., February 21, 2020*

(a) These demand projections include non-potable (i.e., recycled water) use (approximately 2 mgd by 2045). Savings from active conservation programs are not included in these projections.

(b) See text below for description of demand forecast scenarios.

The demand forecast scenarios are described as follows:

- Pre-Recession and Pre-Drought Demand Level Recovery: Demand projections are based on the City's 2000-2007 water use profile, starting with 2018 demand levels and recovering from the drought in five years.
- Pre-Drought Demand Level Recovery: Demand projections are based on the City's 2004-2013 water use profile, starting with 2018 demand levels and recovering from the drought.
- Partial Rebound–Normal Economy, Weather Normalized: Demand projections are based on the Econometric Model with the following assumptions: (1) normal weather, (2) normal economy, (3) price escalation projections that vary by agency, (4) historical active conservation efforts, and (5) passive conservation plumbing codes.
- Current Water Demand Profile: Demand projections are based on the following assumptions: (1) normal economy, and (2) weather normalized. This is water demand calculated from historical 2018 water production data submitted by each BAWSCA member agency. The 2018 data were weather normalized and assume a normal economy. This scenario does not include any additional post-drought demand recovery.

Savings from plumbing codes (also known as passive conservation) is based on federal and state legislated efficiency standards pertaining to plumbing fixtures and appliances. The impact of codes quantified here include the Energy Policy Act of 1992, CALGreen Building Code, AB 715, and SB 407 (governs the types of fixtures available on the market for toilets, showers, washers, etc.). The plumbing code savings have been added into all four scenarios shown above.

Though the BAWSCA projections include recycled water use and extend to 2045, five years beyond the scope of this Water Master Plan, the buildout demand projections are comparable. As discussed in Section 5.3.3, the Water Master Plan land use-based water demand projection counts any potential new (i.e., above existing) recycled water use as potable water use. Therefore, the projection of 13.9 mgd generally compares well with the Maddaus demand projections, particularly the Partial Rebound – Normal Economy, Weather Normalized scenario demand projection of 14.0 mgd.

# CHAPTER 6
# Hydraulic Model Update and Calibration

This chapter describes the process of updating and calibrating the City's water system hydraulic model to confirm it accurately represents the City's existing water system. The hydraulic model was then used to evaluate the adequacy of the City's water system under existing (Chapter 8) and future (Chapter 9) water demand scenarios.

The following sections detail the hydraulic model update and calibration process:

- Hydraulic Model Background
- Hydraulic Model Element Naming Scheme
- Hydraulic Model Update Methodology
- Hydraulic Model Review and Update
- Steady-State Hydraulic Model Calibration
- Summary of Findings and Conclusions

## 6.1 HYDRAULIC MODEL BACKGROUND

As part of the 2002 WMP, Raines, Melton & Carella (RMC) developed an operational water system hydraulic model for the City using $H_2O$Net. In the 2009 WMPU, RMC converted the hydraulic model to $H_2O$MAP and re-evaluated the City's water system using updated land use information. This $H_2O$MAP-based hydraulic model has not been regularly updated since the 2009 WMPU.

In 2017, Innovyze retired the $H_2O$MAP modeling platform in favor of InfoWater. As a result, West Yost rebuilt the City's hydraulic model in InfoWater using the latest information for major facilities (e.g., pumps, storage reservoirs, and valves) provided by the City.

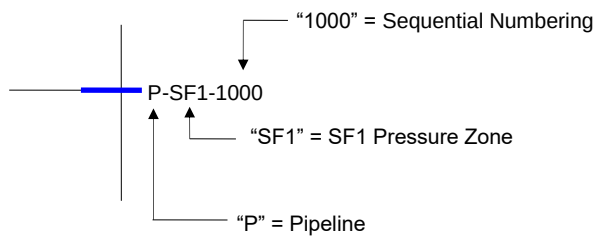
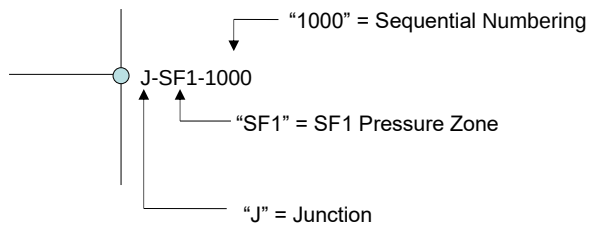
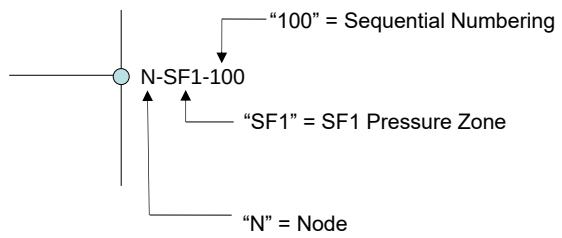
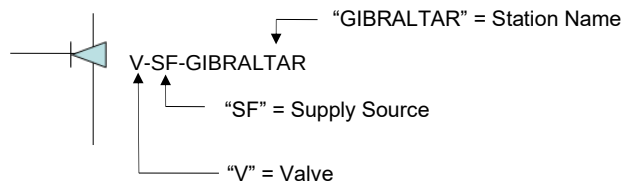
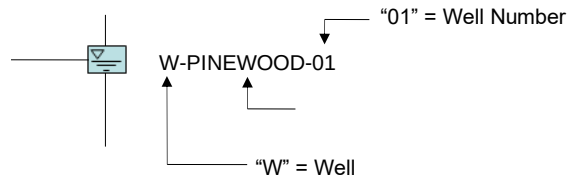
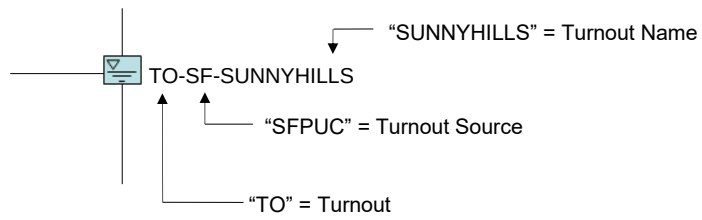
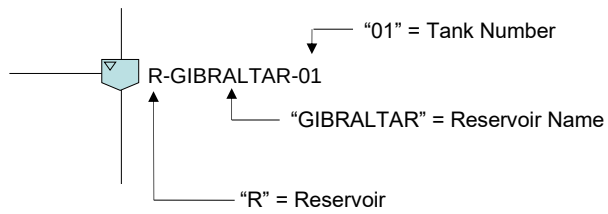
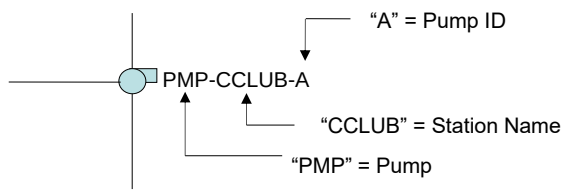
## 6.2 HYDRAULIC MODEL ELEMENT NAMING SCHEME

A specific and consistent naming convention allows modelers to easily locate and identify modeling elements like pipes, junctions, pumps, and storage reservoirs. As each facility is created in the model, it is named logically and sequentially based on industry standards and West Yost's extensive modeling experience. Table 6-1 summarizes the hydraulic element functions, along with prefixes used in naming.

| Table 6-1. Hydraulic Network Elements | | |
|---|---|---|
| Type | Description | Prefix |
| Pipelines | Conveys water from one node to another. Pipelines are assigned hydraulic characteristics (e.g., diameter, roughness) and general information (e.g., pressure zone, year of installation). | P |
| Junctions | Removes (demand) or adds (inflow) water from/to the system. Junctions represent connections to customer service laterals, hydrants, turnouts, etc. | J |
| Nodes | Represents either a transition in pipeline characteristic (e.g., change in diameter) or a point where pressure and/or water quality are monitored. Nodes are similar to junctions but do not add or remove water to the system. | N |
| Valves | Controls flow or pressure in the system based on specified criteria. Valves typically represent pressure reducing valves (PRV) or pump variable frequency drives, using pressure settings provided by the City. | V |
| Wells | A water source with fixed head, representing the hydraulic grade of the groundwater. | W |
| Turnouts | A water source with fixed head, representing the incoming hydraulic grade from the supplier. | TO |
| Storage Reservoirs | Represents storage capacity. Storage reservoir characteristics (e.g., dimensions, capacity, elevation, operating levels) are based on information from the City. | R |
| Pumps | Raises the hydraulic grade to overcome elevation differences and friction losses. Pump operation is based on pump curves or design points provided by the City. | PMP |

Table 6-2 details the model's naming scheme, which is primarily based on the hydraulic element prefix.

**Table 6-2. Naming Scheme for Hydraulic Model Network Elements**

| Model Element | Naming Scheme |
|---|---|
| Pipelines |  |
| Junctions |  |
| Nodes |  |
| Valves |  |
| Wells |  |
| Turnouts |  |
| Storage Reservoirs |  |
| Pumps |  |

## 6.3 HYDRAULIC MODEL UPDATE METHODOLOGY

To rebuild and update the City's water system hydraulic model, West Yost performed the following key tasks:

- Imported existing pipelines from City's geographical information system (GIS) database
- Added new pipelines near the new Milpitas BART station, which were not in the GIS database when it was initially received and imported into the model
- Updated existing and added new water system facilities (e.g., storage reservoirs, booster pump stations, pressure regulating valves, and wells)
- Allocated existing water demands using the City's spatially located meter and billing information
- Performed field hydrant testing within the distribution system on March 11, 2020
- Deployed Hydrant Pressure Recorders (HPRs) throughout the distribution system to record system pressures from March 10 through April 1, 2020
- Calibrated the hydraulic model with the results from data collected during the hydrant testing
- Verified that the hydraulic model system configuration is generally representative of the City's current water system based on system pressures, flows, and tank elevations recorded in the field and from the City's charts and Supervisory Control and Data Acquisition (SCADA) system

As part of these efforts, West Yost coordinated closely with the City to obtain and review:

- Information on existing water supply turnouts, storage reservoirs, booster pump stations, pressure regulating valves, wells, and other water system facilities
- As-built drawings associated with water system improvements implemented since 2002, especially adjacent to the new BART station
- City's GIS database of water system facilities (e.g., pipelines, wells, booster pump stations, etc.), received January 2020
- Metered water consumption information
- Historical SFPUC and VW turnout data
- Historical circular chart and SCADA system data

## 6.4 HYDRAULIC MODEL REVIEW AND UPDATE

The following sections detail specific steps taken to rebuild the hydraulic model in InfoWater and accurately represent the City's existing water system.

### 6.4.1 Pipeline Import and Update

The City engaged HydroScience to update its GIS-based pipeline records by reviewing recent as-builts, reconciling any discrepancies, and adding any missing alignments. After completing this task, HydroScience transmitted the pipeline shapefiles (one for each pressure zone) to West Yost. The shapefiles, which contained only distribution mains, were then imported to InfoWater via the "Import Manager" tool.

West Yost also checked the pipeline network for connectivity issues using InfoWater's built-in network review tools. This multi-step process identified and helped resolve parallel pipes (i.e., inadvertent duplicates), pipes that should be connected, and pipes that cross but do not intersect.

### 6.4.2 Pipeline Roughness Factors

Pipeline roughness is represented by a coefficient, known as a C-factor, with higher values corresponding to smoother surfaces. Ideally, C-factors are assigned to pipelines based on material, diameter, and age. In the 2009 WMPU, all pipelines were assigned a roughness coefficient of 120. West Yost assigned preliminary C-factors to pipelines in the hydraulic model based on material and diameter, using an in-house database of C-factors developed from previous hydrant testing performed for numerous water systems. These preliminary C-factors, which were refined as part of the hydraulic model calibration process (Section 6.5), are presented in Table 6-3.

**Table 6-3. Preliminary Pipeline C-factors Assigned in the Hydraulic Model**

| Pipeline Material | Abbreviation | C-Factor | |
|---|---|---|---|
| | | Diameter ≤ 8 inches | Diameter > 8 inches |
| Asbestos Cement | AC / ACP | 120 | 130 |
| Concrete Cylinder | CCP | -[(a)] | 130 |
| Cast Iron | CIP | 100 | 110 |
| Ductile Iron | DIP | 130 | 140 |
| Polyvinyl Chloride | PVC | 140 | 150 |
| Steel | STL | 120 | 130 |

(a) Material in this diameter range does not exist in City system.

## 6.4.3 System Elevations

Junction elevations in the hydraulic model are based on 1-foot contours[8] developed by VW using LiDAR. ESRI tools were used to interpolate between contours and create a detailed grid map (i.e., raster) of elevations in the City service area. Finally, InfoWater's "Elevation Extractor" tool used the raster map to assign elevations to each junction.

For facility sites (e.g., pump stations and storage tanks), junction elevations were further refined per available as-built drawings. Where elevation or depth information was missing from as-built drawings, junction elevations were unchanged from their original, raster-based values.

## 6.4.4 Existing System Facilities

West Yost reviewed City-provided as-built drawings for existing system facilities and added them to the hydraulic model. These include water supply turnouts, storage reservoirs, pump stations, PRVs, and the Pinewood Well. Operational parameters, including pump curves, PRV settings, and storage reservoir levels, were also confirmed with City staff.

In some cases, "equivalent" facilities were used in the model to simplify functionality without compromising simulation accuracy. For example, turnouts are represented by fixed head reservoirs using the hydraulic grade line of the source supply (SFPUC or VW). Additionally, pressure reducing valves are used to represent the discharge pressure setting for variable speed pumps.

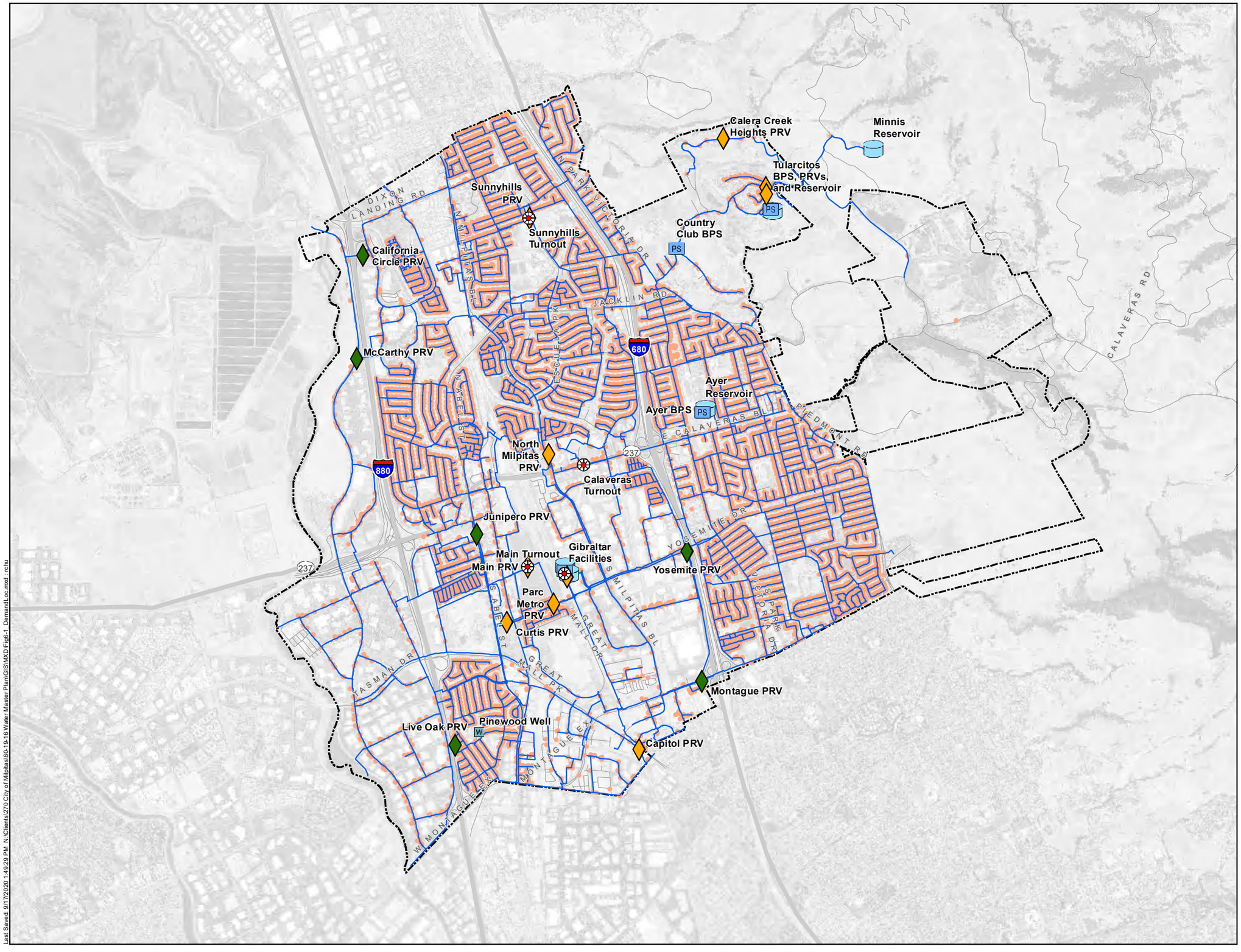
## 6.4.5 Spatially Located Meter Accounts

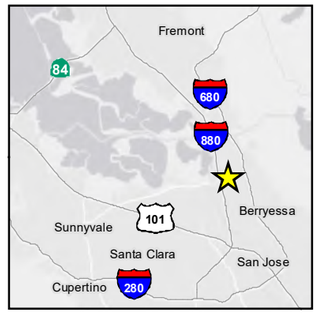
The first step in spatially locating water consumption involved linking billed water consumption to spatially located meters using a unique identifier. The City provided West Yost bimonthly water billing data listing the consumption, service address, unique billing code (i.e., Location_ID), meter type, and billing period for each customer account from 2013 through 2019. Many (but not all) meters in a City-provided water meter GIS file contained this same Location_ID. Using this unique identifier, approximately 77 percent of 2019 demand was spatially located. Ideally, at least 95 percent of demand is spatially located, so additional effort was required.

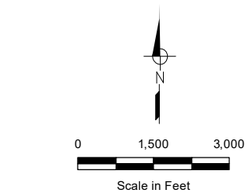
To spatially locate the consumption that could not be linked using Location_IDs, West Yost utilized ESRI's "Geocode Addresses" tool. In short, this tool spatially locates addresses based on a user-provided street database containing details like street name, suffix, direction, and address numbers on each side of the street. Another 21 percent of demand was geocoded, resulting in a total of over 98 percent of demand being spatially located. Figure 6-1 shows the spatial distribution of metered consumption in the hydraulic model.

The goal is to spatially locate production, equal to consumption plus NRW. To this end, spatially located demands were globally scaled up to match the total 2019 consumption. Then, 2019 NRW was added to each location as a fixed proportion of consumption. The final demand included in the hydraulic model equals the City's average daily water production in 2019 (8.3 mgd).

[8] Valley Water Contours downloaded on 2/25/2020 from http://gis.valleywater.org/Download/LIDAR/




- Spatially Located Demand
- Turnout
- Well
- Pressure Reducing Valve
- Emergency Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline
- City Limits

**Figure 6-1**

**Spatially Located Water Demands**

City of Milpitas
2020 Water Master Plan

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## 6.4.6 Water Demand Allocation

InfoWater's "Demand Allocator" tool assigns spatially located demands to the closest junction. Some junctions were excluded from the tool, including those on transmission mains (which typically do not have service connections) or facility sites (e.g., at a pump station). West Yost staff then reviewed the junctions with demands to confirm correct allocation with respect to service area and pressure zone.

The following demand sets were created in the model:

- **EX_ADD**: 2019 average day demand (8.3 mgd)
- **HT_BASE**: Average day demand for hydrant test day (3/11/2020; 8.4 mgd)

The "EX_ADD" demand set was used as the basis to create the "HT_BASE" demand set, which was scaled to equal the average demand on March 11, 2020 and used for steady-state calibration.

# 6.5 STEADY-STATE HYDRAULIC MODEL CALIBRATION

Hydrant test data was used to calibrate the hydraulic model by verifying whether the model can accurately simulate field-observed fire flow conditions. Part of the calibration process entails adjusting pipeline C-factors (within a typical range) to improve model accuracy. For additional detail on the hydrant test process, refer to West Yost's March 9, 2020 memorandum, which is provided as Appendix C. The following sections summarize the hydrant tests and hydraulic model calibration results.

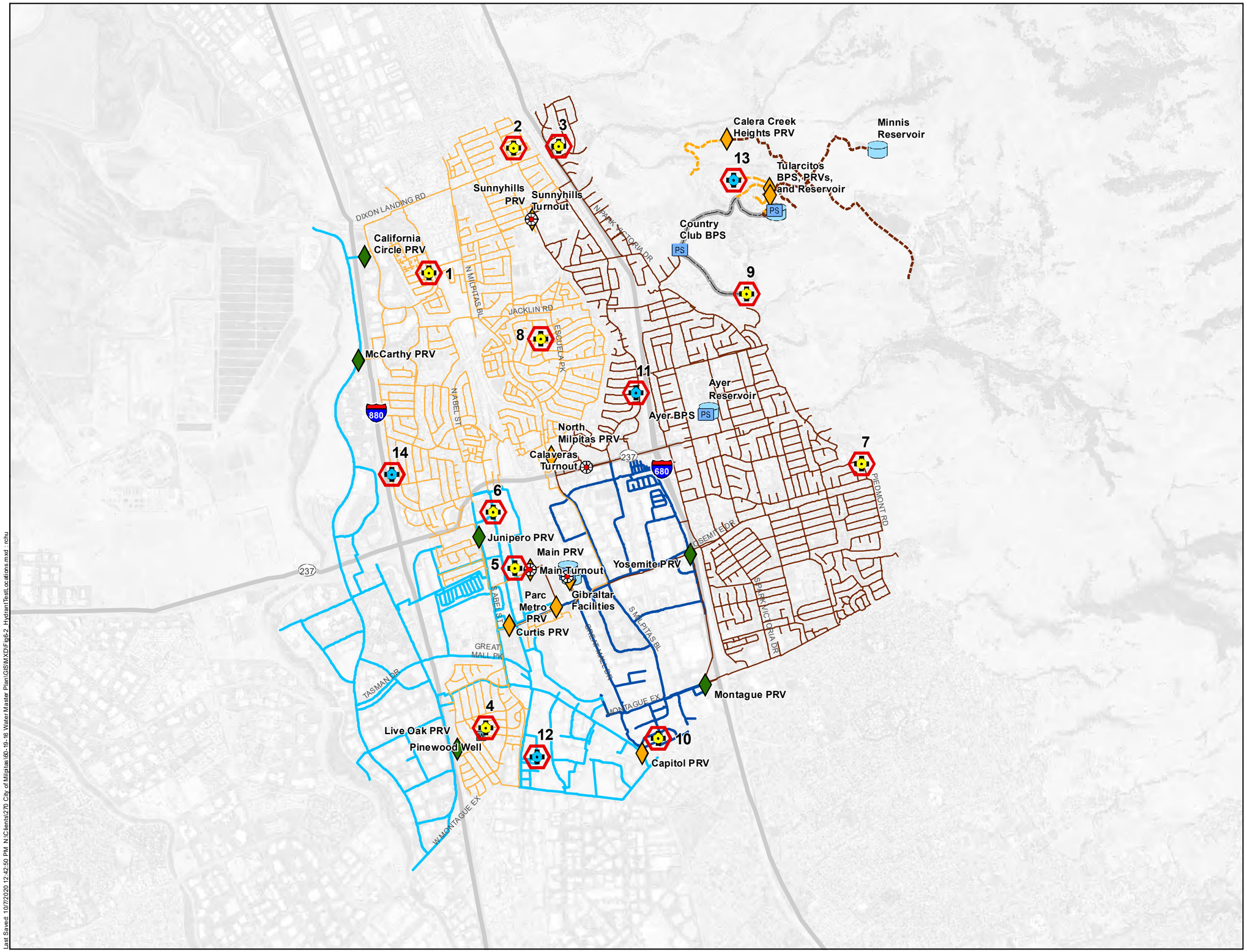
## 6.5.1 Hydrant Tests

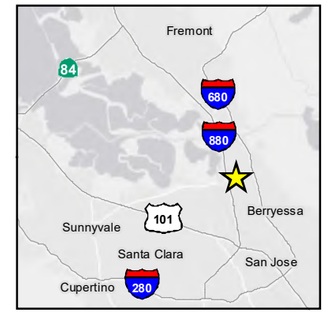
There were 14 hydrant test locations (10 primary and 4 alternate) initially identified based on pipeline diameter, material, and age. Pipeline connectivity was also considered, with priority given to locations requiring fewer valve closures to achieve unidirectional flow. Table 6-4 lists the field status of each test, while Figure 6-2 illustrates the test locations.

**Table 6-4. Hydrant Test Field Status**

| Test No. | Pipeline Material Type | Pipeline Diameter, inches | Location | Field Status |
|---|---|---|---|---|
| 1 | PVC | 8 | Along Elkwood Drive | Completed |
| 2 | AC | 6 | Along Gosser Street | Completed |
| 3 | AC | 6 | Along Stirling Drive and Stratford Drive | Completed |
| 4 | AC | 6 | Along Greentree Way | Completed |
| 5 | PVC | 8 | Along Hammond Way | Completed |
| 6 | AC | 8 | Along Main Street | Completed |
| 7 | AC | 8 | Along Lacey Drive | Completed |
| 8 | AC | 6 | Along Clauser Drive | Not Performed[a] |
| 9 | AC | 8 | Along Calaveras Ridge Drive | Completed |
| 10 | DI | 8 | Within Crossing at Montague Apartments | Completed |
| 11 | AC | 6 | Along Las Lomas Drive and Pacheco Drive | Not Performed[b] |
| 12 | PVC | 8 | Along Costa Street and Mihalakis Street | Not Performed[b] |
| 13 | AC | 8 | Along Pebble Beach Court | Not Performed[b] |
| 14 | AC | 8 | Along Heath Street | Not Performed[b] |

(a) Due to operational concerns, City advised against performing Test 8.
(b) Alternate tests were not performed due to time constraints.




N

0 1,500 3,000

Scale in Feet

- Test Location
- Alternate Test Location
- Turnout
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pump Station
- Storage Reservoir

**Pipeline Pressure Zone**

- VW1
- VW2
- SF1
- SF2
- SF3
- SF4-1
- SF4-2

**Figure 6-2**

**Hydrant Test Locations**

City of Milpitas
2020 Water Master Plan

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Each hydrant test included one flowing hydrant and three to four observation hydrants, which are identified by test number and an alphabetical designation based on proximity to the flowing hydrant. For example, Hydrant 1A is the observation hydrant closest to (flowing) Hydrant 1, while Hydrant 1D is the furthest.

To recreate operational and demand conditions for the hydrant test day (March 11, 2020), City staff provided water system data for turnouts and storage reservoirs. The City turned off booster pump stations during the test period; therefore turnouts were serving all demands in the valley floor. Data was limited for hillside demands during the test period, and since hillside demands are relatively low, demands during the hydrant test period were assumed to be equal to the combined flow from all turnouts. SFPUC turnout flows were provided in hourly increments and averaged from 8:00 am to 6:00 pm, while VW turnout flows were provided in minute increments and averaged from 8:30 am to 5:30 pm. The "test day demand" is the sum of the SFPUC and VW average flows. Spatially allocated average day demands were then scaled up such that the total system demand equals the test day demand.

Each completed hydrant test was simulated using the hydraulic model, and results were compared to field observations. Model performance was evaluated using differential pressure, which is defined as the difference between static and residual pressure for a given location. The model was considered calibrated if differential pressures were within 5 pounds per square inch (psi) of the field data. This psi tolerance is based on standard engineering practice for model calibration in water system planning.

## 6.5.2 Hydraulic Model Calibration Results

The hydraulic model was able to simulate hydrant tests accurately, with only minor adjustments to the preliminary C-factors presented in Table 6-3. Of the nine hydrant tests conducted, eight could be simulated such that differential pressures fell within 5 psi of field observations. The remaining hydrant test (No. 10) was abandoned due to likely incorrect valving during the test. Table 6-5 summarizes the calibration results, while the following sections detail the C-factor adjustments and issues that occurred with Hydrant Test No. 10.

### *6.5.2.1 Pipeline Roughness Factor Adjustments*

Field data from hydrant tests indicated that preliminary C-factors for AC and polyvinyl chloride (PVC) pipes were slightly high. Consequently, the C-factors for AC and PVC pipes 8 inches in diameter and smaller were adjusted down to 110 and 130, respectively. Although no hydrant tests were conducted for AC and PVC pipes larger than 8 inches in diameter, West Yost assumed those preliminary C-factors were also high and decreased them accordingly.

Roughness factors for other pipe materials remain equal to their preliminary values. Table 6-6 summarizes the calibrated C-factors used in the City's hydraulic model.

**Table 6-5. Hydrant Test Calibration Results**

| Hydrant | Field Data | | | | | Modeled Data | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Static Pressure, psi | High Residual Pressure, psi | Low Residual Pressure, psi | Average Residual Pressure, psi | Differential Pressure, psi (Static - Residual) | Static Pressure, psi | Residual Pressure, psi | Differential Pressure, psi (Static - Residual) | Comparison of Differential Pressures between Field and Modeled Data |
| Hydrant Test No. 1 (8" PVC, 1990s, Zone SF1) | | | | | | | | | |
| Flowing 1 | 86 | | | | | 84 | | | |
| 1A | 87 | 44 | 40 | 42 | 45 | 83 | 41 | 43 | 2 |
| 1B | 88 | 52 | 50 | 51 | 37 | 83 | 50 | 33 | 4 |
| 1C | 82 | 76 | 50 | 52 | 30 | 84 | 57 | 27 | 3 |
| 1D | 86 | 64 | 62 | 64 | 22 | 84 | 66 | 18 | 4 |
| Hydrant Test No. 2 (6" AC, 1960s, Zone SF1) | | | | | | | | | |
| Flowing 2 | 54 | | | | | 52 | | | |
| 2A | 48 | 18 | 16 | 17 | 31 | 46 | 15 | 31 | 0 |
| 2B | 51 | 31 | 29 | 30 | 21 | 48 | 30 | 19 | 2 |
| 2C | 53 | 48 | 44 | 46 | 7 | 54 | 49 | 5 | 2 |
| Hydrant Test No. 3 (6" AC, 1980s, Zone SF2) | | | | | | | | | |
| Flowing 3 | 98 | | | | | 94 | | | |
| 3A | 96 | 28 | 24 | 26 | 70 | 91 | 24 | 67 | 3 |
| 3B | 94 | 36 | 32 | 35 | 59 | 87 | 32 | 55 | 4 |
| 3C | 84 | 42 | 38 | 40 | 44 | 81 | 41 | 41 | 3 |
| 3D | 82 | 84 | 58 | 58 | 24 | 79 | 54 | 24 | 0 |
| Hydrant Test No. 4 (6" AC, 1960s, Zone SF1) | | | | | | | | | |
| Flowing 4 | 78 | | | | | 76 | | | |
| 4A | 80 | 41 | 29 | 30 | 50 | 76 | 25 | 51 | -1 |
| 4B | 82 | | 45 | 46 | 36 | 75 | 38 | 37 | -1 |
| 4C | 78 | 60 | 53 | 58 | 20 | 74 | 54 | 20 | 0 |
| Hydrant Test No. 5 (8" PVC, 1980s, Zone VW1) | | | | | | | | | |
| Flowing 5 | 80 | | | | | 80 | | | |
| 5A | 84 | 40 | 40 | 41 | 43 | 80 | 40 | 41 | 3 |
| 5B | 84 | 47 | 45 | 46 | 38 | 81 | 46 | 34 | 4 |
| 5C | 80 | 60 | 50 | 54 | 26 | 81 | 52 | 28 | -2 |
| Hydrant Test No. 6 (8" AC, UNK, Zone VW1) | | | | | | | | | |
| Flowing 6 | 84 | | | | | 82 | | | |
| 6A | 85 | 50 | 48 | 49 | 36 | 82 | 44 | 38 | -2 |
| 6B | 88 | 54 | 52 | 53 | 35 | 82 | 47 | 34 | 1 |
| 6C | 81 | 56 | 52 | 54 | 27 | 81 | 53 | 28 | -1 |
| Hydrant Test No. 7 (8" AC, 1970s, Zone SF2) | | | | | | | | | |
| Flowing 7 | 60 | | | | | 59 | | | |
| 7A | 70 | 52 | 50 | 51 | 19 | 67 | 52 | 15 | 4 |
| 7B | 74 | 64 | 60 | 62 | 12 | 74 | 64 | 10 | 2 |
| 7C | 84 | 81 | 78 | 80 | 4 | 84 | 81 | 3 | 1 |
| Hydrant Test No. 9 (8" AC, 1980s, Zone SF3) | | | | | | | | | |
| Flowing 9 | 143 | | | | | 139 | | | |
| 9A | 138 | 54 | 50 | 50 | 88 | 134 | 45 | 89 | -1 |
| 9B | 148 | 70 | 68 | 69 | 79 | 146 | 69 | 77 | 2 |
| 9C | 141 | 84 | 78 | 78 | 63 | 140 | 76 | 64 | -1 |
| 9D | 136 | 136 | 80 | 85 | 51 | 132 | 83 | 49 | 2 |
| Hydrant Test No. 10 (8" DI, 2000s, Zone VW2) | | | | | | | | | |
| Flowing 10 | 118 | | | | | Test abandoned due to incorrect valving | | | |
| 10A | 120 | 94 | 90 | 92 | 28 | | | | |
| 10B | 122 | 95 | 92 | 94 | 28 | | | | |
| 10C | 116 | 92 | 82 | 90 | 26 | | | | |
| 10D | 119 | 92 | 89 | 90 | 29 | | | | |

**Table 6-6. Calibrated Pipeline C-factors Assigned in the Hydraulic Model**

| Pipeline Material | Abbreviation | C-Factor | |
|---|---|---|---|
| | | Diameter ≤ 8 inches | Diameter > 8 inches |
| Asbestos Cement | AC / ACP | 110 | 120 |
| Concrete Cylinder | CCP | -[(a)] | 130 |
| Cast Iron | CIP | 100 | 110 |
| Ductile Iron | DIP | 130 | 140 |
| Polyvinyl Chloride | PVC | 130 | 140 |
| Steel | STL | 120 | 130 |

(a) Material in this diameter range does not exist in City system.

### *6.5.2.2 Hydrant Test No. 10*

Field observations suggest that Hydrant Test No. 10 did not achieve unidirectional flow through the 8-inch ductile iron pipe (DIP) loop within the Crossing at Montague Apartments. While setting up for the test, City staff could not confirm the valve configuration at the intersection between Hydrant 10 and Hydrant 10D. City staff closed a valve at this intersection, but since field-observed differential pressures are relatively consistent across all four observation hydrants, it seems that the isolation valve closed did not direct flow as intended. As a result, the C-factor for 8-inch diameter, DIP could not be confirmed, and Hydrant Test No. 10 should be disregarded.

Abandoning Hydrant Test No. 10 is not a fatal flaw. Only approximately 8 percent of the City's water system consists of DIP, and the preliminary DIP C-factors are based on an extensive list of roughness factors calibrated for other water systems. West Yost remains confident the hydraulic model can accurately simulate the City's water system under various conditions.

## 6.6 SUMMARY OF FINDINGS AND CONCLUSIONS

Hydrant test simulation results indicate that the hydraulic model can accurately replicate a fire flow or other large demand condition using the pipeline C-factors listed in Table 6-6. As a result, West Yost concludes that the hydraulic model is a reliable representation of the City's existing potable water distribution system and can be used as a planning tool. To ensure long-term accuracy and usefulness, it is recommended that the City regularly update and maintain the hydraulic model as facilities are constructed or replaced. In addition, as data availability increases, the City can augment the hydraulic model to run extended period simulations, which simulate the system operation over time, mimicking the operational controls and settings used for system operations.

# CHAPTER 7
# System Planning and Performance Criteria

This chapter presents the criteria used to size and evaluate the performance of the City's potable water system. Key criteria from the City's 2009 WMPU have been incorporated into this chapter; however, some of the previous criteria have been updated to reflect more recent or suitable standards based on West Yost's experience working with similar municipal water systems.

Table 7-1 summarizes the recommended criteria for this 2020 WMP. The following sections describe each criterion in more detail.

## 7.1 GENERAL WATER SYSTEM GUIDELINES

Before discussing specific planning and performance criteria, it is helpful to provide some general guidelines that a water system should meet. This section identifies the requirements for a reliable water system that delivers high-quality water.

### 7.1.1 Water System Reliability

Based on industry standards, a reliable water system is one that has sufficient storage, redundant pumping and distribution facilities, and emergency alternatives for both water and power supply. Thoughtful water distribution system design also enhances reliability through improved hydraulics and flexibility. For example, replacing pipeline dead-ends with looped configurations improves reliability and reduces the risk of stagnant water, which has poor taste and lower disinfectant residuals. Appropriate pipeline sizing and pressure regulation allows the system to serve peak demands at appropriate pressures while minimizing friction losses. Lastly, proper valve placement streamlines maintenance and repairs, while also increasing operational flexibility.

### 7.1.2 Water Quality Standards

The United States Environmental Protection Agency (USEPA) and the SWRCB DDW establish water quality standards to protect public health and help manage aesthetics. Primary drinking water standards are legally enforceable limits on contaminants that present a risk to human health. In contrast, secondary standards target contaminants that are not health threatening, but may cause taste, odor, or color issues. As a water retailer, the City is responsible for ensuring that all applicable water quality standards and regulations are always met. The City is currently updating a report on its water quality monitoring program.

**Table 7-1. Summary of Recommended Potable Water System Planning and Performance Criteria**

| Component | Criteria | Remarks/Issues |
|---|---|---|
| Water System Performance | | |
| *Fire Flow Requirements* [(a)] | | |
| Single Family Residential | 1,500 gpm @ 2 hrs | Improvements for existing developments will be evaluated on a case-by-case basis because of varying historical standards. |
| Multi-family Residential | 2,500 gpm @ 2 hrs | |
| Commercial | 3,000 gpm @ 3 hrs | |
| Mixed[(b)] | 3,000 gpm @ 3 hrs | |
| Industrial | 4,000 gpm @ 4 hrs | |
| *Peak Supply Capacity* | | |
| Normal Demand Conditions | Provide firm supply capacity equal to maximum day demand; meet peak hour demand from a combination of supply capacity and storage | Firm supply capacity defined as the total water supply with the largest turnout out of service. |
| Fire Flow Demand Conditions | Meet maximum day demand plus fire flow from a combination of supply capacity and storage | |
| *System Pressures* | | |
| Minimum Pressure - Normal Conditions | Average and Maximum Day Demand: 40 psi at customer service connection<br>Peak Hour Demand: 30 psi at customer service connection | Services with pressure less than 30 psi during an average day demand condition require an individual booster pump. |
| Minimum Pressure - Fire Flow Conditions | 20 psi | |
| Maximum Pressure | Zone 1: 80 psi at customer service connection<br>Zone 2 and Hillside Zones: 150 psi at customer service connection | New services with pressure greater than 80 psi require an individual pressure regulator. |
| Pipeline Sizing | | |
| *Transmission Main* | | |
| Diameter | 16 inches or larger | |
| Maximum Velocity - Normal Conditions | 6 ft/s | Criteria based on requirements for new development, existing transmission mains will be evaluated on a case-by-case basis. Evaluation will include age, material type, velocity, head loss, and pressure. |
| Maximum Head Loss - Normal Conditions | 5 ft/kft | |
| Hazen Williams "C" Factor | 130 | For consistency in hydraulic modeling. |
| *Distribution Main* | | |
| Minimum Pipeline Diameter | 8 inches | New pipelines only. |
| Maximum Velocity - Normal Conditions | 8 ft/s | Criteria based on requirements for new development, existing distribution mains will be evaluated on a case-by-case basis. Evaluation will include age, material type, velocity, head loss, and pressure. |
| Maximum Velocity - Fire Flow Conditions | 12 ft/s | |
| Maximum Head Loss - Normal Conditions | 10 ft/kft | |
| Hazen Williams "C" Factor | 130 | For consistency in hydraulic modeling. |
| Storage Facility Sizing | | |
| Operational Storage | 25 percent of maximum day demand | |
| Fire Storage | Fire flow demand for the most severe fire recommended in the pressure zone multiplied by the recommended duration | Refer to Table 7-2. Assumes only one fire flow event would occur in any pressure zone at a time. |
| Emergency Storage | 50 percent of maximum day demand | |
| Groundwater Storage Credit | Volume of water pumped over a 24-hour period | The maximum credit cannot exceed the recommended emergency storage volume. |
| Total Storage Capacity | Operational + Fire + Emergency - Groundwater Credit | |
| Pumping Facility Sizing | | |
| Pumping Capacity | Firm pumping capacity equal to maximum day demand (within the designated operational hours) | Firm pumping capacity defined as the total capacity of all operational pumps minus the capacity of the largest pumping unit. Pumps located in lower pressure zones must deliver the maximum day demand of all pressure zone(s) located above them. |
| Backup Power | All critical pumping facilities[(c)] should be equipped with an on-site, backup power generator | |
| Pressure Reducing Station Sizing | | |
| Valve Capacity | In pressure zones with storage, valve capacity must supply the maximum day demand, and in pressure zones without storage, valve capacity must supply maximum day plus fire flow or peak hour demand, whichever is larger | |

(a) Based on fire flow requirements adopted in the 2009 WMPU, updated to reflect current fire code.

(b) Includes High Density Multi-family Residential land uses in the MMSP area.

(c) A pump station is defined as critical if it serves a pressure zone(s) and/or service area(s) without sufficient fire or emergency storage and meets one of the following criteria:
- The largest facility that provides water to a particular pressure zone and/or service area;
- It is the sole source of water to single or multiple pressure zones and/or service areas;
- It provides water from a supply turnout; or
- It provides water from key groundwater supply wells.

# 7.2 WATER SYSTEM PERFORMANCE CRITERIA

This section describes the recommended system performance criteria for fire flows, supply capacity, and distribution system pressures.

## 7.2.1 Fire Flow Requirements

Municipal water systems providing supply during a fire flow condition must meet minimum standards for fire flow rate and duration and residual pressure. Based on the City's potable water design guidelines and recommendations from state agencies, the City's water system must concurrently meet maximum day demands and maintain at least 20 pounds per square inch (psi) residual pressure when delivering fire flow.

Minimum fire flow requirements are adopted from the 2009 WMPU (updated in coordination with the City's fire department to reflect current fire code) and summarized by land use type in Table 7-2. These requirements specify minimum distribution system capacities during fires and apply to new developments only (not existing system conditions). Existing buildings are assumed to meet fire flow standards that were in place at the time of construction, which are generally lower than current standards. Therefore, the evaluation of the City's water system under existing demand conditions presents systemwide available fire flow only and does not recommend pipeline improvements to increase existing fire flow capacity. However, the City can use these results as a guide for sizing pipeline improvements and to prioritize replacing existing smaller diameter pipelines to improve overall flows throughout the distribution system.

**Table 7-2. Recommended Fire Flow Requirements for Future Development and Pipeline Replacement Planning[(a)]**

| Land Use Designation | Fire Flow, gpm | Duration, hours | Recommended Storage, MG |
|---|---|---|---|
| Single Family Residential | 1,500 | 2 | 0.18 |
| Multi-family Residential | 2,500 | 2 | 0.30 |
| Commercial | 3,000 | 3 | 0.54 |
| Mixed[(b)] | 3,000 | 3 | 0.54 |
| Industrial | 4,000 | 4 | 0.96 |

(a) Based on fire flow requirements adopted in the 2009 WMPU, updated to reflect current fire code.
(b) Includes High Density Multi-family Residential land uses in the Milpitas Metro Specific Plan area.

## 7.2.2 Peak Supply Capacity

Under normal (i.e., non-emergency) demand conditions, the City must meet peak hour demands through a combination of available supplies and storage. In addition, the City must have a firm supply capacity capable of meeting a maximum day demand condition. Firm supply capacity is defined as the total potable water supply capacity with the largest turnout out of service.

Under fire flow demand conditions, the City must meet fire flows and maximum day demand from both available supply capacity and storage.

### 7.2.3 Distribution System Pressures

Water systems are typically evaluated based on pressure, pipeline velocity, and pipeline head loss. Pressures are the most critical criterion because they are used to evaluate satisfactory system performance under different demand conditions. Consequently, the City's existing water system will be evaluated using pressure as the primary criterion; secondary criteria, such as pipeline velocity, head loss, age, and material type, will be used as indicators to locate where water system improvements may be needed. Recommended improvements from existing and buildout system pressure evaluations are presented in Sections 8.5 and 9.6, respectively.

Minimum distribution system pressure criteria are based on industry standards and vary by demand condition. Under average day and maximum day demands, system pressures should remain above 40 psi. Under peak hour demand conditions, system pressures should remain above 30 psi. During fire flow conditions, residual pressures of 20 psi are allowed. Customer service connections with a pressure below 30 psi during an average day demand condition should have an individual booster pump installed.

Maximum distribution system pressure criteria are based on industry standards and vary by pressure zone. In the valley (Zone 1), pressures should remain below 80 psi. In Zone 2 and Hillside Zones (SF3 and SF4), the maximum pressure shall not exceed 150 psi. These pressure limits are consistent with the 2009 WMPU and the high end of typical operating pressures for municipal water systems. The Uniform Plumbing Code (UPC) requires new customer service connections with a pressure above 80 psi to have an individual pressure regulator installed. Since typical pressures in Zone 2 and the Hillside Zones exceed 80 psi, an alternative would be to install main-line PRVs and create pressure sub-zones within these existing pressure zones; however, this would make it more difficult to move water between these zones and could potentially reduce fire flow availability.

This distribution system pressure criteria will be applied to all areas that fall within the normal customer service elevation ranges for each pressure zone. Customers located above or below the normal service elevation ranges may require an individual booster pump or pressure regulator.

## 7.3 WATER FACILITY SIZING

This section describes the recommended sizing criteria for pipelines, storage facilities, booster pumping facilities, backup power, and pressure reducing stations within the City's service area

### 7.3.1 Pipeline Sizing

Pipeline sizing is based on velocity and head loss, which are directly related; higher velocities translate to higher head loss (increases operating costs). Velocity and head loss criteria are defined below for new pipelines and vary with pipeline diameter. Consistent with the 2009 WMPU, transmission mains are defined as pipelines with a diameter of 16 inches or larger, and distribution mains have a diameter less than 16 inches. However, all new pipelines should be required to have a minimum diameter of 8 inches. Compared to 6-inch diameter pipelines, 8-inch diameter pipelines can significantly reduce friction losses at a competitive cost. Phasing out 6-inch diameter (and smaller) pipelines will also help the City streamline its piping and appurtenance inventory.

The following criteria reflect industry standards and West Yost's experience with municipal water systems:

- For transmission mains, the maximum velocity should be limited to 6 feet per second (ft/s), and the maximum head loss should be 5 feet per 1,000 feet (ft/kft) of pipeline.
- For distribution mains, the maximum velocity should be limited to 8 ft/s under normal demand conditions. During fire flow demand conditions, the maximum velocity should be 12 ft/s. Maximum head loss for distribution mains should be 10 ft/kft.

## 7.3.2 Storage Facility Sizing

Storage facilities include reservoirs (i.e., tanks), clearwells, and, in certain cases, groundwater wells. The total recommended treated water storage capacity is the sum of the following three components:

- Operational Storage
- Fire Storage
- Emergency Storage

Each component is detailed below, along with a discussion of groundwater storage credit. West Yost will evaluate storage capacity requirements by pressure zone.

### *7.3.2.1 Operational Storage*

Operational storage is defined as the amount of stored water needed to meet peak demands in excess of normal supply delivery. Since water supplies are generally designed to meet maximum day demands, operational storage is typically used to supply peak demands (e.g., the difference between peak hour and maximum day demand). Supplies replenish operational storage during periods of lower demand.

In accordance with American Water Works Association (AWWA) guidelines[9], West Yost recommends the operational storage volume be 25 percent of the maximum day demand. This is consistent with the operational storage criterion used in the 2009 WMPU.

### *7.3.2.2 Fire Storage*

Fire storage is the volume of water reserved for fire suppression. For a given pressure zone, fire storage is determined by multiplying the maximum required fire flow rate by the required duration. Refer to Table 7-2 for fire storage recommendations by land use designation. Per industry standards, it is assumed that no more than one fire event would occur in a pressure zone at a time.

### *7.3.2.3 Emergency Storage*

Emergency storage helps meet demands during an unplanned event that reduces the quality and/or quantity of potable water supplies. Determining the appropriate emergency storage volume is challenging, as it depends on the diversity of supplies, the reliability of production and distribution facilities, and the duration of the emergency event. The City's overall risk tolerance is also a factor. The

[9] The *AWWA Water Distribution Systems Handbook* (AWWA, 2000) (Section 3.2.2.2 Storage) states that the volume of operational storage required is commonly estimated at 25 percent of the total maximum day demand.

AWWA suggests that individual utilities should determine its specific emergency storage requirements based on perceived system vulnerabilities.

West Yost recommends an emergency storage volume equal to 50 percent of the maximum day demand, consistent with the 2009 WMPU. Emergency storage is not required at every reservoir; one reservoir can hold emergency storage for multiple pressure zones if the zones are hydraulically connected and the stored water remains accessible in emergencies.

#### *7.3.2.4 Groundwater Storage Credit*

Based on the City's available emergency groundwater wells, groundwater storage could offset some of the recommended emergency storage. However, the following must be true to use the groundwater supply to offset the need to provide surface storage:

- Groundwater supply is of potable water quality and can be reliably accessed (i.e., wells are equipped with on-site backup power or a plug-in adapter and transfer switch)
- Groundwater supply is not already being relied upon to meet the City's average day demand requirements
- Sufficient water distribution facilities are available to distribute this water to demand areas

The groundwater storage credit equals the volume of water pumped over a 24-hour period. The maximum credit cannot exceed the recommended emergency storage volume (i.e., 50 percent of maximum day demand).

#### *7.3.2.5 Recommended Total Storage Capacity*

In summary, the City's recommended total water storage capacity is the sum of the following components:

- **Operational Storage**: Volume of water to meet diurnal peaks, assumed to be 25 percent of the maximum day demand; plus
- **Fire Flow Storage**: Volume of water to suppress a fire (varies by land use designation); plus
- **Emergency Storage**: Volume of water as emergency supply during unplanned events, assumed to be 50 percent of maximum day demand; minus
- **Groundwater Storage Credit**: Groundwater supply that can be reliably accessed in an emergency.

## 7.3.3 Pumping Facility Sizing and Backup Power

Based on industry standards, pumping capacity should be sufficient to meet a maximum day demand within the designated operational hours with pumps assumed to operate at firm pumping capacity. Firm pumping capacity is defined as the total pump station capacity with the largest pump out of service. Pumps located in lower pressure zones must deliver the maximum day demand of all pressure zone(s) located above them.

Critical pumping facilities are defined as those facilities that provide service to pressure zone(s) and/or service area(s) which do not have sufficient fire and/or emergency storage available and meet the following criteria:

- The largest pumping facility that provides water to a particular pressure zone and/or service area;
- A facility that provides the sole source of water to single or multiple pressure zones and/or service areas;
- A pumping facility that provides water from a supply turnout; or
- A pumping facility that provides water from key groundwater supply wells (depends on capacity, quality and location).

All critical pumping facilities should be equipped with an on-site, backup power generator.

## 7.3.4 Pressure Reducing Station Sizing

For pressure zones without available storage capacity and where pressure reducing station(s) are the sole supply source, the total capacity from the active pressure reducing station(s) should be equal to a maximum day demand plus fire flow condition or a peak hour demand condition, whichever is larger. For pressure zones with available storage capacity and where pressure reducing station(s) are the sole supply source, the total capacity from the active pressure reducing station(s) should be equal to a maximum day demand.

# CHAPTER 8
# Evaluation of Existing Water System

This chapter evaluates the City's existing water system and its ability to meet recommended planning and performance criteria described in Chapter 7 and summarized in Table 7-1 of this report. The evaluation encompasses both system capacity and hydraulic performance using existing water demands developed in Section 5.1 of this report. System capacity is evaluated based on potable water supply, storage, and pumping, while the hydraulic performance evaluation examines distribution system pressures under various demand and outage conditions. The following evaluations frequently refer to "normal" conditions, which are defined as non-emergencies (i.e., no fires or unplanned outages).

For reference, Appendix A contains a water system schematic profile that summarizes the supply and distribution facilities described in Sections 3.2 and 3.3 of this report, respectively.

This chapter also includes recommendations for addressing any deficiencies identified from the evaluation. These are incorporated in a recommended capital improvement program (CIP) described in Chapter 11 of this report. To simplify cross-referencing with Chapter 11, each proposed project is assigned a unique capital improvement program ID (CIP ID).

The following sections present the evaluation methodology and results:

- Existing Potable Water Demands
- Existing Potable Water Supply Capacity Evaluation
- Existing Potable Water Storage Capacity Evaluation
- Existing Pumping Capacity Evaluation
- Existing Water Distribution System Evaluation
- Summary of Findings and Recommended Improvements

## 8.1 EXISTING POTABLE WATER DEMANDS

Existing potable water demands are based on 2019 billing meter data, which was spatially allocated in the hydraulic model and scaled up to match the City's 2019 average daily water production (8.3 mgd). Maximum day and peak hour demands were calculated based on the adopted peaking factors of 1.6 and 2.9 times the average day demand, respectively, for Zones SF1 and SF2, and 3.2 and 5.8 times the average day demand, respectively, for Zones SF3 and SF4. In the VW service area, the maximum day and peak hour demand peaking factors are 1.9 and 3.4 times the average day demand, respectively. Table 8-1 summarizes existing potable water demands by pressure zone and service area.

**Table 8-1. Summary of Existing Water Demands by Pressure Zone**

| Pressure Zone | Average Day Demand[(a)] | | Maximum Day Demand[(b)] | | Peak Hour Demand[(c)] | |
|---|---|---|---|---|---|---|
| | gpm | mgd | gpm | mgd | gpm | mgd |
| SF1 | 1,748 | 2.52 | 2,797 | 4.03 | 5,069 | 7.30 |
| SF2 | 1,798 | 2.59 | 2,877 | 4.14 | 5,214 | 7.51 |
| SF3 | 14 | 0.02 | 44 | 0.06 | 81 | 0.12 |
| SF4-1 | 19 | 0.03 | 61 | 0.09 | 110 | 0.16 |
| SF4-2 | 17 | 0.02 | 54 | 0.08 | 98 | 0.14 |
| SF Subtotal | 3,596 | 5.18 | 5,833 | 8.40 | 10,571 | 15.2 |
| VW1 | 1,238 | 1.78 | 2,351 | 3.39 | 4,208 | 6.06 |
| VW2 | 951 | 1.37 | 1,806 | 2.60 | 3,232 | 4.65 |
| VW Subtotal | 2,188 | 3.15 | 4,158 | 5.99 | 7,440 | 10.7 |
| **Total** | **5,784** | **8.33** | **9,990** | **14.4** | **18,011** | **25.9** |

(a) Based on spatially allocated 2019 water meter data, scaled to match 2019 water production.
(b) Maximum day demand is 1.6 times the average day demand for Zones SF1 and SF2, 3.2 times the average day demand for Zones SF3 and SF4, and 1.9 times the average day demand for the VW service area.
(c) Peak hour demand is 2.9 times the average day demand for Zones SF1 and SF2, 5.8 times the average day demand for Zones SF3 and SF4, and 3.4 times the average day demand for the VW service area.

## 8.2 EXISTING POTABLE WATER SUPPLY CAPACITY EVALUATION

As described in Section 4.1 of this report, the City's potable water is supplied via turnouts from SFPUC and VW transmission pipelines. The recommended water system performance criteria specify that under normal demand conditions, the following must be satisfied:

- Provide firm supply capacity equal to maximum day demand
- Meet peak hour demand from a combination of supply capacity and storage

Firm supply capacity is defined as the normal water supply with the largest turnout out of service. In the SFPUC service area, the largest turnout is Calaveras (see Figure 3-1), which has a capacity of 13.0 mgd. The VW service area has only one turnout (Gibraltar), so firm supply is zero, as there is no redundant supply source from the VW system. However, as described in Section 3.3 of this report, if the VW turnout is not available, water can be moved from the City's SFPUC service area to the VW service area.

Table 8-2 summarizes the available and required firm supply capacity for each service area. Pinewood Well is not listed in Table 8-2 because it is not part of the City's existing normal water supply (it is only used for emergencies). The SFPUC service area has approximately 15.4 mgd of firm supply surplus, while the VW service area has a firm supply deficit equal to its maximum day demand (5.99 mgd), due to the lack of a redundant supply source from the VW system. Since SFPUC can supply the VW service area and the SFPUC surplus (15.4 mgd) exceeds the VW deficit (5.99 mgd), West Yost concludes that the City overall has sufficient firm supply capacity.

For the second supply capacity criterion listed above, the City can meet peak hour demands for each service area from supplies alone (i.e., before counting storage). Given this significant surplus in supplying peak hour demands, the criterion is not discussed further.

**Table 8-2. Comparison of Available and Required Firm Supply Capacity**

| Supply Source | Turnout | Design Capacity | |
|---|---|---|---|
| | | gpm | mgd |
| SFPUC | Sunnyhills | 7,014 | 10.1 |
| | Calaveras | 9,028 | 13.0 |
| | Main Street | 5,486 | 7.90 |
| | Intertie | 4,000 | 5.76 |
| | **Total Supply Capacity[a]** | **25,528** | **36.8** |
| | Firm Supply Capacity[b] | 16,500 | 23.8 |
| | Required Supply Capacity[c] | 5,833 | 8.40 |
| | Existing Firm Supply Capacity Surplus (Deficit) | 10,667 | 15.4 |
| VW | Gibraltar | 10,000 | 14.4 |
| | **Total Supply Capacity[a]** | **10,000** | **14.4** |
| | Firm Supply Capacity[b] | 0 | 0 |
| | Required Supply Capacity[c] | 4,158 | 5.99 |
| | Existing Firm Supply Capacity Surplus (Deficit) | (4,158)[d] | (5.99)[d] |

(a) Total supply capacity assumes all turnouts are available for use.
(b) Firm supply capacity assumes largest turnout in each service area (Calaveras (SFPUC) and Gibraltar (VW)) is offline.
(c) Required supply capacity is equal to the maximum day demand (see Table 8-1).
(d) VW supply deficit can be met by SFPUC supply surplus.

## 8.3 EXISTING POTABLE WATER STORAGE CAPACITY EVALUATION

Potable water storage is critical for providing operational flexibility and emergency supply during outages or fires. The City's storage reservoir capacity must meet the following requirements (described in Section 7.3.2 of this report):

- Operational storage equal to 25 percent of maximum day demand
- Emergency storage equal to 50 percent of maximum day demand
- Fire storage equal to the largest fire flow demand in a pressure zone multiplied by the recommended duration

The total storage required is the sum of the operational, emergency, and fire storage requirements, less any groundwater credit, which can offset some of the emergency storage requirement. The groundwater credit includes both emergency wells and normally operating wells and equals the volume of water pumped over a 24-hour period. To offset surface storage needs, groundwater must be of potable water quality, and wells must have on-site backup power capabilities. In addition, the City must be able to meet average day demands without relying on groundwater. This is not an issue, since the City does not rely on groundwater as part of its normal (i.e., non-emergency) supply.

The City currently has one operational groundwater well (Pinewood Well), which meets water quality and backup power requirements. As a result, the Pinewood Well provides an emergency groundwater storage credit equal to its daily pumping capacity (1.7 MG).

For each pressure zone, Table 8-3 compares the City's existing potable water storage capacity with storage requirements. Since Zones 1 and 2 in each service area are interconnected through multiple pressure reducing valves (PRVs) that operate under normal conditions, they are combined in each service area (i.e., SF1/SF2 and VW1/VW2). As shown in Table 8-3, there is sufficient storage in the SFPUC service area and a deficit of 0.45 MG in the VW service area. This deficit is not considered critical, due to the flexibility of the Gibraltar facility. Simple valve operations allow the Gibraltar (SF) tank to supply Zone VW2, so the storage surplus for Zones SF1 and SF2 can cover the shortfall in Zones VW1 and VW2.

## Table 8-3. Comparison of Available and Required Water Storage Capacity

| [A] | [B] | [C] | [D] | [E] = [C] + [D] | [F] | [G] | [H] | [I] = [F] + [G] + [H] | [J] = [E] - [I] |
|---|---|---|---|---|---|---|---|---|---|
| | | Available Storage Capacity, MG | | | Required Storage Capacity, MG | | | | |
| Station | Status | Reservoir Capacity | Emergency Groundwater Storage Credit[a] | Total Available Storage | Operational[b] | Emergency[c] | Fire Flow[d] | Total Required Storage | Storage Surplus (Deficit), MG |
| Zones SF1 and SF2 | | | | | | | | | |
| Gibraltar (SF) | Active | 5.00 | -- | **12.30** | 2.04 | 4.08 | 0.96 | **7.09** | **5.21** |
| Ayer | Active | 5.60 | -- | | | | | | |
| Pinewood Well | Standby | -- | 1.70 | | | | | | |
| Zone SF3 | | | | | | | | | |
| Tularcitos | Active | 0.30 | -- | **0.30** | 0.02 | 0.03 | 0.18 | **0.23** | **0.07** |
| Zones SF4-1 and SF4-2 | | | | | | | | | |
| Minnis | Active | 0.34 | -- | **0.34** | 0.04 | 0.08 | 0.18 | **0.30** | **0.04** |
| Zones VW1 and VW2 | | | | | | | | | |
| Gibraltar (VW) | Active | 5.00 | -- | **5.00** | 1.50 | 2.99 | 0.96 | **5.45** | **(0.45)** |

(a) Credit based on 24 hours of pumping capacity. The credit cannot exceed the required emergency storage capacity.

(b) Based on 25 percent of a maximum day demand (see Table 8-1).

(c) Based on 50 percent of a maximum day demand (see Table 8-1).

(d) Based on storage required for largest potential fire flow within the pressure zone. Zones SF1/SF2 and VW1/VW2 = Industrial; Zones SF3 and SF4 = Single Family Residential.

(e) VW storage deficit can be met by SFPUC storage surplus.

## 8.4 EXISTING PUMPING CAPACITY EVALUATION

As described in Section 7.3.3 of this report, industry standard is to have firm pumping capacity equal to maximum day demand. For a given pump station, firm capacity is defined as the total capacity of all operational pumps minus the capacity of the largest pumping unit. In addition, pumping capacity in lower pressure zones should also be able to deliver the maximum day demand of any zones above them. For example, the Zone SF3 pumps should be able to deliver the maximum day demand for Zones SF3 and SF4 (i.e., SF4-1 and SF4-2).

Critical pumping facilities should be equipped with an on-site, backup power generator. A pump station is considered critical if it serves a pressure zone with insufficient storage and meets one of the following criteria:

- It is the largest facility that provides water to a pressure zone and/or service area;
- It is the sole water source to a pressure zone and/or service area;
- It provides water from a supply turnout; or
- It provides water from a key groundwater well.

As discussed in Section 8.3, the pressure zones with insufficient storage are VW1 and VW2. Therefore, the Gibraltar (VW) pump station is deemed critical and should have backup power provisions (which it does). While Zones SF3 and SF4 have sufficient storage, each is served by a single pump station. The City should consider installing backup power generators at the Country Club and Tularcitos pump stations for additional redundancy. These backup power projects are included in Table 11-2 as CIP IDs ECIP-BG-CC and ECIP-BG-TL.

Table 8-4 compares the available and required firm pumping capacities for each pressure zone. Similar to the storage capacity evaluation, Zones 1 and 2 in each service area are combined. In Zones SF1 and SF2, firm pumping capacity consists of one 5,500-gpm pump at Gibraltar (SF) and two 1,800-gpm pumps at Ayer. At 9,100 gpm combined, the firm pumping capacity in Zones SF1 and SF2 exceeds the required firm pumping capacity, which equals the existing MDD of Zones SF1, SF2, and all higher zones (i.e., the entire SFPUC service area). The pumping capacity surplus in Zones SF1 and SF2 is approximately 3,270 gpm.

Similarly, the firm pumping capacities in Zones SF3 and SF4 also exceed requirements. In Zone SF3, the firm pumping capacity consists of one 250-gpm pump at Country Club, while the combined existing MDD of Zones SF3 and higher (i.e., Zones SF3 and SF4) is 159 gpm. The pumping capacity surplus in Zone SF3 is approximately 91 gpm. In Zone SF4, the firm pumping capacity consists of one 250-gpm pump at Tularcitos. The existing MDD of Zone SF4 is only 115 gpm, resulting in a pumping capacity surplus of approximately 135 gpm.

Both sets of pumps at the Gibraltar (VW) PS are included in the pumping capacity evaluation for the VW service area. One set draws from the Gibraltar (VW) storage reservoir, while the other set boosts pressures from the Gibraltar turnout (if necessary). By adjusting valve operations, the “turnout” pumps can also draw from the Gibraltar (VW) storage reservoir. The combined firm capacity for both sets of pumps is 13,500 gpm, which exceeds the VW service area MDD (4,158 gpm) by approximately 9,340 gpm.

**Table 8-4. Comparison of Available and Required Firm Pumping Capacity**

| Pump Station | Critical Facility[a] | Existing On-site Backup Power | Status | Firm Capacity[b], gpm | Total Firm Pumping Capacity, gpm | Existing Maximum Day Demand[c], gpm | Pumping Capacity Surplus (Deficit), gpm |
|---|---|---|---|---|---|---|---|
| Zones SF1 and SF2 | | | | | | | |
| Gibraltar (SF) | | ✓ | Active | 5,500 | 9,100 | 5,833 | 3,267 |
| Ayer | | ✓ | Active | 3,600 | | | |
| Zone SF3 | | | | | | | |
| Country Club | | | Active | 250 | 250 | 159 | 91 |
| Zones SF4-1 and SF4-2 | | | | | | | |
| Tularcitos | | | Active | 250 | 250 | 115 | 135 |
| Zones VW1 and VW2 | | | | | | | |
| Gibraltar (VW) - from tank | ✓ | ✓ | Active | 5,500 | 13,500 | 4,158 | 9,342 |
| Gibraltar (VW) - from turnout[d] | ✓ | ✓ | Active | 8,000 | | | |

(a) Pump stations are considered critical if they serve a pressure zone with insufficient storage and meet other criteria. Refer to Table 7-1.

(b) Firm pumping capacity was defined as the total pump station capacity with the largest pump out of service.

(c) Includes maximum day demands for higher pressure zones, per Table 7-1.

(d) These pumps are intended to boost pressures from the VW turnout but can be valved to draw from the Gibraltar (VW) tank.

## 8.5 EXISTING WATER DISTRIBUTION SYSTEM EVALUATION

West Yost used the updated hydraulic model to conduct steady-state hydraulic analyses of the existing water distribution system. The goal of this evaluation is to identify necessary improvements to support the City's existing water demands while meeting the recommended system performance criteria presented in Sections 7.2.1 and 7.2.3 of this report.

In evaluating the existing system, pressure criteria are prioritized over velocity criteria. This prioritization is typical, because older water systems tend to have many undersized pipes, and strictly adhering to velocity standards would identify those pipes as candidates for replacement, even though pressures meet recommended criteria. West Yost does not recommend replacing existing pipes solely for failing to meet velocity criteria, so while velocity results will be summarized for non-emergency scenarios, the following analyses focus on pressures and fire flow availability.

The following evaluations examine distribution system performance under existing water demand conditions:

- Average Day Demand Scenario: evaluates the potential for high customer service pressures in the system during an average day demand condition
- Peak Hour Demand Scenario: evaluates the potential for low customer service pressures in the system during a peak hour demand condition
- Maximum Day Demand Scenario: evaluates the potential for low customer service pressures in the system during a maximum day demand condition
- Maximum Day plus Fire Flow Scenario: evaluates fire flow availability in the system under a maximum day demand condition
- Emergency Operations (each scenario is evaluated under (a) maximum day demand conditions and (b) maximum day demand plus fire flow):
  - Outage Scenario 1: SFPUC turnouts are offline
  - Outage Scenario 2: VW turnout is offline
  - Outage Scenario 3: SFPUC and VW turnouts are offline
  - Outage Scenario 4: Power outage; all facilities without backup generators are offline
  - Outage Scenario 5: PRVs normally allowing flow between Zones 1 and 2 are offline.

To capture the entire range of normal water system operations, each non-emergency scenario above was evaluated using two operational alternatives. These alternatives are described in the following section.

### 8.5.1 Evaluation Alternatives

Throughout a normal day, the City varies water distribution system operations to achieve different goals. During morning (approximately 6:00 am to 10:30 am) and evening (approximately 5:00 pm to 11:00 pm) peak demand periods in the SFPUC service area, pumps at Gibraltar (SF) and Ayer draw from their respective tanks and deliver flows to the system. This supplements turnout flows and turns over water stored in reservoirs. During midday (approximately 11:00 am to 4:00 pm) and overnight (approximately 12:00 am to 5:00 am) low demand periods, the pumps are off. Turnouts alone supply the system, including refilling the Gibraltar (SF) and Ayer tanks.

In the hillside zones (i.e., Zones SF3 and SF4), operations also vary by pump status. Both the Country Club and Tularcitos pump stations operate on a two-pump lead lag system, with operation determined by the water level of the "destination" reservoir (i.e., Tularcitos reservoir for the Country Club pumps and Minnis reservoir for the Tularcitos pumps). The maximum water level in both reservoirs is 23 feet, and setpoints are the same for both pump stations. The lead pump turns on when the destination reservoir level is 15 feet and stops at 21.5 feet, while the lag pump starts at 14 feet and stops at 21 feet. When the Country Club and Tularcitos pumps are off, the Tularcitos and Minnis storage reservoirs serve zones SF3 and SF4, respectively, via gravity. When the Country Club and Tularcitos pumps are operating, they simultaneously serve the hillside zones and refill the elevated storage tanks.

The Gibraltar (VW) pumps also operate on a daily schedule, depending on the season. In the winter and spring, pumps operate during the day (approximately 6:30 am to 5:00 pm), and the Gibraltar (VW) reservoir fills overnight (approximately 7:00 pm to 4:00 am). The schedule reverses in the summer and fall, with the reservoir filling during the day (approximately 7:00 am to 5:00 pm) and pumps running overnight (approximately 9:00 pm to 5:00 am). Seasonal operations change around May 15th and November 15th, based on peak rate schedules set by Pacific Gas and Electric (PG&E).

West Yost identified two operational alternatives to represent the primary modes in which the water system normally functions. These operational alternatives are summarized in Table 8-5. In Base operations, all pumps are off, whereas Alternative 1 allows pump operation as needed. For both alternatives, all turnouts are open, and gravity tank levels are at their minimum. Since the Zone 1 and Zone 2 storage reservoirs (both Gibraltar tanks and the Ayer tank) feed booster pumps, their tank levels do not impact system pressures. Therefore, they are not listed in Table 8-5.

**Table 8-5. Summary of Operational Alternatives**

| Facility | Base | Alternative 1 – Pumps On |
|---|---|---|
| SFPUC Service Area | | |
| Turnouts[(a)] | Open | |
| Gibraltar (SF) Pump Station | **Closed** | Open |
| Ayer Pump Station | **Closed** | Open |
| Country Club Pump Station | **Closed** | Open |
| Tularcitos Tank Level | Minimum | |
| Tularcitos Pump Station | **Closed** | Open |
| Minnis Tank Level | Minimum | |
| VW Service Area | | |
| Gibraltar Turnout | Open | |
| Gibraltar (VW) Pump Station | **Closed** | Open |

(a) SFPUC turnouts include Sunnyhills, Calaveras, Main Street, and the Intertie turnout.

## 8.5.2 Average Day Demand Analysis

The hydraulic model was used to conduct a steady-state hydraulic analysis of the system during an existing average day demand (ADD) condition for each of the alternatives listed in Table 8-5. As shown in Table 8-1, the ADD for the existing water service area is approximately 5,784 gpm (8.33 mgd). Per recommended water system performance criteria detailed in Section 7.2.3 of this report, under ADD conditions pressures should be at least 40 psi at customer service connections. In addition, customer service pressures should not exceed 80 psi in Zone 1 (SF1 and VW1) or 150 psi in other zones.

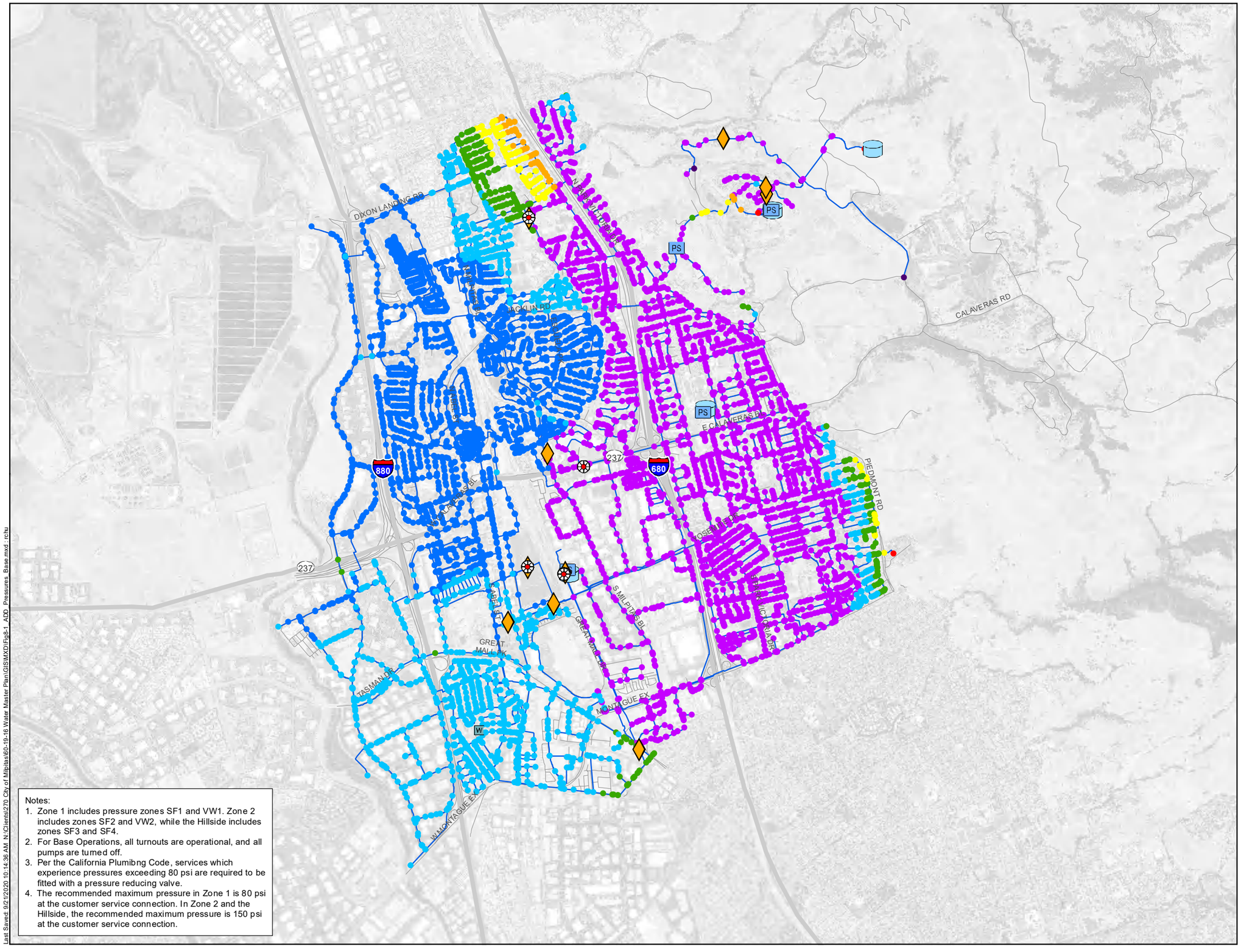
Results from the ADD simulations for Base and Alternative 1 operations are shown on Figure 8-1 and Figure 8-2, respectively. In each figure, color-coded circles represent distribution system pressures during an ADD condition. In both Base and Alternative 1 cases, there are no customer service locations with pressures below 40 psi. The lowest customer service pressure in the distribution system is approximately 42 psi (Base alternative), located at the eastern end of Manferd Street near I-680 in Zone SF1. The same location has the lowest pressure with pumps on (Alternative 1), but the pressure is slightly higher (44 psi).

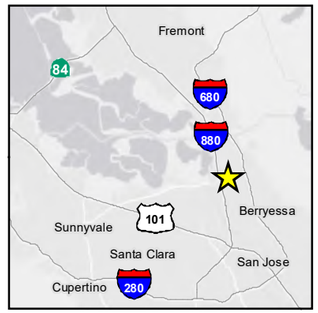
Many customer service locations experience pressures above the recommended limit. Pressures are generally higher when pumps are on, so Alternative 1 (Figure 8-2) is a more conservative representation of high pressures within the system. Per Table 7-1, recommended maximum pressures vary by zone, so Figure 8-1 and Figure 8-2 classify high pressures (i.e., exceeding the maximum) accordingly.

In Zone 1 (SF1 and VW1), high pressures are defined as exceeding 80 psi, and corresponding locations are dark blue. Much of Zone SF1 and the northern portion of Zone VW1 experience high pressures during an ADD condition. In Zone 2 (SF2 and VW2) and above (SF3 and SF4), high pressures are defined as exceeding 150 psi, and corresponding locations are dark purple. As shown on Figure 8-2, the area north of Highway 237 and adjacent to I-680 in Zone SF2 experiences high pressures during an ADD condition.

California Plumbing Code requires new services with pressures greater than 80 psi be fitted with a PRV. West Yost recommends that the City verify that individual PRVs are installed on existing customer service laterals in high pressure areas (i.e., dark blue, light purple, and dark purple locations on Figure 8-2). Alternatively, the City could install PRVs on potable water mains and create pressure sub-zones within the existing pressure zones; however, creation of pressure sub-zones would restrict the ability to move water between the existing zones and would reduce the fire flow availability.

Per Table 7-1, under normal conditions the maximum recommended velocities for transmission and distribution mains is 6 and 8 ft/s, respectively. Transmission mains are pipelines 16 inches or larger in diameter, while distribution mains are pipelines smaller than 16 inches in diameter. Under an existing ADD condition, almost all pipelines meet recommended velocity criteria. The only high-velocity pipeline segments are on either side of the Sunnyhills PRV. This 6-inch diameter stretch of pipe experiences velocities of 16.5 ft/s in the Base alternative and 9.0 ft/s in Alternative 1. The remaining pipes meet recommended velocity criteria, with velocities ranging from 0.01 ft/s to approximately 6.1 ft/s.




N

0 1,500 3,000

Scale in Feet

**Average Day Pressure**

- Less than 40 psi
- 40 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

Notes:

1. Zone 1 includes pressure zones SF1 and VW1. Zone 2 includes zones SF2 and VW2, while the Hillside includes zones SF3 and SF4.
2. For Base Operations, all turnouts are operational, and all pumps are turned off.
3. Per the California Plumibng Code, services which experience pressures exceeding 80 psi are required to be fitted with a pressure reducing valve.
4. The recommended maximum pressure in Zone 1 is 80 psi at the customer service connection. In Zone 2 and the Hillside, the recommended maximum pressure is 150 psi at the customer service connection.

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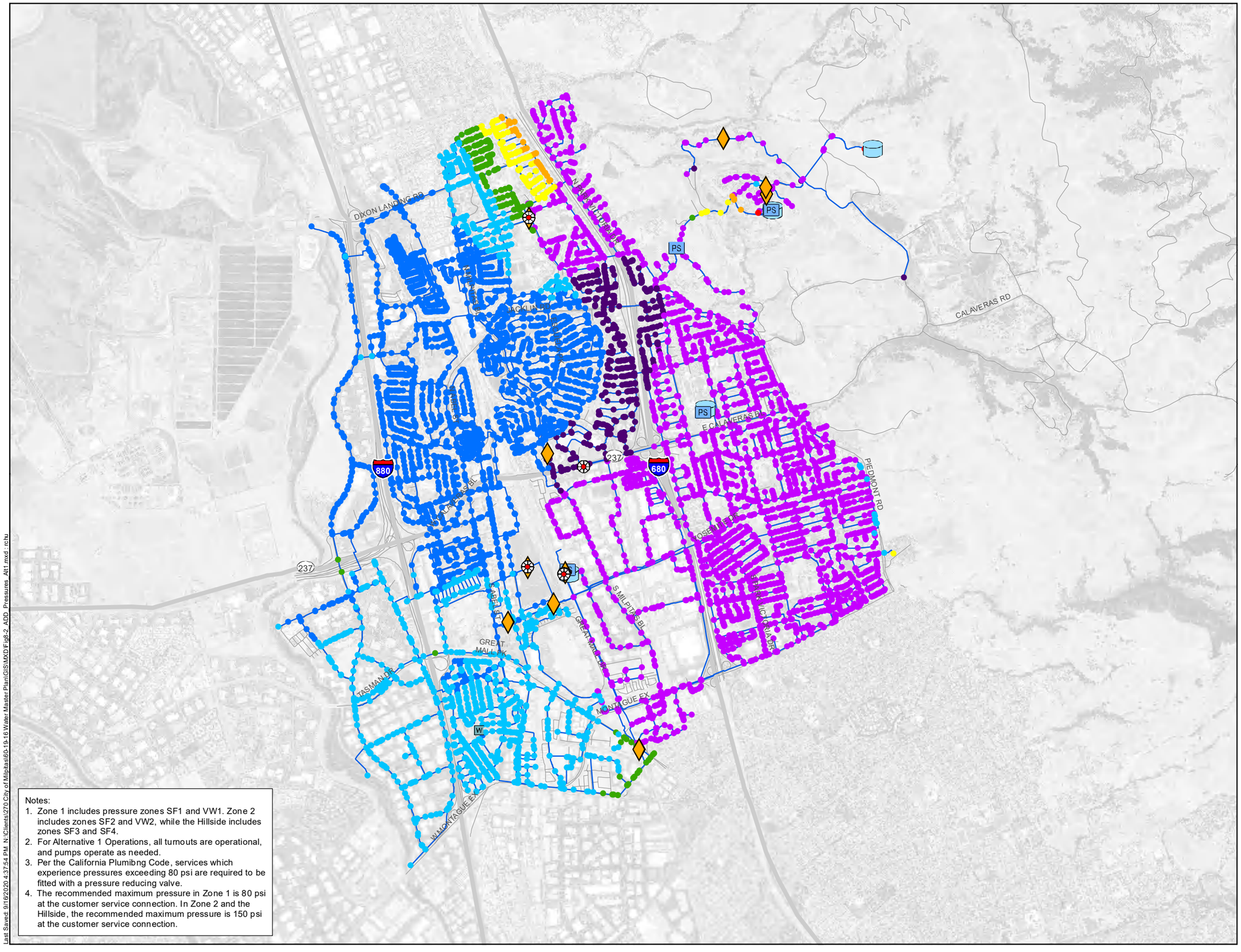
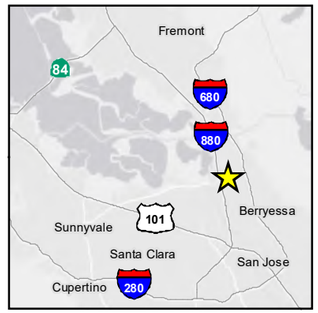
## Figure 8-1

## Existing System Pressures Average Day Demand Base Operations

City of Milpitas
2020 Water Master Plan




N

0 1,500 3,000

Scale in Feet

**Average Day Pressure**

- Less than 40 psi
- 40 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

Notes:

1. Zone 1 includes pressure zones SF1 and VW1. Zone 2 includes zones SF2 and VW2, while the Hillside includes zones SF3 and SF4.
2. For Alternative 1 Operations, all turnouts are operational, and pumps operate as needed.
3. Per the California Plumibng Code, services which experience pressures exceeding 80 psi are required to be fitted with a pressure reducing valve.
4. The recommended maximum pressure in Zone 1 is 80 psi at the customer service connection. In Zone 2 and the Hillside, the recommended maximum pressure is 150 psi at the customer service connection.

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**Figure 8-2**

**Existing System Pressures**
**Average Day Demand**
**Alternative 1 Operations**

City of Milpitas
2020 Water Master Plan

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## 8.5.3 Peak Hour Demand Analysis

The hydraulic model was used to conduct a steady-state hydraulic analysis of the system during an existing PHD condition for each of the alternatives listed in Table 8-5. As shown in Table 8-1, the PHD for the existing water service area is approximately 18,011 gpm (25.9 mgd). Under PHD conditions, the recommended minimum pressure is 30 psi. Any services experiencing pressures less than 30 psi during a PHD condition would require an individual booster pump.

Results from the PHD simulations for Base and Alternative 1 operations are shown on Figure 8-3 and Figure 8-4, respectively. Figure 8-3 and Figure 8-4 are similar to Figure 8-1 and Figure 8-2, with distribution system locations color coded by pressure. Pressures are slightly higher for Alternative 1 (pumps on), but there are no significant differences in system performance based on operations. In both cases, there are no customer service locations with pressures below 30 psi.

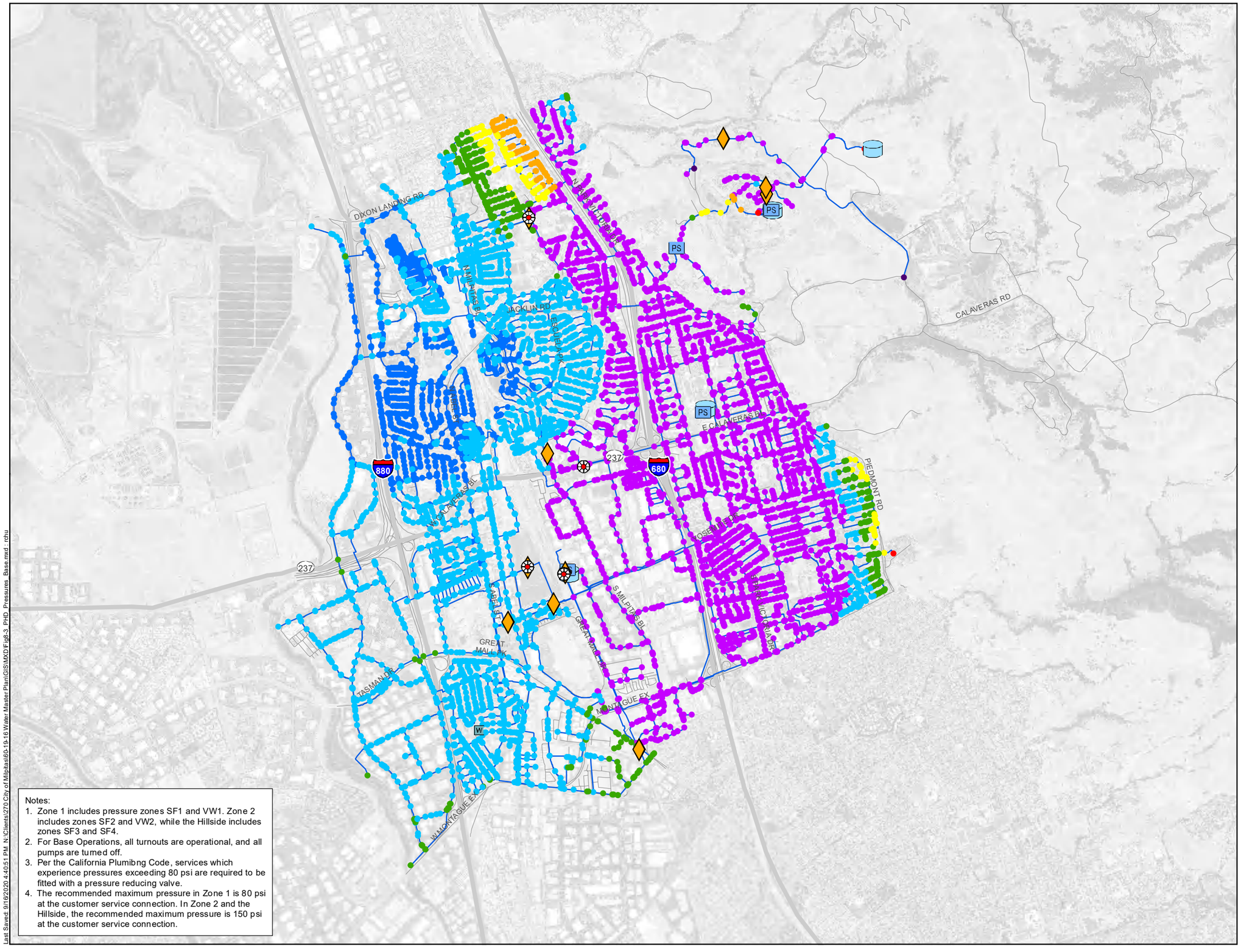
Almost all distribution system pipelines meet velocity criteria under PHD conditions. The 6-inch diameter pipes on either end of the Sunnyhills PRV continue to experience high velocities: 25.5 ft/s in the Base alternative and 19.9 ft/s in Alternative 1. Pipelines at the Gibraltar facility and at the Sunnyhills and Main turnouts also see high velocities (8-12 ft/s). For the rest of the system, velocities range from 0.01 ft/s to approximately 7.8 ft/s.

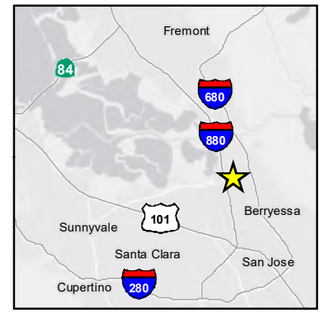
## 8.5.4 Maximum Day Demand Analysis

The hydraulic model was used to conduct a steady-state hydraulic analysis of the system during an existing MDD condition for each of the alternatives listed in Table 8-5. As shown in Table 8-1, the MDD for the existing water service area is approximately 9,990 gpm (14.4 mgd). Under MDD conditions, the recommended minimum pressure is 40 psi. The same maximum pressure criteria apply as described in the ADD analysis, but since pressures would be higher under ADD conditions, system performance relative to maximum pressures is not discussed here.

Results from the MDD simulations for Base and Alternative 1 operations are shown on Figure 8-5 and Figure 8-6, respectively. As with figures for ADD and PHD demand conditions, distribution system locations are color coded by pressure. Pressures are slightly higher for Alternative 1 (pumps on), but there are no significant differences in system performance based on operations. In both cases, there are no customer service locations with pressures below 40 psi.

Almost all distribution system pipelines meet velocity criteria under MDD demand conditions. The 6-inch diameter pipes on either end of the Sunnyhills PRV experience high velocities: approximately 19.1 ft/s and 12.1 ft/s under Base and Alternative 1 operations, respectively. Also, on either side of the Gibraltar PRV, the 16-inch diameter pipes see velocities of 6.6 ft/s under Base operations. For the rest of the system, velocities range from 0.01 ft/s to approximately 7.7 ft/s.




N

0 1,500 3,000

Scale in Feet

**Peak Hour Pressure**

- Less than 30 psi
- 30 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

CITY OF MILPITAS CALIFORNIA

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# Figure 8-3

## Existing System Pressures Peak Hour Demand Base Operations

City of Milpitas
2020 Water Master Plan

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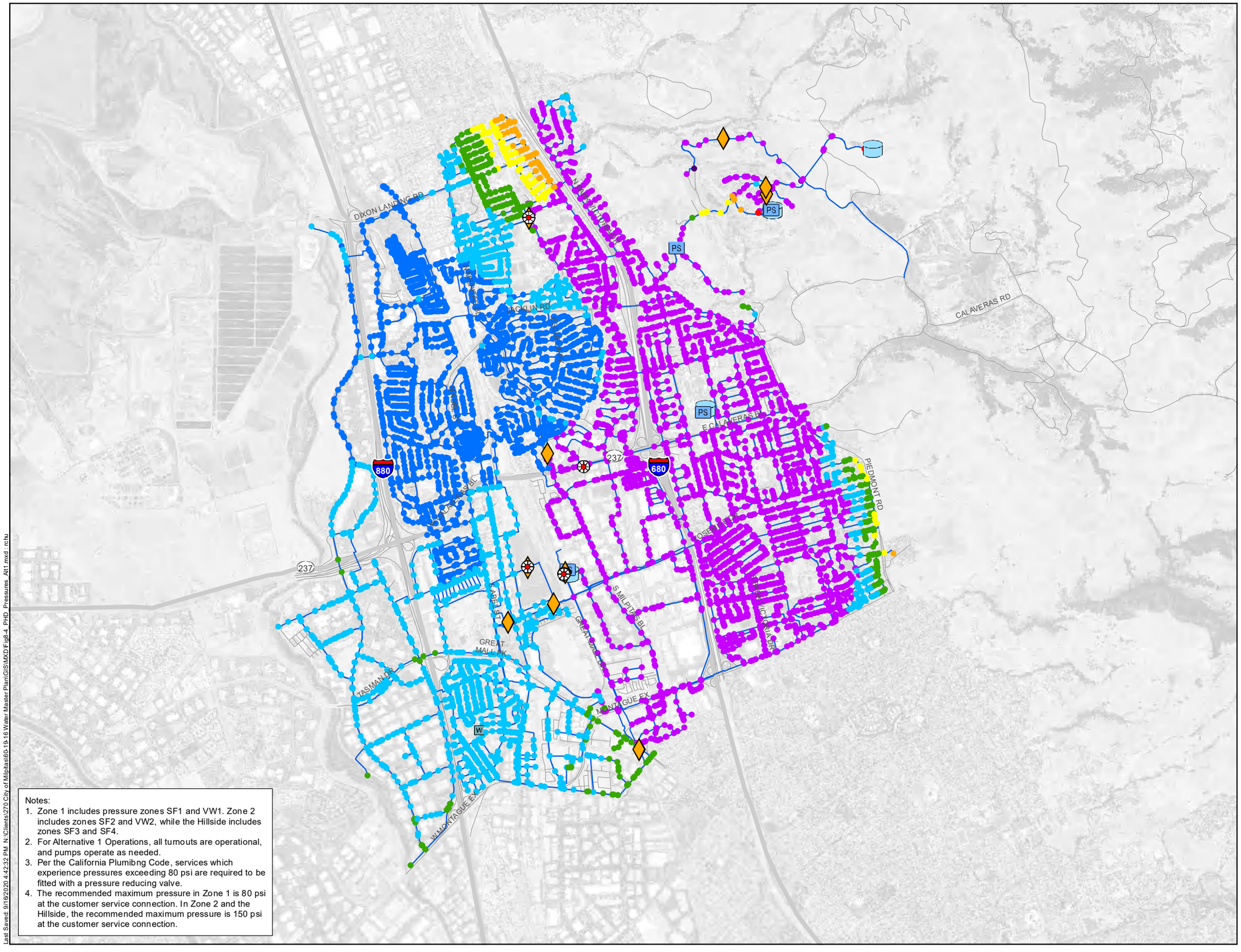


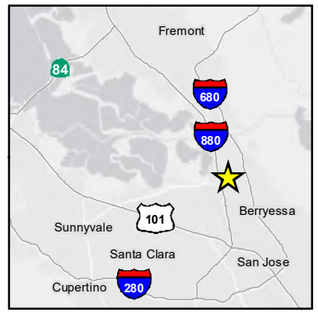


N

0 1,500 3,000

Scale in Feet

**Peak Hour Pressure**

- Less than 30 psi
- 30 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

Notes:

1. Zone 1 includes pressure zones SF1 and VW1. Zone 2 includes zones SF2 and VW2, while the Hillside includes zones SF3 and SF4.
2. For Alternative 1 Operations, all turnouts are operational, and pumps operate as needed.
3. Per the California Plumibng Code, services which experience pressures exceeding 80 psi are required to be fitted with a pressure reducing valve.
4. The recommended maximum pressure in Zone 1 is 80 psi at the customer service connection. In Zone 2 and the Hillside, the recommended maximum pressure is 150 psi at the customer service connection.

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CITY OF MILPITAS CALIFORNIA

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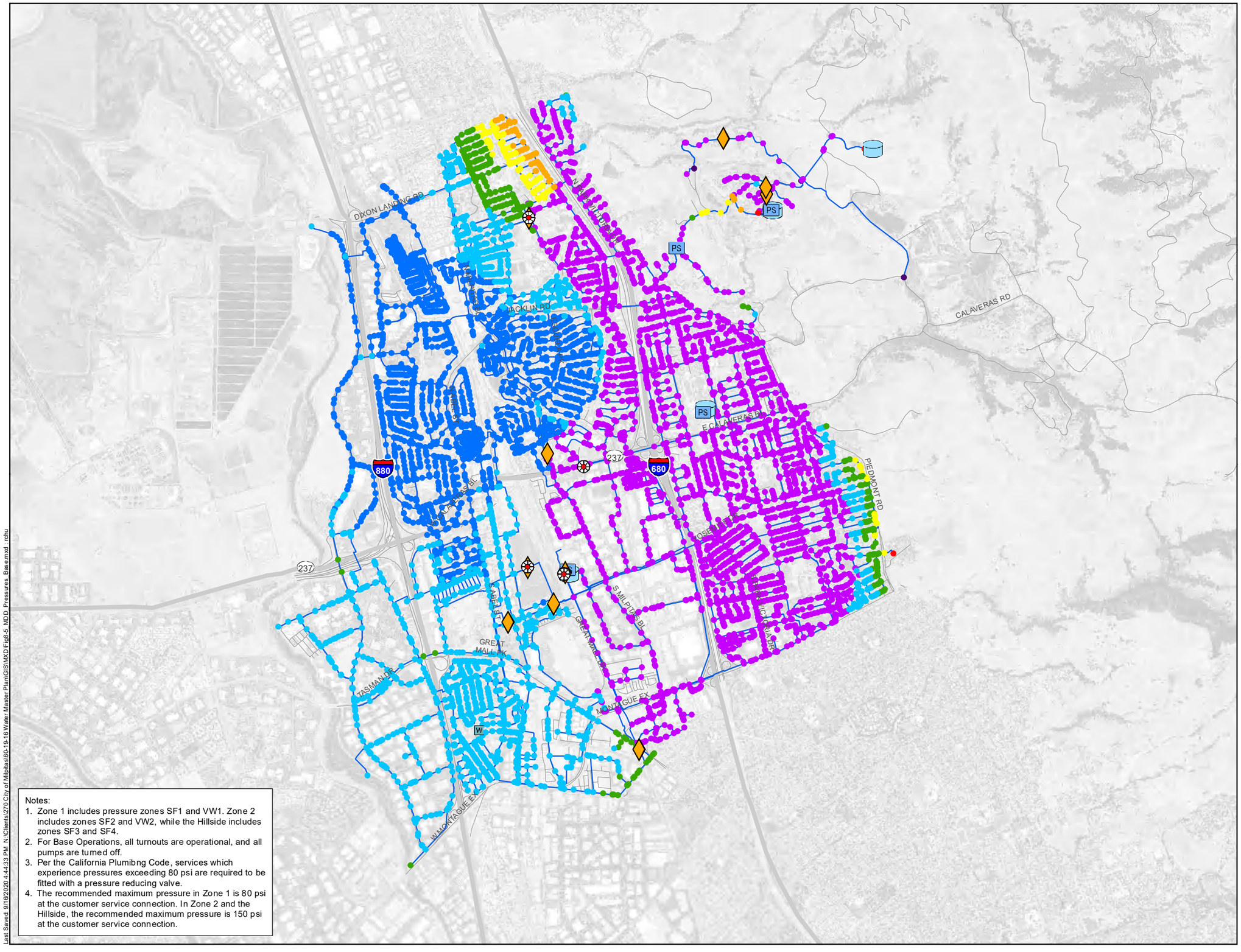
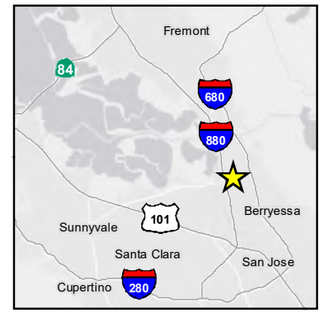
**Figure 8-4**

**Existing System Pressures**
**Peak Hour Demand**
**Alternative 1 Operations**

City of Milpitas
2020 Water Master Plan




N

0 1,500 3,000

Scale in Feet

**Maximum Day Pressure**

- Less than 40 psi
- 40 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

Notes:

1. Zone 1 includes pressure zones SF1 and VW1. Zone 2 includes zones SF2 and VW2, while the Hillside includes zones SF3 and SF4.
2. For Base Operations, all turnouts are operational, and all pumps are turned off.
3. Per the California Plumibng Code, services which experience pressures exceeding 80 psi are required to be fitted with a pressure reducing valve.
4. The recommended maximum pressure in Zone 1 is 80 psi at the customer service connection. In Zone 2 and the Hillside, the recommended maximum pressure is 150 psi at the customer service connection.

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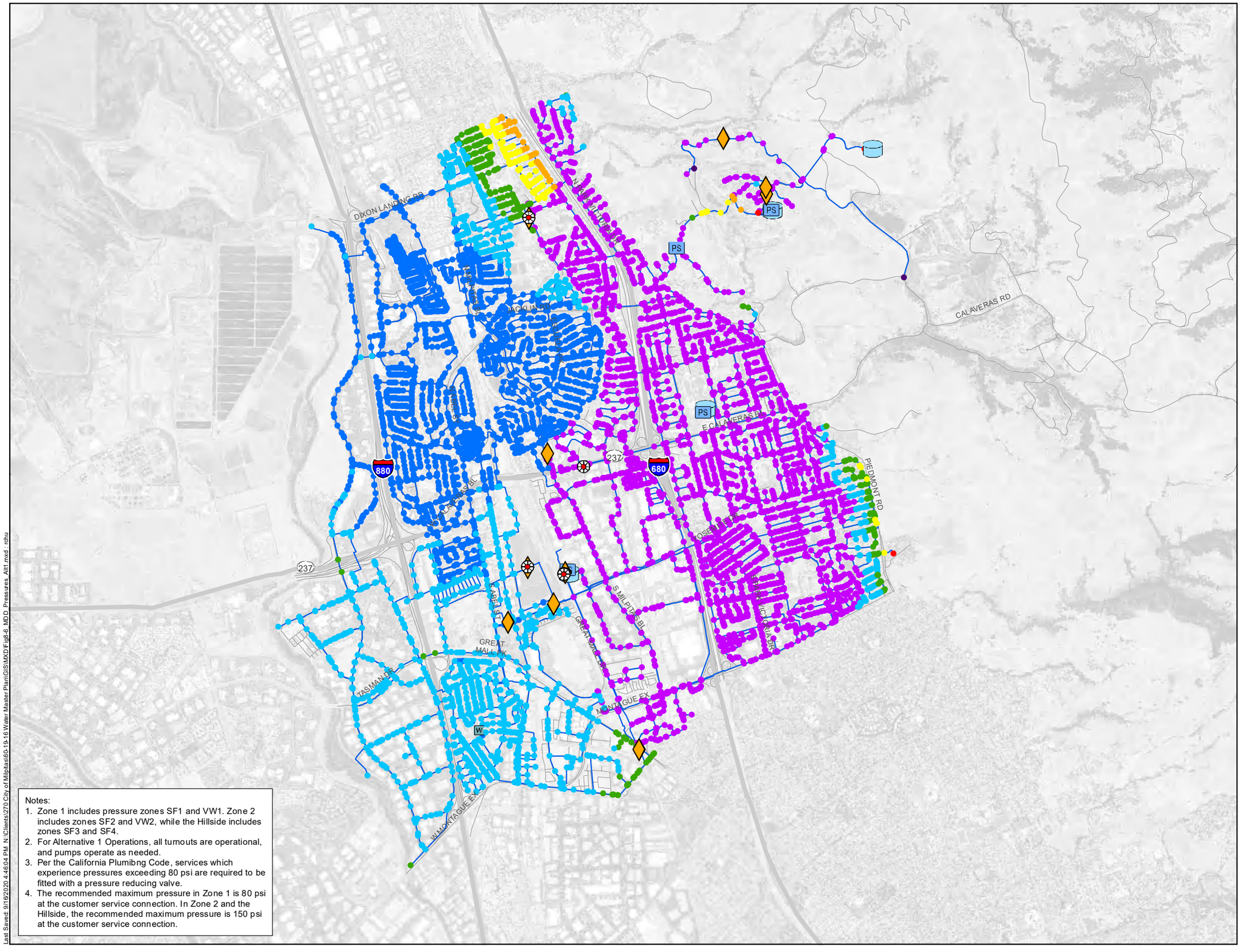
**Figure 8-5**

**Existing System Pressures**
**Maximum Day Demand**
**Base Operations**

City of Milpitas
2020 Water Master Plan




**Maximum Day Pressure**

- Less than 40 psi
- 40 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

Notes:

1. Zone 1 includes pressure zones SF1 and VW1. Zone 2 includes zones SF2 and VW2, while the Hillside includes zones SF3 and SF4.
2. For Alternative 1 Operations, all turnouts are operational, and pumps operate as needed.
3. Per the California Plumibng Code, services which experience pressures exceeding 80 psi are required to be fitted with a pressure reducing valve.
4. The recommended maximum pressure in Zone 1 is 80 psi at the customer service connection. In Zone 2 and the Hillside, the recommended maximum pressure is 150 psi at the customer service connection.

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**Figure 8-6**

**Existing System Pressures**
**Maximum Day Demand**
**Alternative 1 Operations**

City of Milpitas
2020 Water Master Plan

## 8.5.5 Maximum Day Demand Plus Concurrent Fire Flow Analysis

Based on existing land use of adjacent parcels and recommended fire flows in Table 7-1, fire flows were assigned to hydrant locations throughout the distribution system. Where a hydrant may serve multiple land uses (e.g., commercial and industrial), the higher fire flow was assigned. In total, fire flows were assigned to approximately 2,150 locations throughout the distribution system.

Fire flows were then simulated during an MDD condition using the hydraulic model. The hydraulic model conducts fire flow analyses by simulating a fire flow demand at one hydrant location and verifying whether the system can serve all other normal customer demands while maintaining desired residual pressures. This is repeated for all hydrant locations within the distribution system. Hydrant locations meet recommended fire flows if they can deliver the recommended fire flow while maintaining a 20-psi residual system pressure. Note, this fire flow analysis reflects distribution system capacity, as individual hydrants and their associated losses are not modeled.

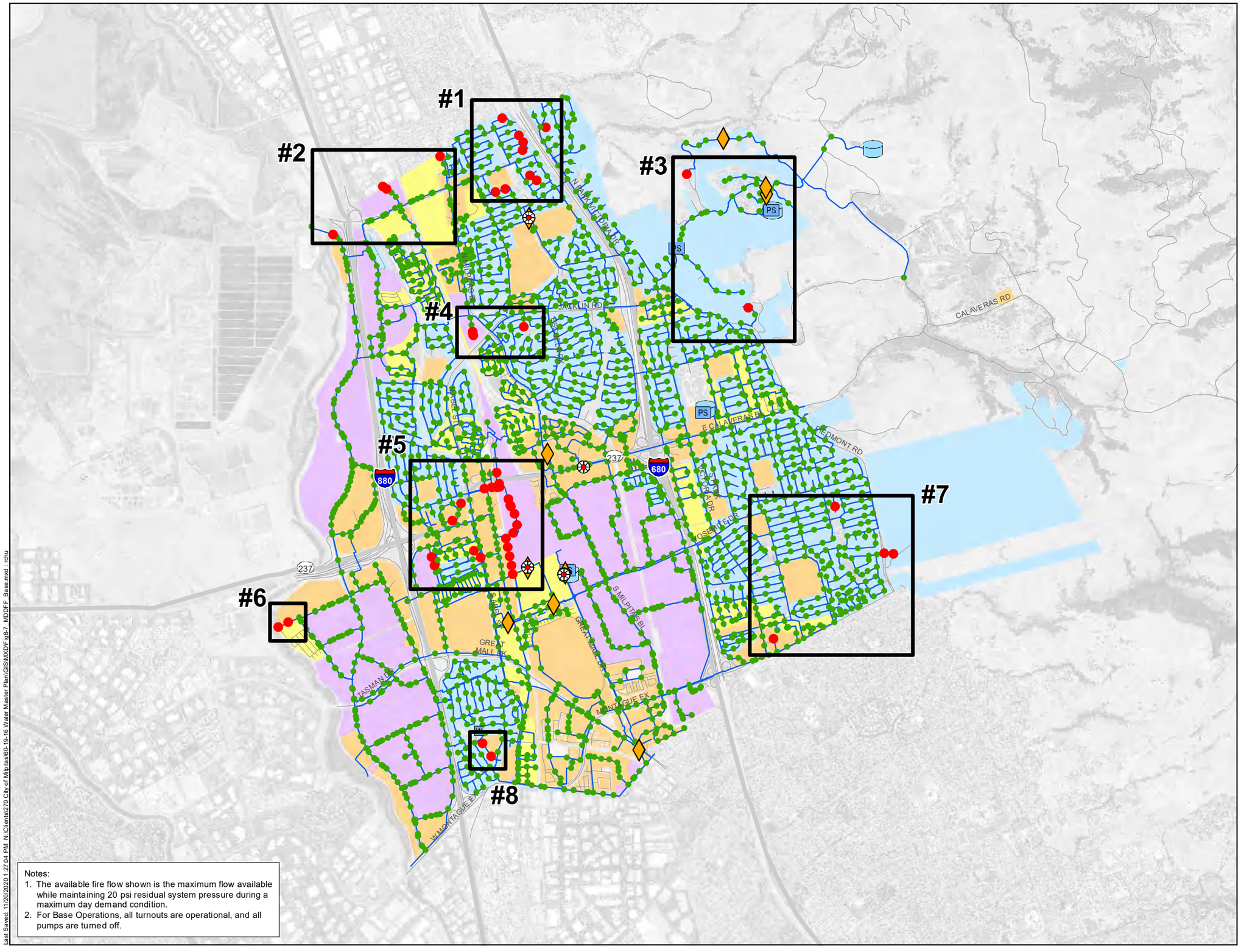
As discussed in Section 7.2.1, recommended fire flow criteria presented in Table 7-2 apply to future development and not existing system conditions. Much of the City's distribution system is older and was designed to earlier fire flow standards in place at the time the pipelines were installed. Therefore, the existing system fire flow evaluation presents systemwide available fire flow and does not recommend pipeline improvements to increase existing fire flow capacity. However, the City can use these results to prioritize replacing smaller diameter pipelines to improve overall flows throughout the distribution system, which is why potential improvement projects are discussed below.

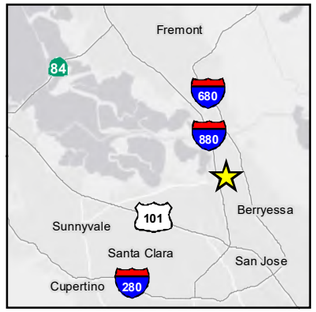
Fire flow analyses were performed independently for each pressure zone, with Zones 1 and 2 combined for each service area. It was assumed that only one fire event would occur at a time, which is standard industry practice. Results from MDD plus concurrent fire flow simulations for Base and Alternative 1 operations are shown on Figure 8-7 and Figure 8-8, respectively. Hydrant locations are represented by circles and color coded by fire flow availability, while parcels are shaded according to recommended fire flow. For example, a green circle adjacent to a purple parcel means that the distribution system can meet a 4,000 gpm fire flow at that location while maintaining 20 psi in the rest of the system.

System performance is similar for the two operational alternatives. With pumps off (Base alternative), 51 locations do not meet recommended fire flows, while 45 locations are below the fire flow criterion under Alternative 1. All "below criterion" locations in Alternative 1 are also flagged in the Base alternative, so pump operation improves fire flow availability for six locations. Since pumps could be off during a fire event, recommended improvements address all 51 below criterion locations identified in the Base alternative.

Before evaluating system improvements, West Yost examined each below criterion location to verify whether the recommended fire flow could be adequately served by multiple hydrants. Distributing the recommended fire flow among multiple hydrants reduces friction losses, because only a portion of the flow reaches the hydrant closest to the simulated fire. The remainder of the fire flow is delivered by an adjacent hydrant served by a shorter (or entirely different) pipeline path. These reduced friction losses can be significant, in some cases allowing otherwise below criterion locations to meet recommended fire flows.

It was assumed that any location with another hydrant within the City's hydrant spacing guidelines (500 feet for single family areas and 300 feet for all other areas) would qualify for delivering fire flows through multiple hydrants. If the qualifying hydrants could combine to deliver the recommended fire flow while maintaining a 20-psi residual system pressure, then the location was no longer considered below criterion" Of the 51 below criterion locations identified in the Base alternative, 13 met recommended fire flows after looking at multiple hydrants.




N

0 1,500 3,000

Scale in Feet

**Available Fire Flow**

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

Notes:
1. The available fire flow shown is the maximum flow available while maintaining 20 psi residual system pressure during a maximum day demand condition.
2. For Base Operations, all turnouts are operational, and all pumps are turned off.

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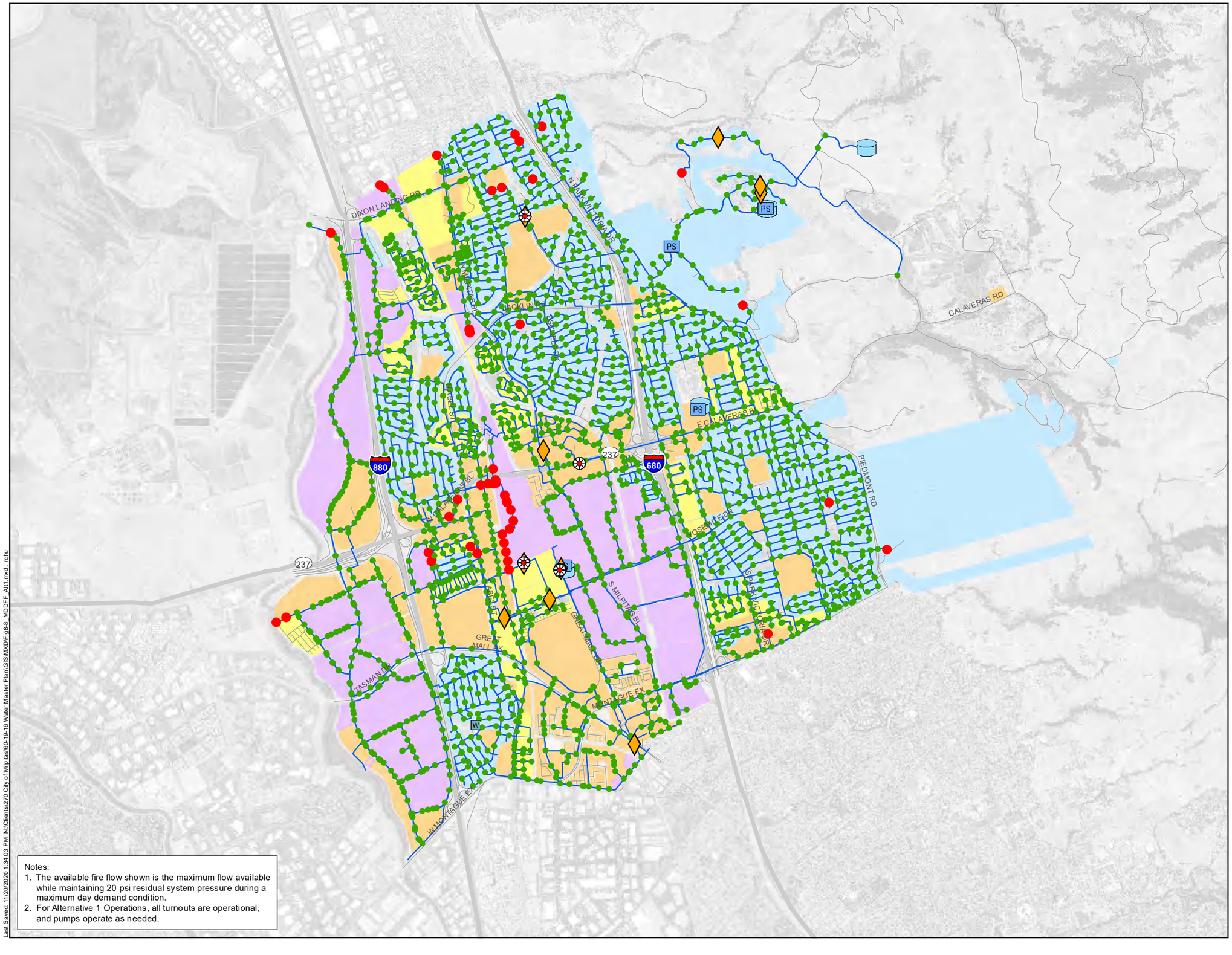
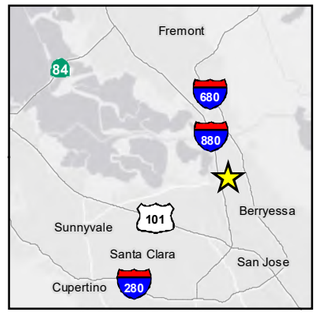
**Figure 8-7**

**Existing System Available Fire Flow Base Operations**

City of Milpitas
2020 Water Master Plan




N

0 1,500 3,000

Scale in Feet

**Available Fire Flow**

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

Notes:
1. The available fire flow shown is the maximum flow available while maintaining 20 psi residual system pressure during a maximum day demand condition.
2. For Alternative 1 Operations, all turnouts are operational, and pumps operate as needed.

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**Figure 8-8**

**Existing System Available Fire Flow Alternative 1 Operations**

City of Milpitas
2020 Water Master Plan

To organize discussion of the remaining below criterion locations, Figure 8-7 groups them into eight geographic areas. The recommended improvements for each area are discussed below. As mentioned earlier, each proposed project is assigned a CIP ID to simplify cross-referencing with Chapter 11. In general, to comply with the City's design guidelines, the City should also consider upsizing any pipelines smaller than 6 inches in diameter that serve hydrants. These are also listed below.

- Area No. 1
  - Along Sussex Place, replace approximately 190 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-23)
- Area No. 2
  - Along Milmont Drive between Dixon Landing Road and the ACWD intertie, replace approximately 910 LF of 8-inch and 10-inch diameter pipeline with 12-inch diameter pipeline (ECIP-PI-06)
- Area No. 3
  - Along Calera Creek Heights Drive between approximately hydrants 4A-001 and 4A-005, replace approximately 1,480 LF of 6-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-26)
- Area No. 4
  - Along Hanson Court, replace approximately 610 LF of 8-inch diameter pipeline with 12-inch diameter pipeline (ECIP-PI-05)
  - Along Merz Court, replace approximately 430 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-21)
- Area No. 5
  - Along Sinnott Lane, Bothelo Avenue, and East Carlo Street, replace approximately 1,730 LF of 6-inch and 8-inch diameter pipeline with 12-inch diameter pipeline (ECIP-PI-01)
  - On Hammond Way near Tom Evatt Park, replace the (normally closed) isolation valve separating Zones VW1 and SF1 with an emergency pressure reducing valve (EPRV) to allow flows from Zone SF1 during a fire event along Hammond Way (ECIP-V-01). Alternatively, the City can replace approximately 1,300 LF of 8-inch diameter pipeline with 12-inch diameter pipeline (ECIP-PI-02).
  - Along Railroad Avenue between approximately hydrant 1A-355 and the southern end of Railroad Avenue, replace approximately 880 LF of 8-inch diameter pipeline with 12-inch diameter pipeline (ECIP-PI-07)
  - For the below criterion locations near the western end of Corning Avenue, install a new isolation valve at the end of the existing Zone SF1 pipeline, immediately upstream of the tee connecting Zones VW1 and SF1. Should a fire occur at the adjacent industrial site, the City can open existing (normally closed) isolation valves (numbers 35 and 35100) to supplement flows to the area. The hydraulic model shows these locations meet recommended fire flows with this adjustment. The new isolation valve can be closed to maintain separation between Zones VW1 and SF1 (ECIP-V-02). Alternatively, the City can replace approximately 870 LF of 8-inch diameter pipeline with 12-inch diameter pipeline (ECIP-PI-03).

  - Along South Abel Street between Sylvia Avenue and Corning Avenue, replace approximately 240 LF of 6-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-11)

- Area No. 6
  - Along Technology Drive between Murphy Ranch Road and the western end of Technology Drive, replace approximately 740 LF of 4-inch diameter pipeline with 12-inch diameter pipeline (ECIP-PI-04)
- Area No. 7
  - Along Carlsbad Street between Carlsbad Court and Ben Rodgers Park, replace approximately 160 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-25)
  - Along Pinard Street from Ridgemont Drive up to the Lee's Orchard community, replace approximately 680 LF of 8-inch diameter pipeline with 12-inch diameter pipeline (ECIP-PI-16)
  - Within the shopping center east of the intersection of South Park Victoria Drive and Landess Avenue, replace approximately 450 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-08)
- Area No. 8
  - Along Greenwood Way between Pinewood Way and Fallen Leaf Drive, replace approximately 860 LF of 6-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-10)
- Pipelines less than 6 inches in diameter that serve hydrants
  - Along Santa Rita Drive near the intersection of Santa Rita Drive and Via Baja Drive, replace approximately 20 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-32)
  - Along Calle del Prado, replace approximately 90 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-33)
  - Along Kennedy Drive between Topham Court and Prada Drive, replace approximately 330 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-34)
  - Along Ramos Court, replace approximately 60 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-36)
  - Along Stemel Court, replace approximately 50 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-37)
  - Along Sepulveda Court, replace approximately 20 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-38)
  - Along Berg Court, replace approximately 110 LF of 4-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-39)

## 8.5.6 Emergency Outage Scenarios

The following emergency outage evaluations identify how well the distribution system functions without one or more key facilities. For reference, the outage scenarios consist of:

- SFPUC turnouts are offline
- VW turnout is offline
- SFPUC and VW turnouts are offline
- Power outage; all facilities without backup generators are offline
- PRVs normally allowing flow between Zones 1 and 2 are offline

Emergency outage scenarios are not intended to evaluate the adequacy of emergency water supplies, which is outside the scope of this master plan. Instead, these evaluations examine system pressures and fire flow availability during an MDD condition. To be conservative, storage reservoir levels are assumed to be at the minimum of normal operating range (see Table 3-4).

Since emergency scenarios assume certain facilities are offline, the corresponding evaluations do not examine system performance under Base and Alternative 1 operations. Besides the assumed outage, there are no additional operational restrictions. All facilities not assumed offline as part of the scenario are assumed to be operational.

Results for each emergency outage scenario are summarized below. Where presented, figures showing system performance during emergency outages are similar to non-emergency figures discussed above. Distribution system locations are color coded by either pressure (for MDD evaluations) or fire flow availability (for fire flow evaluations).

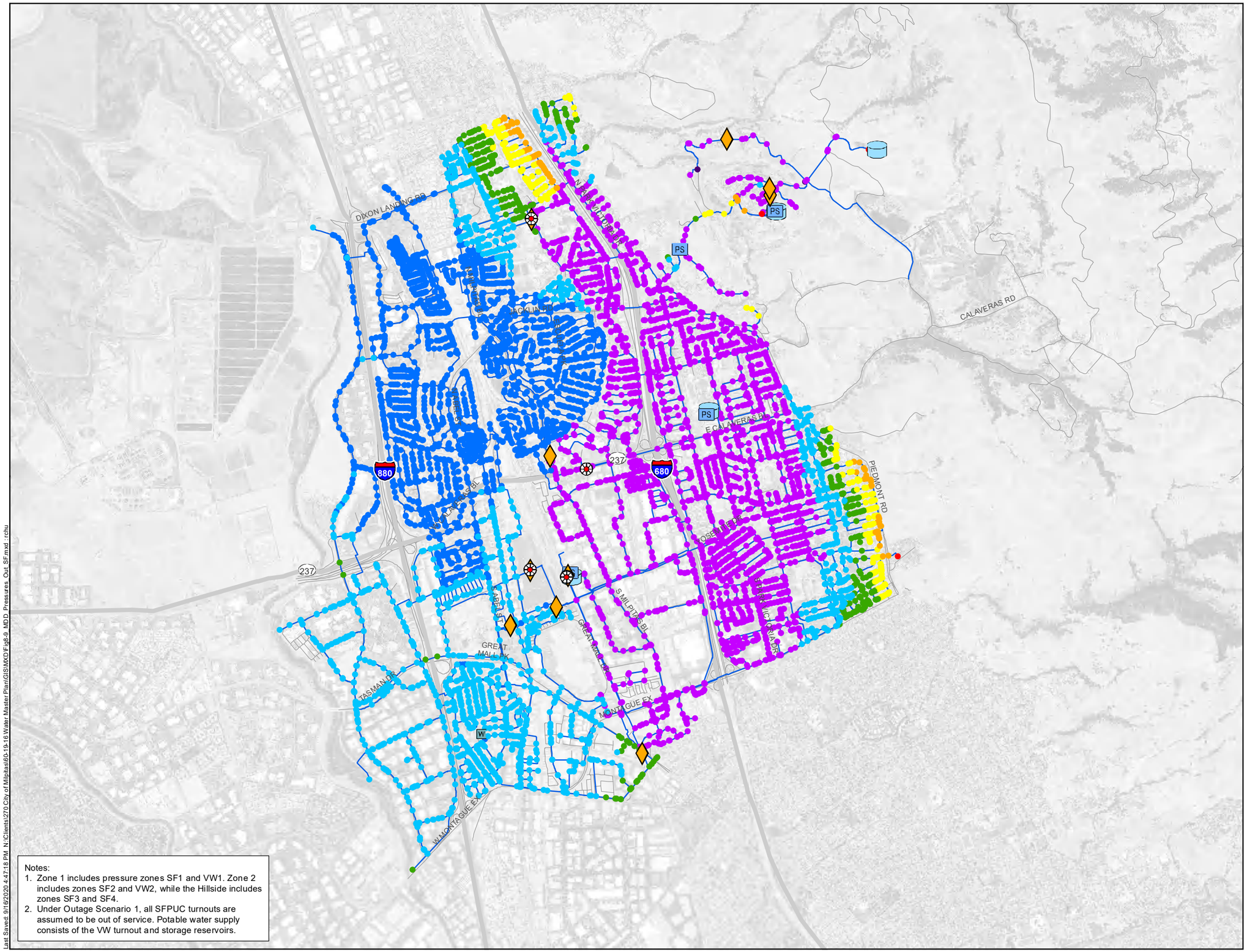
### *8.5.6.1 Outage Scenario 1 – SFPUC Offline*

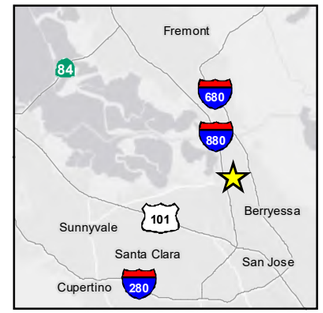
This outage scenario assumes supply from SFPUC is unavailable, so the Sunnyhills, Calaveras, Main Street, and Intertie turnouts are offline. As a result, the City's normally available potable water supply consists of VW (i.e., the Gibraltar turnout) and storage.

Figure 8-9 shows system pressures under MDD conditions in this outage scenario. Even without SFPUC turnout flows, the system is able to maintain adequate pressures. There are no customer service locations with pressures below 40 psi.

Fire flow availability is significantly hindered with SFPUC turnouts offline. As shown on Figure 8-10, in this outage scenario more than 260 locations do not meet recommended fire flows under this outage scenario. Compared to normal operations, this is over 200 additional below criterion locations, most of which are in Zone SF2. This is due to the relatively small pumps at the Ayer pump station. While the Gibraltar (SF) pumps can serve Zone SF1 fire flows, the pumps at the Ayer pump station cannot deliver Zone SF2 fire flows.

As a result, West Yost recommends installing a pump to meet fire flow at the Ayer pump station (ECIP-PS-AY) with a design capacity of 4,000 gpm at 285 ft of total dynamic head (TDH). Hydraulic model results show that with the pump installed, the distribution system actually slightly outperforms the existing system under normal conditions. While 45 locations were below criterion under Alternative 1 operations, 43 are below criterion with SFPUC turnouts offline and the new Ayer pump active.




N

0 1,500 3,000

Scale in Feet

**Maximum Day Pressure**

- Less than 40 psi
- 40 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

# Figure 8-9

## Existing System Pressures Maximum Day Demand Outage Scenario 1

City of Milpitas
2020 Water Master Plan

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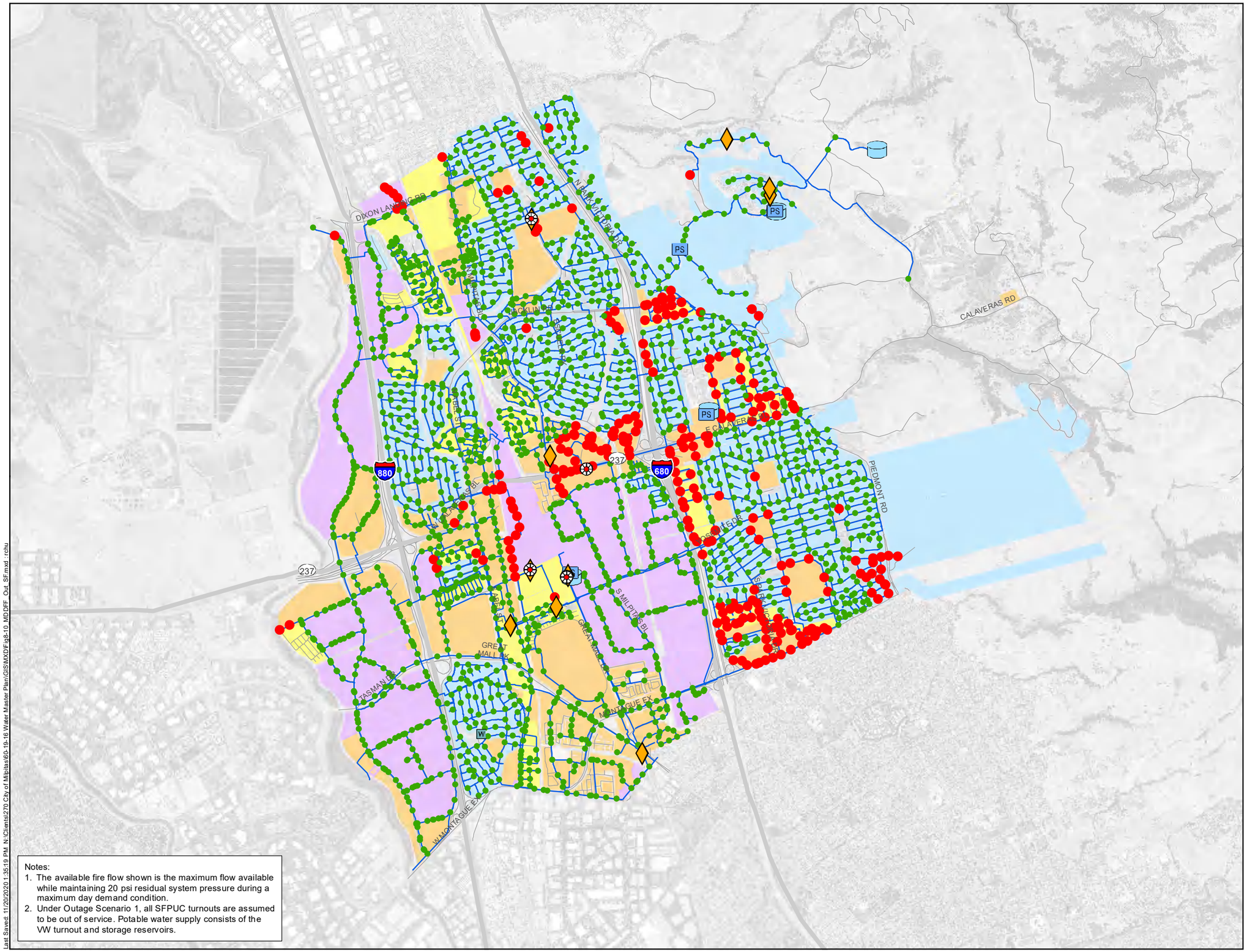


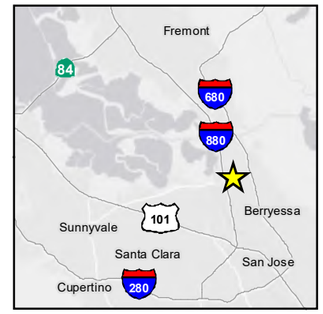


N

0 1,500 3,000

Scale in Feet

**Available Fire Flow**

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

Notes:
1. The available fire flow shown is the maximum flow available while maintaining 20 psi residual system pressure during a maximum day demand condition.
2. Under Outage Scenario 1, all SFPUC turnouts are assumed to be out of service. Potable water supply consists of the VW turnout and storage reservoirs.

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**Figure 8-10**

**Existing System Available Fire Flow Outage Scenario 1**

City of Milpitas
2020 Water Master Plan

### 8.5.6.2 Outage Scenario 2 – VW Offline

This outage scenario assumes supply from VW is unavailable, so the Gibraltar turnout is offline. As a result, the City's normally available potable water supply consists of SFPUC turnouts and storage.

Figure 8-11 and Figure 8-12 show system pressures and fire flow availability, respectively, under MDD conditions in this outage scenario. System performance is similar to the Alternative 1 MDD scenarios (Figure 8-6 and Figure 8-8). The Gibraltar (VW) pumps adequately substitute for the Gibraltar turnout, so there remain no customer service locations with pressures below 40 psi. Regarding fire flow availability, there are no additional below criterion locations resulting from the turnout outage. Thus, West Yost does not recommend any improvements based on Outage Scenario 2.

### 8.5.6.3 Outage Scenario 3 – SFPUC and VW Offline

This outage scenario assumes supplies from both SFPUC and VW are unavailable, so all turnouts are offline. As a result, the City's normally available potable water supply consists of storage only.

Figure 8-13 and Figure 8-14 show system pressures and fire flow availability, respectively, under MDD conditions in this outage scenario. Since the VW outage does not significantly impact the distribution system, this scenario is similar to Outage Scenario 1 (SFPUC offline). In other words, customer service pressures remain at or above 40 psi, but fire flow availability is significantly reduced.

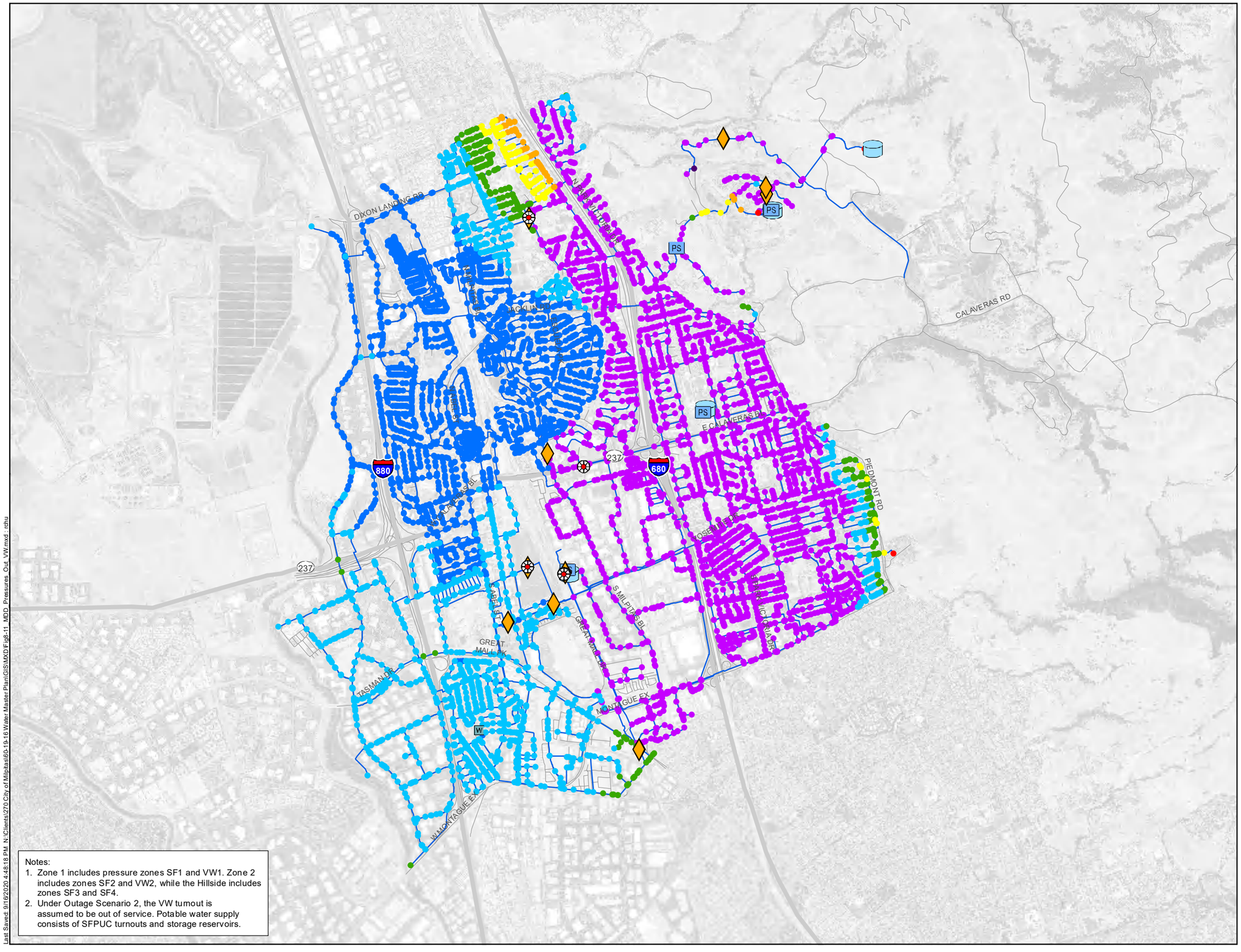
The additional pumping capacity at the Ayer pump station recommended in Outage Scenario 1 eliminates the fire flow impacts resulting from the turnout outage. No other improvements are needed to address issues created by this outage scenario.

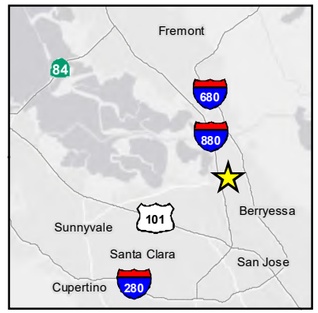
### 8.5.6.4 Outage Scenario 4 – Power Outage

This outage scenario assumes electrical power is unavailable, so any facilities without backup generators are offline. While this does not impact the City's normally available potable water supply, distribution system operations are hindered. The Country Club and Tularcitos pump stations have backup power plug-in adapters and transfer switches, but the City does not yet have portable generators. To be conservative, it is assumed the Country Club and Tularcitos pump stations are unavailable in a power outage. However, the Tularcitos and Minnis storage reservoirs can still serve Zones SF3 and SF4, respectively, during a power outage.

Figure 8-15 and Figure 8-16 show system pressures and fire flow availability, respectively, under MDD conditions in this outage scenario. The power outage does not significantly impact customer service pressures or fire flow availability, as the hillside storage reservoirs can adequately serve their respective pressure zones via gravity.

While there are no critical improvements associated with this outage scenario, having backup power capabilities at the Country Club and Tularcitos pump stations would provide redundancy. This could entail a backup generator or, as the City has discussed, purchasing a portable genset capable of powering either pump station.




N

0 1,500 3,000

Scale in Feet

**Maximum Day Pressure**

- Less than 40 psi
- 40 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Figure 8-11**

**Existing System Pressures**
**Maximum Day Demand**
**Outage Scenario 2**

City of Milpitas
2020 Water Master Plan

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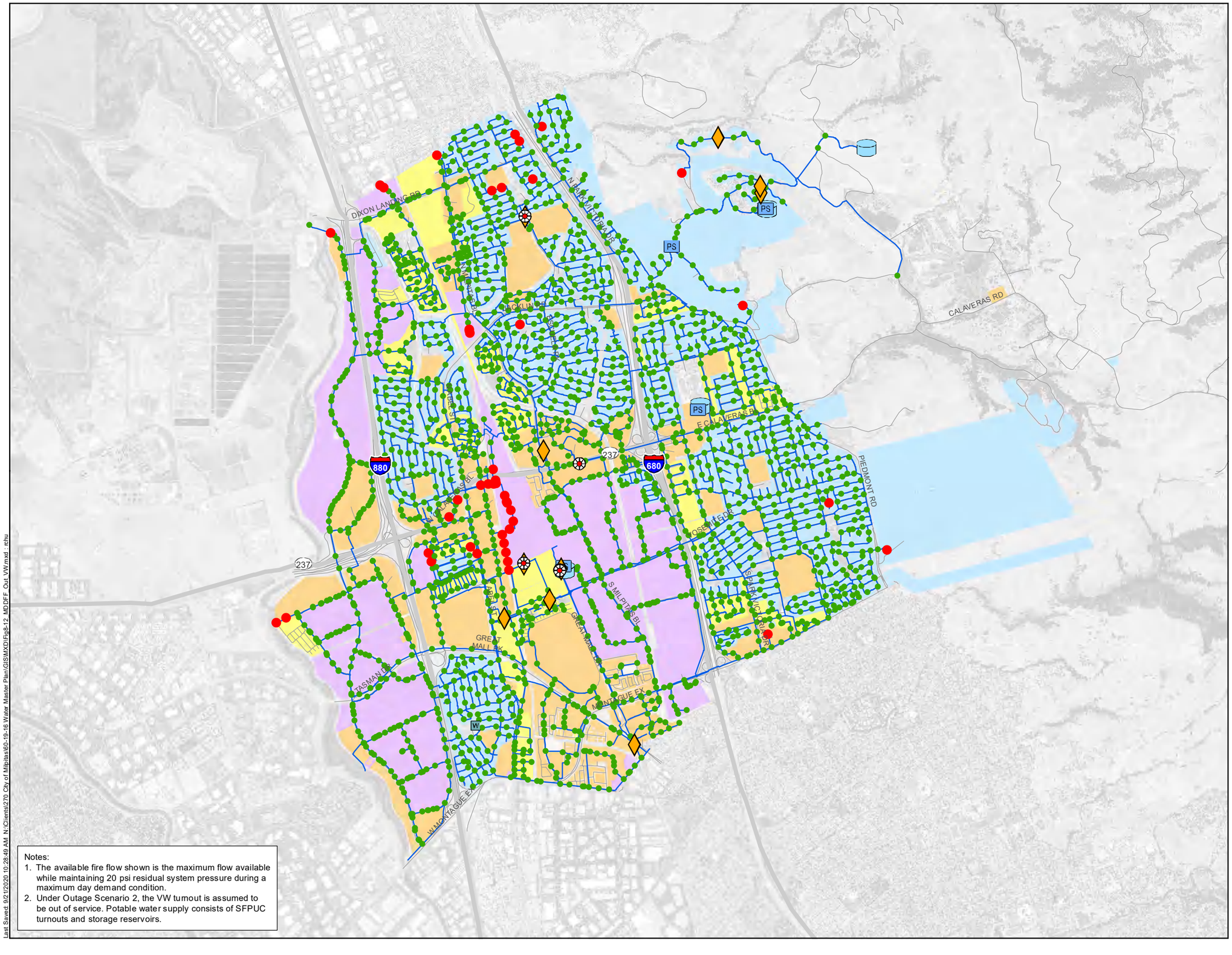


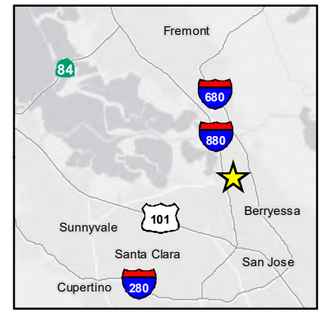


N

0 1,500 3,000

Scale in Feet

**Available Fire Flow**

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

Notes:
1. The available fire flow shown is the maximum flow available while maintaining 20 psi residual system pressure during a maximum day demand condition.
2. Under Outage Scenario 2, the VW turnout is assumed to be out of service. Potable water supply consists of SFPUC turnouts and storage reservoirs.

**Figure 8-12**

**Existing System Available Fire Flow Outage Scenario 2**

City of Milpitas
2020 Water Master Plan

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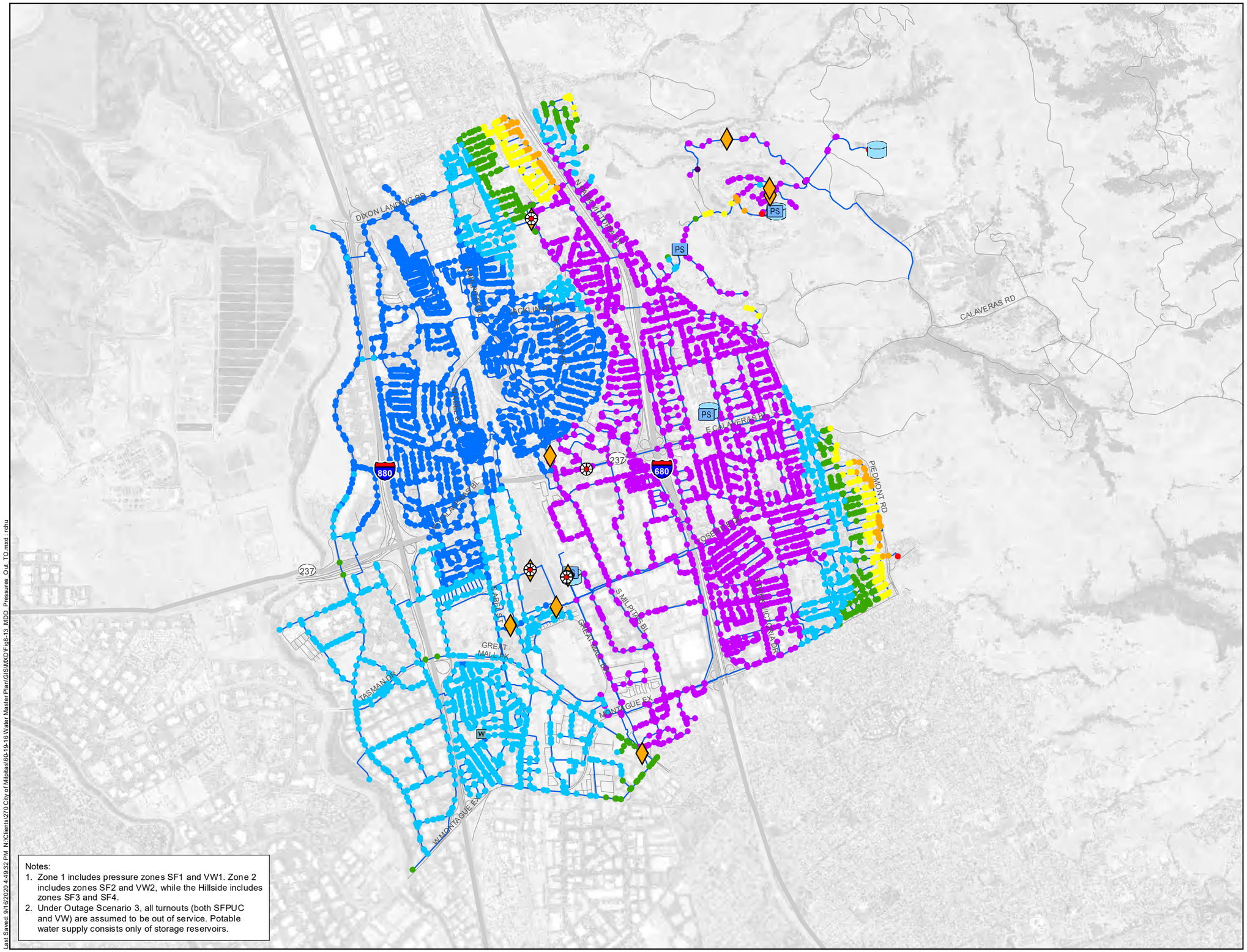


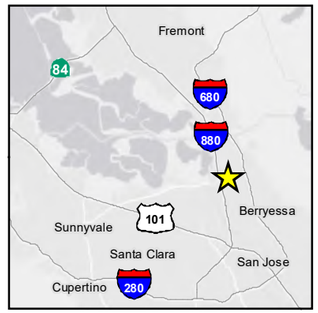


N

0 1,500 3,000

Scale in Feet

**Maximum Day Pressure**

- Less than 40 psi
- 40 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

Notes:
1. Zone 1 includes pressure zones SF1 and VW1. Zone 2 includes zones SF2 and VW2, while the Hillside includes zones SF3 and SF4.
2. Under Outage Scenario 3, all turnouts (both SFPUC and VW) are assumed to be out of service. Potable water supply consists only of storage reservoirs.

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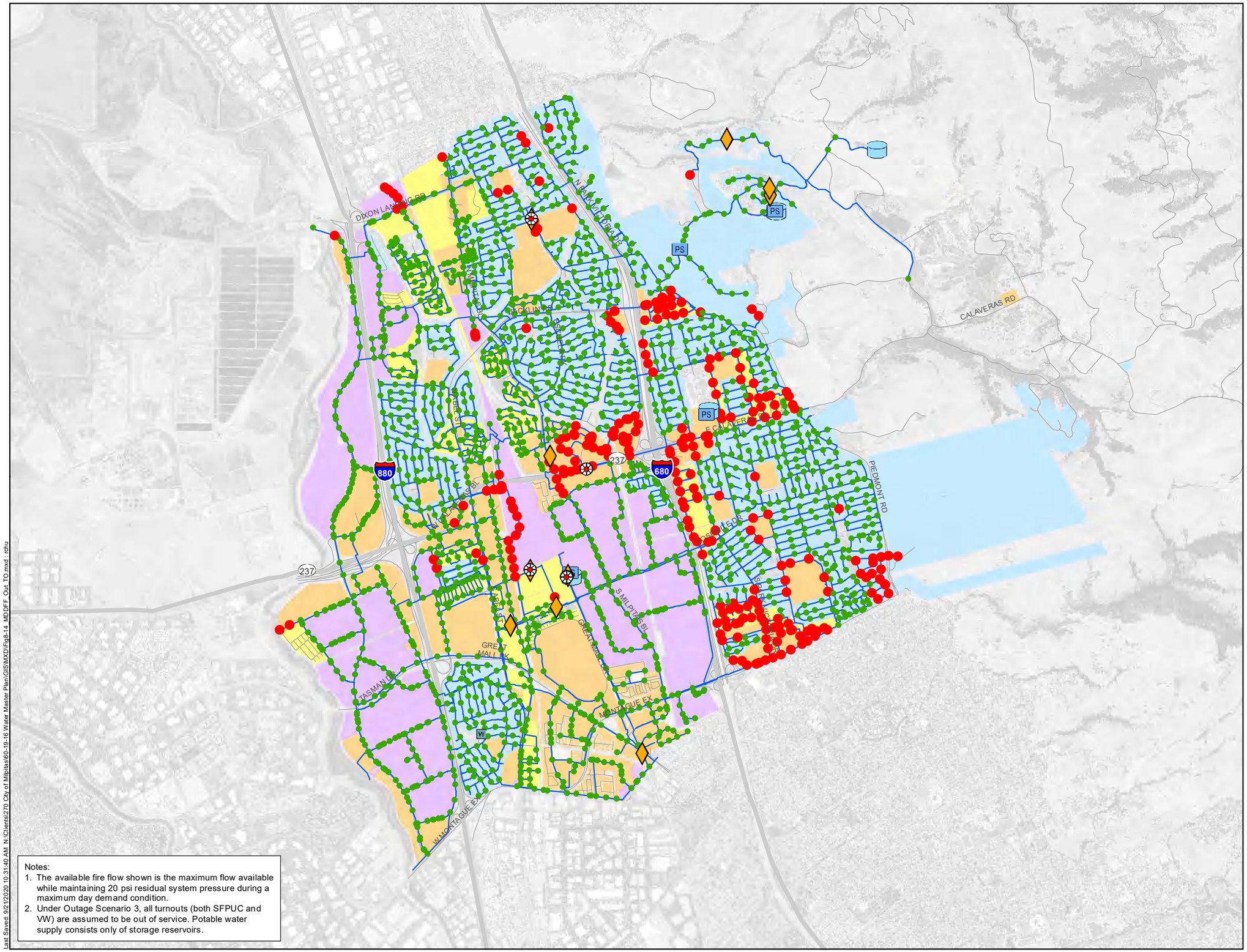
**Figure 8-13**

**Existing System Pressures Maximum Day Demand Outage Scenario 3**

City of Milpitas
2020 Water Master Plan




**Available Fire Flow**

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

Notes:
1. The available fire flow shown is the maximum flow available while maintaining 20 psi residual system pressure during a maximum day demand condition.
2. Under Outage Scenario 3, all turnouts (both SFPUC and VW) are assumed to be out of service. Potable water supply consists only of storage reservoirs.

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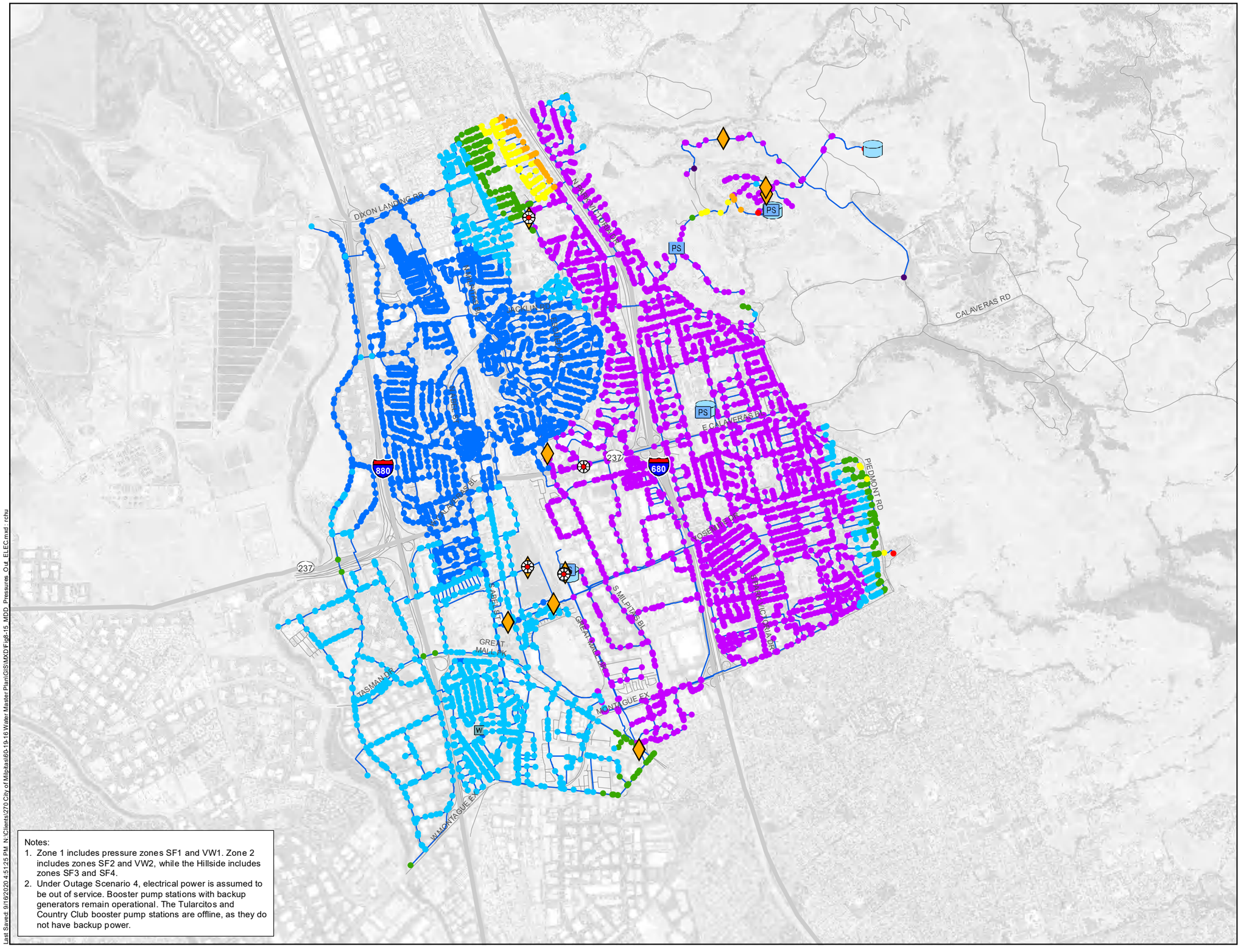
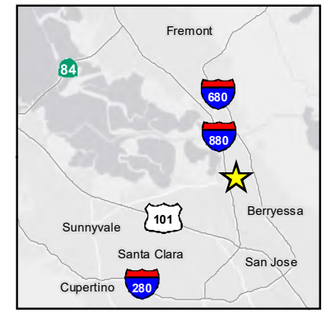
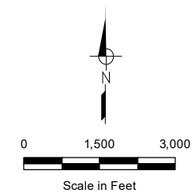
**Figure 8-14**

**Existing System Available Fire Flow Outage Scenario 3**

City of Milpitas
2020 Water Master Plan




**Maximum Day Pressure**

- Less than 40 psi
- 40 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Figure 8-15**

**Existing System Pressures**
**Maximum Day Demand**
**Outage Scenario 4**

City of Milpitas
2020 Water Master Plan

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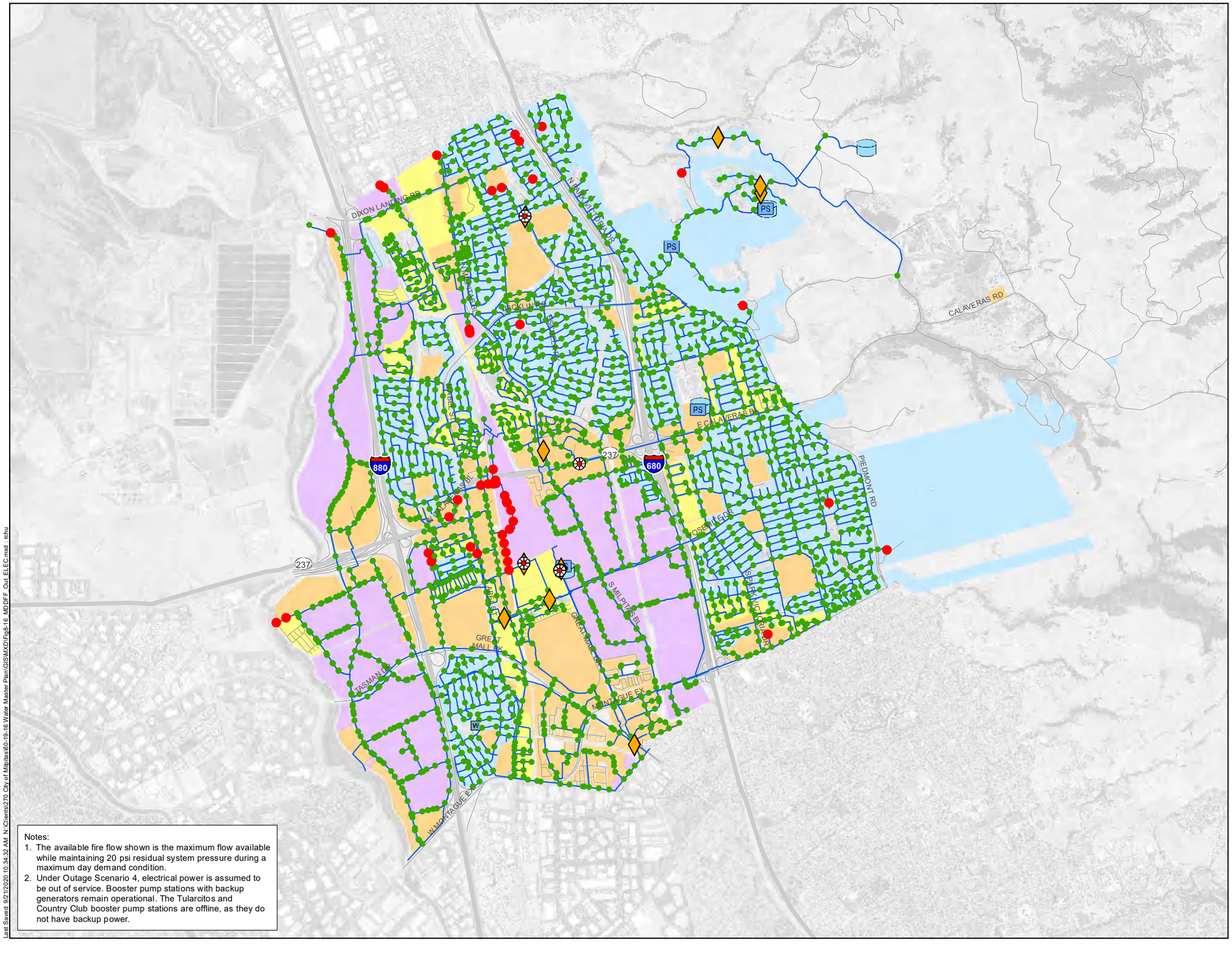


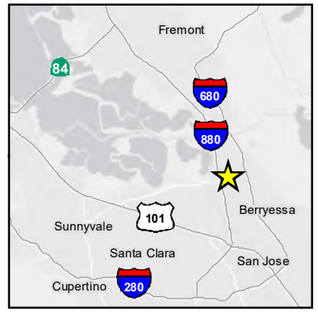


N

0 1,500 3,000

Scale in Feet

**Available Fire Flow**

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

Notes:

1. The available fire flow shown is the maximum flow available while maintaining 20 psi residual system pressure during a maximum day demand condition.
2. Under Outage Scenario 4, electrical power is assumed to be out of service. Booster pump stations with backup generators remain operational. The Tularcitos and Country Club booster pump stations are offline, as they do not have backup power.

**Figure 8-16**

**Existing System Available Fire Flow Outage Scenario 4**

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2020 Water Master Plan

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### *8.5.6.5 Outage Scenario 5 – Zone 1/2 PRVs Offline*

Outage Scenario 5 assumes a PRV normally allowing flow between Zones 1 and 2 is offline. These "Zone 1/2" PRVs include Main, North Milpitas, and Sunnyhills in the SFPUC service area and Capitol, Curtis East, Curtis West, and Parc Metro in the VW service area. System performance is evaluated with one PRV closed at a time. It is assumed EPRVs are available as needed.

Under MDD conditions, customer service pressures are not significantly impacted by any single Zone 1/2 PRV outage. Should any of these PRVs fail, the remaining PRVs allow the distribution system to operate such that customer service pressures are at least 40 psi.

In contrast, fire flow availability can be significantly reduced depending on the PRV outage. For Main, North Milpitas, and Curtis (East and West), operational status did not significantly impact fire flow availability. However, when Sunnyhills, Capitol, or Parc Metro were offline, fire flow availability decreased. The fire flow impacts of these outages are shown on Figure 8-17 and discussed below, followed by a review of the recommended improvements.

#### 8.5.6.5.1 Sunnyhills PRV Outage

Should the Sunnyhills PRV go offline, eight additional locations do not meet recommended fire flows. These locations are all in Zone SF1. West Yost recommends the following improvements to address these new below criterion locations:

- Near the intersection of Coelho Street and Diel Drive, replace the (normally closed) isolation valve separating Zones SF1 and SF2 with an EPRV to allow flows from SF2 during a fire event in the northern area of Zone SF1 (ECIP-V-03).
- Along Callan Street near the intersection of Callan Street and Arizona Avenue, replace approximately 140 LF of 6-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-28).
- Along Gross Street, near the intersection of Gross Street and Conway Street, replace approximately 170 LF of 6-inch diameter pipeline with 8-inch diameter pipeline (ECIP-PI-31).

#### 8.5.6.5.2 Capitol PRV Outage

Should the Capitol PRV go offline, 11 additional locations do not meet recommended fire flows. However, during a fire at any of these 11 locations (all in Zone VW1), the Live Oak and McCarthy EPRVs will allow sufficient flow from Zone SF1 to meet recommended fire flows. Thus, a Capitol PRV outage can be adequately handled by existing facilities, and no improvements are necessary.

#### 8.5.6.5.3 Parc Metro PRV Outage

Should the Parc Metro PRV go offline, five additional locations do not meet recommended fire flows. At one of these locations, EPRV operation improves fire flows to meet the recommended criterion. West Yost recommends the following improvements to address the remaining below criterion locations:

- Along Curtis Avenue, connect the existing 10-inch diameter pipeline on the northern side of the street to the existing 18-inch diameter pipeline on the southern side of the street. This new connection should be a 12-inch diameter pipeline (approximately 30 LF) and installed downstream of the Curtis PRVs (i.e., in Zone VW1) (ECIP-PN-01).

- Along Hammond Way, east of Tom Evatt Park, connect the existing 8-inch diameter pipelines in Zone VW1. These pipelines are currently dead ends, created by normally closed isolation valves separating the SFPUC and VW service areas. This new connection should be an 8-inch diameter pipeline and is estimated to be approximately 60 LF (ECIP PN-02).

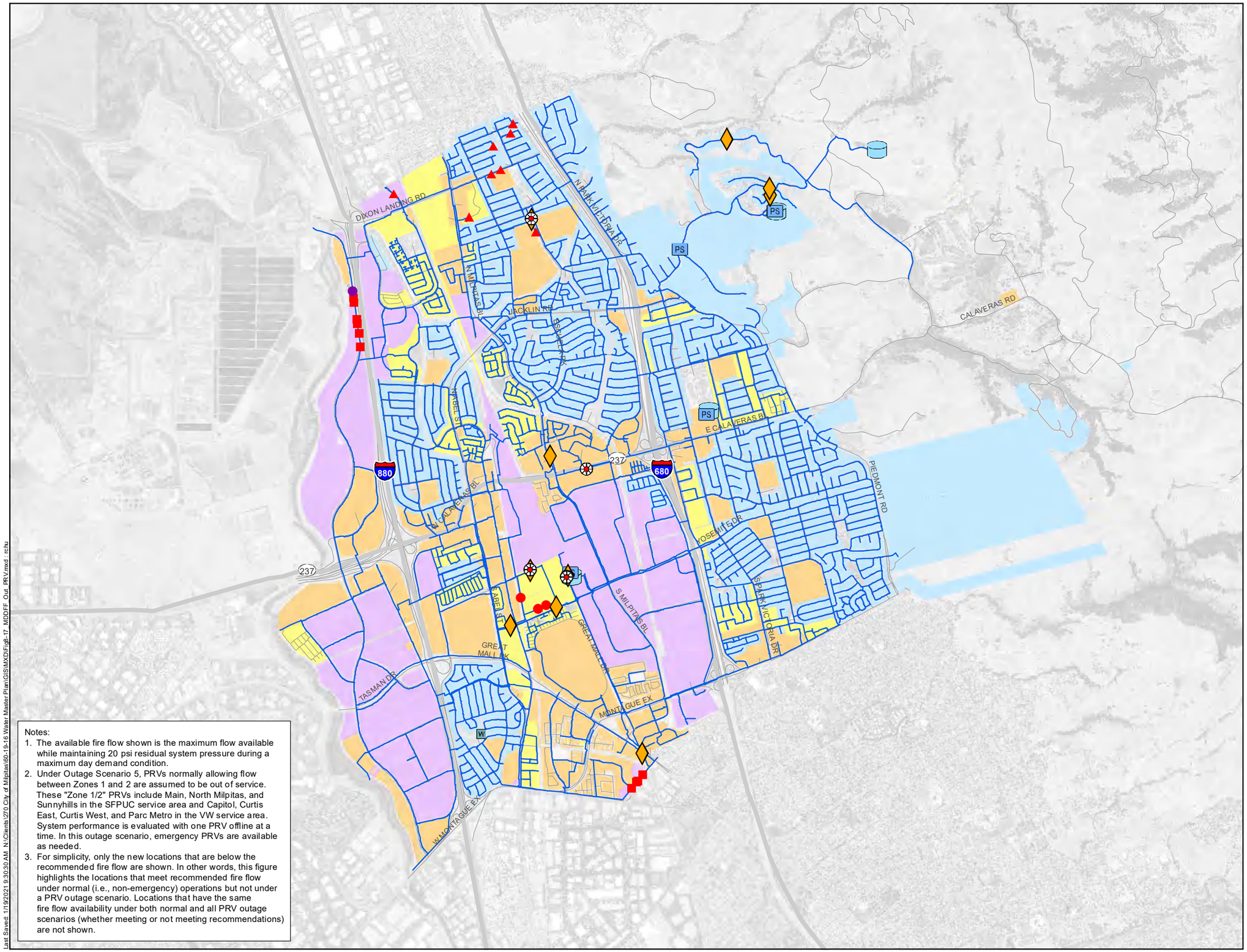
### 8.5.6.5.4 PRV Outage Priority

Table 8-6 summarizes distribution system performance for each PRV outage. As shown in Table 8-6, each PRV is assigned a priority based on the impact of its outage. Parc Metro and Sunnyhills are the highest priority PRVs, while Main, North Milpitas, and Curtis East/West are the lowest priority PRVs.

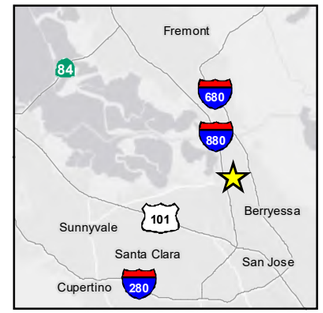
**Table 8-6. PRV Outage Priority[a]**

| PRV | Priority (Low, Med, High) | No. of Additional "Below Criterion" Locations[b] | Notes |
|---|---|---|---|
| SFPUC Service Area | | | |
| Sunnyhills | High | 8 | Pipeline improvements recommended |
| Main | Low | 0 | No new below criterion locations from PRV outage |
| North Milpitas | Low | 0 | No new below criterion locations from PRV outage |
| VW Service Area | | | |
| Parc Metro | High | 5 | New pipelines recommended |
| Capitol | Med | 11 | New below criterion locations fixed via existing EPRVs |
| Curtis East | Low | 0 | No new below criterion locations from PRV outage |
| Curtis West | Low | 0 | No new below criterion locations from PRV outage |

(a) Only PRVs normally allowing flow from Zone 2 to Zone 1 are assigned a priority.
(b) Below criterion locations cannot serve recommended fire flows while maintaining a 20-psi residual system pressure during maximum day demands. This represents the number of "below criterion" locations above normal operations (i.e., Base scenario).




Notes:
1. The available fire flow shown is the maximum flow available while maintaining 20 psi residual system pressure during a maximum day demand condition.
2. Under Outage Scenario 5, PRVs normally allowing flow between Zones 1 and 2 are assumed to be out of service. These "Zone 1/2" PRVs include Main, North Milpitas, and Sunnyhills in the SFPUC service area and Capitol, Curtis East, Curtis West, and Parc Metro in the VW service area. System performance is evaluated with one PRV offline at a time. In this outage scenario, emergency PRVs are available as needed.
3. For simplicity, only the new locations that are below the recommended fire flow are shown. In other words, this figure highlights the locations that meet recommended fire flow under normal (i.e., non-emergency) operations but not under a PRV outage scenario. Locations that have the same fire flow availability under both normal and all PRV outage scenarios (whether meeting or not meeting recommendations) are not shown.




N

0 1,500 3,000

Scale in Feet

**Locations Not Meeting Recommended Fire Flow Due to the Following PRV Outage(s)**

- Sunnyhills
- Parc Metro
- Capitol or Parc Metro
- Capitol
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

CITY OF MILPITAS CALIFORNIA

WEST YOST

**Figure 8-17**

**Existing System Available Fire Flow Outage Scenario 5**

City of Milpitas
2020 Water Master Plan

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## 8.6 SUMMARY OF FINDINGS AND RECOMMENDED IMPROVEMENTS

Below is a summary of findings and recommendations from the evaluations detailed in this chapter. Key recommendations for the existing system were used to develop a CIP, which is the focus of Chapter 11.

- Supply Capacity
  - Existing firm supplies exceed maximum day demand. While the VW service area has a firm supply deficit, it can be met by the surplus in the SFPUC service area. No additional supply facilities are recommended based on existing demands and normal operating conditions.
- Storage Capacity
  - There is sufficient storage in the SFPUC service area and a deficit of 0.45 MG in the VW service area. This deficit is not considered critical, as the Zone SF1 storage surplus can cover the shortfall in Zones VW1 and VW2. No additional storage is recommended based on existing demands and normal operating conditions.
- Pumping Capacity
  - Each pressure zone has a pumping capacity surplus. No additional pumping facilities are recommended based on existing demands and normal operating conditions.
- Distribution System
  - The existing distribution system meets all minimum pressure criteria under ADD, PHD, and MDD conditions.
  - West Yost identified potential improvements to address the locations not meeting recommended fire flows in the existing system. These mainly consist of upsizing existing 6-inch and 8-inch diameter pipelines, though some PRV and isolation valve improvements are also recommended. It is assumed these improvements will be implemented for the future water system evaluation in Chapter 9.
  - To comply with the City's design guidelines and improve fire flow capacity, the City should consider upsizing any 4-inch diameter pipelines that serve hydrants to 8-inch diameter pipelines.
  - Should SFPUC turnouts go offline, most of Zone SF2 has reduced fire flow capacity. As a result, West Yost recommends installing a pump at the Ayer pump station with a capacity of 4,000 gpm.
  - The existing system is well equipped to handle a power outage or a VW supply outage. No additional significant impacts arise in either emergency scenario.
  - To evaluate system performance during a PRV outage, PRVs normally allowing flow from Zone 2 to Zone 1 were simulated to be disabled one at a time. The Sunnyhills and Parc Metro PRVs are the most critical, as outages at either of these PRVs results in new locations not meeting recommended fire flows. Recommended improvements include a new EPRV, new pipelines, and pipeline upsizing.

# CHAPTER 9
# Evaluation of Future Water System

This chapter evaluates the City's future (i.e., buildout) water system and its ability to meet recommended planning and performance criteria described in Chapter 7 and summarized in Table 7-1 of this report. It is assumed complete buildout will occur in the year 2040. The evaluation encompasses both system capacity and hydraulic performance using buildout water demands developed in Section 5.1 of this report. System capacity is evaluated based on potable water supply, storage, and pumping, while the hydraulic performance evaluation examines buildout distribution facilities under various demand and outage conditions. The following evaluations frequently refer to "normal" conditions, which are defined as non-emergencies (i.e., no fires or unplanned outages).

This chapter also includes recommendations for addressing any deficiencies identified from the evaluation. These are incorporated in a recommended CIP described in Chapter 11 of this report. To simplify cross-referencing with Chapter 11, each proposed project is assigned a unique CIP ID.

The following sections present the evaluation methodology and results:

- Buildout Potable Water Demands
- Potable Water Facilities for Buildout Analysis
- Buildout Potable Water Supply Capacity Evaluation
- Buildout Potable Water Storage Capacity Evaluation
- Buildout Pumping Capacity Evaluation
- Buildout Water Distribution System Evaluation
- Summary of Findings and Recommended Improvements

## 9.1 BUILDOUT POTABLE WATER DEMANDS

Buildout potable water demands are summarized in Table 9-1 and represent a combination of existing demands (presented in Table 8-1) and new demands from planned future growth and development in Opportunity Areas and the Gateway Specific Plan/Milpitas Metro Specific Plan areas. While existing demands were adjusted for NRW based on actual production data, future demands were assumed to have an NRW of 11 percent (as discussed in Section 5.1.3). Maximum day and peak hour peaking factors remain as listed in Table 5-7.

New water demand is concentrated in the VW service area, as most of the planned, future growth and development (including Gateway Specific Plan and Milpitas Metro Specific Plan) is anticipated in Zones VW1 and VW2. Existing demands in the SF service area are estimated to increase approximately 18 percent at buildout, while demands in the VW service area are expected to increase by almost 150 percent over the same period. Citywide, the buildout average day demand is estimated at approximately 13.9 mgd, a 67 percent increase from the existing (2019) average day demand of 8.3 mgd.

**Table 9-1. Buildout (2040) Potable Water Demands by Pressure Zone**

| Pressure Zone | Average Day Demand[a] | | Maximum Day Demand[b] | | Peak Hour Demand[c] | |
|---|---|---|---|---|---|---|
| | gpm | mgd | gpm | mgd | gpm | mgd |
| SF1 | 2,213 | 3.19 | 3,541 | 5.10 | 6,417 | 9.24 |
| SF2 | 1,973 | 2.84 | 3,157 | 4.55 | 5,722 | 8.24 |
| SF3 | 14 | 0.02 | 44 | 0.06 | 81 | 0.12 |
| SF4-1 | 19 | 0.03 | 61 | 0.09 | 110 | 0.16 |
| SF4-2 | 17 | 0.02 | 54 | 0.08 | 98 | 0.14 |
| SF Subtotal | 4,236 | 6.10 | 6,857 | 9.87 | 12,429 | 17.90 |
| VW1 | 3,464 | 4.99 | 6,582 | 9.48 | 11,779 | 16.96 |
| VW2 | 1,974 | 2.84 | 3,752 | 5.40 | 6,713 | 9.67 |
| VW Subtotal | 5,439 | 7.83 | 10,334 | 14.88 | 18,492 | 26.63 |
| **Total** | **9,675** | **13.93** | **17,191** | **24.75** | **30,920** | **44.53** |

(a) Based on existing (2019) demands, plus new demands from Opportunity Areas, Gateway Specific Plan, and Milpitas Metro Specific Plan (see Table 5-9 of this report).

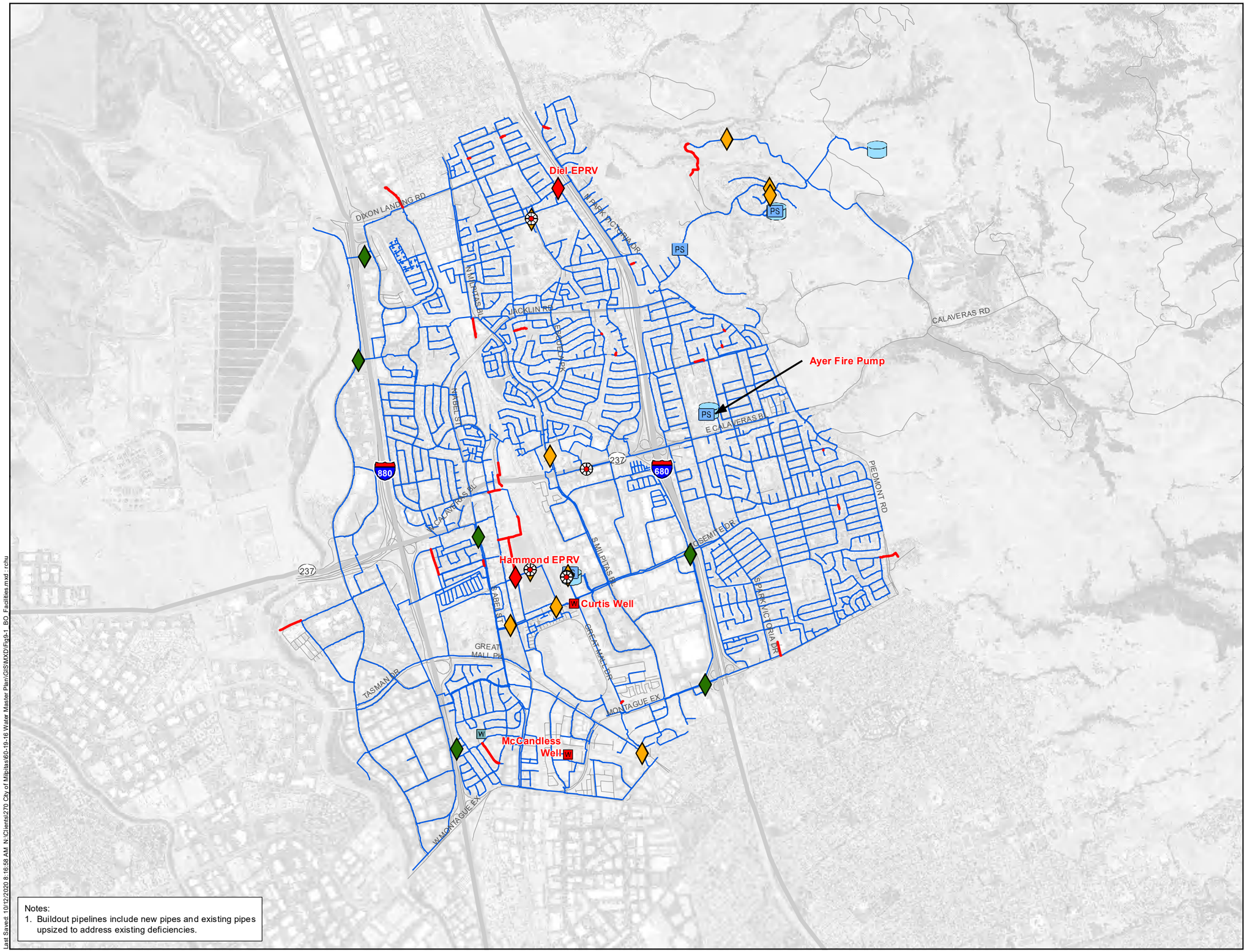
(b) Maximum day demand is 1.6 times the average day demand for Zones SF1 and SF2, 3.2 times the average day demand for Zones SF3 and SF4, and 1.9 times the average day demand for the VW service area.

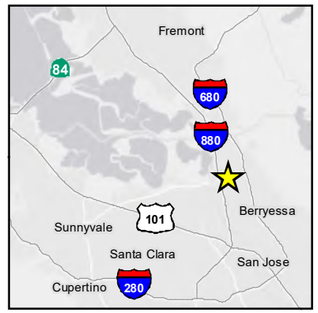
(c) Peak hour demand is 2.9 times the average day demand for Zones SF1 and SF2, 5.8 times the average day demand for Zones SF3 and SF4, and 3.4 times the average day demand for the VW service area.

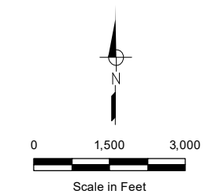
## 9.2 POTABLE WATER FACILITIES FOR BUILDOUT ANALYSIS

At buildout, the City expects three groundwater wells to be available for emergency use only (i.e., at the time of this report, the wells are not planned or intended to operate normally): Pinewood Well, Curtis Well, and McCandless Well. Table 9-2 summarizes the location and capacity for each of these wells. The capacity for Pinewood Well is from the 2009 WMPU (Table 4-3), while the capacity for McCandless Well (currently under construction) is based on discussions with the design team and production testing, which was performed at the end of 2020. It was conservatively assumed that Curtis Well would have the same capacity as McCandless Well, however the Curtis Well capacity is subject to change. While Curtis Well is located within Zone SF1, it is adjacent to transmission mains for Zones SF1, SF2, and VW2. Given the projected large increase in demands in the VW service area (approximately 3,250 gpm in additional average day demand), it is assumed that Curtis Well would serve Zone VW2.

While the City does not currently anticipate any other major water system changes, **the following buildout analyses assume that the existing system infrastructure recommendations detailed in Sections 8.5.5 and 8.5.6 of this report have been implemented**. This includes pipeline improvements, two new EPRVs (Diel and Hammond), and the additional 4,000 gpm pump at Ayer. West Yost recommends that the City complete these existing system CIP projects to optimize system performance and operations as the City approaches buildout. Figure 9-1 shows the existing potable water system with these improvements, Curtis Well, and McCandless Well. On Figure 9-1, the new facilities are highlighted in red.




**Buildout Facilities**

- Buildout Groundwater Well
- Buildout Emergency PRV
- Buildout Pipeline

**Existing Facilities**

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

Notes:
1. Buildout pipelines include new pipes and existing pipes upsized to address existing deficiencies.

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**Figure 9-1**

**Potable Water Facilities for Buildout Analysis**

City of Milpitas
2020 Water Master Plan

**Table 9-2. Emergency Groundwater Wells at Buildout**

| Well Facility | Location | Pressure Zone Served | Capacity | |
|---|---|---|---|---|
| | | | gpm | mgd |
| Pinewood Well[a,d] | 227 Lonetree Court | SF1 | 1,181 | 1.70 |
| Curtis Well[b,d] | 330 East Curtis Avenue | VW2[e] | 400 | 0.58 |
| McCandless Well[c,d] | Near 1680 McCandless Drive | VW1 | 400 | 0.58 |

(a) Pinewood Well capacity per 2009 WMPU, Table 4-3.
(b) Curtis Well capacity is assumed to be equal to McCandless Well but is subject to change pending additional testing.
(c) McCandless Well capacity per discussions with design team in September 2020.
(d) Pinewood Well has a plug-in adapter and transfer switch to receive power from a portable generator. It is assumed Curtis Well and McCandless Well will also have these backup power features.
(e) While Curtis Well is located within Zone SF1, it is adjacent to transmission mains for Zones SF1, SF2, and VW2. Given the projected large increase in demands in the VW service area, it is assumed Curtis Well would serve Zone VW2.

## 9.3 BUILDOUT POTABLE WATER SUPPLY CAPACITY EVALUATION

As described in Section 7.2.2 of this report, the recommended water system performance criteria specify that under normal demand conditions, the following must be satisfied:

- Provide firm supply capacity equal to maximum day demand
- Meet peak hour demand from a combination of supply capacity and storage

Firm supply capacity is defined as the normal water supply with the largest turnout out of service, therefore, groundwater wells (which provide emergency supply) are excluded. In the SFPUC service area, the largest turnout is Calaveras, which has a capacity of 13.0 mgd. The VW service area has only the Gibraltar turnout, therefore, firm supply capacity is zero.

Table 9-3 summarizes the firm supply capacity evaluation for each service area at buildout. The SFPUC service area has a firm supply capacity surplus of approximately 13.9 mgd, while the VW service area has a firm supply capacity deficit of approximately 14.9 mgd. Since water can be moved from the City's SFPUC service area to the VW service area, the surplus in the SFPUC service area can offset most of the deficit in the VW service area. The resulting net deficit is approximately 1.0 mgd.

To address the firm supply capacity deficit and provide supply redundancy in the VW service area at buildout, West Yost recommends constructing a second VW turnout with a capacity of 10,000 gpm (or 14.4 mgd, equal to the Gibraltar turnout) (CIP ID BCIP-TO-01). This would increase the VW service area firm supply capacity to 14.4 mgd and change the City-wide firm supply deficit to a surplus of approximately 13.4 mgd. Without this new turnout, the City would fail to meet the firm supply capacity criterion described in Section 7.2.2 of this report.

Ideally, the second VW turnout would be adjacent to both VW's Milpitas Pipeline and existing City transmission mains. Locating the turnout is outside the scope of this report, though the City has identified one potential site: within a public service utility easement near the intersection of Piper Drive and Garden Street. The distribution system evaluation described in Section 9.6 below assumes this new "Piper" turnout is active, but other locations for a second VW turnout are possible.

By incrementally increasing existing demands, a firm supply capacity "trigger demand" can be identified. This is the demand at which existing supply facilities become insufficient, and any additional demand would require new supplies (i.e., turnouts or groundwater wells). Due to different peaking factors in each service area, the firm supply capacity trigger demand varies slightly depending on the location and timing of growth. Assuming the SFPUC service area would be fully built out prior to the VW service area, the firm supply capacity trigger demand is approximately 13.4 mgd. In the opposite scenario (i.e., VW service area built out before the SFPUC service area), the trigger demand decreases slightly to 13.3 mgd. Based on the linear demand growth projection summarized in Table 5-10 of this report, City demands will approach these levels around the year 2038. This trigger timing is similar for the Maddaus demand projections (Partial Rebound – Normal Economy, Weather Normalized) discussed in Section 5.3.4.2 of this report.

**Table 9-3. Comparison of Available and Required Firm Supply Capacity at Buildout**

| Supply Source | Facility | Design Capacity | |
|---|---|---|---|
| | | gpm | mgd |
| SFPUC | Sunnyhills Turnout | 7,014 | 10.1 |
| | Calaveras Turnout | 9,028 | 13.0 |
| | Main Street Turnout | 5,486 | 7.90 |
| | Intertie Turnout | 4,000 | 5.76 |
| | **Total Supply Capacity[a]** | **25,528** | **36.8** |
| | Firm Supply Capacity[b] | 16,500 | 23.8 |
| | Required Supply Capacity[c] | 6,857 | 9.9 |
| | **Buildout Firm Supply Capacity Surplus (Deficit)** | **9,643** | **13.9** |
| VW | Gibraltar Turnout | 10,000 | 14.4 |
| | **Total Supply Capacity[a]** | **10,000** | **14.4** |
| | Firm Supply Capacity[b] | 0 | 0 |
| | Required Supply Capacity[c] | 10,334 | 14.9 |
| | **Buildout Firm Supply Capacity Surplus (Deficit)[d]** | **(10,334)** | **(14.9)** |

(a) Total supply capacity assumes all turnouts and wells are available for use.
(b) Firm supply capacity assumes largest turnout in each service area (Calaveras and Gibraltar) is offline.
(c) Required supply capacity is equal to the maximum day demand (see Table 9-1).
(d) Most of the VW service area supply capacity deficit can be met by SFPUC service area supply surplus. A deficit of 1.0 mgd remains if the SFPUC supply capacity surplus is considered.

For the second criterion listed above, Table 9-4 compares total supply plus storage to peak hour demands. Total supply equals the combined capacity from all turnouts, while storage consists of the firm pumping capacity from storage reservoirs. This includes the Ayer, Gibraltar (SF), and Gibraltar (VW) pump stations. To be conservative, firm pumping capacity is assumed (i.e., the largest pump is out of service at each pump station). Also, it is assumed the 4,000 gpm pump recommended in Section 8.5.6.1 of this report has been installed at Ayer.

As shown in Table 9-4, the SFPUC service area has a peak hour supply surplus of approximately 24,000 gpm and can even meet peak hour demands with supplies alone. In the VW service area, peak hour supplies exceed demands by approximately 9,000 gpm. Achieving this surplus in the VW service area requires utilizing the Gibraltar turnout and both sets of pumps at the Gibraltar (VW) pump station. In

other words, the City would need to operate valves within the Gibraltar (VW) pump station so the pumps that normally boost Gibraltar turnout pressures would instead draw from the Gibraltar (VW) reservoir.

**Table 9-4. Comparison of Available and Required Peak Hour Supply at Buildout**

| Supply Source | Total Supply Capacity[(a)], gpm | Firm Pumping Capacity from Storage[(b)], gpm | Total Peak Hour Supply Capacity[(c)], gpm | Peak Hour Demand[(d)], gpm | Peak Hour Supply Surplus (Deficit), gpm |
|---|---|---|---|---|---|
| SFPUC | 25,528 | 10,900 | 36,428 | 12,429 | 23,999 |
| VW | 10,000 | 13,500 | 23,500 | 18,492 | 5,008 |

(a) Equals the total capacity from turnouts. Refer to Table 9-3.
(b) Firm pumping capacity assumes the largest pump is offline at each pump station. Pump stations drawing from storage include Ayer, Gibraltar (SF), and Gibraltar (VW). It is assumed the 4,000 gpm pump recommended in Section 8.5.6.1 of this report has been installed at the Ayer pump station.
(c) Equals the sum of total supply capacity and firm pumping capacity from storage.
(d) Refer to Table 9-1.

## 9.4 BUILDOUT POTABLE WATER STORAGE CAPACITY EVALUATION

As described in Section 7.3.2 of this report, the required storage reservoir capacity in each pressure zone is the sum of the following components:

- Operational storage equal to 25 percent of maximum day demand
- Emergency storage equal to 50 percent of maximum day demand
- Fire storage equal to the largest fire flow demand in a pressure zone multiplied by the recommended duration

The total storage required is the sum of the operational, emergency, and fire storage requirements, less any groundwater credit, which can offset some of the emergency storage requirement.

The groundwater storage credit is calculated for each pressure zone and equals the volume of water pumped over a 24-hour period. The credit cannot exceed the recommended emergency storage volume (i.e., 50 percent of maximum day demand). To offset surface storage needs, groundwater must be of potable water quality, and wells must have backup power capabilities. In addition, the City must be able to meet average day demands without relying on groundwater (which it can).

For each pressure zone, Table 9-5 compares the City's buildout potable water storage capacity with storage requirements. Since Zones 1 and 2 are interconnected through multiple PRVs that operate under normal conditions (see Figure 3-1), they are combined in each service area (i.e., SF1/SF2 and VW1/VW2). As shown in Table 9-5, all three wells qualify for the emergency groundwater storage credit and contribute a storage capacity equivalent to their 24-hour pumping capacities. As a result, there is a 4.11 MG storage surplus in Zones SF1/SF2 and a deficit of 5.97 MG in Zones VW1/VW2. Since stored SFPUC water at Gibraltar can be delivered to VW customers, the surplus in Zones SF1/SF2 can reduce the VW service area shortfall, up to a maximum of 5 MG (the capacity of the Gibraltar (SF) storage reservoir). However, even after accounting for this offset (4.11 MG), there remains a net storage deficit in the VW service area of approximately 1.86 MG.

**Table 9-5. Comparison of Available and Required Water Storage Capacity at Buildout**

| [A] | [B] | [C] | [D] | [E] = [C] + [D] | [F] | [G] | [H] | [I] = [F] + [G] + [H] | [J] = [E] - [I] |
|---|---|---|---|---|---|---|---|---|---|
| | | Available Storage Capacity, MG | | | Required Storage Capacity, MG | | | | |
| Facility | Status | Available Reservoir Capacity | Emergency Groundwater Storage Credit[a] | Total Available Storage | Required Operational[b] | Emergency[c] | Fire Flow[d] | Total Required Storage | Storage Surplus (Deficit), MG |
| Zones SF1 and SF2 | | | | | | | | | |
| Gibraltar (SF) | Active | 5.00 | -- | **12.30** | 2.41 | 4.82 | 0.96 | **8.19** | **4.11** |
| Ayer | Active | 5.60 | -- | | | | | | |
| Pinewood Well | Standby | -- | 1.70 | | | | | | |
| Zone SF3 | | | | | | | | | |
| Tularcitos | Active | 0.30 | -- | **0.30** | 0.02 | 0.03 | 0.18 | **0.23** | **0.07** |
| Zones SF4-1 and SF4-2 | | | | | | | | | |
| Minnis | Active | 0.34 | -- | **0.34** | 0.04 | 0.08 | 0.18 | **0.30** | **0.04** |
| Zones VW1 and VW2 | | | | | | | | | |
| Gibraltar (VW) | Active | 5.00 | -- | **6.15** | 3.72 | 7.44 | 0.96 | **12.12** | **(5.97)** |
| Curtis Well | Standby | -- | 0.58 | | | | | | |
| McCandless Well | Standby | -- | 0.58 | | | | | | |

(a) Credit based on 24 hours of pumping capacity. The credit cannot exceed the required emergency storage capacity.

(b) Based on 25 percent of a maximum day demand (see Table 9-1).

(c) Based on 50 percent of a maximum day demand (see Table 9-1).

(d) Based on storage required for largest potential fire flow within the pressure zone. Zones SF1 and VW1/VW2 = Industrial; Zone SF2 = Commercial; Zones SF3 and SF4 = Single Family Residential.

As a result, West Yost recommends the City construct a new, 2 MG storage reservoir in the VW service area (CIP ID BCIP-S-01). While additional groundwater wells would also reduce the storage capacity deficit, lower than expected productivity at the McCandless Well suggests new storage reservoir(s) may be a more reliable investment. The City is currently evaluating potential locations for this new storage reservoir.

To deliver water stored in this new reservoir to the distribution system, West Yost recommends constructing a new pump station (CIP ID BCIP-PS-01) with a firm capacity of 4,000 gpm (approximately 5.8 mgd). This ensures that pumps can meet the largest (i.e., industrial) fire flows in the service area. Also, at this capacity pumps can empty the reservoir in approximately eight hours.

By incrementally increasing existing demands, a storage capacity "trigger demand" can be identified. This is the demand at which existing storage facilities (Gibraltar and Ayer Reservoirs plus Pinewood Well) become insufficient, and any additional demand would require new storage (i.e., reservoirs or groundwater wells). Due to different peaking factors in each service area, the storage capacity trigger demand varies slightly depending on the location and timing of growth. Assuming the SFPUC service area would be fully built out prior to the VW service area, the storage capacity trigger demand is approximately 11.8 mgd. In the opposite scenario (i.e., VW service area built out before the SFPUC service area), the trigger demand decreases slightly to 11.7 mgd. Based on the linear demand growth projection summarized in Table 5-10 of this report, City demands will approach these levels around the year 2032.

This trigger timing is significantly sooner based on the Maddaus demand projections (Partial Rebound – Normal Economy, Weather Normalized) discussed in Section 5.3.4.2 of this report. Because Maddaus projects more demand to be added by 2025 (and more gradual growth from 2025 through 2045), City demands will reach storage trigger levels by around 2024, about eight years sooner than the linear growth projection.

Note, storage and timing requirements may change as actual potable water demands adjust to conservation efforts, efficiency standards, and expanded recycled water use. In addition, if Curtis Well production exceeds expectations, the increased groundwater storage credit would also reduce the overall storage capacity deficit. The City should monitor demands and groundwater well feasibility as it continues to grow and approaches buildout.

## 9.5 BUILDOUT PUMPING CAPACITY EVALUATION

As described in Section 7.3.3 of this report, the City should have firm pumping capacity equal to MDD. For a given pump station, firm capacity is defined as the total capacity of all operational pumps minus the capacity of the largest pumping unit. In addition, pumping capacity in lower pressure zones should also be able to deliver the maximum day demand of any zones above them. For example, the Zone SF3 pumps should be able to deliver the maximum day demand for Zones SF3 and SF4 (i.e., SF4-1 and SF4-2).

For each pressure zone, Table 9-6 compares the available and required pumping capacities at buildout. In Zones SF1 and SF2, firm pumping capacity consists of one 5,500 gpm pump at Gibraltar (SF) and three 1,800 gpm pumps at Ayer. It is assumed the 4,000-gpm pump recommended in Section 8.5.6.1 of this report has been installed at Ayer, so firm capacity assumes that pump is offline. As a result, the combined firm pumping capacity in Zones SF1 and SF2 is 10,900 gpm, which exceeds the required firm pumping capacity (i.e., the buildout MDD of the entire SFPUC service area). The pumping capacity surplus in Zones SF1 and SF2 is approximately 4,040 gpm.

**Table 9-6. Comparison of Available and Required Firm Pumping Capacity at Buildout**

| Pump Station | Critical Facility[a] | On-site Backup Power | Status | Firm Capacity[b], gpm | Total Firm Pumping Capacity, gpm | Buildout Maximum Day Demand[c], gpm | Pumping Capacity Surplus (Deficit), gpm |
|---|---|---|---|---|---|---|---|
| Zones SF1 and SF2 | | | | | | | |
| Gibraltar (SF) | | ✓ | Active | 5,500 | 10,900 | 6,857 | 4,043 |
| Ayer[d] | | ✓ | Active | 5,400 | | | |
| Zone SF3 | | | | | | | |
| Country Club | | | Active | 250 | 250 | 159 | 91 |
| Zones SF4-1 and SF4-2 | | | | | | | |
| Tularcitos | | | Active | 250 | 250 | 115 | 135 |
| Zones VW1 and VW2 | | | | | | | |
| Gibraltar (VW) - from tank | ✓ | ✓ | Active | 5,500 | 13,500 | 10,334 | 3,166 |
| Gibraltar (VW) - from turnout[e] | ✓ | ✓ | Active | 8,000 | | | |

(a) Pump stations are considered critical if they serve a pressure zone with insufficient storage and meet other criteria. Refer to Table 7-1.

(b) Firm pumping capacity was defined as the total pump station capacity with the largest pump out of service.

(c) Includes maximum day demands for higher pressure zones, per Table 7-1.

(d) It is assumed the 4,000 gpm fire pump recommended in Section 8.5.6.1 has been installed at the Ayer pump staiton.

(e) These pumps are intended to boost pressures from the VW turnout but can be valved to draw from the Gibraltar (VW) tank.

No changes are anticipated at either the Country Club or Tularcitos pump stations, therefore, firm pumping capacities in Zones SF3 and SF4 remain at 250 gpm each. This comfortably exceeds buildout pumping requirements. Firm pumping capacity surpluses in Zones SF3 and SF4 are 91 and 135 gpm, respectively.

Both sets of pumps at the Gibraltar (VW) PS are included in the pumping capacity evaluation for the VW service area. One set draws from the Gibraltar (VW) storage reservoir, while the other set boosts pressures from the Gibraltar turnout (if necessary). By adjusting valve operations, the "turnout" pumps can also draw from the Gibraltar (VW) storage reservoir. The combined firm capacity for both sets of pumps is 13,500 gpm, which exceeds the VW service area buildout MDD (10,334 gpm) by approximately 3,170 gpm.

## 9.6 BUILDOUT WATER DISTRIBUTION SYSTEM EVALUATION

West Yost used the updated hydraulic model to conduct steady-state hydraulic analyses of the buildout water distribution system. The goal of this evaluation was to identify necessary improvements to support the City's buildout water demands while meeting the recommended system performance criteria presented in Sections 7.2.1 and 7.2.3 of this report.

**This evaluation assumes infrastructure recommendations detailed in Sections 8.5.5 and 8.5.6 of this report have been implemented and that the new VW Piper turnout introduced in Section 9.3 is active**. The new VW Piper turnout is assumed to be a 20-inch diameter connection and include a PRV that will evenly distribute VW flows between the Piper and Gibraltar turnouts.

In evaluating the buildout system, pressure criteria are prioritized over velocity criteria. This prioritization is typical, because older water systems tend to have many undersized pipes, and strictly adhering to velocity standards would identify those pipes as candidates for replacement, even though pressures meet recommended criteria. West Yost does not recommend replacing existing pipes solely for failing to meet velocity criteria. While velocity results will be summarized for non-emergency scenarios, the following analyses focus on pressures and fire flow availability.

The following evaluations are intended to identify distribution facility sizing and capacity requirements at buildout. As a result, they examine system performance under high demand scenarios only (i.e., Peak Hour Demand and Maximum Day Demand plus Fire Flow).

- **Peak Hour Demand Scenario**: evaluates the potential for low customer service pressures in the system during a peak hour demand condition
- **Maximum Day Demand plus Fire Flow Scenario**: evaluates fire flow availability in the system under a maximum day demand condition
- **Emergency Operations** (each scenario is evaluated under maximum day demand plus fire flow):
  - Outage Scenario 1: SFPUC turnouts are offline
  - Outage Scenario 2: VW turnouts are offline
  - Outage Scenario 3: SFPUC and VW turnouts are offline
  - Outage Scenario 4: Power outage; all facilities without backup generators are offline
  - Outage Scenario 5: PRVs normally allowing flow between Zones 1 and 2 are offline

To capture the entire range of normal water system operations, each non-emergency scenario above was evaluated using the two operational alternatives summarized in Table 8-5 of this report. In the Base alternative, all pumps are off, whereas Alternative 1 allows pump operation as needed. For both alternatives, all turnouts are open, and gravity tank levels are at their minimum of normal operating range.

## 9.6.1 Peak Hour Demand Analysis

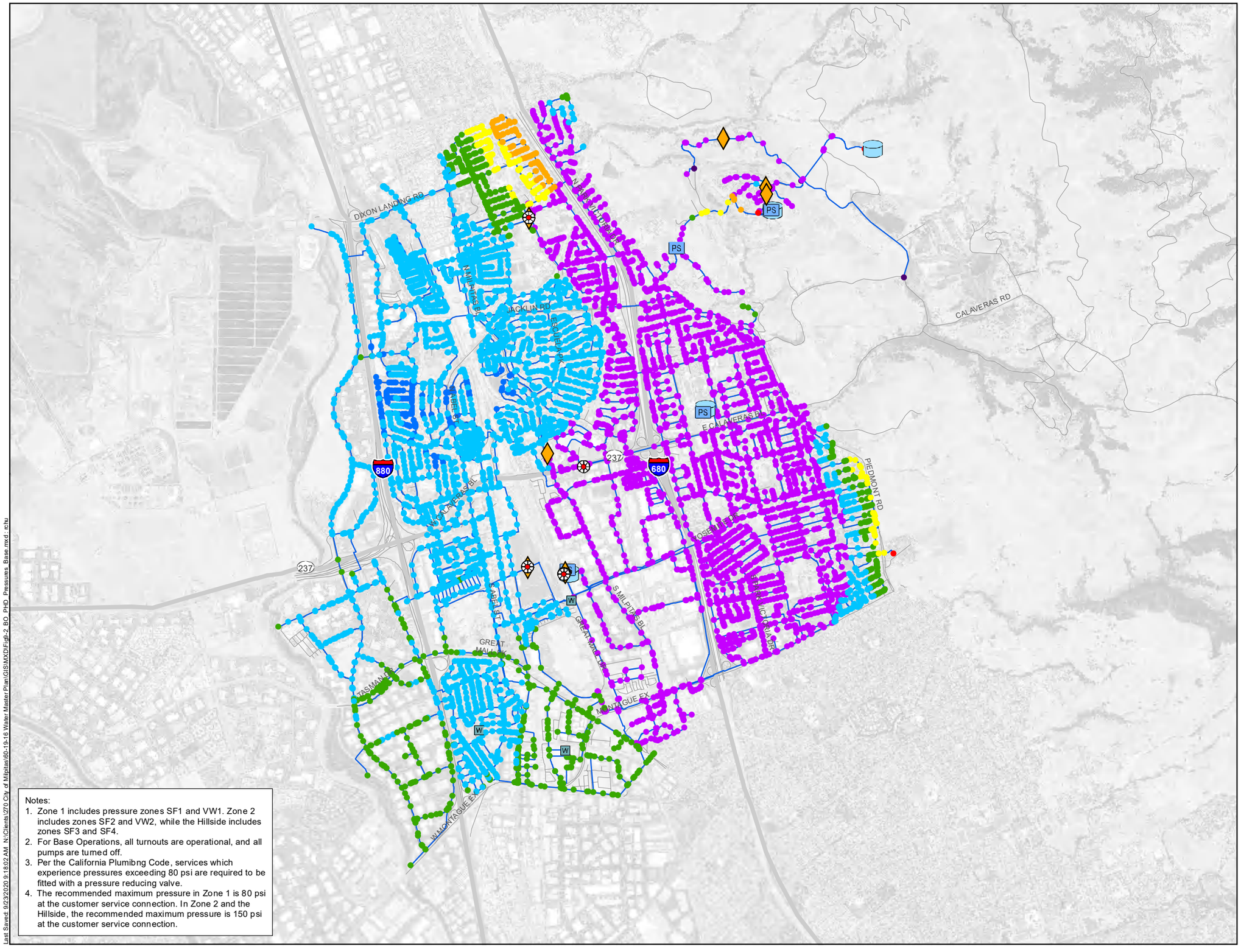
The hydraulic model was used to conduct a steady-state hydraulic analysis of the system during a buildout PHD condition. As shown in Table 9-1, the PHD for the buildout water service area is approximately 30,776 gpm (44.3 mgd). Under PHD conditions, the recommended minimum pressure is 30 psi. Any services experiencing pressures less than 30 psi during a PHD condition would require an individual booster pump.

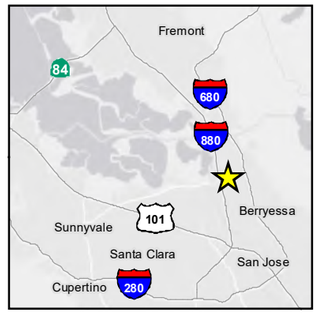
Results from the PHD simulations for Base and Alternative 1 operations are shown in Figure 9-2 and Figure 9-3, respectively. In each figure, color-coded circles represent distribution system pressures during a PHD condition. Pressures are slightly higher for Alternative 1 (pumps on), but there are no significant differences in system performance based on operations. In both cases, there are no customer service locations with pressures below 30 psi.

Per Table 7-1 of this report, under normal conditions the maximum recommended velocities for transmission and distribution mains is 6 and 8 ft/s, respectively. Transmission mains are pipelines 16 inches or larger in diameter, while distribution mains are pipelines smaller than 16 inches in diameter. Under PHD conditions, pipeline velocities exceed recommended limits near supply sources (i.e., turnouts and pump stations) and PRVs.

In the SFPUC service area, high velocity pipelines include those adjacent to the Sunnyhills PRV (over 24 ft/s in both Base and Alternative 1 operations) and downstream of the Sunnyhills, Main, and Calaveras turnouts (between approximately 9 and 11 ft/s under Base operations). When pumps are on (Alternative 1), turnout flows are lower. As a result, during Alternative 1 operations, pipeline velocities near the Sunnyhills, Main, and Calaveras turnouts are below the recommended limit.

In the VW service area, high velocity pipelines are located at and adjacent to the Gibraltar facility and PRVs. This includes the transmission main along Curtis Avenue and Yosemite Drive (between South Abel Street and South Milpitas Boulevard). Transmission mains in this area and downstream of the Gibraltar facility have velocities between 7 and 17 ft/s during Base operations (pumps off) and between 7 and 12 ft/s during Alternative 1 operations (pumps on). Pipeline velocities near PRVs are the same for Base and Alternative 1 operations. The pipelines adjacent to the Curtis East and Parc Metro PRVs have velocities of 7.1 and 8.4 ft/s, respectively, during a PHD condition. Velocities in the pipelines near the Capitol PRV are approximately 10.7 ft/s.




N

0 1,500 3,000

Scale in Feet

**Peak Hour Pressure**

- Less than 30 psi
- 30 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

Notes:

1. Zone 1 includes pressure zones SF1 and VW1. Zone 2 includes zones SF2 and VW2, while the Hillside includes zones SF3 and SF4.
2. For Base Operations, all turnouts are operational, and all pumps are turned off.
3. Per the California Plumibng Code, services which experience pressures exceeding 80 psi are required to be fitted with a pressure reducing valve.
4. The recommended maximum pressure in Zone 1 is 80 psi at the customer service connection. In Zone 2 and the Hillside, the recommended maximum pressure is 150 psi at the customer service connection.

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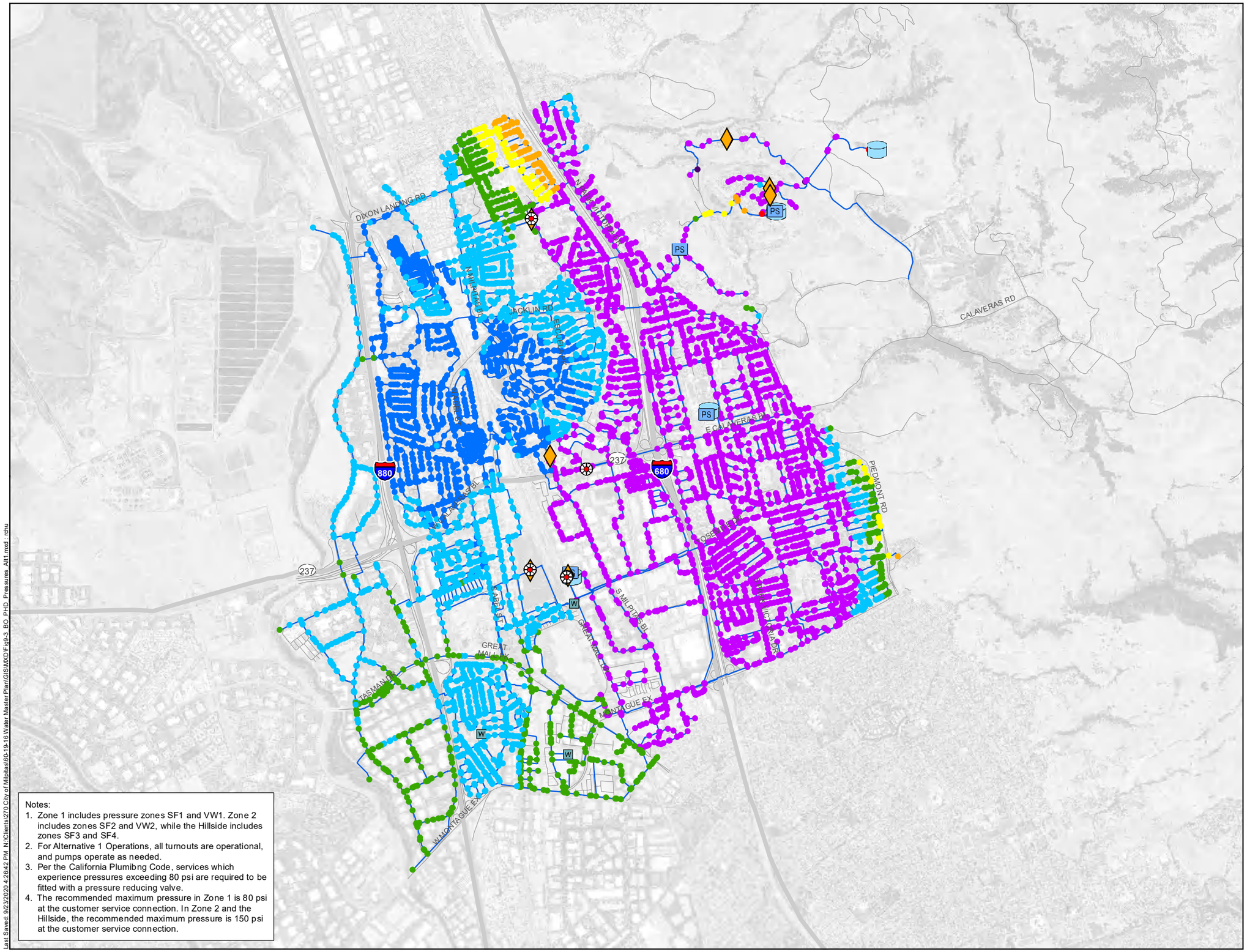
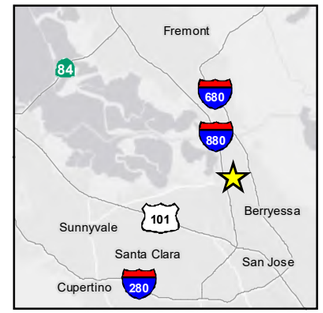
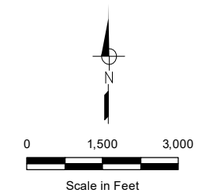
**Figure 9-2**

**Buildout System Pressures**
**Peak Hour Demand**
**Base Operations**

City of Milpitas
2020 Water Master Plan




**Peak Hour Pressure**

- Less than 30 psi
- 30 psi to 50 psi
- 50 psi to 60 psi
- 60 psi to 70 psi
- 70 psi to 80 psi

**High Pressure (Zone 1)**

- Greater than 80 psi

**High Pressure (Zone 2 and Hillside)**

- 80 psi to 150 psi
- Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

Notes:

1. Zone 1 includes pressure zones SF1 and VW1. Zone 2 includes zones SF2 and VW2, while the Hillside includes zones SF3 and SF4.
2. For Alternative 1 Operations, all turnouts are operational, and pumps operate as needed.
3. Per the California Plumibng Code, services which experience pressures exceeding 80 psi are required to be fitted with a pressure reducing valve.
4. The recommended maximum pressure in Zone 1 is 80 psi at the customer service connection. In Zone 2 and the Hillside, the recommended maximum pressure is 150 psi at the customer service connection.

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**Figure 9-3**

**Buildout System Pressures**
**Peak Hour Demand**
**Alternative 1 Operations**

City of Milpitas
2020 Water Master Plan

## 9.6.2 Maximum Day Demand Plus Concurrent Fire Flow Analysis

Fire flows in the model were updated based on buildout land uses in growth areas and the Gateway Specific Plan and Milpitas Metro Specific Plan areas. Outside of these areas, fire flows remain as originally assigned in Section 8.5.5 of this report. Fire flows were then simulated during a buildout MDD condition using the hydraulic model. The hydraulic model conducts fire flow analyses by simulating a fire flow demand at one hydrant location and verifying whether the system can serve all other normal customer demands while maintaining desired residual pressures. This is repeated for all hydrant locations within the distribution system. Hydrant locations meet recommended fire flows if they can deliver the recommended fire flow while maintaining a 20-psi residual system pressure. Note, this fire flow analysis reflects distribution system capacity, as individual hydrants, and their associated losses are not modeled.

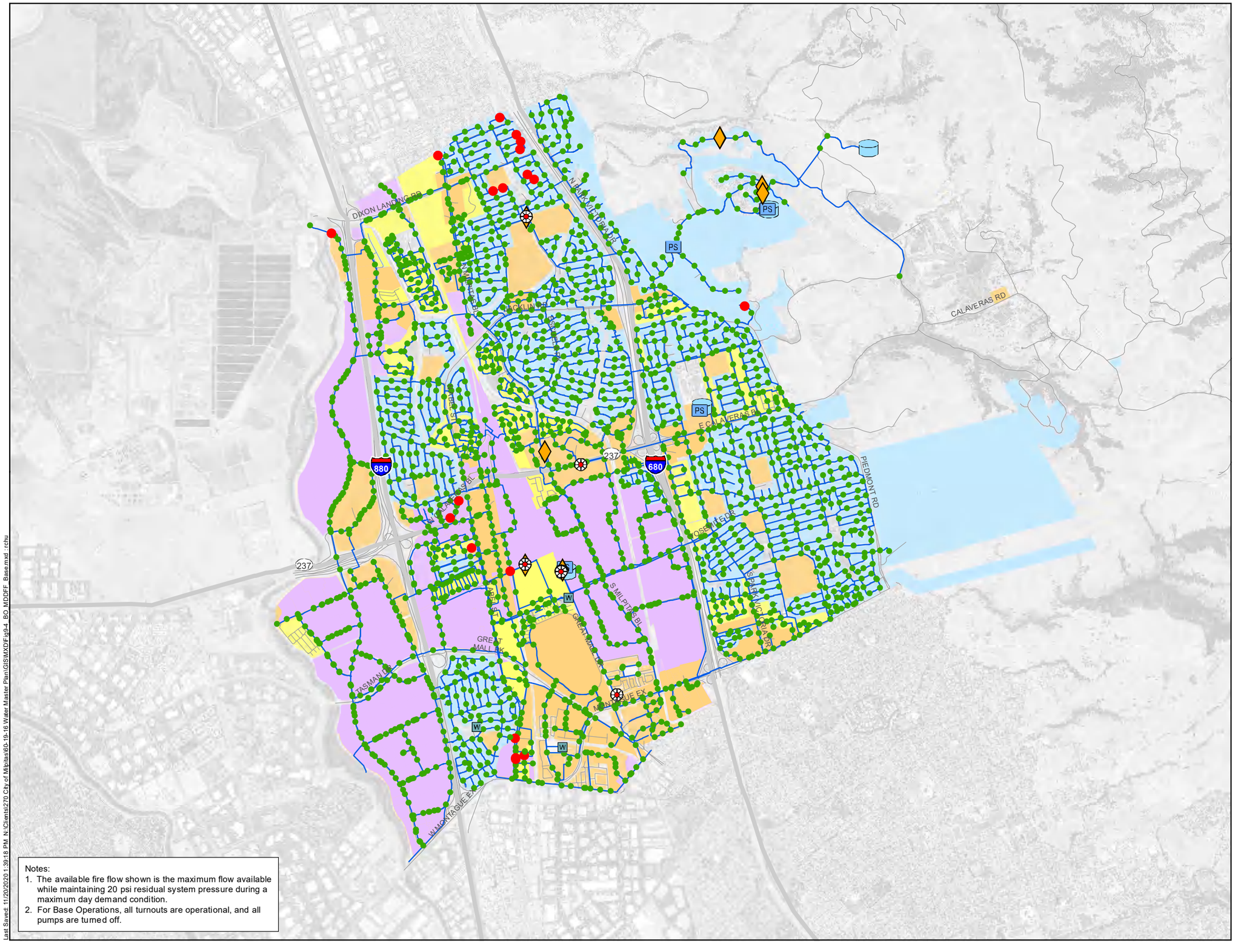
Fire flow analyses were performed independently for each pressure zone, with Zones 1 and 2 combined for each service area (i.e., VW1/VW2 and SF1/SF2). It was assumed that only one fire event would occur at a time, which is standard industry practice. Results from MDD plus concurrent fire flow simulations for Base and Alternative 1 operations are shown on Figure 9-4 and Figure 9-5, respectively. Hydrant locations are represented by circles and color coded by fire flow availability, while parcels are shaded according to the recommended fire flow. For example, a green circle adjacent to a purple parcel means that the distribution system can meet a 4,000 gpm fire flow at that location while maintaining 20 psi in the rest of the system.

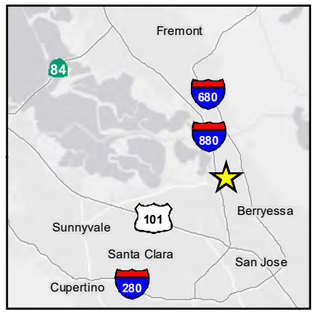
System performance is similar for the two operational alternatives. With pumps off (Base alternative), 19 locations do not meet recommended fire flows, while 15 locations are below the fire flow criterion under Alternative 1. All “below criterion” locations in Alternative 1 are also flagged in the Base alternative, therefore, pump operation improves fire flow availability for four locations. Since pumps could be off during a fire event, recommended improvements address all 19 below criterion locations identified in the Base alternative.

As discussed in Section 8.5.5 of this report, some below criterion fire flows can be eliminated by delivering the recommended flow through multiple hydrants. It was assumed that any location with another hydrant within the City’s hydrant spacing guidelines (500 feet for single family areas and 300 feet for all other areas) would qualify for delivering fire flows through multiple hydrants. If the qualifying hydrants could combine to deliver the recommended fire flow while maintaining a 20 psi residual system pressure, then the location was no longer considered below criterion. Of the 19 below criterion locations identified in the Base alternative, 16 met recommended fire flows after looking at multiple hydrants.

The three remaining below criterion locations are all at the southern end of Zone VW1, near South Main Street. To address these locations, West Yost recommends installing a new EPRV between Zones SF1 and VW1 near the intersection of Cedar Way and South Main Street (CIP ID BCIP-V-01). This emergency 8-inch connection would replace a normally closed isolation valve and allow flow from Zone SF1 if pressures in Zone VW1 fall 5 psi below PHD pressures. In addition to improving fire flows under normal operations, this “Cedar” EPRV also provides redundancy for a Capitol PRV outage (detailed below in Section 9.6.3.5).

The proposed Cedar EPRV location is based on the MDD plus concurrent fire flow hydraulic analysis described in this section and the existing connection between Zones SF1 and VW1 at the intersection of Cedar Way and South Main Street. Additional study is required to determine whether this location is feasible or if other locations would also solve the below criterion locations in this area.




N

0 1,500 3,000

Scale in Feet

**Available Fire Flow**

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

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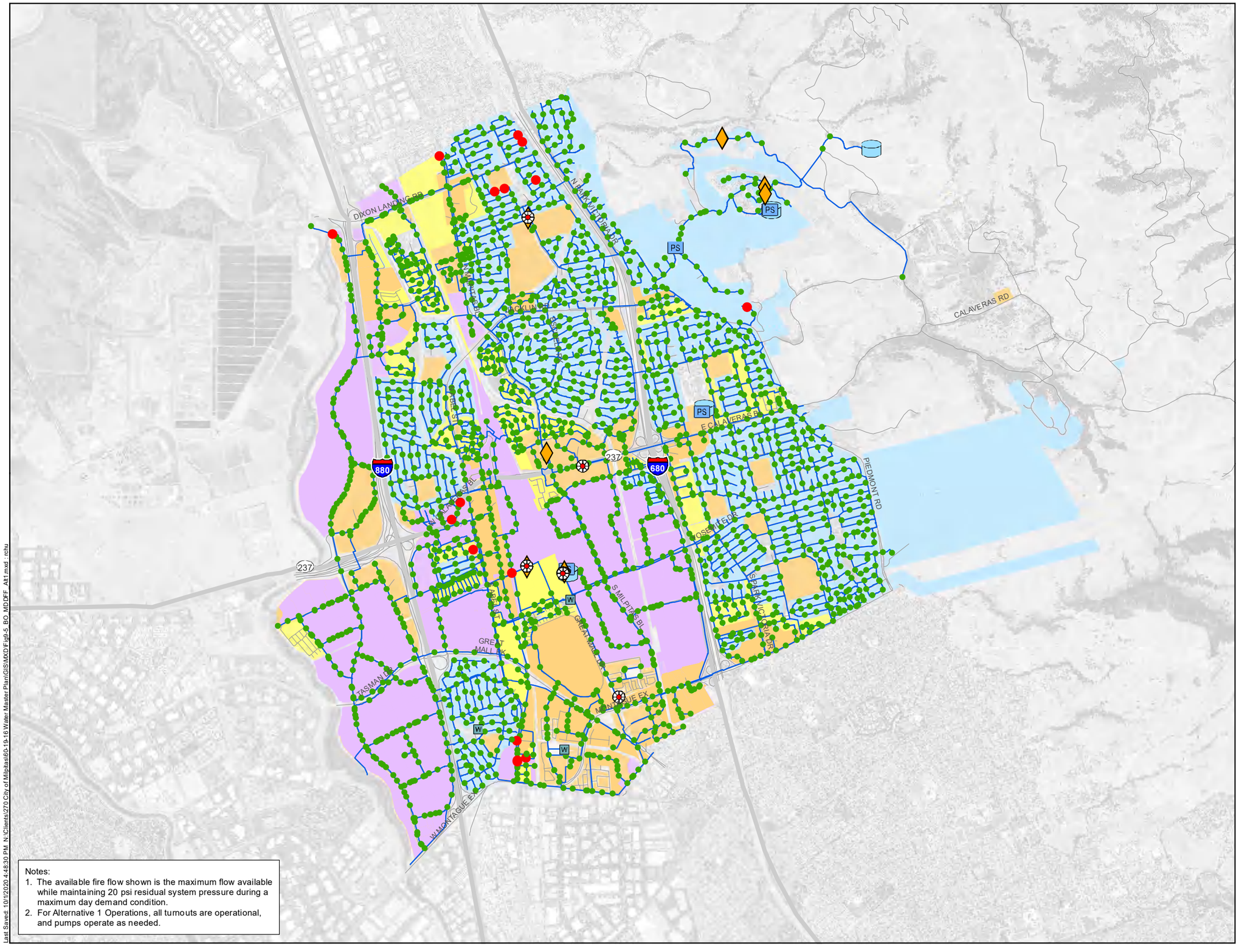
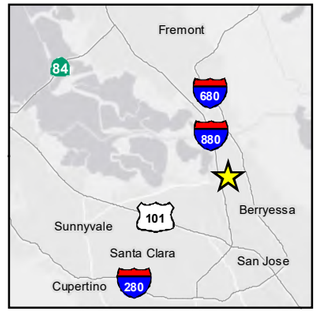
**Figure 9-4**

**Buildout System Available Fire Flow Base Operations**

City of Milpitas
2020 Water Master Plan




N

0 1,500 3,000

Scale in Feet

**Available Fire Flow**

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline

**Recommended Fire Flow**

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm

**Figure 9-5**

**Buildout System Available Fire Flow Alternative 1 Operations**

City of Milpitas
2020 Water Master Plan

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## 9.6.3 Emergency Outage Scenarios

The following emergency outage evaluations identify how well the distribution system functions without one or more key facilities. For reference, the outage scenarios consist of:

- SFPUC turnouts are offline
- VW turnouts are offline
- SFPUC and VW turnouts are offline
- Power outage; all facilities without backup generators are offline
- PRVs normally allowing flow between Zones 1 and 2 are offline

Emergency outage scenarios are not intended to evaluate the adequacy of emergency water supplies, which is outside the scope of this master plan. Instead, these evaluations examine system pressures and fire flow availability during an MDD condition. To be conservative, storage reservoir levels are assumed to be at the minimum of normal operating range (see Table 3-4).

Since emergency scenarios assume certain facilities are offline, the corresponding evaluations do not examine system performance under Base and Alternative 1 operations. Besides the assumed outage, there are no additional operational restrictions. All facilities not assumed offline as part of the scenario are assumed to be operational.

Results for each emergency outage scenario are summarized below. Where presented, figures showing system performance during emergency outages are similar to non-emergency figures discussed above. Distribution system locations are color coded by fire flow availability (for fire flow evaluations).

### *9.6.3.1 Outage Scenario 1 – SFPUC Offline*

This outage scenario assumes supply from SFPUC is unavailable, therefore, the Sunnyhills, Calaveras, Main Street, and Intertie turnouts are offline. As a result, the City's normally available potable water supply consists of VW (i.e., the Gibraltar and Piper turnouts) and storage.

After implementing the distribution system improvements summarized in Section 8.6 of this report, fire flow availability is not significantly impacted with SFPUC turnouts offline. There are no new below criterion locations in this outage scenario. In other words, the pumps at Gibraltar and Ayer alone can adequately serve fire flows in the SFPUC service area during an MDD condition. Thus, West Yost does not recommend any improvements based on Outage Scenario 1.

### *9.6.3.2 Outage Scenario 2 – VW Offline*

This outage scenario assumes supply from VW is unavailable, therefore, the Gibraltar and Piper turnouts are offline. As a result, the City's normally available potable water supply consists of SFPUC turnouts and storage.

Fire flow availability is not significantly impacted with VW turnouts offline. There are no additional below criterion locations in this outage scenario, though adequately serving fire flows during an MDD condition required adjusting pump operation. In addition to the two pumps that normally draw from the Gibraltar (VW) storage reservoir, one 5,000-gpm pump that normally boosts turnout pressures was also drawing

from the same reservoir. Since this operational flexibility already exists at the Gibraltar facility, West Yost does not recommend any improvements based on Outage Scenario 2.

#### *9.6.3.3 Outage Scenario 3 – SFPUC and VW Offline*

This outage scenario assumes supplies from both SFPUC and VW are unavailable, therefore, all turnouts are offline. As a result, the City's normally available potable water supply consists of storage only (i.e., Gibraltar (SF), Gibraltar (VW), Ayer, Tularcitos, and Minnis reservoirs).

Since neither the SFPUC nor the VW outages significantly impacted fire flow availability, the same is true for the simultaneous outage of both supplies. During an MDD condition, the Gibraltar (SF) and Ayer pumps can adequately serve fire flows in Zones SF1/SF2. In the VW service area, the same three pumps as Outage Scenario 2 are necessary to serve fire flows: two pumps that normally draw from the Gibraltar (VW) storage reservoir and one 5,000-gpm pump that normally boosts turnout pressures. There are no new below criterion locations in Outage Scenario 3. Thus, West Yost does not recommend any improvements based on Outage Scenario 3.

#### *9.6.3.4 Outage Scenario 4 – Power Outage*

This outage scenario assumes electrical power is unavailable, therefore, any facilities without backup generators are offline. While this does not impact the City's normally available potable water supply, distribution system operations are hindered. Because the Country Club and Tularcitos pump stations only have plug-in adaptors and transfer switches to allow for use of portable generators, and do not have on-site emergency generators, they are assumed to be unavailable in a power outage. However, the Tularcitos and Minnis storage reservoirs can still serve Zones SF3 and SF4, respectively, during a power outage.

A power outage does not significantly impact fire flow availability. There are no new below criterion locations associated with this outage scenario, which makes sense, as the impact of a power outage is similar to Base operations (pumps off). As a result, no improvements are necessary from Outage Scenario 4.

#### *9.6.3.5 Outage Scenario 5 – Zone 1/2 PRVs Offline*

Outage Scenario 5 assumes a PRV normally allowing flow between Zones 1 and 2 is offline. These "Zone 1/2" PRVs include Main, North Milpitas, and Sunnyhills in the SFPUC service area and Capitol, Curtis East, Curtis West, and Parc Metro in the VW service area. System performance is evaluated with one PRV closed at a time. It is assumed EPRVs are available as needed.

Impacts to fire flow availability vary depending on which PRV is offline. At buildout, the Capitol PRV is most critical. Should the Capitol PRV go offline, 17 additional locations do not meet recommended fire flows. Activating EPRVs and the McCandless Well allows 14 locations to meet recommended fire flows. The remaining three are solved via the proposed Cedar EPRV. While Sunnyhills, Curtis East, and Parc Metro PRV outages also create new below criterion locations, all can be solved by EPRVs (Diel, McCarthy, and Hammond). Outages of the Main, North Milpitas, and Curtis West PRVs did not result in any new below criterion locations.

## 9.7 SUMMARY OF FINDINGS AND RECOMMENDED IMPROVEMENTS

Below is a summary of findings and recommendations from the evaluations detailed in this chapter. Key recommendations for the buildout system were used to develop a CIP, which is the focus of Chapter 11 of this report.

- Supply Capacity
  - Buildout firm supplies fall short of maximum day demands. The firm supply surplus in the SFPUC service area cannot make up for the deficit in the VW service area. Thus, West Yost recommends constructing a new VW turnout near the intersection of Piper Drive and Garden Street with the same capacity as the Gibraltar turnout.
- Storage Capacity
  - Buildout storage capacity is insufficient. The storage capacity surplus in the SFPUC service area cannot make up for the deficit in the VW service area. West Yost recommends constructing a new, 2 MG storage reservoir in the VW service area.
  - To deliver water from this new storage reservoir, West Yost recommends constructing a new pump station with a firm capacity of 4,000 gpm.
- Pumping Capacity
  - Each pressure zone has a pumping capacity surplus. No additional pumping facilities are recommended based on buildout demands.
- Distribution System
  - The buildout distribution system meets the minimum pressure criterion under a PHD condition.
  - To address locations not meeting recommended fire flows in Base operation and PRV outage scenarios, West Yost recommends installing a new EPRV near the intersection of Cedar Way and South Main Street. The Cedar EPRV would allow flows from Zone SF1 to Zone VW1 should pressures in Zone VW1 drop significantly.

# CHAPTER 10
# Asset Renewal and Replacement

This chapter presents a summary of the Water Utility Condition Assessment Technical Memorandum prepared in conjunction with this Water Master Plan, provides a discussion of risk management guidelines and asset profiling, and recommends projects and activities to manage infrastructure risk. Recommended projects are incorporated in a recommended CIP described in Chapter 11 of this report.

A summary of the Seismic Risk Assessment of the City's water system facilities, conducted in parallel to this Water Master Plan as part of the compliance with the America's Water Infrastructure Act of 2018, is also provided in this chapter.

## 10.1 SUMMARY OF WATER UTILITY CONDITION ASSESSMENT FINDINGS

The Water Utility Condition Assessment Technical Memorandum, included in Appendix D, summarizes the condition assessment that was performed for the City's water utility assets under Task 3 – Water Utility Asset Condition Assessment of this Water Master Plan. That technical memorandum presents assessment methodologies, asset valuations, likelihood and consequence of failure factors, and business risk scores for assets in the City's water distribution system.

The analysis focused on asset and facility risk. Risk is a combination of an asset's likelihood to fail and an asset's consequence if it should fail as shown below.

- Likelihood of Failure (LOF), which estimates the probability that a failure will occur in an asset by meeting the end of its physical, design, service, or economic useful life
- Consequence of Failure (COF), which estimates the impacts of asset failure expressed either qualitatively or quantitatively, being a loss, injury, or disadvantage from a social, economic, environmental, or regulatory standpoint
- Risk is estimated using the conventional risk equation: *Risk = LOF x COF*

Risk was defined on a scale from Low to High based on COF ratings of Negligible to Severe and LOF ratings of Unlikely to Very Likely. Table 10-1 presents the adopted risk matrix.

**Table 10-1. Risk Methodology**

| | | | LOF Rating | | | |
|---|---|---|---|---|---|---|
| | | | 1 Unlikely | 2 Possible | 3 Likely | 4 Very Likely |
| COF Rating and Definition | 1 Negligible | No fiscal/operational impact | Low | Low | Low | Low |
| | 2 Minimal | Slight pressure loss, minor public response, possible slight injury, minor detours | Low | Low | Medium | Med-High |
| | 3 Moderate | Water service interrupted over local area, increased media coverage, increased injury potential, public transit impacted, restoration up to one-month impact | Medium | Medium | Med-High | High |
| | 4 Severe | Water service interrupted over wide area including fire capacity, potential local media coverage, potential consent order, transit impacts to BART or other outside agencies, long-term economic impact, greater than one-month restoration | Medium | Med-High | High | High |

Assets were classified by type and evaluated for LOF and COF to determine a risk rating. Water Meter, Line Valve and Fire Hydrant assets were evaluated as individual assets. Other individual asset assessments were aggregated into PRVs, Wells, Turnouts, Interties, Reservoirs, Pipelines and Pump Stations. Table 10-2 presents a summary of risk by these asset groupings. Some asset groups are represented in more than one risk level since individual assets or facilities are currently at different risk levels.

**Table 10-2. Water System Risk Level**

| | | LOF | | | |
|---|---|---|---|---|---|
| | | 1<br>Unlikely | 2<br>Possible | 3<br>Likely | 4<br>Very Likely |
| COF | 1<br>Negligible | Hydrants<br>Valves<br>Pipelines | Hydrants<br>Valves<br>Meters<br>Pipelines | Hydrants<br>Meters<br>Pipelines | Meters<br>Pipelines |
| | 2<br>Minimal | Hydrants<br>Valves<br>Pipelines | Hydrants<br>Valves<br>PRVs<br>Intertie<br>Meters<br>Pipelines | Hydrants<br>Valves<br>Well<br>Reservoir<br>PRVs<br>Intertie<br>Meters<br>Pipelines | Meters<br>Pipelines |
| | 3<br>Moderate | Hydrants<br>Valves<br>Pipelines | Hydrants<br>Valves<br>PRVs<br>Intertie<br>Reservoirs<br>Pipelines | Hydrants<br>Valves<br>PRVs<br>Turnouts<br>Reservoirs<br>Pump Stations<br>Pipelines | Pump Stations<br>Pipelines |
| | 4<br>Severe | Pipelines | Pipelines | Pipelines | Pipelines |

## 10.2 RISK MANAGEMENT GUIDELINES AND ASSET PROFILING

Risk management applied to utility planning and management leverages the assessment of LOF and COF into asset life-cycle decision-making. The combination of LOF and COF together provides a risk rating for assets and facilities. Risk Triggers are defined in this section.

### 10.2.1 Risk Threshold Triggers

Leveraging risk management involves more than just applying a decision point based on a current condition or risk rating to prioritize a project. Risk management affords the utility manager knowledge of the system to optimize maintenance, plan condition assessment activities, anticipate fiscal expenditures and prioritize refurbishment and replacement. Establishing risk threshold triggers is a valuable tool to anticipate when to modify current practices.

#### *10.2.1.1 Risk Threshold Triggers*

Risk threshold triggers can be set at many levels and for many responses; however, it is best to keep them simple and few to avoid complicating maintenance and asset management practices. To keep the analysis simple as the City begins developing its risk management efforts, triggers have been set as follows:

- Level A - Watch
- Level B - Investigate
- Level C - Act

##### 10.2.1.1.1 Level A - Watch

This initial action level represents the point an asset or facility depicts aging or performance that requires increased attention, health checks or predictive maintenance efforts. Vertical assets such as mechanical and electrical equipment and structures warrant this attention and effort based on visual observations, age and runtime. Due to limited access associated with distribution systems, pipeline assets may pass through this level without action.

A typical action associated with this trigger includes maintenance modifications which may be indicated when the likelihood of failure reaches a level where predictive maintenance may be implemented or additional maintenance efforts may benefit the asset. Predictive maintenance is typically a data collection effort that informs the maintenance manager of potential faults or failures that may be remedied prior to an asset component failure.

##### 10.2.1.1.2 Level B - Investigate

This secondary action level is consistent with condition assessment activities. Once an asset or facility reaches this level, a focused condition assessment may be planned to evaluate where the asset is on its useful life curve and identify potential operational or maintenance activities that may support extending its life. Condition assessment also provides the utility manager with valuable forecasting data for fiscal planning. Water distribution pipelines typically fit this profile based on age, combined with failure history and local conditions, such as aggressive soils and pipe type. Vertical assets fit this profile based on age, performance and predictive maintenance data collection.

A typical action associated with this trigger includes condition assessment activities which may be indicated when the risk rating of an asset or a facility reaches a level that advanced planning should be performed to identify its point on the useful life curve. Identifying this point supports advanced planning for rehabilitation and replacement as well as modifications to asset condition monitoring. Preventative maintenance efforts can support condition assessment.

##### 10.2.1.1.3 Level C - Act

The third action level is the beginning of renewal activities. This may be as long-term as placement on a mid-range capital improvement plan or as immediate as design development and construction.

Rehabilitation and replacement (R&R) are indicated when the asset or facility risk does not support its intended level of service and, as such, requires some form of renewal. Rehabilitation and replacement must be planned sufficiently ahead of time to complete the activity prior to failure.

### 10.2.1.1.4 Risk Threshold Trigger Setpoints

Triggers were applied to the risk threshold matrix to identify trigger levels that will support long-term risk management of the water utility infrastructure. These triggers were also used to develop and prioritize recommendations to improve the water system. Table 10-3 presents the risk threshold triggers (Level A, Level B and Level C) as defined above.

**Table 10-3. Risk Threshold Triggers**

| | | | LOF Rating | | | |
|---|---|---|---|---|---|---|
| | | | 1 Unlikely | 2 Possible | 3 Likely | 4 Very Likely |
| COF Rating and Definition | 1 Negligible | No fiscal/operational impact | No Action | No Action | No Action | Level C |
| | 2 Minimal | Slight pressure loss, minor public response, possible slight injury, minor detours | No Action | Level A | Level B | Level C |
| | 3 Moderate | Water service interrupted over local area, increased media coverage, increased injury potential, public transit impacted, restoration up to one-month impact | No Action | Level B | Level C | Level C |
| | 4 Severe | Water service interrupted over wide area including fire capacity, potential local media coverage, potential consent order, transit impacts to BART or other outside agencies, long-term economic impact, greater than one-month restoration | Level A | Level C | Level C | Level C |

## 10.2.2 High Risk Assets Profiling

Risk Threshold Triggers were applied to asset risk ratings developed in the Water Utility Condition Assessment Technical Memorandum (see Appendix D).

### *10.2.2.1 Facilities*

A summary of facilities and their risk threshold triggers are presented in Table 10-4 and Table 10-5. As noted earlier, some asset groups are represented in more than one risk level since individual assets or facilities are currently at different risk levels.

**Table 10-4. Risk Threshold Triggers of Facilities by LOF and COF**

| | | LOF Rating | | | |
|---|---|---|---|---|---|
| | | 1<br>Unlikely | 2<br>Possible | 3<br>Likely | 4<br>Very Likely |
| COF | 1<br>Negligible | Hydrants<br>Valves<br>Pipelines | Hydrants<br>Valves<br>Meters<br>Pipelines | Hydrants<br>Meters<br>Pipelines | Meters<br>Pipelines |
| | 2<br>Minimal | Hydrants<br>Valves<br>Pipelines | Hydrants<br>Valves<br>PRVs<br>Intertie<br>Meters<br>Pipelines | Hydrants<br>Valves<br>Well<br>Reservoir<br>PRVs<br>Intertie<br>Meters<br>Pipelines | Meters<br>Pipelines |
| | 3<br>Moderate | Hydrants<br>Valves<br>Pipelines | Hydrants<br>Valves<br>PRVs<br>Intertie<br>Reservoirs<br>Pipelines | Hydrants<br>Valves<br>PRVs<br>Turnouts<br>Reservoirs<br>Pump Stations<br>Pipelines | Pump Stations<br>Pipelines |
| | 4<br>Severe | Pipelines | Pipelines | Pipelines | Pipelines |

**Table 10-5. Facilities by Risk Threshold Trigger**

| Facility | Risk Threshold Trigger |
|---|---|
| Calera Creek Heights PRV | Level A - Watch |
| Main PRV | |
| Sunnyhills PRV | |
| SJW Intertie | |
| Curtis Well | Level B - Investigate |
| Live Oak PRV | |
| Tularcitos North Vault PRV | |
| Tularcitos South Vault PRV | |
| North Milpitas PRV | |
| Capitol PRV | |
| Junipero PRV | |
| Gibraltar PRV | |
| McCarthy PRV | |
| Yosemite PRV | |
| Minnis Reservoir | |
| Gibraltar (VW) Reservoir | |
| Gibraltar (SF) Reservoir | |
| ACWD Intertie | |
| SCVWD Intertie | |
| Curtis PRV | Level C - Act |
| Montague PRV | |
| Main Turnout | |
| Calaveras Turnout | |
| Sunnyhills Turnout | |
| Gibraltar Turnout | |
| Tularcitos Reservoir | |
| Ayer Reservoir | |
| Pinewood Well | |
| Country Club Pump Station | |
| Tularcitos Pump Station | |
| Gibraltar Pump Station | |
| Ayer Pump Station | |

### *10.2.2.2 Horizontal Assets*

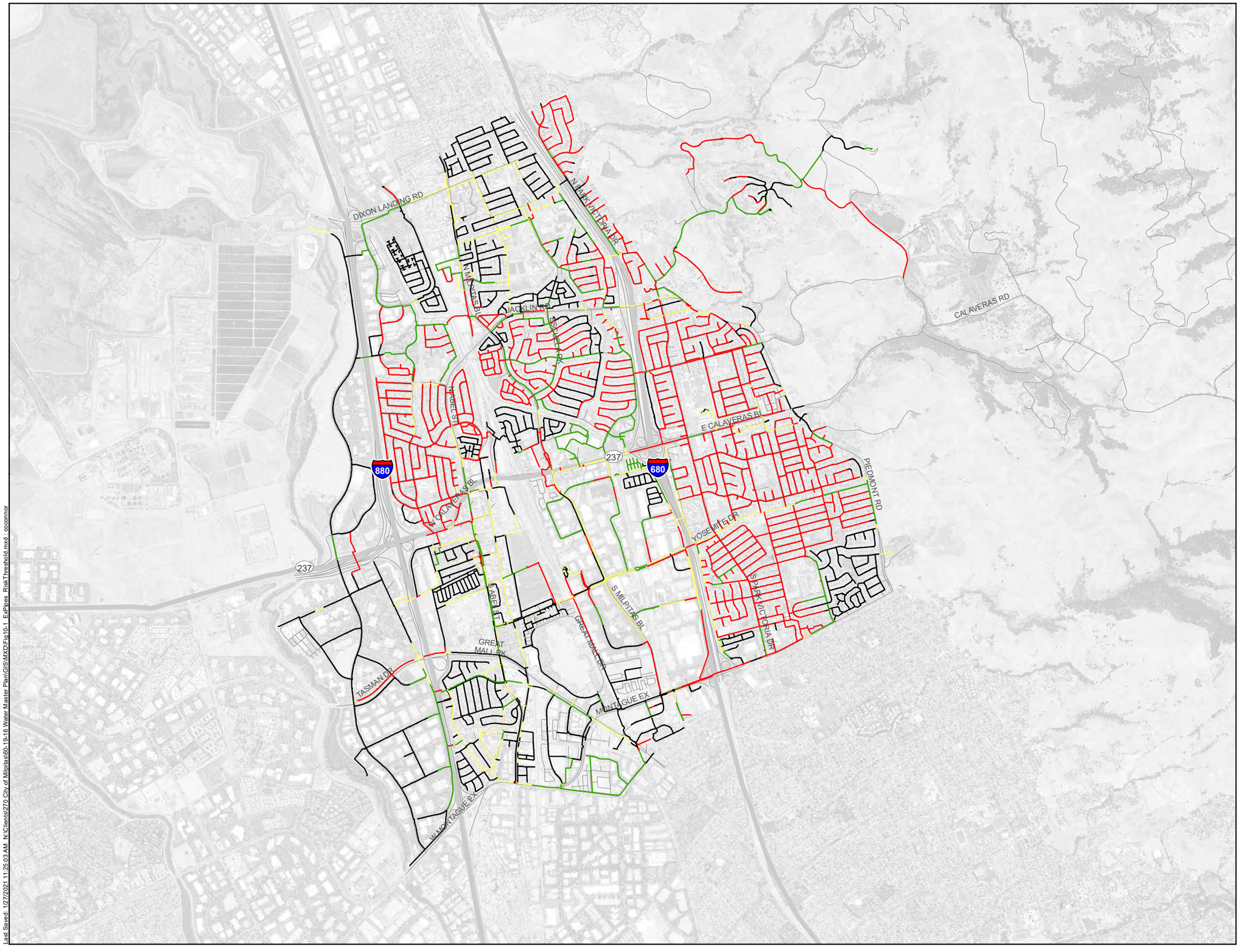
There are numerous other assets, not associated with facilities, that are associated with pipeline or horizontal assets. These include pipelines, fire hydrants, valves and water meters. Table 10-6 presents a summary of pipeline assets in each classification with their corresponding risk threshold level. Table 10-7 presents a summary count of non-pipeline assets by classification. Pipelines represented in Table 10-6 and Table 10-7 are shown on Figure 10-1. A full listing of each asset is included in the Water Utility Condition Assessment Technical Memorandum (see Appendix D).

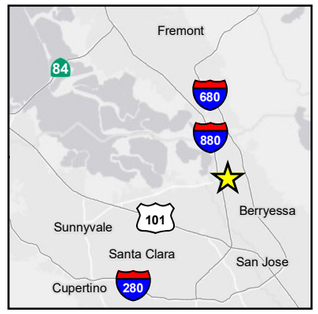
**Table 10-6. Asset Count (Miles) of Risk Threshold Trigger by Asset Classification (April 2020 GIS)**

| Pipe Diameter | Risk Threshold Trigger | | |
|---|---|---|---|
| | Level A | Level B | Level C |
| Pipeline, Miles | | | |
| 4-inch | 0.0 | 0.0 | 0.2 |
| 6-inch | 0.5 | 0.9 | 3.2 |
| 8-inch | 0.5 | 3.2 | 7.4 |
| 10-inch | 0.4 | 2.9 | 11.8 |
| 12-inch | 18.5 | 7.7 | 32.2 |
| 14-inch | 2.7 | 1.8 | 7.0 |
| 16-inch | 0.8 | 2.7 | 5.2 |
| 18-inch | 0.7 | 1.2 | 3.9 |
| 20-inch | 0.0 | 0.0 | 0.1 |
| 24-inch | 0.0 | 0.2 | 1.1 |
| 30-inch | 0.0 | 0.0 | 0.0 |
| **Total** | **24.1** | **20.6** | **72.1** |

**Table 10-7. Asset Count of Risk Threshold Trigger by Asset Classification**

| Asset Classification | Risk Threshold Trigger | | |
|---|---|---|---|
| | Level A | Level B | Level C |
| Water Meter | 2 | 4 | 1815 |
| Fire Hydrants | 231 | 1265 | 3025 |
| Line Valves | 877 | 1970 | 4848 |




N

0 1,500 3,000

Scale in Feet

**Pipeline Risk Threshold Trigger**

- No Action
- Level A
- Level B
- Level C

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**Figure 10-1**

**Existing Pipelines Risk Threshold Level**

City of Milpitas
2020 Water Master Plan

## 10.3 RECOMMENDED PROJECTS

Recommended projects were identified based on the asset classification and the risk prioritization developed above. They include general maintenance modifications, detailed condition assessment, refurbishment and replacement.

### 10.3.1 Water Meters

Most of the City's 16,351 Water Meters are beyond their typical useful life of roughly 15 years. Roughly 75 percent have exceeded this age in service. The City currently does not have a water meter replacement program other than replacement upon failure. For a water meter, failure is typically hidden resulting in an undetected meter accuracy reduction. The City is currently implementing an Advanced Metering Infrastructure (AMI) program that will ultimately replace existing water meters to conform to the new AMI system.

With the AMI replacement of the water meter inventory the City should investigate the creation of a water meter test program. The American Water Works Association recommends testing of water meters at a minimum of once every 20 years. This minimum test interval is beyond the nominal useful life of a meter and simply serves to confirm that replacement is, in fact, warranted. A meter test program can be established with a goal to test an appropriate sample of water meters and to profile meter performance specifically in the City's water system to confirm performance and useful life. A test program may begin at 10 years meter age with a goal to test 2 to 5 percent of the meter population per year.

As the AMI program evolves, the system will be selected, and it will be known if existing meters and meter components will be compatible with the new AMI system or if existing assets will require replacement. A new meter test program can then be configured based on the asset replacement rate associated with the AMI program and staffing resources.

### 10.3.2 Facilities

Each of the 32 facilities evaluated are at a risk trigger level of at least Level A which indicates each should be considered at a minimum for maintenance review.

Facilities at Level A consist of PRVs and Interties and, while they require little maintenance, the preventative maintenance (PM) program should be modified to include visual assessments at least annually to begin to collect condition data to support future decision-making.

Facilities at Level B and Level C include PRVs, wells, interties, reservoirs, pumping stations and turnouts. The PM program should be modified as noted for Level A, as well as a detailed condition assessment program. Since these ratings are based on only a desktop assessment, assets at Level C are not immediately identified for replacement but should be given priority in condition assessment.

### 10.3.3 Pipelines, Fire Hydrants and Line Valves

Pipeline assets are at risk trigger levels as high as Level C based on the desktop condition and risk assessment performed. Given the level of data available to support the desktop analysis, it is recommended that the maintenance program be reviewed to capture measurable performance data associated with pipeline failures and that a comprehensive condition assessment be conducted of representative portions of the distribution system.

Line valve and fire hydrant assets are at risk trigger levels as high as Level C based on the desktop condition and risk assessment performed. Slightly over half of the City's 9,330 fire hydrants and line valves exceed a typical useful life of 30 years. The City recently acquired equipment to support a valve and hydrant exercise program to provide mainline flushing and valve maintenance. The program is just now beginning. The exercise program should be developed with the objective to locate each valve in the field and confirm in GIS; confirm valves are operable, accessible and free of tuberculation; assure they are able to achieve a tight isolation; and, record depth, number of turns and turn direction. A valve exercise program should target the older system valves and hydrants rapidly in the first few years of the program and then settle into a pace of exercising all valves once every 5 years.

## 10.3.4 Summary of Asset Renewal and Replacement Recommendations

Capital and non-capital recommendations are presented in this section.

### *10.3.4.1 Capital and Non-Capital Recommendations*

A list of capital and non-capital recommendations was developed based on the risk assessment and the risk thresholds presented in this chapter and the Water Utility Condition Assessment Technical Memorandum (included in Appendix D). Table 10-8 presents these recommendations which include projects (capital) and improvement measures (non-capital) that respond to the current state of the City's distribution system.

### *10.3.4.2 R&R Forecast and Methodology*

R&R planning is a forecast of planned effort and expenditures for the renewal or improvement of an asset and ultimately the replacement of the asset. While not yet specifically indicated, pending actual condition assessment, a forecast of asset replacement was developed and included to establish a baseline order of magnitude estimate of asset R&R for fiscal planning. This forecast may be used for current fiscal planning but should be verified based on the findings of the recommended condition assessment studies. Assumptions are presented below:

- Forecast year of action based on remaining asset useful life
- Actual asset replacement assumed to be 20 percent of assets reaching project useful life

A forecast of R&R expenditures is presented on Figure 10-2 and in Table 10-9.

## Figure 10-2. 30-Year R&R Forecast

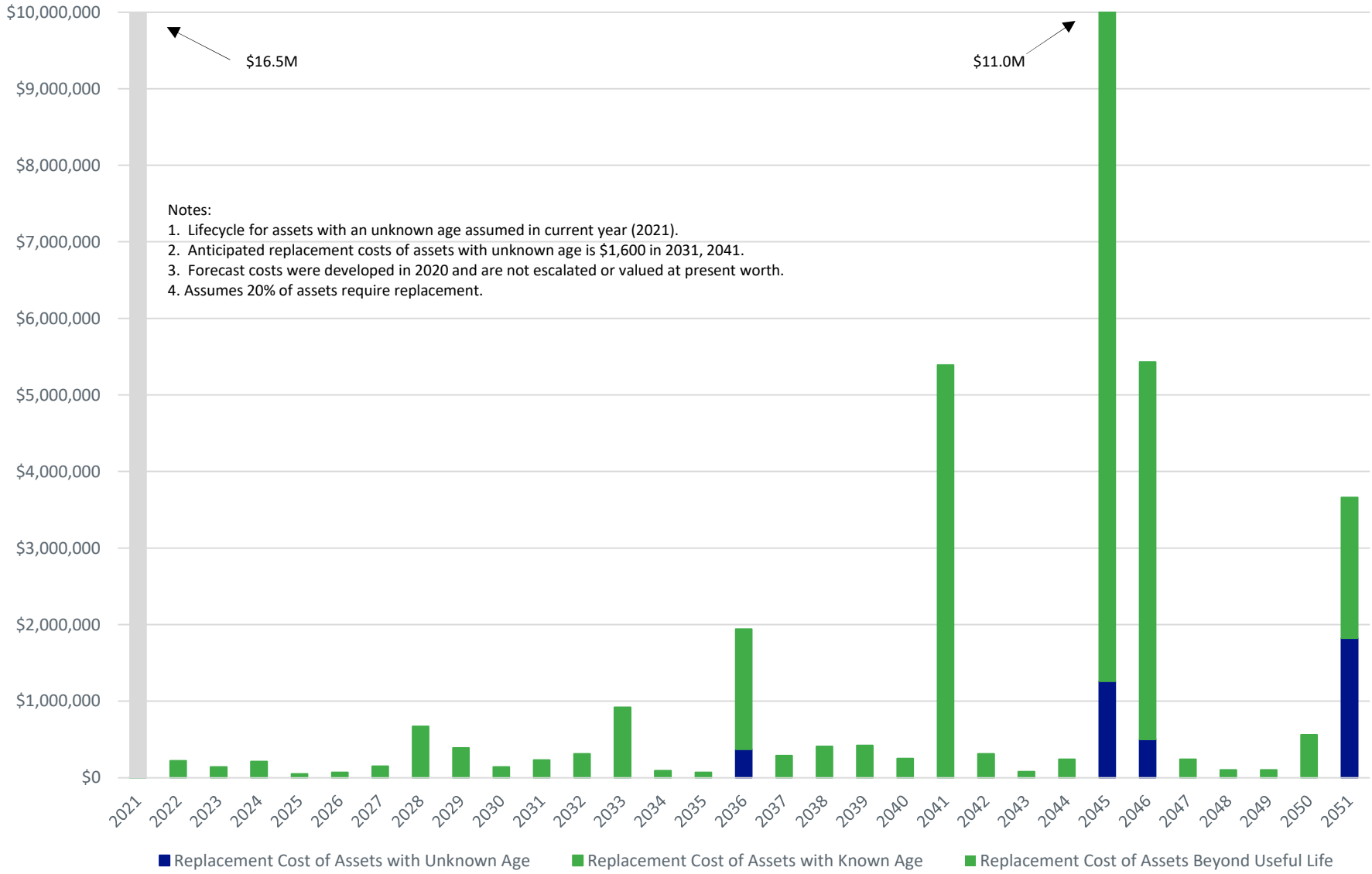

**Table 10-8. Asset Renewal and Replacement Recommendations**

| Title | Description | Capital Cost Estimate, $ |
|---|---|---|
| Capital Projects | | |
| Pipeline Condition Assessment | Conduct a comprehensive assessment of the pipeline distribution system using both destructive and non-destructive assessment techniques. Technologies may include cathodic protection resistivity surveys, coupon sampling and testing, acoustic surveys and electromagnetic surveys and leak detection monitoring. The condition assessment should include appurtenances to pipelines such as air valves, blow off assemblies, fire hydrants and valves.<br>The assessment should focus on metallic and asbestos cement pipeline material segments to document a correlation between pipe material, diameter, age and soil conditions to better estimate remaining useful life. | $500,000 |
| Detailed Facility Condition Assessment | Detailed facility condition assessment studies should be performed at all Level B and C facilities. Level C facilities should be prioritized for immediate assessment. Condition assessment efforts were valued at 2.5% of asset or facility replacement cost. | |
| | **Level B Recommendations** | |
| | **PRV/Intertie/Turnout**<br>• Live Oak PRV<br>• North Vault PRV<br>• South Vault PRV<br>• Milpitas PRV<br>• Capitol PRV<br>• Abel PRV<br>• Gibraltar PRV<br>• McCarthy PRV<br>• Sinclair PRV<br>• ACWD Intertie<br>• SCVWD Intertie | <br>5,000<br>15,000<br>15,000<br>5,000<br>15,000<br>5,000<br>15,000<br>15,000<br>5,000<br>15,000<br>5,000 |
| | **Subtotal PRV/Intertie/Turnout** | **$115,000** |
| | **Well/Res/PS**<br>• Curtis Well<br>• Minnis Reservoir<br>• Gibraltar Res (VW)<br>• Gibraltar Res (SF) | <br>75,000<br>80,000<br>325,000<br>325,000 |
| | **Subtotal Well/Res/PS** | **$805,000** |
| | **Level B Total Cost** | **$920,000** |
| | **Level C Recommendations** | |
| | **PRV/Intertie/Turnout**<br>• Curtis PRV<br>• Montague PRV<br>• Main Street Turnout<br>• Calaveras Turnout<br>• Sunnyhills Turnout<br>• Gibraltar Turnout | <br>15,000<br>5,000<br>20,000<br>15,000<br>15,000<br>25,000 |
| | **Subtotal PRV/Intertie/Turnout** | **$95,000** |
| | **Well/Res/PS**<br>• Tularcitos Reservoir<br>• Country Club Pump Station<br>• Tularcitos Pump Station<br>• Ayer Reservoirs<br>• Pinewood Well<br>• Gibraltar Pump Station<br>• Ayer Pump Station | <br>75,000<br>60,000<br>70,000<br>355,000<br>105,000<br>435,000<br>125,000 |
| | **Subtotal Well/Res/PS** | **$1,225,000** |
| | **Level C Total Cost** | **$1,320,000** |
| Water Meters | Develop a water meter test program | $100,000 |
| Non-Capital Projects | | |
| Data Gathering | Develop business processes and modify the CMMS to collect asset performance data.<br>**Failure Hierarchy** – A failure hierarchy should be developed that supports the capture of problems, causes and remedies (PCR) employed for each asset. A sampling of PCR codes is included Appendix D for PUMP assets. Maintenance staff should then note the appropriate code in the work order when responding to asset problems.<br>**Condition Assessment Data** – Visual and predictive data elements should be developed, and the CMMS modified to provide data fields to capture this data during PM activities. At a minimum visual data should be collected to capture corrosion observations, concrete spalling, burning or arcing, and evidence of leakage. A simple domain should be developed to index readings including a photo-based guide for standardization between staff. Predictive data should be consistent with the City's predictive maintenance program and may include oil analysis, vibration monitoring and thermal imaging.<br>**CMMS Automation** - Business Processes and CMMS workflows should be developed or otherwise modified to require the completion of specific fields such as Failure Codes as part of work order completion. The completion of these fields will be controlled by automated workflow that does not allow the work order to advance from the work performer to the quality assurance reviewer unless all required fields are completed. | NA |
| Line Valves and Fire Hydrants | Develop a valve and hydrant exercise program. | NA |
| Review Maintenance Program | The existing maintenance program should be reviewed to identify additional monitoring of assets at Level A and B facilities. | NA |

**Table 10-9. 30-Year R&R Forecast**

| Year | Replacement Cost of Assets Beyond Useful Life, $ | Replacement Cost of Assets with Known Age, $ | Replacement Cost of Assets with Unknown Age, $ | Total Replacement Costs, $ |
|---|---|---|---|---|
| 2021 | 16,500,000 | 10,000 | - | 16,510,000 |
| 2022 | - | 220,000 | - | 220,000 |
| 2023 | - | 140,000 | - | 140,000 |
| 2024 | - | 210,000 | - | 210,000 |
| 2025 | - | 50,000 | - | 50,000 |
| 2026 | - | 70,000 | - | 70,000 |
| 2027 | - | 150,000 | - | 150,000 |
| 2028 | - | 670,000 | - | 670,000 |
| 2029 | - | 390,000 | - | 390,000 |
| 2030 | - | 140,000 | - | 140,000 |
| 2031 | - | 230,000 | - | 230,000 |
| 2032 | - | 310,000 | - | 310,000 |
| 2033 | - | 920,000 | - | 920,000 |
| 2034 | - | 90,000 | - | 90,000 |
| 2035 | - | 70,000 | - | 70,000 |
| 2036 | - | 1,570,000 | 370,000 | 1,940,000 |
| 2037 | - | 290,000 | - | 290,000 |
| 2038 | - | 410,000 | - | 410,000 |
| 2039 | - | 420,000 | - | 420,000 |
| 2040 | - | 250,000 | - | 250,000 |
| 2041 | - | 5,390,000 | - | 5,390,000 |
| 2042 | - | 310,000 | - | 310,000 |
| 2043 | - | 80,000 | - | 80,000 |
| 2044 | - | 240,000 | - | 240,000 |
| 2045 | - | 9,690,000 | 1,260,000 | 10,950,000 |
| 2046 | - | 4,930,000 | 500,000 | 5,430,000 |
| 2047 | - | 240,000 | - | 240,000 |
| 2048 | - | 100,000 | - | 100,000 |
| 2049 | - | 100,000 | - | 100,000 |
| 2050 | - | 560,000 | - | 560,000 |
| 2051 | - | 1,840,000 | 1,820,000 | 3,660,000 |
| **Total** | **-** | **$30,090,000** | **$3,950,000** | **$50,540,000** |

## 10.4 OVERVIEW OF SEISMIC RISK ASSESSMENT OF CITY'S WATER SYSTEM FACILITIES

As part of the parallel preparation of the City's Risk and Resilience Assessment (RRA), in compliance with America's Water Infrastructure Act of 2018 (AWIA), a seismic risk assessment of the City's water system facilities was conducted. A technical memorandum was prepared to document the methodologies used and estimated consequences associated with an earthquake event affecting the City water system. The technical memorandum is included as Appendix E of this Water Master Plan.

The earthquake scenario selected for the City is the Hayward-Rodgers Creek event described in the United States Geological Survey (USGS) Northern California Legacy Catalog (also referred to as ShakeMaps). At magnitude 6.8, this event represents the largest magnitude event described by ShakeMap in relatively close proximity to key City utilities. According to USGS, this event has an estimated annual probability of approximately 0.74 percent (i.e., a 0.74 percent chance of occurring in any given year), and an approximately 31 percent chance of occurrence within the next 50 years.

The Hayward-Rodgers Creek 6.8 magnitude earthquake is estimated to cause significant damage to the City's non-linear and linear assets. The Hazus Method (for non-linear assets) estimates moderate damage to the buildings and moderate/severe damage to the pump stations and reservoirs. The ALA Method (for linear assets) estimates 8 breaks and 32 leaks from the transmission mains and 192 breaks and 58 leaks from the distribution pipelines. Repair and replacement costs are estimated using crew size, labor rate, shift duration, and order of magnitude material costs for the City. Specific recommendations resulting from the seismic risk analysis are included within the City's RRA and include retrofit of reservoirs to meet sloshing wave standards, implementation of seismically resilient design standards for pipelines, and installation of overland piping connections for critical pipelines that may be damaged during an earthquake, among others. Recommended projects are incorporated in the recommended CIP described in Chapter 11 of this report.

# CHAPTER 11
# Recommended Capital Improvement Plan

This chapter presents the recommended CIP for the City's existing and future water system based on the evaluations described in Chapters 8, 9, and 10 of this report, as well as the Risk and Resilience Assessment (RRA) conducted in parallel with this WMP. In addition to summarizing the recommended capital improvement projects, this chapter provides estimates of probable construction costs for each project. The recommended CIP identifies improvements at a Master Plan level and does not necessarily include all required on-site infrastructure or constitute design of improvements. Subsequent detailed design is required to determine the exact sizes and locations of these proposed improvements.

Construction costs are presented in 2020 dollars based on an Engineering News Record (ENR) Construction Cost Index (CCI) of 12920.6 for San Francisco and were developed based on bids from other municipal water facility design projects and standard cost estimating guides. Using cost estimate classifications from the Association for the Advancement of Cost Engineering (AACE), the following costs are Class 5 estimates, which are associated with projects that are only zero to two percent defined. The expected accuracy range for Class 5 cost estimates spans from -50 percent to +100 percent (i.e., the actual cost is typically between half and double the estimate).

Total CIP costs include mark-ups totaling 70 percent of the estimated base construction costs to allow for:

- Design and Construction Contingency: 35 percent
- Engineering: 10 percent
- Construction Management: 15 percent
- Program Implementation: 10 percent

CIP costs do not include costs for land acquisition, right-of-way acquisition, or annual operation and maintenance. Appendix F details the assumptions and development of construction cost estimates for each type of water facility (e.g., storage reservoirs, pump stations, and pipelines).

This chapter organizes the components of the recommended CIP according to the evaluation that identified the improvements. The final section of this chapter summarizes the recommendations and groups them into five-year CIP phases through the year 2051. Sections of this chapter include:

- Improvements from Renewal and Replacement Study
- Improvements from Existing System Analysis
- Improvements from Future System Analysis
- Improvements from Risk and Resilience Assessment
- Summary and Phasing of Recommended Improvements

## 11.1 IMPROVEMENTS FROM RENEWAL AND REPLACEMENT STUDY

Chapter 10 summarized the condition assessment of the City's water utility assets and recommended projects and activities to manage infrastructure risk. Each water utility asset was evaluated for risk in terms of likelihood and consequence of failure, with recommended projects prioritizing higher risk assets. Recommendations include general maintenance modifications, detailed condition assessment, and renewal and replacement.

Table 11-1 presents the costs for the recommended projects from Chapter 10. Facility condition assessment costs were estimated at 2.5 percent of asset or facility replacement cost. Note, the forecast of renewal and replacement costs is preliminary and based on asset age only. Renewal and replacement costs will change as the City performs detailed condition assessments.

**Table 11-1. Probable Costs for Recommendations from Asset Renewal and Replacement Study[a]**

| Component | Description | CIP Cost, dollars |
|---|---|---|
| Pipeline Condition Assessment | Conduct a comprehensive assessment of the pipeline distribution system using both destructive and non-destructive assessment techniques. | 500,000 |
| Detailed Facility Condition Assessment[b] | Detailed facility condition assessment studies should be performed at all Level B and Level C facilities. Level C facilities should be prioritized for immediate assessment. | 2,240,000 |
| Water Meter Test Program | Develop a water meter test program. | 100,000 |
| Asset Renewal and Replacement[c] | 30-year forecast of asset renewal and replacement. | 50,540,000 |
| | **Total** | **$ 53,380,000** |

(a) Costs shown are in 2020 dollars.
(b) Facility condition assessment efforts were valued at 2.5 percent of asset or facility replacement cost.
(c) Forecast is preliminary and based on asset age only. Renewal and replacement costs will change pending condition assessment.

## 11.2 IMPROVEMENTS FROM EXISTING SYSTEM ANALYSIS

Chapter 8 summarized the evaluation of the City's existing potable water system and its ability to meet recommended operational and design criteria listed in Table 7-1 of this report. West Yost recommended projects to improve existing system operations. As discussed in Section 7.2.1, the existing system fire flow evaluation presents systemwide available fire flow and does not recommend pipeline improvements to specifically increase existing fire flow capacity. However, because results from the existing system fire flow analysis can help prioritize replacing smaller diameter pipelines to improve overall distribution system flows, recommended improvements from that analysis are included in the CIP.

Table 11-2 presents preliminary capital cost estimates for the recommended existing system improvements, which are organized by priority (high to low) and improvement type. West Yost assigned priorities based on the reason for the improvement, and these will help determine CIP phasing. High priority improvements address meeting recommended fire flows in normal conditions (i.e., no outages), while medium priority improvements address meeting recommended fire flows in emergency outage

scenarios (e.g., SFPUC turnouts offline). Finally, low priority improvements consist of projects that generally improve system performance and/or reliability but do not address any specific issues (e.g., upsizing any 4-inch diameter pipelines that serve hydrants to comply with City design guidelines). Where recommendations consisted of either a pipeline or valve improvement for a particular location (e.g., ECIP-V-01 or ECIP-PI-02), valves were selected for the CIP due to comparable cost and less potential disruption during construction (e.g., traffic impacts). Appendix G contains figures showing the location of these recommended improvements and, for some larger projects (e.g., EPRVs and new Ayer pump), single-page project summaries.

The total CIP cost (including mark-ups) for improvements to the existing system is approximately $6.6 million. This includes a 50 percent discount for the new pump at the Ayer pump station, since the cost basis assumes an entirely new pump station, while the recommendation is to provide an additional pump at an existing pump station. In other words, a cost was developed for a new pump station with a firm capacity of 5.76 mgd (4,000 gpm), and half that cost was used to estimate installing a new 4,000 gpm pump at Ayer.

**Table 11-2. Probable Construction Costs for Recommended Improvements to Existing System[a]**

| Improvement Type | Improvement Description | CIP ID | Reason for Improvement | Priority | Quantity | Estimated Construction Cost[b], dollars | CIP Cost (includes mark-ups)[c,d], dollars |
|---|---|---|---|---|---|---|---|
| Interconnection | On Hammond Way near Tom Evatt Park, replace the existing (normally closed) isolation valve separating Zones VW1 and SF1 with a new emergency PRV (Hammond EPRV). | ECIP-V-01 | Fire Flow | High | 1 LS | $ 282,000 | $ 479,000 |
| Interconnection | Near the western end of Corning Avenue, install a new isolation valve at the end of the existing Zone SF1 pipeline, immediately upstream of the tee connecting Zones VW1 and SF1. | ECIP-V-02 | Fire Flow | High | 1 LS | $ 8,000 | $ 14,000 |
| Pipeline Improvement | Along Sinnott Lane, Bothelo Avenue, and East Carlo Street, replace existing 6-inch and 8-inch diameter pipeline with 12-inch diameter pipeline. | ECIP-PI-01 | Fire Flow | High | 1,731 lf | $ 320,301 | $ 545,000 |
| Pipeline Improvement | Along Technology Drive between Murphy Ranch Road and the western end of Technology Drive, replace existing 4-inch diameter pipeline with 12-inch diameter pipeline. | ECIP-PI-04 | Fire Flow | High | 742 lf | $ 137,198 | $ 233,000 |
| Pipeline Improvement | Along Hanson Court, replace existing 8-inch diameter pipeline with 12-inch diameter pipeline. | ECIP-PI-05 | Fire Flow | High | 611 lf | $ 113,070 | $ 192,000 |
| Pipeline Improvement | Along Milmont Drive between Dixon Landing Road and the ACWD intertie, replace existing 8-inch and 10-inch diameter pipeline with 12-inch diameter pipeline. | ECIP-PI-06 | Fire Flow | High | 907 lf | $ 167,841 | $ 285,000 |
| Pipeline Improvement | Along Railroad Avenue between approximately hydrant 1A-355 and the southern end of Railroad Avenue, replace existing 8-inch diameter pipeline with 12-inch diameter pipeline. | ECIP-PI-07 | Fire Flow | High | 880 lf | $ 162,788 | $ 277,000 |
| Pipeline Improvement | Within the shopping center east of the intersection of South Park Victoria Drive and Landess Avenue, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-08 | Fire Flow | High | 450 lf | $ 60,727 | $ 103,000 |
| Pipeline Improvement | Along Greenwood Way between Pinewood Way and Fallen Leaf Drive, replace existing 6-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-10 | Fire Flow | High | 861 lf | $ 116,222 | $ 198,000 |
| Pipeline Improvement | Along South Abel Street between Sylvia Avenue and Corning Avenue, replace existing 6-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-11 | Fire Flow | High | 240 lf | $ 32,397 | $ 55,000 |
| Pipeline Improvement | Along Pinard Street from Ridgemont Drive up to the Lee's Orchard community, replace existing 8-inch diameter pipeline with 12-inch diameter pipeline. | ECIP-PI-16 | Fire Flow | High | 680 lf | $ 125,767 | $ 214,000 |
| Pipeline Improvement | Along Merz Court, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-21 | Fire Flow | High | 425 lf | $ 57,396 | $ 98,000 |
| Pipeline Improvement | Along Sussex Place, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-23 | Fire Flow | High | 192 lf | $ 25,906 | $ 44,000 |
| Pipeline Improvement | Along Carlsbad Street between Carlsbad Court and Ben Rodgers Park, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-25 | Fire Flow | High | 160 lf | $ 21,583 | $ 37,000 |
| Pipeline Improvement | Along Calera Creek Heights Drive between approximately hydrants 4A-001 and 4A-005, replace existing 6-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-26 | Fire Flow | High | 1,476 lf | $ 199,262 | $ 339,000 |
| Pump Station[e] | Install a 4,000 gpm (5.76 mgd) fire pump at Ayer Pump Station. | ECIP-PS-AY | Fire Flow (Outage) | Med | 1 LS | $ 1,216,733 | $ 2,068,000 |
| Interconnection | Near the intersection of Coelho Street and Diel Drive, replace the existing (normally closed) isolation valve separating Zones SF1 and SF2 with a new emergency PRV (Diel EPRV). | ECIP-V-03 | Fire Flow (Outage) | Med | 1 LS | $ 282,000 | $ 479,000 |
| Pipeline Improvement | Along Callan Street near the intersection of Callan Street and Arizona Avenue, replace existing 6-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-28 | Fire Flow (Outage) | Med | 145 lf | $ 19,562 | $ 33,000 |
| Pipeline Improvement | Along Gross Street, near the intersection of Gross Street and Conway Street, replace existing 6-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-31 | Fire Flow (Outage) | Med | 171 lf | $ 23,072 | $ 39,000 |
| New Pipeline (Developed Area) | Along Curtis Avenue, connect the existing 10-inch diameter pipeline on the northern side of the street to the existing 18-inch diameter pipeline on the southern side of the street with a new, 12-inch diameter pipeline. | ECIP-PN-01 | Fire Flow (Outage) | Med | 30 lf | $ 5,550 | $ 9,000 |
| New Pipeline (Developed Area) | Along Hammond Way, east of Tom Evatt Park, connect the existing 8-inch diameter pipelines in Zone VW1 with a new, 8-inch diameter pipeline. | ECIP-PN-02 | Fire Flow (Outage) | Med | 57 lf | $ 7,628 | $ 13,000 |
| Backup Generator | Install a backup generator at the Country Club Pump Station. | ECIP-BG-CC | General Reliability | Low | 1 LS | $ 200,000 | $ 340,000 |
| Backup Generator | Install a backup generator at the Tularcitos Pump Station. | ECIP-BG-TL | General Reliability | Low | 1 LS | $ 200,000 | $ 340,000 |
| Pipeline Improvement | Along Santa Rita Drive near the intersection of Santa Rita Drive and Via Baja Drive, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-32 | Hydrant Service[f] | Low | 21 lf | $ 2,895 | $ 5,000 |
| Pipeline Improvement | Along Calle del Prado, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-33 | Hydrant Service[f] | Low | 89 lf | $ 12,029 | $ 20,000 |
| Pipeline Improvement | Along Kennedy Drive between Topham Court and Prada Drive, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-34 | Hydrant Service[f] | Low | 331 lf | $ 44,646 | $ 76,000 |
| Pipeline Improvement | Along Ramos Court, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-36 | Hydrant Service[f] | Low | 62 lf | $ 8,424 | $ 14,000 |
| Pipeline Improvement | Along Stemel Court, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-37 | Hydrant Service[f] | Low | 45 lf | $ 6,109 | $ 10,000 |
| Pipeline Improvement | Along Sepulveda Court, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-38 | Hydrant Service[f] | Low | 21 lf | $ 2,874 | $ 5,000 |
| Pipeline Improvement | Along Berg Court, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline. | ECIP-PI-39 | Hydrant Service[f] | Low | 107 lf | $ 14,483 | $ 25,000 |
| | | | | | | **Total** | **$ 6,589,000** |

(a) Costs shown are in 2020 dollars.

(b) Estimated construction costs do not reflect an adjustment to account for the current economic bidding climate.

(c) Costs include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

(d) Total rounded to the nearest $1,000.

(e) Since this an upgrade to an existing pump station (and not a new pump station), the estimated cost is discounted 50 percent.

(f) To comply with the City's design guidelines, West Yost also recommends upsizing pipelines less than 6 inches in diameter that serve hydrants.

## 11.3 IMPROVEMENTS FROM FUTURE SYSTEM ANALYSIS

Chapter 9 summarized the evaluation of the City's future (i.e., buildout) potable water system and its ability to meet recommended operational and design criteria listed in Table 7-1 of this report. Evaluation of the buildout system assumed that improvements recommended from the existing system analysis were implemented. Any buildout system deficiencies were then addressed via additional improvements.

Table 11-3 presents preliminary capital cost estimates for the recommended buildout system improvements. With demands in the VW service area increasing over 65 percent from existing levels, supply and storage capacity improvements are recommended. In addition to a new storage reservoir, the Curtis Well helps address the storage capacity deficiency at buildout by providing an emergency groundwater storage credit. The Cedar EPRV will help serve fire flows in Zone VW1 and improve system reliability. Since these projects address capacity deficiencies or improve fire flow, all are considered high priority. Appendix G contains project summary sheets for each of these recommended improvements.

The total CIP cost (including mark-ups) for improvements to the buildout system is approximately $16.6 million. This total does not include land acquisition costs, which may be necessary for the new storage reservoir. A public service utility easement is available for the Piper turnout, but space is limited. As a result, it is assumed a pump station will not be constructed at the Piper turnout. While the Gibraltar facility has a pump station to boost low pressures from the Gibraltar turnout, to date the City has not used it. Therefore, constructing the Piper turnout without a booster pump station is acceptable.

**Table 11-3. Probable Construction Costs for Recommended Improvements to Future System[a]**

| Improvement Type | Improvement Description | CIP ID | Reason for Improvement | Priority | Quantity | Estimated Construction Cost[b], dollars | CIP Cost (includes mark-ups)[c,d], dollars |
|---|---|---|---|---|---|---|---|
| Turnout | New VW turnout near the intersection of Piper Drive and Garden Street with a capacity of 10,000 gpm (14.4 mgd). | BCIP-TO-01 | Firm Supply Capacity | High | 1 LS | $ 313,000 | $ 532,000 |
| Storage Reservoir[e] | 2.0 MG reservoir in VW service area. | BCIP-S-01 | Storage Capacity | High | 1 LS | $ 3,254,000 | $ 5,532,000 |
| Pump Station | Firm capacity of 4,000 gpm (5.76 mgd) for new storage reservoir. | BCIP-PS-01 | Storage Capacity | High | 1 LS | $ 2,433,466 | $ 4,137,000 |
| Groundwater Well[f] | Construct Curtis Well. | BCIP-W-01 | Storage Capacity | High | 1 LS | $ 3,500,000 | $ 5,950,000 |
| Interconnection | Near the intersection of Cedar Way and South Main Street, replace the existing (normally closed) isolation valve separating Zones SF1 and VW1 with a new emergency PRV (Cedar EPRV). | BCIP-V-01 | Fire Flow | High | 1 LS | $ 282,000 | $ 479,000 |
| | | | | | | **Total** | **$ 16,630,000** |

(a) Costs shown are in 2020 dollars.

(b) Estimated construction costs do not reflect an adjustment to account for the current economic bidding climate.

(c) Costs include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

(d) Total rounded to the nearest $1,000.

(e) Recommended active volume. Cost assumes the storage reservoir will be an aboveground steel tank. Land acquisition costs are not included.

(f) Estimated construction cost assumes Curtis Well capacity is between 500 and 1,000 gpm. A higher capacity may result in higher costs.

## 11.4 IMPROVEMENTS FROM RISK AND RESILIENCE ASSESSMENT

West Yost conducted an RRA in compliance with the requirements of the 2018 America's Water Infrastructure Act. This effort includes assessments of both cyber and physical risks and resilience and development of a risk and resilience strategy. Recommendations from the RRA, referred to as risk and resilience management strategies (RRMS), include physical upgrades, planning efforts, and cyber security projects.

Table 11-4 presents the recommended RRMS, organized by project type, along with a project description and priority as assigned in the RRA. High-level cost estimates were developed for four of the 23 RRMS. These four projects and their costs, which total approximately $2.1 million (2020 dollars), are included in the CIP summary and phasing detailed in Section 11.5.

**Table 11-4. Risk and Resilience Assessment Management Strategies[a]**

| Project Type | Project No. | Project Name[b] | Project Description[b] | Priority | CIP Cost[c], dollars |
|---|---|---|---|---|---|
| Physical Upgrade | 1 | Physical Security Updates - Perimeter Fencing | Enhance security of site perimeters by establishing and implementing a minimum fencing standard (e.g., 8-feet high, anti-climb fabric, barbed wire). | High | $ 30,000 |
| | 2 | Physical Security Updates - Turnout | Enhance security of turnout site perimeter by installing minimum 8-ft fencing. Property owned by SFPUC. Work with SFPUC to make improvements. | High | |
| | 3 | Warning Signage | Install signage at all facilities to inform that trespassing, tampering, and vandalism are criminal acts under relevant federal statutes. | High | |
| | 4 | Site Security Protocols | Implement policy of keeping all gates and doors locked at reservoir and pump station sites, and require key or access card to open. | High | $ 20,000 |
| | 5 | Harden Critical Transmission Mains against Earthquakes - Emergency Connections | Install overland piping connections for critical pipelines that may be used to provide temporary distribution capacity. | High | |
| | 6 | Harden Critical Transmission Mains against Earthquakes - Emergency Connections Exercises | Conduct periodic exercises for existing overland piping connections across faults. | High | |
| | 7 | Harden Critical Transmission Mains against Earthquakes - Replace Isolation Valves | Following implementation of a program to locate and assess isolation valves on critical transmission mains (see Harden Critical Transmission Mains against Earthquakes - Identify Isolation Valves). Replace isolation valves according to priority. | High | $ 2,000,000 |
| | 8 | Harden Critical Reservoirs against Earthquakes - Isolation Valves | Assess and replace (as needed) isolation valves and buried connections at reservoirs. | Medium | |
| | 9 | ShakeAlert Participation | Enroll in program to receive early warning indications from USGS (or other agencies). Development of protocols for responding to ShakeAlert signals included in other RRMS projects | Medium | $ 85,000 |
| | 10 | Valve Integration with ShakeAlert | Install new or modify existing automatic valves to be integrated with or informed by ShakeAlert. Develop remote valve closure protocol to prevent leakage of safe drinking water from reservoirs during and following an earthquake. Coordinate valve closure protocol with Distribution. | High | |
| | 11 | Equipment Integration with ShakeAlert | Integrate ShakeAlert with process controls to prevent or reduce earthquake damage. Develop protocols for equipment shutdowns based on risk. | High | |
| | 12 | Retrofit Steel Reservoirs to Meet Sloshing Wave Standard | Evaluation of the City's reservoir roof and overflow heights and reservoir operating levels revealed that maximum potential sloshing wave height triggered by an earthquake would exceed the reservoir roof heights for all of the City's reservoirs. This could result in structural damage to the reservoirs. Steel reservoirs may be physically retrofitted to increase the roof height to meet the sloshing wave standard. It is recommended that the reservoirs be retrofitted to meet the standard. | Low | |
| | 13 | Implement Seismic Design Standards for Pipeline Upgrades and Replacements | Seismic design standards for pipelines were previously identified in the 2006 City of Milpitas Water System Seismic Improvements Strategic Plan (prepared by DWSA). This project would be a continuation of implementation of the recommended upgrades to pipelines within the system. | Medium | |
| | 14 | Security Cameras for Critical and Remote Facilities | Where feasible, install PTZ security cameras at the most critical and remote assets. Evaluate feasibility of storing footage from new cameras. This effort is currently in progress. | High | |
| | 15 | Fire Pump at Ayer Pump Station | Install fire pump at the Ayer Pump Station to increase fire flow capacity when the SFPUC turnouts are offline. Note that this project is also included in the recommendations for the 2020 Water Master Plan. | High | |
| Planning and Studies | 16 | Harden Critical Transmission Mains against Earthquakes - Identify and Assess Isolation Valves | Locate distribution system PRVs and isolation valves, determine if the valves are functional, evaluate the condition of the valves, and record and summarize the data collected during the field investigation. Following evaluation of the distribution valves prioritize valves for maintenance/replacement. | Medium | |
| | 17 | Evaluate Concrete Reservoirs Ability to Withstand Sloshing Wave Forces | Evaluation of the City's reservoir roof and overflow heights and reservoir operating levels revealed that maximum potential sloshing wave height triggered by an earthquake would exceed the reservoir roof heights for all of the City's reservoirs. This could result in structural damage to the reservoirs. Concrete roofs may be capable of withstanding forces produced by the sloshing wave if the roof height does not meet the standard, however, further evaluation by a structural engineer is recommended to confirm this. | Complete | |
| Cyber Security | 18 | Develop and Implement a SCADA Master Plan | Prepare a SCADA Master Plan to provide a road map for utility-wide SCADA system policies, procedures and improvements; provide increased security and uniformity across utility. This project would include or provide definition to the projects listed here. This effort is currently in progress. | High | |
| | 19 | Conduct Day Without SCADA Exercises & Document Capabilities | Following implementation of the City's new SCADA system, conduct emergency preparedness exercises to test operation of distribution system without automation (SCADA). Since the City currently operates the system without the use of SCADA, the purpose of this excercise is to maintain staff knowledge and capabilities. | High | |
| | 20 | Engage DHS for Cybersecurity Services | Engage Cybersecurity Infrastructure Security Agency (CISA) for cybersecurity services including assessments, tools, and recommendations. CISA offers a wide range of assessments. At a minimum, this project will engage DHS for a Phishing Campaign Assessment and a Remote Penetration Test. To be implemented following implementation of SCADA. | Medium | |
| Shorter Term Activities or Projects | 21 | Business Continuity Plan | Develop a Business Continuity Plan to outline the policies and procedures the City must follow to resume business operations following a major disruption (fire, flood, earthquake, cyberattack, etc.). | High | |
| | 22 | Day without Phone Exercises | Exercise radio skills on bi-annual basis with monthly radio call ins. Planning for this exercise is currently in progress. | High | |
| | 23 | Functional Training on ERP | Conduct functional training exercises on the City's ERP to prepare staff for emergency events. | Medium | |
| | | | | **Total** | **$ 2,135,000** |

(a) Costs shown are in 2020 dollars.

(b) Project names and descriptions have been generalized to not identify specific system vulnerabilities.

(c) Costs were only developed for four projects recommended in the Risk and Resilience Assessment.

## 11.5 SUMMARY AND PHASING OF RECOMMENDED IMPROVEMENTS

This section combines the above recommendations and organizes them into five-year CIP periods according to project priority. CIP phasing generally consists of five-year periods spanning from 2021 through 2051. This period is 31 years, so the final CIP period spans six years (2046-2051). It was assumed that improvements from the existing system analysis would be implemented in the next ten years (i.e., by 2030), while improvements from the future system analysis would be implemented when existing facilities can no longer meet operational criteria summarized in Table 7-1 of this report.

It was assumed that condition assessments, water meter test development, and physical upgrades would occur by 2025. Asset renewal and replacement follows the schedule presented in Table 10-9 of this report. Note, the asset renewal and replacement schedule was developed based on asset age and is subject to change pending findings from the recommended detailed condition assessments.

For the existing system analysis, high priority improvements are assigned to the 2021-2025 CIP period, while medium and low priority improvements are assigned to the 2026-2030 CIP period. As noted in Section 9.4 of this report, storage capacity is expected to become insufficient around 2032. Therefore, the new storage reservoir and Curtis Well (which reduces the storage requirement via an emergency groundwater storage credit) are assigned to the 2031-2035 CIP period. In contrast, firm supplies (i.e., largest turnout in each service area offline) can meet demands until around 2038, so the Piper turnout can be pushed to the 2036-2040 CIP period.

Table 11-5 summarizes the proposed CIP phasing and cost in 2020 dollars. Improvements are grouped according to their “source” (e.g., Renewal and Replacement Study), and their costs are assigned to a five-year CIP period. The total CIP cost through 2051 is approximately $78.7 million (2020 dollars).

## Table 11-5. Capital Improvement Program Phasing

| Improvement | Capital Cost, $M[a] | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2021-2025 | 2026-2030 | 2031-2035 | 2036-2040 | 2041-2045 | 2046-2051[b] | Total |
| Improvements from Renewal and Replacement Study (Chapter 10) | | | | | | | |
| Pipeline Condition Assessment | $0.5 | - | - | - | - | - | $0.5 |
| Detailed Facility Condition Assessment | $2.2 | - | - | - | - | - | $2.2 |
| Water Meter Test Program | $0.1 | - | - | - | - | - | $0.1 |
| Asset Renewal and Replacement | $17.1 | $1.4 | $1.6 | $3.3 | $17.0 | $10.1 | $50.5 |
| Subtotal | $20.0 | $1.4 | $1.6 | $3.3 | $17.0 | $10.1 | $53.4 |
| Improvements from Existing System Analysis (Chapter 8) | | | | | | | |
| Hammond EPRV and Corning Isolation Valve | $0.5 | - | - | - | - | - | $0.5 |
| Pipeline Improvements - Fire Flow | $2.6 | - | - | - | - | - | $2.6 |
| Fire Pump at Ayer Pump Station | - | $2.1 | - | - | - | - | $2.1 |
| Diel EPRV | - | $0.5 | - | - | - | - | $0.5 |
| Pipeline Improvements and New Pipelines - Fire Flow (Outage) | - | $0.1 | - | - | - | - | $0.1 |
| Backup Generators at Country Club and Tularcitos Pump Stations | - | $0.7 | - | - | - | - | $0.7 |
| Hydrant Service Pipeline Improvements | - | $0.2 | - | - | - | - | $0.2 |
| Subtotal | $3.1 | $3.5 | $0.0 | $0.0 | $0.0 | $0.0 | $6.6 |
| Improvements from Future System Analysis (Chapter 9) | | | | | | | |
| Piper Turnout | - | - | - | $0.5 | - | - | $0.5 |
| VW Storage Reservoir | - | - | $5.5 | - | - | - | $5.5 |
| Pump Station for VW Storage Reservoir | - | - | $4.1 | - | - | - | $4.1 |
| Curtis Well | - | - | $6.0 | - | - | - | $6.0 |
| Cedar EPRV | - | - | $0.5 | - | - | - | $0.5 |
| Subtotal | $0.0 | $0.0 | $16.1 | $0.5 | $0.0 | $0.0 | $16.6 |
| Improvements from Risk and Resilience Assessment[c] | | | | | | | |
| Perimeter Fencing | $0.030 | - | - | - | - | - | $0.030 |
| Site Security Protocols | $0.020 | - | - | - | - | - | $0.020 |
| Replace Isolation Valves | $2.0 | - | - | - | - | - | $2.0 |
| ShakeAlert Participation | $0.085 | - | - | - | - | - | $0.085 |
| Subtotal | $2.1 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $2.1 |
| **Total** | **$25.2** | **$4.9** | **$17.7** | **$3.8** | **$17.0** | **$10.1** | **$78.7** |

(a) Costs shown are in 2020 dollars.

(b) Includes forecasted renewal and replacement costs for the year 2051.

(c) Costs were only developed for four projects recommended in the Risk and Resilience Assessment.

# CHAPTER 12
# References

Below is a list of references used for the preparation of this Water Master Plan, sorted alphabetically by author.


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# Appendix A

## Water System Schematic Profile

Elev (FT)

1000
900
800
700
600
500
400
300
200
100
0

## LEGEND

- WHOLESALER SUPPLY LINE
- CITY DISTRIBUTION LINE
- EMERGENCY/NORMALLY CLOSED LINE
- SERVICE ZONE
- VALVE (NORMALLY CLOSED)
- WELL
- PRESSURE REDUCING VALVE (PRV)
- EMERGENCY PRV
- CITY RESERVOIR
- PUMP STATION (PS)
- TURNOUT
- INTERTIE

**NOTE:**
Tank Elevations shown are Top of Tank Elevation

SFPUC
San Francisco Public Utilities Commission

SCVWD
Santa Clara Valley Water District

MINNIS TANK
0.35 MG ELEV: 908'

ZONE 4SF-2 HGL = 885'

CALERA CREEK HEIGHTS PRV

TULARCITOS S. VAULT PRV

ZONE 4SF-1 HGL = 740'

TULARCITOS N. VAULT PRV

TULARCITOS PS

TULARCITOS TANK
0.31 MG
ELEV: 567'

ZONE 3SF HGL = 545'

COUNTRY CLUB PS

SUNNYHILLS TURNOUT

SAN JOSE WATER INTERTIE HGL: 345'

ALAMEDA COUNTY WATER DISTRICT INTERTIE HGL: 345'

SFPUC BAY DIVISION PIPELINES NO. 3 & 4
HGL: 340'

MAIN ST TURNOUT

GIBRALTAR TURNOUT

CALAVERAS BLVD TURNOUT

ZONE 2SF HGL = 340'

MAIN ST PRV

GIBRALTAR PRV

N MILPITAS PRV

ZONE 1SF HGL = 200'

AYER PRV

AYER PS

SUNNY HILLS PRV

YOSEMITE EPRV

JUNIPERO EPRV

MONTAGUE EPRV

LIVE OAK EPRV

CALIFORNIA CIRCLE EPRV

MCCARTHY EPRV

ALAMEDA COUNTY WATER DISTRICT INTERTIE
HGL: 190'

GIBRALTAR PS

GIBRALTAR TANK
5 MG ELEV: 48'

AYER TANK
5.6 MG ELEV: 85'

CURTIS WELL

PINEWOOD WELL

Based on the Gibraltar PRV setting, the Zone 2SC HGL should be 325 feet.

GIBRALTAR SCVWD TURNOUT

SCVWD MILPITAS PIPELINE HGL: 425'

GIBRALTAR PRV

GIBRALTAR EMERGENCY BOOSTER

ZONE 2SC HGL = 258'

ZONE 1SC HGL = 200'

CAPITOL PRV

CURTIS PRV

PARC METRO PRV

GIBRALTAR PS

GIBRALTAR PRV

GIBRALTAR TANK
5 MGD ELEV: 48'

MCCANDLESS WELL
(FUTURE)

| | PRESSURE REDUCING VALVES | |
|---|---|---|
| | PRV NAME | HGL |
| SFPUC | MAIN ST | 207' |
| | GIBRALTAR | UK |
| | N MILPITAS | 207' |
| | AYER | UK |
| | SUNNY HILLS | 199' |
| | TULARCITOS SOUTH VAULT | 762' |
| | TULARCITOS NORTH VAULT | 707' |
| | CALERA CREEK HEIGHTS | 787' |
| SCVWD | CAPITOL | 201' |
| | GIBRALTAR | 325' |
| | CURTIS | 202' |
| | GIBRALTAR | UK |
| | PARC METRO | UK |
| EMERGENCY | MCCARTHY | 73' |
| | CALIFORNIA CIRCLE | 71' |
| | LIVE OAK | 125' |
| | JUNIPERO | 169' |
| | MONTAGUE | 216' |
| | YOSEMITE | 211' |

**NOTE:**
UK denotes unknown

HydroScience

City of Milpitas
Water Distribution System Plan
Schematic Profile

# Appendix B

## System Operations Narratives

# City of Milpitas Distribution System Operation

# General Description

## WATER SUPPLY

The City of Milpitas receives water from two wholesale agencies, San Francisco Public Utilities Commission (SFPUC) and Valley Water (VW). Water from SFPUC is brought through the City by two transmission lines, Bay Division Pipelines 3 & 4, supplies Milpitas through 3 turnouts – Sunnyhills, Calaveras, and Main Street. Valley Water is brought to the City via the East Pipeline, and has one turnout at the City's Gibraltar Pump Station. There is an Intertie connection between Valley Water and SFPUC which runs from the end of the East Pipeline at Gibraltar Pump station and proceeds approximately 1,000 feet north the the SFPUC/VW Intertie Pump Station. Milpitas has a connection to this pipeline which can serve as an additional turnout to SFPUC, which we call the Intertie Turnout. When the SFPUC/VW Intertie is not in operation to transport water from SFPUC to VW or vice versa, the Intertie turnout is used by Milpitas to receive water from SFPUC, thus keeping the Intertie pipeline with fresh water in it.

The City also currently has one operational well, Pinewood Well, can be used to supply water to a portion of the City's zone 1SF distribution system. This well is currently premitted as a Standby Well, and thus can only be used for emergency operations only. An additional well, Curtis Well, has been drilled and developed, but there is no pump station and no connection to distribution system infrastructure. Curtis Well contains manganese and will require treatment. Possible infrastructure connections are to zones 1SC, 2SC and 2SF. In addition, a connection to Gibraltar Pump Station for blending purposes is also in consideration. A third well is in the planning stages now, McCandless Park Well. A test hole had been drilled and the above and below ground portions of the main well are in design with an anticipated completed date of sometime in 2022. This well will also require manganese removal treatment, and will serve zone 1SC.

### Pressure Zones

Milpitas does not blend water from the two wholesalers that serve the City. As a result, Milpitas distinct areas that are served water from one or the other wholesaler, and they are designated by the letter codes SF and SC. Each wholesaler served area has two main pressure zones in the area of the City that resides on the valley floor. Zones are identified as low pressure or high pressure. Low pressure zones have a number designation of 1, and are regulated by pressure reducing valves to have a maximum pressure of about 80 psi in the zone. High pressure zones have a number designation of 2. The high pressure zone served

by SF is not regulated and is set by the pressure supplied by SFPUC at the turnouts, which is typically between 130 and 140 psi. For the high pressure zone served by VW, it is set by a pressure reducing valve at Gibraltar Pump Station to between 135 and 140 psi. Valley Water is typically supplied from the East Pipeline at a pressure of 170 – 180 psi.

There are two additional pressure zones that cover the developed area of the hills in Milpitas which includes the Summit Pointe Golf and Country Club. This water system was originally called La Questa and is now commonly referred to as "The Hillside". Water is transported to these zones, designated 3 and 4a and 4b. These system will be described in more detail later in this document.

## DISTRIBUTION SYSTEM OPERATION

### VW System

The area of Milpitas which is served by Valley Water (formerly known as Santa Clara Valley Water District, or SCVWD) was carved out in the late 1980s to be served separately from the rest of the City's distribution system, which was formerly completely serviced by SFPUC. The area selected was primarily commercial/industrial. See the zone map for visual reference. Gibraltar Pump Station was constructed as part of this effort and has two 5 MG storage tanks, one designated for VW water and one for SFPUC water. The station is really 3 stations in one, and was intended to serve multiple purposes. For the distribution of VW water, the turnout connection to the East Pipeline was located on the station grounds. Water from the turnout goes through a revenue meter and vault, maintained by VW, and then goes through a Pressure Reducing Valve (PRV) to enter the City's zone 2SC distribution system. Water is also sent to the VW reservoir for storage directly from the turnout. Water from the reservoir can be pumped out of the reservoir and into zone 2SC by one of two pumping systems. When pumping from storage, flow from the turnout is generally halted. Once water enters zone 2SC, it is maintained at about 135 psi. There are three PRV stations that then take water from zone 2SC and reduce the pressure to send it to zone 1SC. Pressure in zone 1SC is maintained to have a maximum of about 80 psi as the highest pressure within the zone. The three PRVs that send water to zone 1SC are Curtis, Parc Metro and Capitol. The Curtis PRV is actually two PRVs in parallel, designated East and West.

In addition to the main PRVs that control pressure in zones 1SC and 2SC, there are also Emergency PRV stations. These are standby PRV stations that will only open and supply water if the pressure in zone they are supplying falls below a certain setpoint. For zone 2SC, there are two stations, Yosemite and Montague, that will allow water to pass from zone 2SF to zone 2SC if the pressure in zone 2SC falls below about 120 psi. For zone 1SC, there are 4 emergency PRV stations, Live Oak, McCarthy, California Circle, and Junipero. These stations will supply water from zone 1SF to zone 1SC if the pressure in zone 1SC falls below about 60 psi at the point of highest pressure. It is important to note that the emergency PRVs for both zones

only flow in *one* direction, from the SF zones to the SC zones, and *not* in the opposite direction. The SC zones were intentionally set up to have higher pressures than the corresponding SF zones so that this system could work this way.

**SFPUC System**

The portion of the City supplied by water from SFPUC is primarily residential, with some commercial. Water is supplied to these zones from the 3 primary turnouts, Sunnyhills (called Washington by SFPUC), Calaveras, and Main Street (called Hammond by SFPUC). Each turnout has connections to the two Bay Division Pipelines, 3 and 4. There are two parallel revenue meters that supply a manifold to which the city connects for our supply. At the Sunnyhills and Main St. turnouts, there are two types of connections. Connections that go directly to zone 2SF are unregulated, fed directly at the pressure supplied by SFPUC. Connections that go to zone 1SF are fed through two parallel PRVs located within the turnout vault structure. At the Calaveras turnout, the connections are all to zone 2SF, and therefore unregulated. There is an associated PRV station a short distance away next to Milpitas City hall, called the Milpitas PRV station, that takes water from the Calaveras turnout and sends it to zone 1SF. This station has two PRVs in parallel, but one larger than the other. All turnout PRV stations with parallel PRVs operate in a lead/lag fashion, with one set to a slightly higher pressure setpoint than the other.

Water from zone 2SF supplies zone 3SF by acting as the supply to the first of two booster pumping stations, Country Club. Country Club booster pump station recieves water from zone 2SF as the suction supply that is then pumped into Zone 3SF. There is a 12" supply line that travels from the output of Country Club pump station up to the next station, Tularcitos, where it both supplies water to zone 3SF and fills the 310,000 gallon reservoir there. Both the pumps and the reservoir supply water to zone 3SF. The pumps at Country Club are activated by the level of the Tularcitos Reservoir. Then the level gets down to 15 feet the lead pump is turned on. Usually this is enough to start filling the reservoir, but if demand is high enough for the reservoir level to continue to fall to 14 feet, the lag pump will also turn on. Once the reservoir reaches 21.5 feet the pumps are shut off.

In the same manner, pumps at Tularcitos pull water from the reservoir and pump it into zone 4SFa and up to the Minnis Reservoir. Tularcitos pumps are controlled by the level of the Minnis Reservoir. Zone 4SF is broken into two subzones, a and b. Water from zone 4SFa feeds three PRVs called North Vault, South Vault, and Calera Creek Heights. Due to the elevation differences in zone 4, the PRVs are necessary to break the pressure midway in the zone. Zone 4SFa is unregulated, and the lower part of the zone, zone 4SFb is the portion regulated by the three PRV stations.

Each reservoir, Minnis and Tularcitos, has a nozzle type mixing system which uses a pump to circulate water from the tank through the pump and back in through the side of the tank and

out a nozzle mounted inside which faces up at an angle to circulate the water both vertically and horizontally to avoid thermal and chemical stratification. Each also has a sampling pump and equipment for conducting water quality testing onsite.

Ayer Pump Station is located within zone 2SF and has 3 vertical turbine pumps and a 5.6 MG reservoir. The station has a single inlet/outlet which can be used to either fill the reservoir with water from zone 2SF or pump water into zone 2SF, but it cannot do both at the same time. Operation of this station is set up on a fill and pump basis, twice per day, pumping into the zone during morning and evening peak times, and filling from the zone during afternoon and overnight low demand periods.

Gibraltar Pump Station is located within zone 2SC, but also receives water from zone 1SF as well as the Intertie turnout. Gibraltar has a 5 MG reservoir and is also set up on a daily pump and fill cycle, pumping during morning and evening peak times to zone 1SF and filling during afternoon and overnight low demand periods from the Intertie turnout when not in use by SFPUC/VW, or from zone 1SF when the Intertie turnout is not available.

Pinewood Well is located in the southwest portion of the City in the neighborhood called The Pines and is in Pinewood Park. This well can produce about 1200 gallons per minute at an output pressure of about 70 psi. It is currently permitted as a Standby well and is need of further renovation, but it is eventually planned to be permitted as an active well and used to supplement the zone 1SF supply.

Curtis Well is located in Curtis Park, and has no pump station or connection to infrastructure yet. It was originally designed to provide emergency water supply to zone 2SF, but it's location facilitates a connection to both zones 1 & 2SC, as well as zone 2SF. In addition, a sleeve was put in crossing under the railroad tracks to allow a future line to connect the well to Gibraltar Pump Station for possible mixing or treatment to take place at Gibraltar. This would allow Curtis Well to run and blend water for pumping to zone 2SC or zone 1SF from Gibraltar.

**INTERTIES**

There are three inter-city interties. Two are with Alameda County Water District. The first one is located on Milmont drive at the border of Fremont and Milpitas. The second is on North Park Victoria, also at the border of Milpitas and Fremont. Both are manual interties, with significant pressure differences in the normal operating pressures of each system. Both interties have been used successfully to supply water from Milpitas to ACWD.

The third intertie is with San Jose, and is located on Landess Avenue. It is also manual. This intertie has no planned flushing points, and needs to be upgraded to allow routine operation and flushing.

City of Milpitas Water System Emergency Operations Scenarios

This document is a simplified overview of some of the possible emergency conditions that may arise and what changes to system operations are possible to mitigate the impacts of those conditions on the delivery of water to the City's water system customers. This is not a comprehensive how-to manual, as each emergency condition is unique, and the exact circumstances will dictate the actual actions to be taken. This document is intended as a guide to what is possible, and to help guide the responder to considering all possible actions in response to any specific emergency condition. The scenarios below are listed individually, but may occur in any combination, and each will have to be taken into consideration and weighed against the existing system conditions at the time.

**SCENARIOS**

1. Loss of Supply
    a. Loss of SFPUC Supply
    b. Loss of SCVWD (VW) Supply
    c. Loss of both SFPUC & VW Supply
    d. Loss of Well Supplies
2. Pump Station Issues
    a. Loss of PG&E power
        i. Ayer
        ii. Gibraltar
        iii. Hillside
        iv. Wells
    b. Loss of water supply
        i. Gibraltar
        ii. Ayer
        iii. Hillside

3. Distribution System Issues
    a. PRV Station loss/malfunction
    b. Zone interconnection
    c. Agency interconnection
    d. Contamination
    e. Fire suppression aid
    f. Main Line break
    g. Fire hydrant hit
    h. Construction shutdowns/tie-ins

1. Loss of Supply
    a. Loss of SFPUC supply

The loss of SFPUC supply may can occur in three ways: Loss of a single turnout, a reduction in quantity from SFPUC, or the total loss of supply from SFPUC.

i. Loss of a Turnout

SFPUC water is supplied to the City by four turnouts: Sunny Hills, Calaveras, Main Street and the SFPUC/SCVWD Intertie (when available). The loss of a single turnout can be compensated by the other turnouts. Changes in flow patterns within the distribution system will occur which can result in lower pressures in the extremities of the system and dirty water in areas where the flow has reversed or increased. These changes are most significant in zone SF2. The use of Ayer pump station to support peak use times is recommended.

ii. Reduction of Supply from SFPUC

In the event SFPUC cannot meet demands there may be a reduction in supply. Here are the possible ways to add supply to zones SF1 and SF2:

1. Pump from storage at Gibraltar and Ayer;
2. Activate Pinewood Well to pump to zone SF1;
3. (FUTURE) Activate Curtis Well to pump to either Gibraltar or zone SF2;
4. Use water from SCVWD at Gibraltar to supply zone SF1 through the use of the Intertie turnout;
5. Use water from SCVWD at Gibraltar to fill SFPUC reservoir and pump to zone SF1;
6. Use water from SCVWD by opening isolation valves in zones SC1 and/or SC2;

7. Contact ACWD and/or SJ Muni to activate intercity interties for zones SF1 & 2 – significant pressure differences exist, and this is a last resort.

iii. Total loss of supply from SFPUC

In the unlikely event we lose all supply from SFPUC or are required to isolate from SFPUC, the options are similar to the partial loss scenario above but may require a combination of options. Pumping from storage is the most immediate remedy while the other options are set up. Storage will not last long and is dependent on the amount of water in storage at that moment and the time of year the outage occurs. If the outage will last more than a few days, use of Pinewood and (future) Curtis Wells may be significant, as SCVWD will likely be tasked to help provide water to SFPUC and their supply may also be limited.

b. Loss of SCVWD Supply

SCVWD water is only supplied to the City through a single turnout located at Gibraltar Pump Station. Loss of supply may occur as a reduction in available water or as a total loss.

i. Supply Reduction and Total Loss Options
   1. Pump from storage at Gibraltar and use the VW turnout only to provide water to the SCVWD reservoir;
   2. Use SF water from the SFPUC/VW Intertie directly from the Intertie turnout using the Intertie PRV into zone SC2 – pressure will be reduced to about 130 to 135 psi, max;
   3. Use water from zone SF1 to provide water to the SCVWD reservoir either directly (pumping to zone

SF1 will not be possible in this configuration) or by floating the two reservoirs, while pumping to zone SC2.

c. Total Loss of both VW and SFPUC Supplies
    i. In the event both wholesale suppliers lose the ability to provide water to the City, the remaining supplies are limited to
        1. Storage at Ayer and Gibraltar;
        2. Pinewood, McCandless and Curtis Wells;
        3. Intercity Interties with ACWD and SJWC.
    ii. Pumping from storage would be the first recourse until the other two options are brought online. Ayer can supply water from the center of zone SF2. Gibraltar can provide water to zones SF1 and SC2.
    iii. Pinewood Well can pump to zone SF1 directly. Future options may allow it to pump to zone SC1.
    iv. McCandless Well, when completed, will be able to pump directly to zone SC1.
    v. Curtis Well, if completed, will be able to pump to any of the following:
        1. Gibraltar Pump Station, either or both reservoirs;
        2. Zone SF2;
        3. Zone SC2; or
        4. Zone SC1
    vi. Intercity Interties with ACWD can provide water to zones SF1 and SF 2 if ACWD has water to provide, along the City's north border.
    vii. An Intercity Intertie with SJWC can provide water to zone SF2 along the southeast border of the City if SJWC has water to provide and the zone pressure in our zone SF2 is low enough to accept water from SJWC.

d. Loss of Well Supplies
    i. Currently, the only well capable of supplying water to the City is Pinewood Well. It is currently permitted as

an Emergency Standby Well. Loss of this well would remove it from the options to provide water in the scenarios listed previously.

ii. Once all three of the City's wells are completed and brought into service as everyday supplies, the loss of supply from these wells would increase the amount of water the City would pull from its wholesale providers, which could have contract implications. In the event of an emergency, the loss of these wells as backup water supplies would eliminate the ability of the City to have an independent water supply under its control and eliminate this option as a means to provide water under any of the other emergency scenarios listed previously.

2. Pump Station Issues
    a. Loss of PG&E Power
        i. Ayer
            1. Ayer Pump Station is equipped with a 1,000 KW Caterpillar Genset which is capable of automatically starting and completely powering the station and all three pumps in the event of the loss of outside power.
            2. The station has a 1,000 gallon (900 gallon useable) above ground fuel storage tank that is capable of running the station for 24 hours before requiring refueling.
        ii. Gibraltar
            1. Gibraltar Pump Station is equipped with a 2.5 MW Genset which is capable of automatically starting and completely powering the pump station and all pumps in the event of the loss of outside power.
            2. The station has a 10,000 gallon (9,000 gallons useable) above ground fuel tank that is capable

of running the genset for 72 hours before refueling would be required.

3. The station also has 3 diesel powered pumps which can run independently with local controllers even if the station has no power. Pump 2 can be used to pump to zone SC2, pump 3 can be used to pump to zone SF1, and Pump 7 can be used as a booster to pump water directly from the SCVWD turnout into zone SC2.

iii. Hillside

1. All three Hillside stations are reliant on PG&E power for operation. All three do have a UPS battery emergency supply that will maintain power to the control panel and communications only.
2. Country Club and Tularcitos pump stations have a quick connect transfer switch mounted on the outside of the control building enclosures to be used with a portable trailer genset in the event of a power outage.
3. Country Club and Tularcitos also have pumper connections that can be used with either a trailer mounted portable pump or with a fire truck to act as emergency pumps and bypass the station to pump water to the next station. The City has a portable Paco trailer mounted pump with a capacity of approximately 1,000 gpm that can be used at either station.

iv. Wells

1. Pinewood well is not currently set up to easily take power from a portable generator set, nor does it have any installed backup power generator set. Loss of PG&E Utility power will render the well essentially inoperable and unable to serve water into the distribution system.

2. McCandless Well is being designed with a quick connect backup power transfer connection switch similar to the Hillside pump stations and should be operable to at least serve water on an emergency basis.
3. Curtis Well will likely be designed to the same standard as McCandless and able to use a portable generator as backup power to serve water on an emergency basis.

b. Loss of Water Supply
    i. Gibraltar
        1. Gibraltar Pump Station has three water supply sources:
            a. 42” pipeline from VW, known as the Milpitas Pipeline or the East Pipeline;
            b. 24” distribution line from Zone 1SF which can draw water from Main Street Turnout PRVs and Milpitas PRV (the Zone 1SF connection to the Calaveras Turnout);
            c. 10” connection to the VW/SFPUC Intertie which we call the Intertie Turnout, and normally draws SF water and is closed when VW is using the Intertie to send water to SFPUC.
        2. Virtually any of these supplies can be used to support the loss of any other supply through the use of valving at the pump station and/or the use of the two reservoirs onsite. The pump station was designed with versatility in mind, both in the manner and number of pump installations and in the use of valves and bypass pipelines. There are too many combinations possible to list them out individually. Here we will list the general possibilities – the Operator is encouraged to

carefully examine the potential water pathways for each situation to arrive at the best possible solution and to ensure no harm will be done.

3. Loss of the 42” VW supply:
    a. Intertie supply can be used through the Intertie PRV by setting to its highest pressure setpoint and closing the normally open connection to Zone 1SF and then opening the normally closed connection to Zone 2SC - PRV will support about 130 – 135 psi, so zone will run at a slightly lower pressure - the SF reservoir cannot be filled while in this mode;
    b. Booster or Peak Shaving pumps can be used to supply water from storage by using a Flow Through setup to supply the reservoir from Zone 1SF – Pumps can be run in conjunction with the Intertie PRV by setting the pumps to the same pressure as the PRV or the pumps can run in lead at a higher pressure with the Intertie PRV acting as a backup supply. Pumps 3 and 4 cannot be used to pump water from the SF reservoir while supplying water to the SC reservoir from zone 1SF.
    c. The 30” suction lines from the two 5 MG reservoirs can be linked together by opening valve BFV 101 between pumps 2 and 3. The level between the two reservoirs should be as close to the same as possible – the larger the difference between them, the higher the water velocity will be as valve BFV 101 is opened and the levels begin to equalize. This

method allows filling to occur through the SF reservoir from either zone 1SF or the Intertie PRV.

4. Loss of 24” zone 1SF line supply:
    a. Use the Intertie supply to fill reservoir and supply zone 1SF directly. Do not run pump 4 or 3 at the same time as filling the reservoir from zone 1SF, water will only recirculate and not supply the zone.
    b. Use the SC reservoir by opening valve BFV 101 to equalize the SC and SF reservoirs. See 2.b.i.3.c. above for caveats about opening valve BFV 101.
    c. Use the zone 2SC supply by closing valve BFV 020 and then opening valve BFV 021A to fill the SF reservoir from zone 2SC and use pump 4 and/or 3 to supply zone 1SF. This CANNOT be used to directly supply zone 1SF from zone 2SC due to the higher pressure.
5. Loss of 10” VW/SFPUC Intertie supply
    a. This supply is normally only used when the Intertie is not being used to send water from VW to SFPUC or vice versa. Normal configuration sends SFPUC water through this connection to our zone 1SF. Loss of this supply is made up from the 18” connection to zone 1SF which draws water through the distribution system from the low pressure supply PRV at Main St turnout and/or the Milpitas PRV, which is a nearly direct connection to the Calaveras Turnout.
    b. If it is not possible to fill the SF reservoir through the distribution system connection

to zone 1SF, there is a normally closed connection to zone 2SC which can be used to fill the SF reservoir. Since this is a high pressure zone, it cannot be used to directly supply zone 1SF – this must be done through use of pumps 3 and/or 4.

c. An additional method to use VW water to supply zone 1SF is to open the 30" isolation valve between the two reservoirs so they are both filled from the VW supply and use pumps 3 and/or 4 to send water to zone 1SF.

ii. Ayer

1. Ayer is supplied solely from zone 2SF. The station currently has a single inlet/outlet design, so water can only flow one way into or out of the station at any given time, meaning the station can pump out water or fill the reservoir, but cannot do both at the same time.
2. Calaveras Turnout is the main source of supply to Ayer pump station via large mains that come directly east on Calaveras Blvd from the Calaveras Blvd turnout and valve lot.
3. Loss of supply to Ayer would only occur if there were a loss of the pipeline that supplies the station from Calaveras Blvd, or if that segment of line was not in operation. There is no alternative supply for Ayer in either of those events, and Ayer would not be able to pump water out to the system, regardless of the quantity of water in storage.
4. A CIP project to provide a secondary pipeline connection from zone 2SF to the station has been proposed, but is not currently in design or under construction.

iii. Hillside

1. The Hillside, or La Questa, water system has only a single supply source – zone 2SF. Water is supplied from system pressure in zone 2SF to Country Club Pump Station. CCPS then pumps water into zone 3SF through a 12 inch transmission and distribution line via 2 250 gpm submersible vertical turbine pumps. This line both supplies the zone and delivers water to a 350,000 gallon reservoir (Tularcitos) at the top of the zone. This reservoir provides gravity pressure to the zone when the pumps are not in use.
2. There is no alternative source of supply if water cannot be delivered from zone 2SF to CCPS. If CCPS experiences failure that results in neither of the 2 pumps being able to pump water, then a backup potable water trailer pump must be brought in to act as the pump station. This pump would hook up to a fire hydrant at the pump station that would provide water from zone 2SF to the suction side of the trailer pump, and then the discharge line from the trailer pump would be connected to a special pumper connection designed for this purpose to provide water to zone 3SF. If the trailer pump is not available for some reason, a fire engine pumper can also be used.
3. Tularcitos reservoir and pump station is the next step in the Hillside water system. Tularcitos Pump station is nearly identical to CCPS in that it has 2 250 gpm submersible vertical turbine pumps that send water from zone 3SF and/or the Tularcitos Reservoir and deliver it into a 12 inch combination distribution/transmission line that

serves zone 4SFa and Minnis Reservoir. Minnis Reservoir provides gravity head and flow for zones 4SFa and 4SFb.

4. Loss of the pumps at Tularcitos would result in the loss of water supply to Minnis and zones 4SFa&b. Use of a trailer pump would be needed to replace the function of those pumps, similar to CCPS. Supply would come from a connection on the Tularcitos Reservoir, and discharge would be connected to a special pumper connection, similar to CCPS, to supply water to zone 4SFa and Minnis Reservoir.
5. Loss of the Tularcitos Reservoir would result in the loss of gravity supplied water to zone 3SF. There are two ways to compensate for this reservoir being out of service.
    a. At CCPS there is a pressure relief valve located in a vault with a manhole cover between the fenced pump station and Country Club Drive. This pressure relief valve is specifically there to enable the CCPS pumps to be run constantly to supply water to zone 3SF at a constant pressure. The pumps at CCPS are single speed pumps and cannot be ramped up and down to respond to demand changes in the zone to maintain a constant pressure. Instead, the relief valve will open at a set pressure to relieve the excess discharge from the pumps back into zone 2SF. This is not a perfect solution because the water discharged back into zone 2SF simply returns to the suction side of the CCPS pumps, thus running in a circle, and will result in the water being heated

and boiled by the pumps if not relieved. The solution to this is to use hoses to run a constant flow from hose bib connections on the discharge of each pump to the storm drain so that a minimal flow of new water is always coming into the pumps to keep them cool.

b. The other method to replace the supply from Tularcitos Reservoir is to use a combination pressure relief valve/pressure reducing valve located at Tularcitos Pump Station. There is a double leaf hatch covered vault with this valve located within. This valve has dual pilot valve systems installed on it, and normally uses the pilot valve system that is configured to run the valve as a pressure relief valve. This pilot system must be shut down, and the pilot valve system on the other side opened to configure the valve as a pressure reducing valve. This valve is connected to zone 4SFa and zone 3SF. As a relief valve it opens to relieve excess pressure from zone 4SFa to zone 3SF. As a pressure reducing valve, it opens to maintain use water from zone 4SFa/Minnis Reservoir to maintain a set pressure in zone 3SF, thus doing what Tularcitos reservoir was doing. This is the preferred method to use when Tularcitos Reservoir is not in service to maintain pressure in zone 3SF.

c. Getting water from zone 3SF to zone 4SFa/Minnis when Tularcitos Reservoir is not in service is different depending on

which method you are using to maintain pressure in zone 3SF. If telemetry is still working between Minnis and Tularcitos, the pumps at Tularcitos will cycle according to the level in Minnis reservoir and can be left to run on their own if using the CC pump method in a. above. The pumps at CC will supply water to the pumps at Tularcitos. Only one pump at Tularcitos should be used in auto to fill Minnis so that the capacity of the CC pumps are not exceeded. If using the pressure reducing valve method in b. above to maintain zone 3SF pressure, the pumps at CC and at Tularcitos will need to be run manually and at the same time. The level at Minnis will need to be monitored, and the pumps both shut down at the same time.

6. Loss of the Minnis Reservoir will result in the loss of gravity pressure and flow for zones 4SFa&b. This is compensated by using the combination relief and pressure reducing valve at Tularcitos in a manner similar to using the relief valve at CC when Tularcitos Reservoir is offline. With the combo valve operating on the pressure relief pilot system the pumps can be used to maintain the pressure in the system. Similar to the CC method, hoses need to be connected to the hose bibs on the discharge side of the pumps in order to keep a minimum flow through the pump and prevent the water from recirculating through the pump and overheating/boiling. See 5.a above.

3. Distribution System Issues
    a. PRV Station Loss/Malfunction
        i. Pressure Reducing Stations take water from a higher zone and feed it into a subsequent zone at a lower pressure. They are both a source of supply and pressure regulator. When I PRV fails, it will usually show signs before having a catastrophic failure. The regulated pressure will begin to increase and become more difficult to control to the desired set point. A gradually rising pressure on the regulated downstream side of the PRV can be a sign that the valves main diaphragm has a pinhole in it and needs to be replaced. It can also be a sign that the pilot valve is failing. If a PRV has failed or needs to be taken out of service the valve can usually be isolated by closing the up and down stream line valves and allowing the lag PRV to take over the load, assuming there is a lag PRV – most stations are configured with lead/lag parallel valves, but not all of them (Capital Ave and Parc Metro, for instance). If a valve does not have a parallel lead/lag to take over, the system balance may need to be adjusted by checking the other PRV stations and making minor pressure setpoint changes. Since possible flow direction changes may occur in the distribution system, this may result in dirty water calls and the need for flushing/NO-DES use to respond to the water flow changes.
    b. EPRV Station Loss Malfunction
        i. The EPRV stations are single PRVs set to allow water to move from SF zones into corresponding SC zones in the event that pressure falls in the SC zone below the minimum setpoint of the EPRV. When this happens, the EPRV will open and allow water to flow from the SF zone to the SC zone and will try to regulate the SC zone toe the EPRV setpoint pressure. Malfunction of an

EPRV will not result in overpressure of any zone, since the served zone is normally higher than the supplying zone, and water cannot flow in reverse through a PRV, even if it has failed. Loss of the function of this station only results in the loss of protection for the served zone in the event that zone incurs a pressure reduction. Zone isolation valves can be opened to directly supply water from the SF zone to the SC zone if needed as an alternative to the EPRV.

c. Zone Interconnection
    i. There are 44 zone isolation valves throughout the City. These are valves that were closed when the City went from being solely supplied by SFPUC to being supplied by both SFPUC and SCVWD (VW). There valves were marked by using large G12 valve boxes and painting them red. The are only to be opened in the event a zone has a supply failure that results in the loss of supply and pressure and all other means of supplying the zone are not available. Opening of these valves will need to be accompanied by flushing of the lines up and downstream and there will likely be dirty/stagnant water.
d. Agency Interconnection
    i. Milpitas has 3 intercity interties, two with ACWD and one with SJWC. Similar to the zone isolation valves, use of these valves is a last resort emergency response measure. Pressures are not the same between the separate agencies, and use must be coordinated between both agencies before opening the valves.
    ii. Connections with ACWD are located with one in zone 1SF on Milmont and one in 2SF on Churchill. The connection with SJWC is located in zone 2SF at the south end of the zone on Landess Ave.

# Appendix C

## Hydrant Testing and HPR Placement Plan

WEST YOST ASSOCIATES

# MEMORANDUM

DATE: March 9, 2020 Project No.: 270-60-19-16
SENT VIA: EMAIL

TO: Harris Siddiqui, PE, City of Milpitas
Glen Campi, City of Milpitas

FROM: Roger Chu, PE, RCE #87591

REVIEWED BY: Amy Kwong, PE, RCE #73213

SUBJECT: City of Milpitas – 2020 Water Master Plan Update – Hydrant Testing and HPR Placement Plan

This memorandum summarizes the proposed hydrant testing and pressure data collection procedures required to calibrate the City of Milpitas's (City) potable water system hydraulic model. West Yost Associates' (West Yost) recommended plan for hydrant testing and hydrant pressure recorder (HPR) placement is provided for your review and comment, as summarized in the following sections:

- Hydrant Testing
- Hydrant Pressure Recorder Placement
- Summary of Hydrant Testing and HPR Placement Plan

It is recommended the City shares this plan with the appropriate parties (e.g., water operations and/or Fire Department staff), so they are aware of the equipment being used or installed at the proposed testing/pressure monitoring locations. Field pressure monitoring is scheduled to occur beginning March 10 through March 18 (monitoring period), and hydrant testing is scheduled for March 11, 2020.

## HYDRANT TESTING

The purpose of hydrant testing is to confirm the assignment of roughness factors (C-factors) to pipelines in the City's hydraulic model. West Yost will use data collected though hydrant testing to ensure the assigned pipeline C-factors are appropriate and representative of actual field conditions. Hydrant tests were selected based on the combination of pipeline material type, diameter, and age that represents the majority of the City's water distribution system.

Details related to hydrant testing are presented in the following sections:

- Personnel and System Data Requirements
- Hydrant Testing Schedule
- Testing Requirements and Procedure
- City's Responsibilities

## Personnel and System Data Requirements

West Yost would like to request the following City personnel and system data to accomplish the recommended hydrant testing under West Yost's direction:

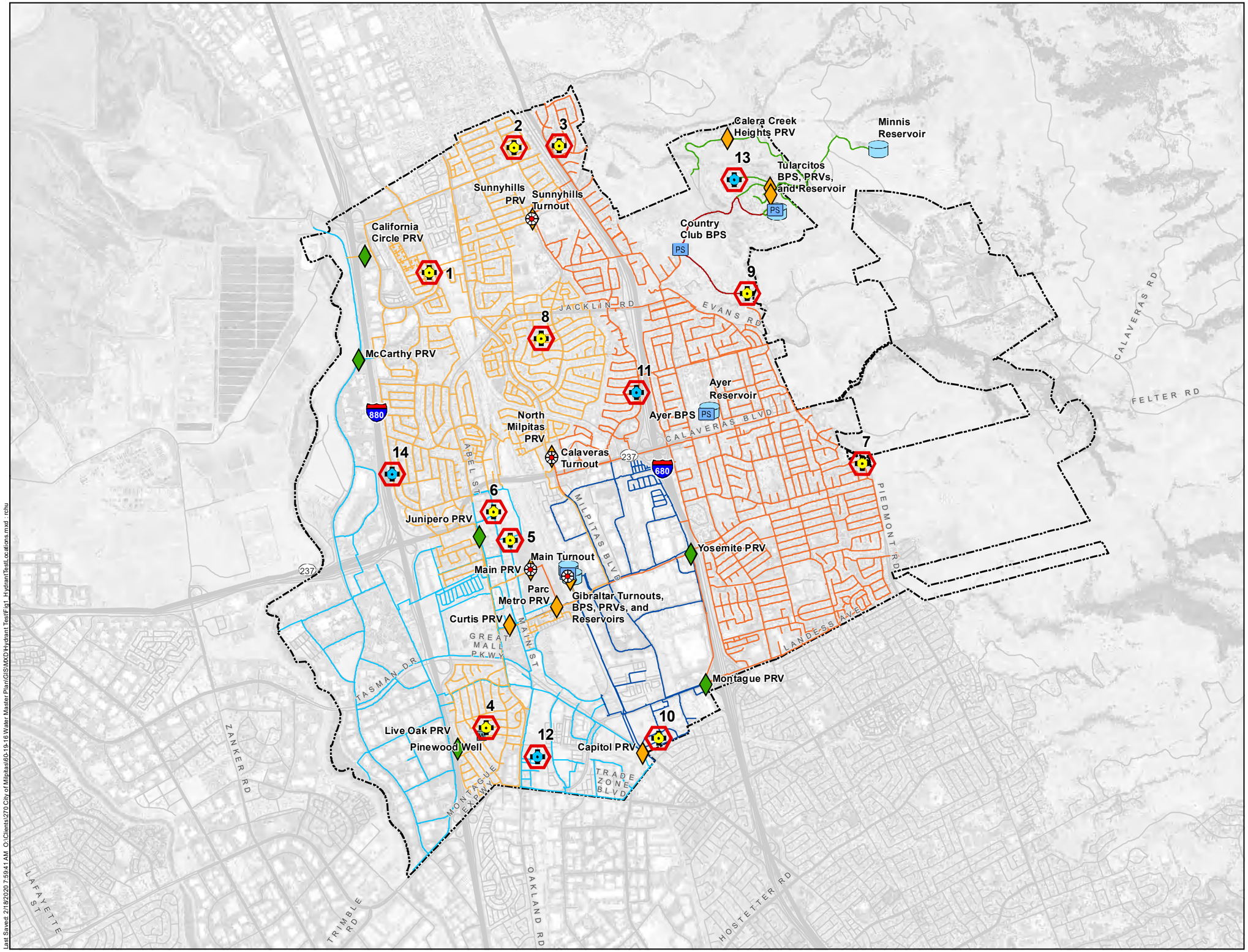
- Three (3) to five (5) City staff members (with vehicles) that will be available during regular working hours to assist with, but not limited to the following:
  - Closing and re-opening valves, as needed, before and after hydrant testing
  - Reading and recording hydrant pressure data
  - Flowing the test hydrant and de-chlorination
  - Directing and controlling traffic and hydrant flows (i.e., to the nearest drainage inlet) to ensure safety
  - Public outreach and interface, as needed
- System information during the monitoring period that includes the following:
  - Available SCADA and telemetry data from all water distribution system facilities:
    - Turnout flows and pressures
    - Reservoir levels [feet]
    - Booster Pump Station information (pump operational status, speed settings, discharge pressures [psi], and flow rate [gpm])
    - Pressure Reducing Valve information (upstream pressure [psi], downstream pressure [psi], and flow rate [gpm], if available)

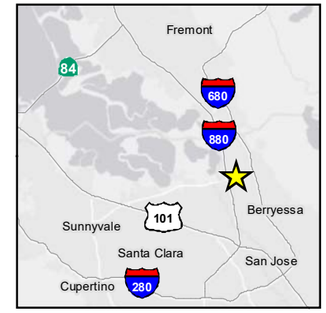
## Hydrant Testing Schedule

West Yost requests that hydrant testing be scheduled from **7:30 AM to 4:30 PM on March 11, 2020**. West Yost will meet with the City staff before hydrant testing at the City's Public Works Department, located at 1265 North Milpitas Boulevard, to conduct a brief field coordination meeting to review hydrant testing procedure and protocol (i.e., where to go and what to do). West Yost will also use this coordination meeting to distribute pressure gauges necessary to complete hydrant testing (hydrant wrenches to be provided by City staff). In addition, West Yost will also discuss with City staff what order they prefer to conduct tests (i.e., avoid school traffic or commuter traffic, etc.) and to review hydrant tests that may present challenges.

## Testing Requirements and Procedure

West Yost plans to conduct up to ten (10) hydrant tests within the City's water system. Figure 1 shows the proposed hydrant test locations. In addition, four (4) alternative hydrant tests have been identified. If any of the primary test locations are unable to be completed, an alternative location may be used. Table A-1 in Attachment A lists the proposed test locations. Details regarding each of the proposed tests (e.g., flowing hydrant, observation hydrants, closed valves, etc.) is also provided in Attachment A (Figures A-1 through A-14).




N

0 1,500 3,000

Scale in Feet

- Test Location
- Alternate Test Location
- Turnout
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pump Station
- Storage Reservoir

**Pipeline Pressure Zone**

- SCZ1
- SCZ2
- SFZ1
- SFZ2
- SFZ3
- SFZ4
- City Limits

WEST YOST ASSOCIATES

**Figure 1**

**Hydrant Test Location Map**

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2020 Water Master Plan Update

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Each hydrant test will involve maintaining flow from a single hydrant while monitoring the residual pressure at two (2) to four (4) observation hydrants located near the flowing hydrant. The field-observed static and residual pressure readings will then be used to confirm pipeline C-factors to calibrate the hydraulic model to observed conditions. Hydrant test locations have been selected to isolate pipelines of a particular material type, diameter, and age. Some tests will require City staff members to close one (1) or more isolation valves prior to the test and then re-open these isolation valves following the test.

The general testing procedure at each of the hydrant test locations is outlined below and illustrated on Figure 2:

**Step 1.** Before attaching the pressure gauge, flush the test (flowing) hydrant and each observation hydrant to remove sediments, which might damage the gauge or cause faulty readings.

**Step 2.** Attach the pressure gauge to the hydrant with the gauge's test cock valve open. Slowly open the hydrant and bleed off the gauge with the gauge's test cock until the hydrant is fully pressurized.

**Step 3.** Close the gauge test cock valve, and then measure the static pressures at the designated test hydrant and each observation hydrant.

**Step 4.** Flow the designated test hydrant and measure the discharge flow and pressure.

**Step 5.** Measure the residual pressures at the designated test hydrant and at each observation hydrant while the test hydrant is flowing.

**Step 6.** Continue monitoring pressure until the "all clear" is given by a West Yost employee. Record the static pressure and then detach the pressure gauge. ***IMPORTANT:*** *Before closing the hydrant, be sure the gauge's test cock valve is open and bleeding while the hydrant is being closed.*

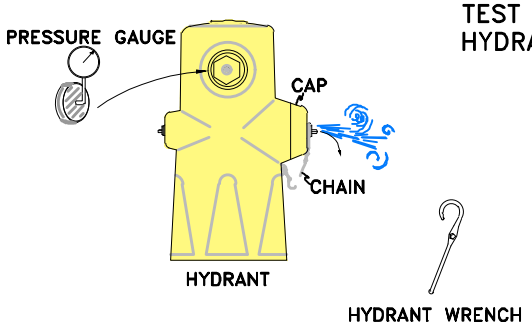
At least one (1) City staff member will be required at the flowing test hydrant and up to two (2) additional City personnel will be required in the field to assist with the opening and closing of valves (refer to Attachment A). West Yost will provide three (3) staff members to direct, oversee, and assist in the field data collection work effort.

It is anticipated that each hydrant test will take no more than 30 minutes and that each hydrant will be flowing for no more than 10 minutes during a test.

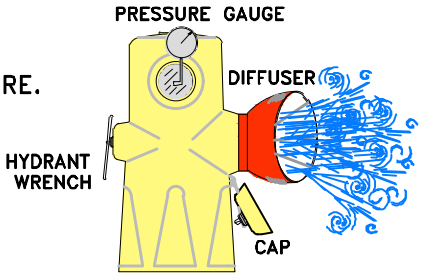
## Testing Equipment

West Yost will provide a 4.5-inch diameter Swivel Piezo Diffuser and pressure gauges during the hydrant testing program. It is our recommendation that the 4.5-inch diameter Swivel Piezo Diffuser be used for all proposed hydrant tests. For any hydrant test where is it not possible to use this type of diffuser due to drainage or traffic control issues, an alternative method will need to be further evaluated and confirmed before the day of field testing.

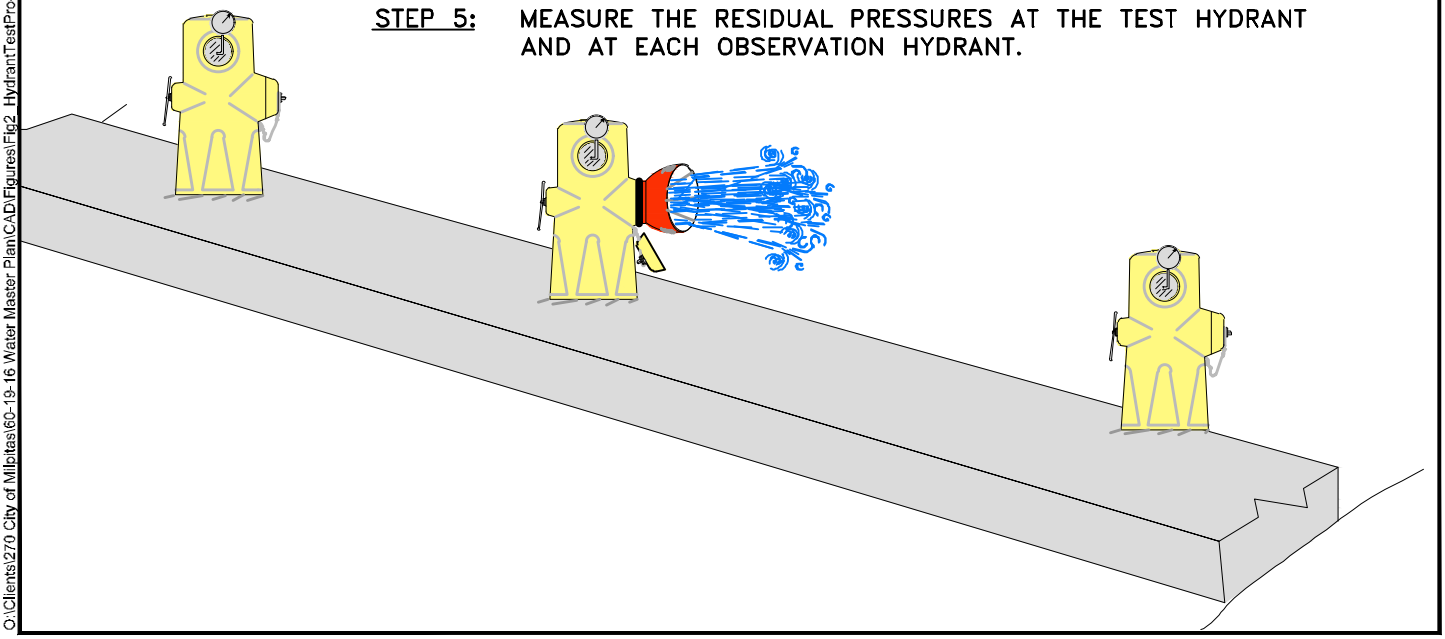
STEPS 1, 2 & 3: REMOVE HYDRANT CAP, FLUSH OUT HYDRANT AND MEASURE THE STATIC PRESSURES AT THE TEST HYDRANT AND AT EACH OBSERVATION HYDRANT.




STEP 4: FLOW THE DESIGNATED TEST HYDRANT AND MEASURE THE DISCHARGE FLOW AND PRESSURE.




STEP 5: MEASURE THE RESIDUAL PRESSURES AT THE TEST HYDRANT AND AT EACH OBSERVATION HYDRANT.



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Note:
1. Figure is not to scale.

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**Figure 2**

**Hydrant Test Procedure**

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2020 Water Master Plan Update

### City's Responsibilities

The City will be responsible for providing the following hydrant testing equipment:

1. Vehicles
2. Hydrant wrenches
3. Equipment for closing valves and controlling traffic
4. De-chlorination equipment[1]
5. Two-way portable communication for each testing personnel

*The City is also responsible for notifying residents, and other City staff and departments (i.e., Fire Department) about the scheduled hydrant testing, obtaining approvals that may be required, and providing proper drainage of the hydrant flow.*

West Yost requests that the City staff review and inspect each of the proposed test locations before the testing date to identify any potential problems or hazards with the selected locations. Of concern is the potential for flooding landscaping or building basements or creating hazardous traffic conditions. West Yost recommends that all drainage inlets/manholes be inspected near the testing site to confirm proper drainage. Additionally, the City should check the location and status of hydrants and valves that will be operated during hydrant testing. Detailed figures, which illustrate the flowing hydrant, observation hydrants, and valves to be closed, are provided in Attachment A.

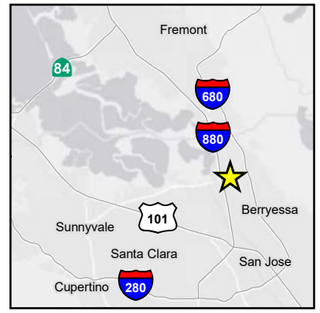
## HYDRANT PRESSURE RECORDER PLACEMENT

Placement of HPRs at key hydrants within the City's water system allows West Yost to verify pressures simulated in the City's hydraulic model. West Yost has identified twenty (20) hydrants to monitor water system pressures with HPRs. The selected HPR locations are typically downstream of water supply facilities (e.g., turnouts, booster pump stations, and pressure reducing valves).

West Yost is proposing to install the twenty (20) HPRs on March 10, 2020 to collect pressure information for a total of one (1) week. West Yost plans to attach the HPRs to the 2.5-inch port on specified hydrants and lock them in place with a padlock. After the seven-day monitoring period is complete, West Yost will remove the HPRs from their locations (March 18, 2020) and download and review the collected data. Figure 3 shows the general location of each HPR. Table B-1 (in Attachment B), describes the approximate location of each HPR and the water supply facility being monitored. Attachment B also includes detailed figures showing the specific location of each hydrant selected for HPR placement (Figures B-1 through B-20). West Yost requests that City staff review and inspect each of the proposed HPR placement locations before the placement date to identify any potential problems with the selected locations.

[1] Handling of water released from each hydrant test will need to comply with City Operations procedures and be consistent with the City's NPDES permit for planned releases from hydrant tests.

Calera Creek Heights PRV
18
20
Minnis Reservoir
16
19
Sunnyhills PRV
9
4
California Circle PRV
14
15
17
Tularcitos BPS, PRVs, and Reservoir
Country Club BPS
JACKLIN RD
EVANS RD
CALAVERAS RD
McCarthy PRV
680
Ayer Reservoir
Ayer BPS
PS
5
3
North Milpitas PRV
CALAVERAS BLVD
237
8
FELTER RD
880
PIEDMONT RD
Junipero PRV
ABEL ST
Main Turnout
Gibraltar Turnouts, BPS, PRVs, and Reservoirs
Yosemite PRV
2
Main PRV
MILPITAS BLVD
7
12
Curtis PRV
MAIN ST
6
Parc Metro PRV
1
GREAT MALL PKWY
LANDESS AVE
TASMAN DR
11
13
Montague PRV
CAPITOL AVE
Pinewood Well
W
Live Oak PRV
Capitol PRV
10
ZANKER RD
MONTAGUE EXPWY
TRADE ZONE BLVD
OAKLAND RD
TRIMBLE RD
HOSTETTER RD




N

0 1,500 3,000

Scale in Feet

- Proposed HPR Location
- Turnout
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pump Station
- Storage Reservoir

**Pipeline Pressure Zone**

- SCZ1
- SCZ2
- SFZ1
- SFZ2
- SFZ3
- SFZ4
- City Limits

**Figure 3**

**Hydrant Pressure Recorder Location Map**

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It is important for City staff to coordinate with the Fire Department and any other appropriate parties regarding the HPR locations and duration of monitoring. This will help reduce the chance of inadvertently shutting off a hydrant with an HPR installed and may also reduce the risk of an HPR being removed or tampered with. *Each HPR is equipped with a padlock and a set of keys will be provided to the City staff. However, in case of an emergency, the Fire Department can break the lock to remove the HPR.* If an HPR is required to be removed during a non-emergency, or if the associated hydrant needs to be shut off, West Yost requests that the Fire Department inform City staff and that City staff will then coordinate with West Yost.

## SUMMARY OF HYDRANT TESTING AND HPR PLACEMENT PLAN

Hydrant testing will be performed as described above beginning at 7:30 AM on Wednesday, March 11, 2020. West Yost proposes to install HPRs on Tuesday, March 10, 2020 and remove them on Wednesday, March 18, 2020. The locations and associated detailed location maps of the designated hydrants for testing and HPR placement are presented in Attachments A and B, respectively.

West Yost requests a conference call with City staff on Wednesday, March 4, approximately one week before the scheduled testing day, to review and finalize preparations for the hydrant testing and HPR placement. An Outlook meeting request will be sent to City staff to finalize a suitable meeting date and time.

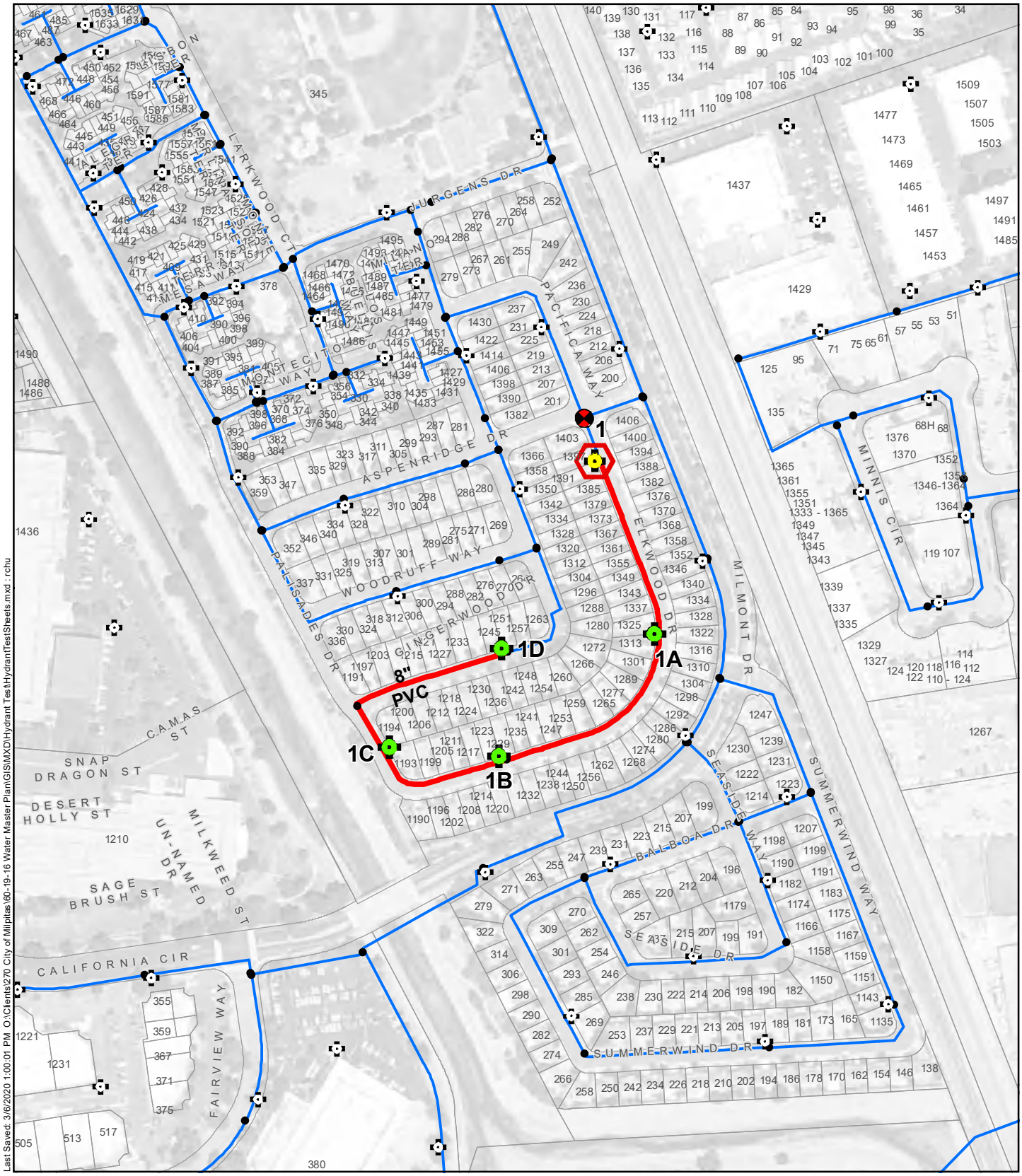
Please feel free to contact Roger Chu at (925) 425-5631 or Amy Kwong at (925) 461-6788 if you have any questions or comments.

# ATTACHMENT A

**Table A-1. Hydrant Test Locations[a]**

| Test No. | Pipeline Material | Installation Decade | Pipeline Diameter, Inches | Location | Pressure Zone | No. of Closed Valves | Comments |
|---|---|---|---|---|---|---|---|
| 1 | PVC | 1990s | 8 | Along Elkwood Drive | SF1 | 1 | - |
| 2 | AC | 1960s | 6 | Along Gosser Street | SF1 | 1 | - |
| 3 | AC | 1980s | 6 | Along Stirling Drive and Stratford Drive | SF2 | 2 | - |
| 4 | AC | 1960s | 6 | Along Greentree Way | SF1 | 3 | - |
| 5 | PVC | 1980s | 8 | Along Hammond Way | SC1 | 1 | - |
| 6 | AC | UNK[b] | 8 | Along Main Street | SC1 | 2 | - |
| 7 | AC | 1970s | 8 | Along Lacey Drive | SF2 | 1 | - |
| 8 | AC | 1970s | 6 | Along Clauser Drive | SF1 | 3 | - |
| 9 | AC | 1980s | 8 | Along Calaveras Ridge Drive | SF3 | 0 | - |
| 10 | DI | 2000s | 8 | Within Crossing at Montague Apartments | SC2 | 1 | - |
| 11 | AC | 1980s | 6 | Along Las Lomas Drive and Pacheco Drive | SF2 | 1 | Alternate |
| 12 | PVC | 2000s | 8 | Along Costa Street and Mihalakis Street | SC1 | 2 | Alternate |
| 13 | AC | 1980s | 8 | Along Pebble Beach Court | SF4-1 | 0 | Alternate |
| 14 | AC | 1960s | 8 | Along Heath Street | SF1 | 2 | Alternate |

(a) 10 test locations and 4 alternate test locations, if time permits.
(b) UNK = unknown




Flowing Hydrant
Observed Hydrant
Hydrant
Closed Valve (1 total)
Valve

Test Pipeline
Pipeline

N

0 150 300
Scale in Feet

**Figure A-1**

**Test 1 - Zone SF1**
**(8-inch PVC - 1990s)**

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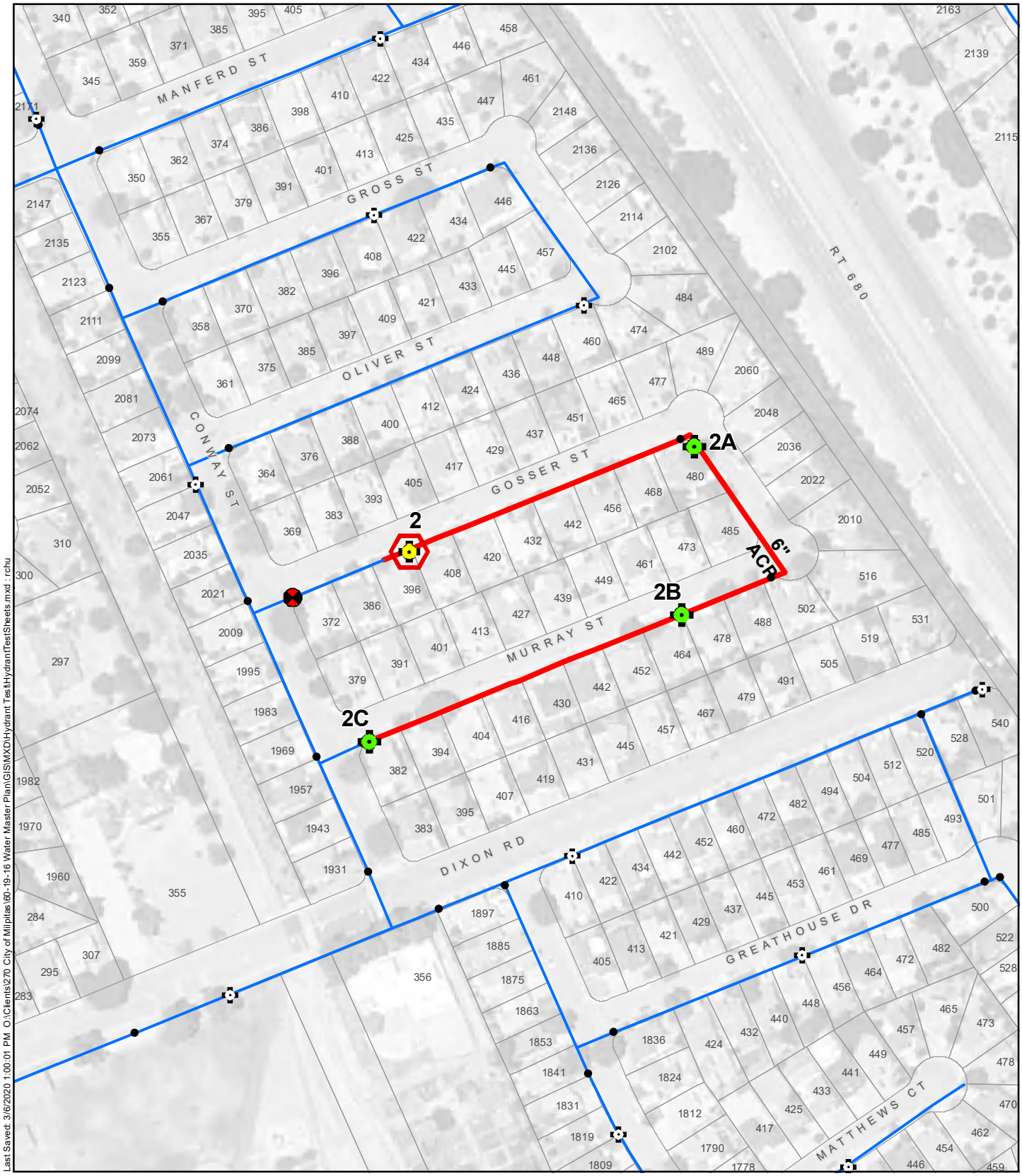


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Flowing Hydrant

Observed Hydrant

Hydrant

Closed Valve (1 total)

Valve

Test Pipeline

Pipeline

N

0 100 200

Scale in Feet

**Figure A-2**

**Test 2 - Zone SF1**
**(6-inch AC - 1960s)**

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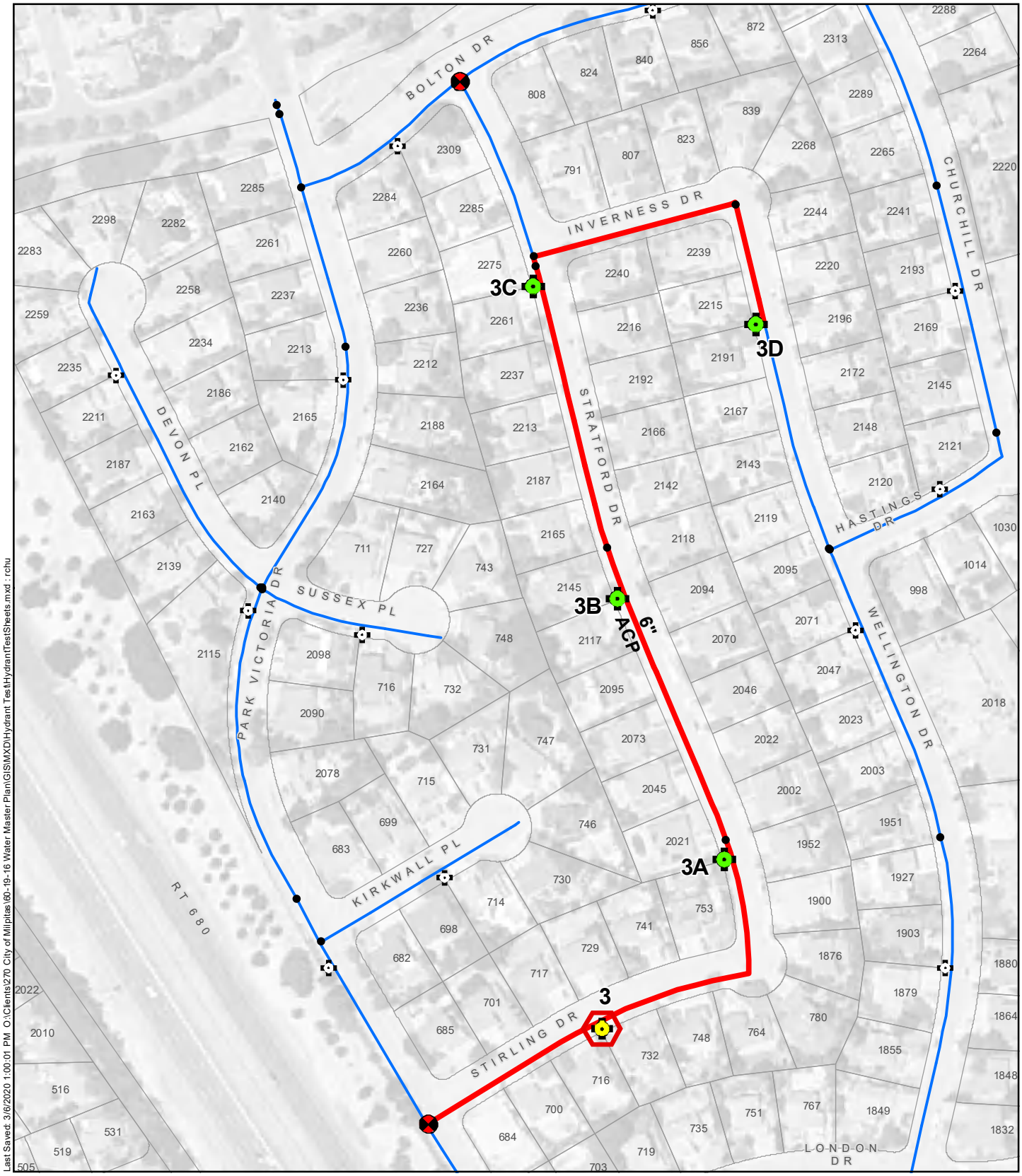


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Flowing Hydrant
Observed Hydrant
Hydrant
Closed Valve (2 total)
Valve

Test Pipeline
Pipeline

N

0 100 200
Scale in Feet

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**Figure A-3**

**Test 3 - Zone SF2 (6-inch AC - 1980s)**

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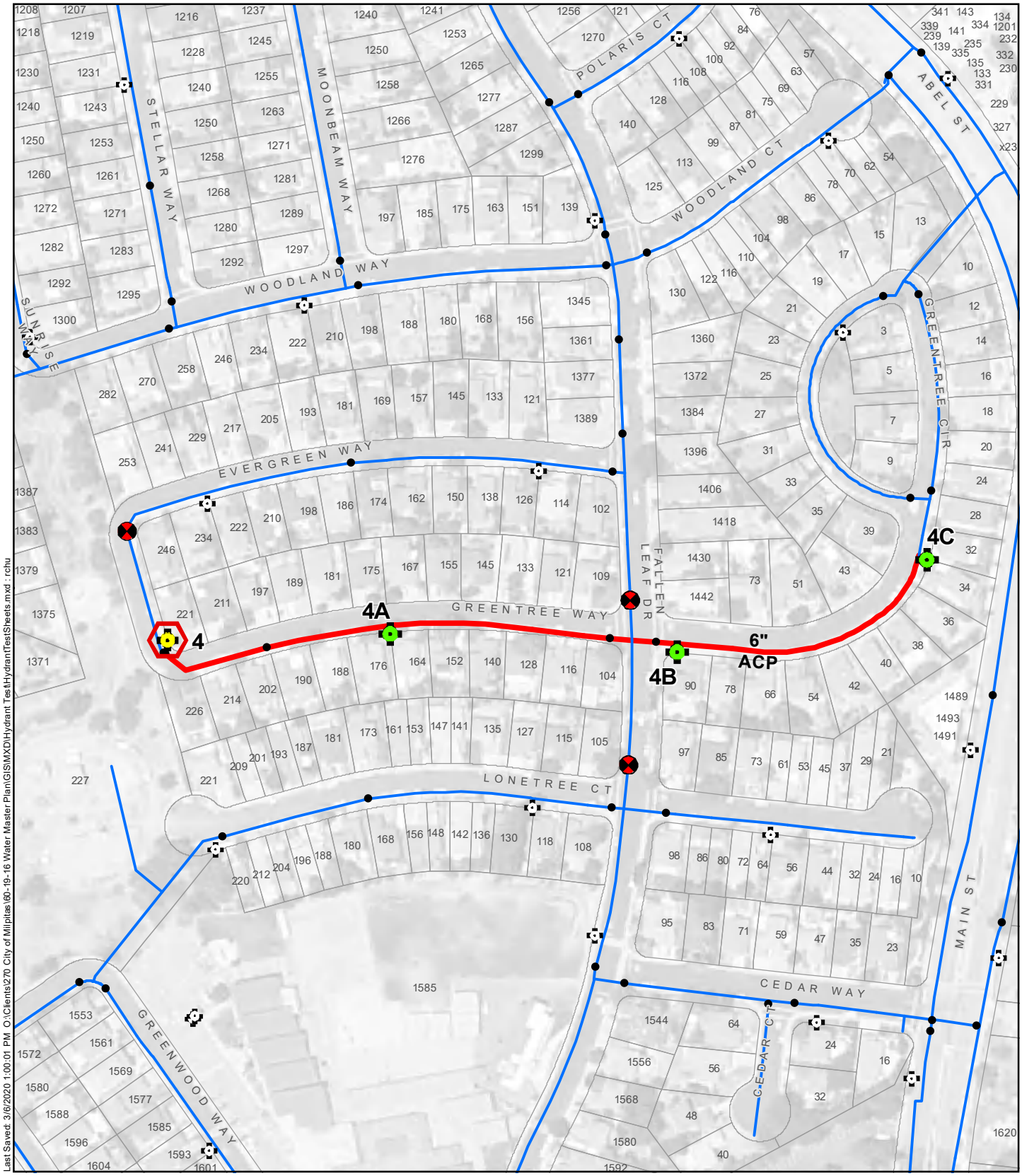


**Figure A-4**

**Test 4 - Zone SF1**
**(6-inch AC - 1960s)**

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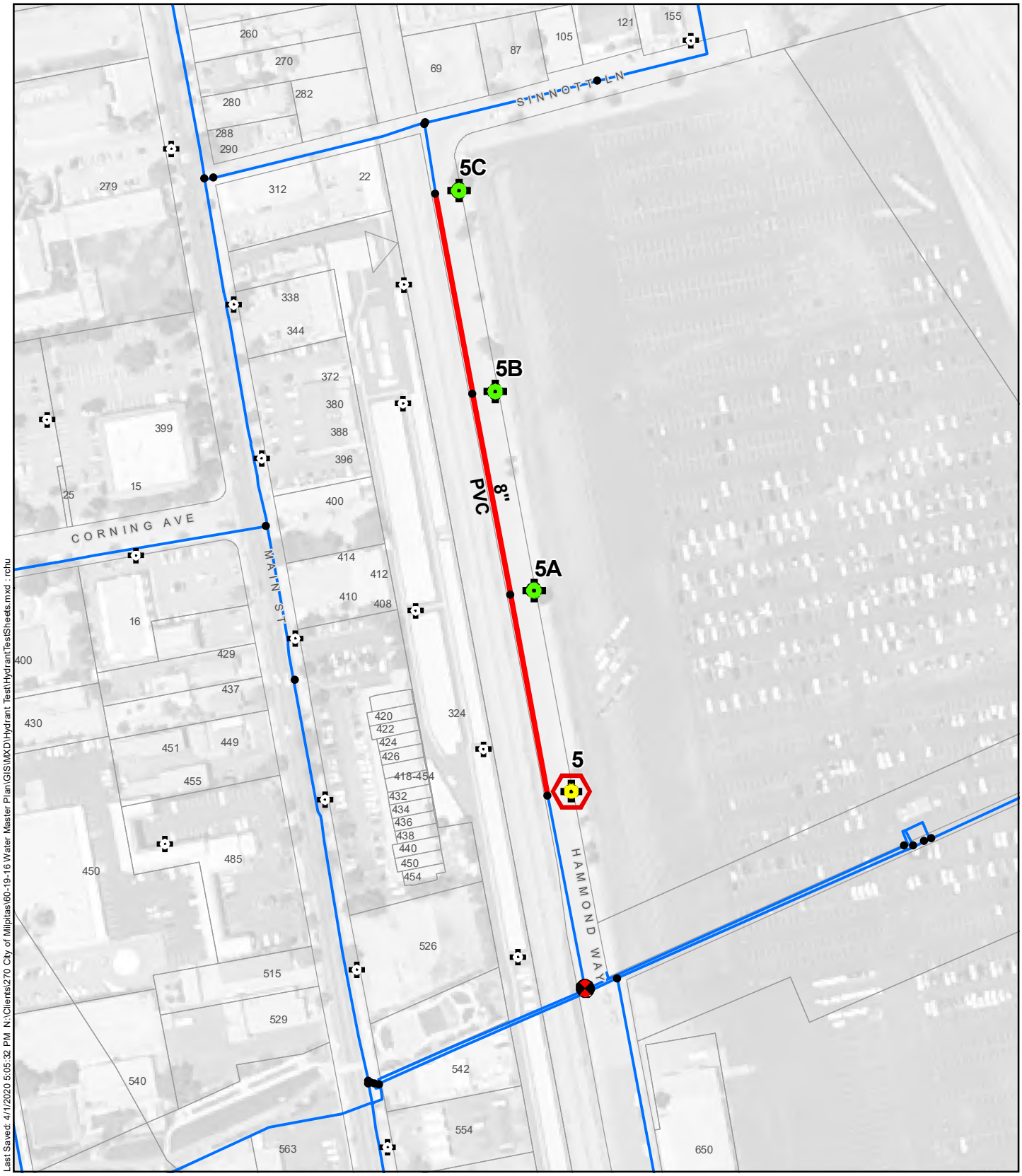


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Flowing Hydrant
Observed Hydrant
Hydrant
Closed Valve (1 total)
Valve

Test Pipeline
Pipeline

N

0 100 200
Scale in Feet

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**Figure A-5**

**Test 5 - Zone SC1**
**(8-inch PVC - 1980s)**

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**Figure A-6**

**Test 6 - Zone SC1**
**(8-inch AC - UNK)**

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2020 Water Master Plan Update

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Flowing Hydrant

Observed Hydrant

Hydrant

Closed Valve (1 total)

Valve

Test Pipeline

Pipeline

N

0 150 300

Scale in Feet

**Figure A-7**

**Test 7 - Zone SF2**
**(8-inch AC - 1970s)**

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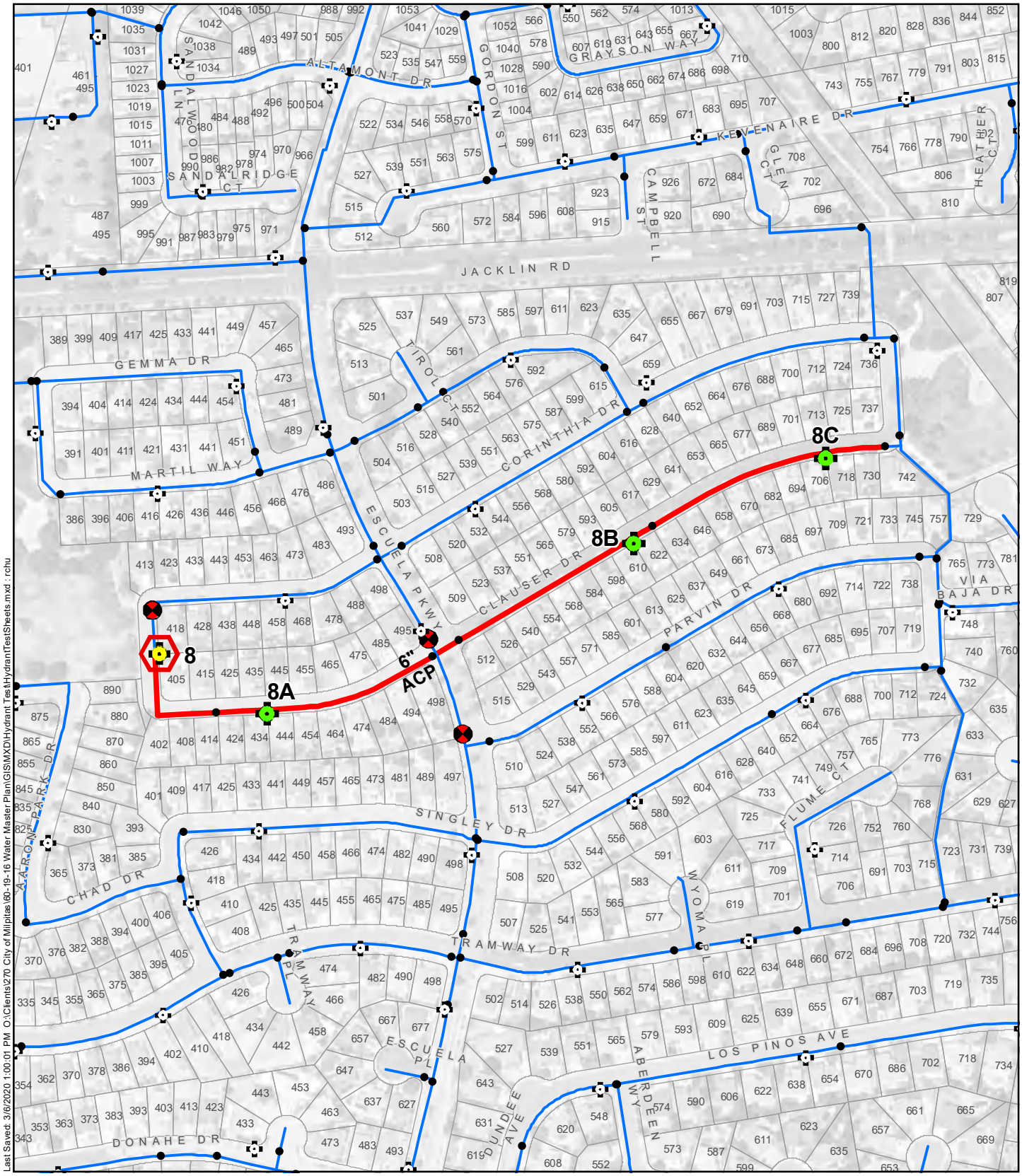


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Flowing Hydrant

Observed Hydrant

Hydrant

Closed Valve (3 total)

Valve

Test Pipeline

Pipeline

N

0 150 300

Scale in Feet

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**Figure A-8**

**Test 8 - Zone SF1**
**(6-inch AC - 1970s)**

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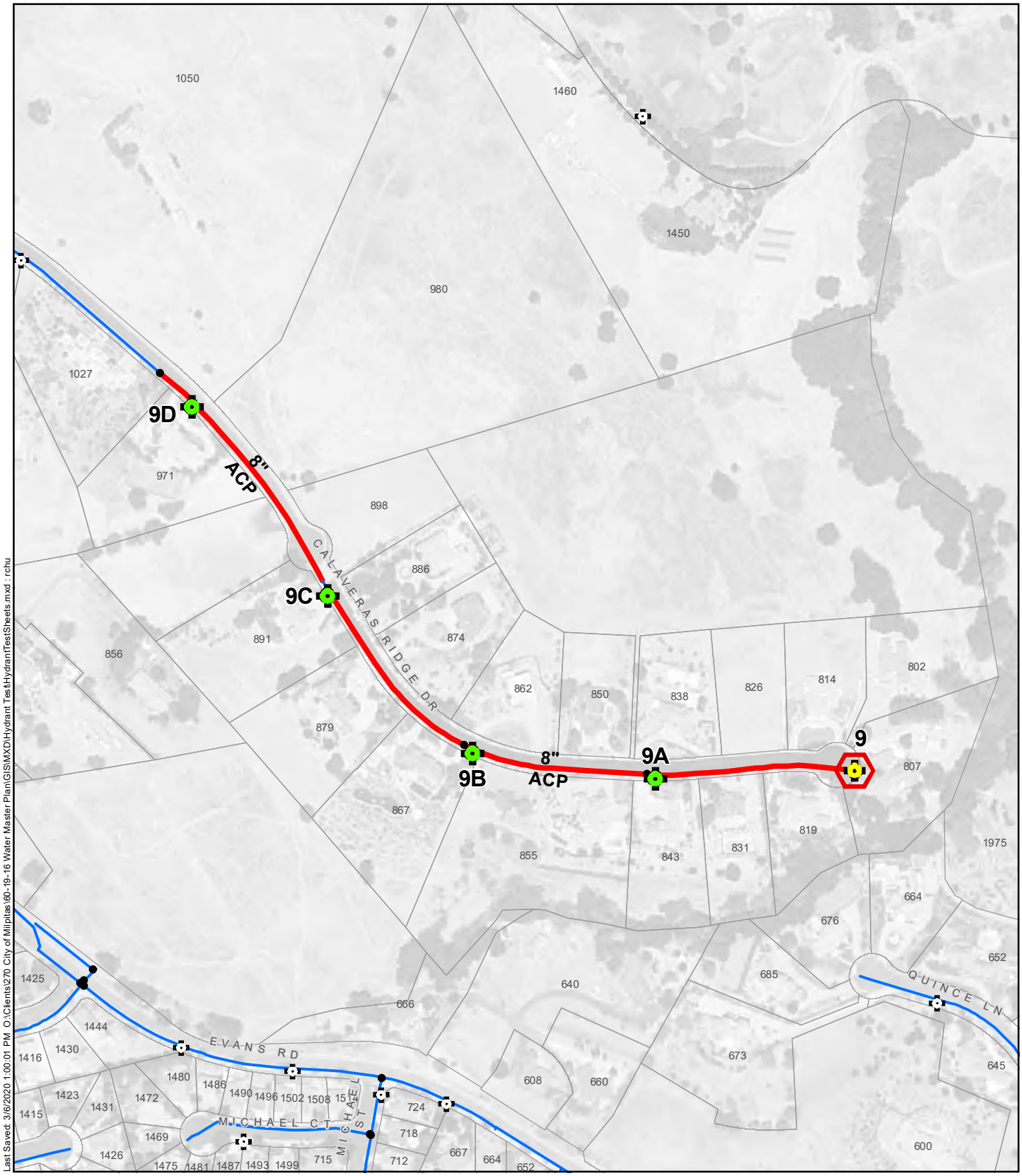


**Figure A-9**

**Test 9 - Zone SF3**
**(8-inch AC - 1980s)**

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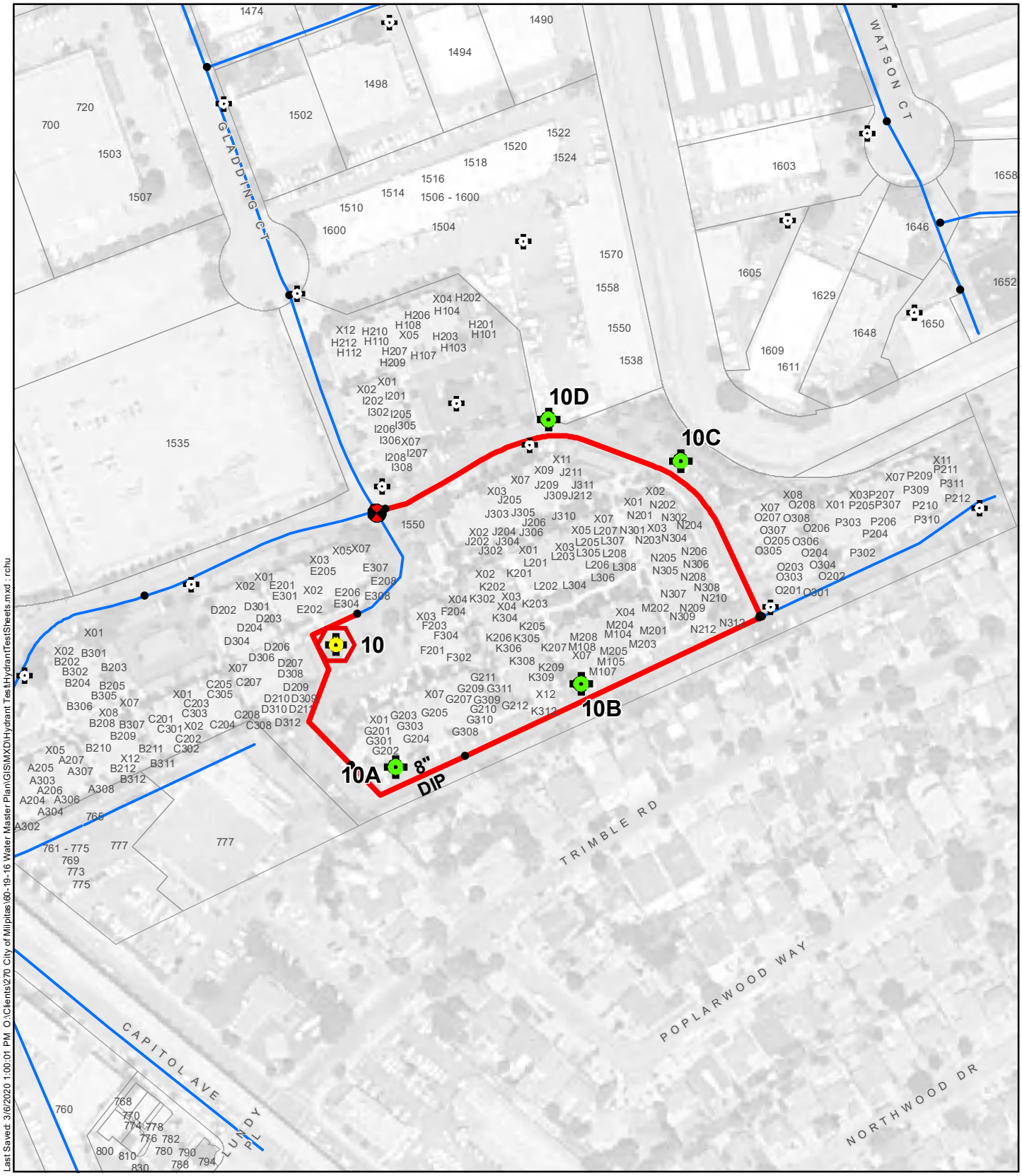


Flowing Hydrant
Observed Hydrant
Hydrant
Closed Valve (1 total)
Valve
Test Pipeline
Pipeline

N

0 100 200
Scale in Feet

**Figure A-10**

**Test 10 - Zone SC2 (8-inch DI - 2000s)**

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2020 Water Master Plan Update

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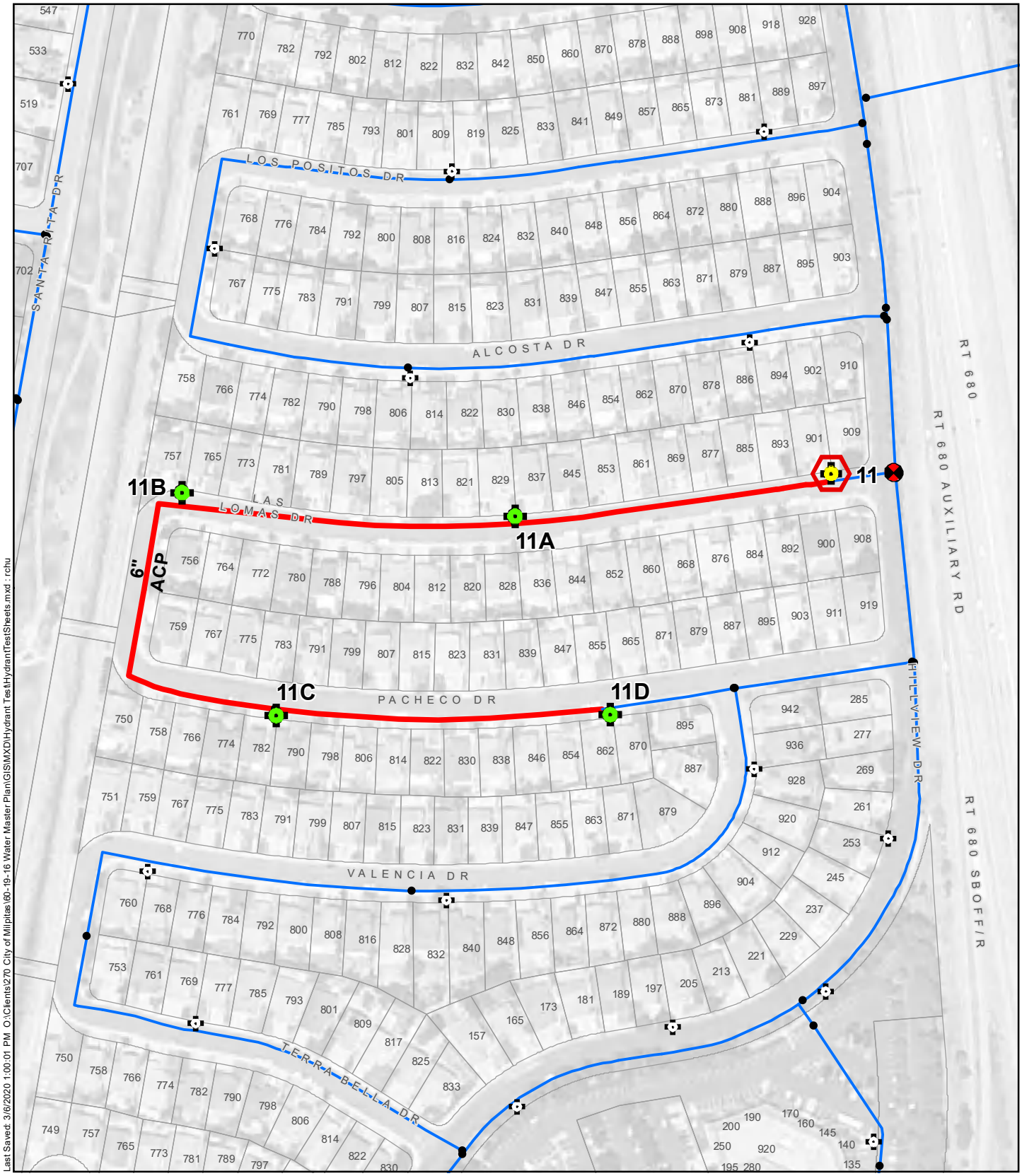


Flowing Hydrant
Observed Hydrant
Hydrant
Closed Valve (1 total)
Valve

Test Pipeline
Pipeline

N

0 100 200
Scale in Feet

**Figure A-11**

**Alternate Test 11**
**Zone SF2**
**(6-inch AC - 1980s)**

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2020 Water Master Plan Update

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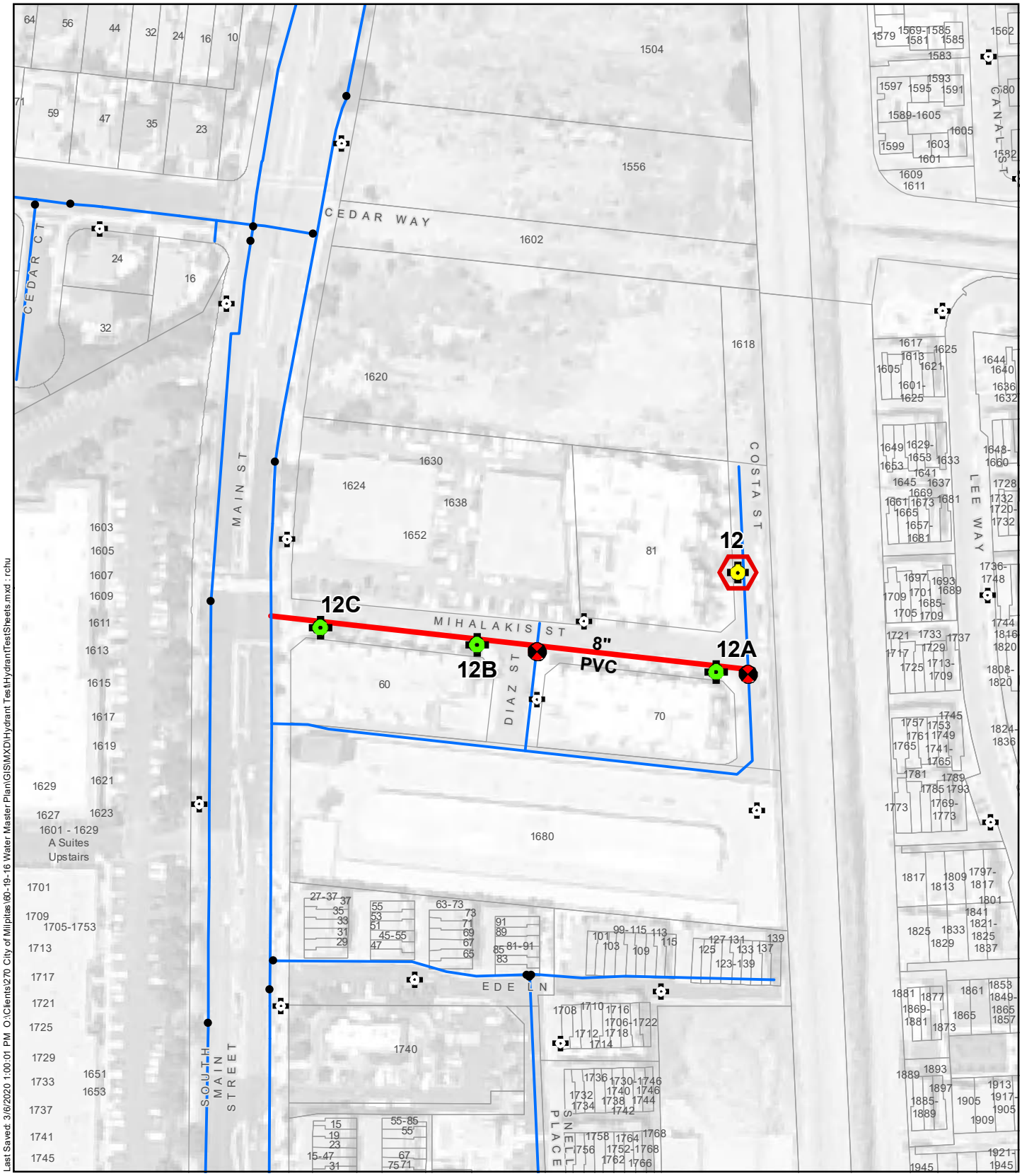


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Flowing Hydrant

Observed Hydrant

Hydrant

Closed Valve (2 total)

Valve

Test Pipeline

Pipeline

N

0 75 150

Scale in Feet

CITY OF MILPITAS CALIFORNIA

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**Figure A-12**

**Alternate Test 12**
**Zone SC1**
**(8-inch PVC - 2000s)**

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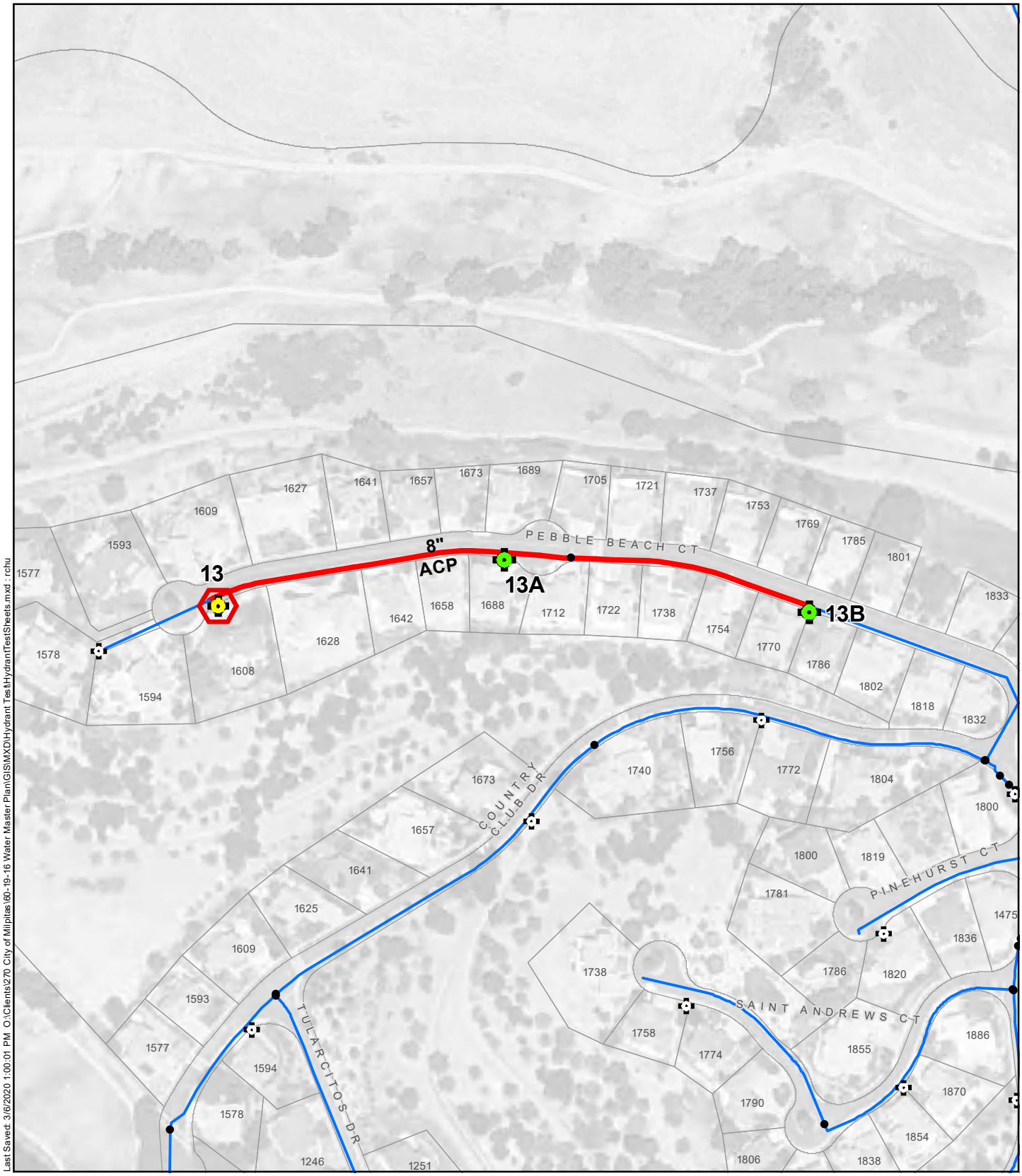
2020 Water Master Plan Update

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Flowing Hydrant
Observed Hydrant
Hydrant
Closed Valve (0 total)
Valve
Test Pipeline
Pipeline

N

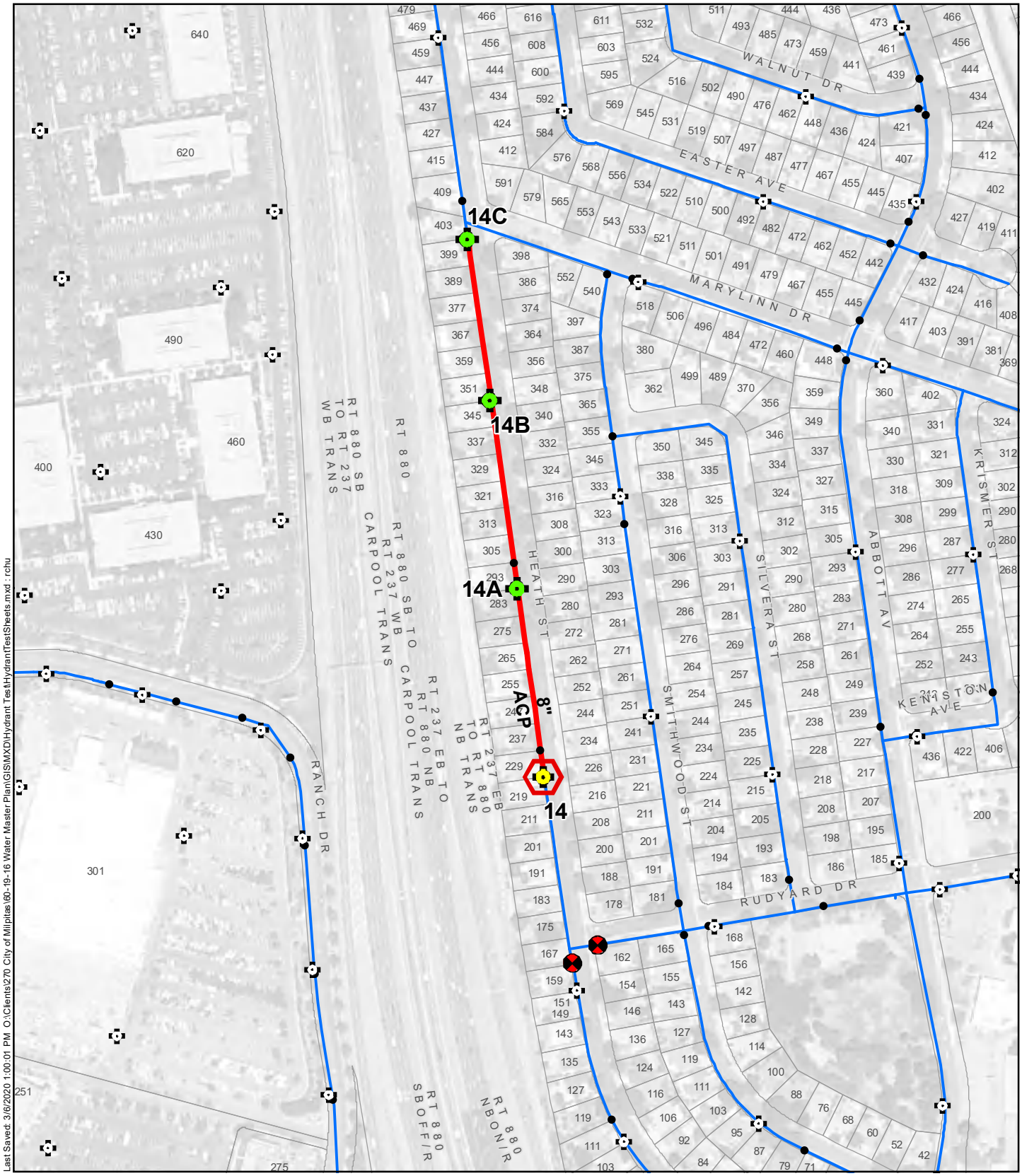
0 100 200
Scale in Feet

WEST YOST ASSOCIATES

**Figure A-13**

**Alternate Test 13**
**Zone SF4-1**
**(8-inch AC - 1980s)**

City of Milpitas
2020 Water Master Plan Update




Flowing Hydrant
Observed Hydrant
Hydrant
Closed Valve (2 total)
Valve

Test Pipeline
Pipeline

N

0 150 300
Scale in Feet

**Figure A-14**

**Alternate Test 14**
**Zone SF1**
**(8-inch AC - 1960s)**

City of Milpitas
2020 Water Master Plan Update

# ATTACHMENT B

| Table B-1. Hydrant Pressure Recorder Locations | | | |
|---|---|---|---|
| HPR No. | Pressure Zone | Facility Monitored | Location |
| 1 | SF1 | Gibraltar BPS | Near 819 E Curtis Ave |
| 2 | SF1 | Main St PRV | SW corner of Corning Avenue and Abel Street |
| 3 | SF1 | N Milpitas PRV | Near 70 N Milpitas Boulevard |
| 4 | SF1 | Sunnyhills PRV | Near 361 Washington Drive |
| 5 | SF2 | Ayer BPS | Near 1439 E Calaveras Boulevard |
| 6 | SC1 | Parc Metro PRV | Near 232 Parc Place Drive |
| 7 | SF2 | Main St Turnout | Near 271 Parc Place Drive |
| 8 | SF2 | Calaveras Turnout | NE corner of N Milpitas Boulevard and E Calaveras Boulevard |
| 9 | SF2 | Sunnyhills Turnout | Near 1589 Washington Drive |
| 10 | SC1 | Capitol PRV | Lundy Pl near 880 E Capitol Avenue |
| 11 | SC1 | Curtis PRV | Near 1189 Barber Lane |
| 12 | SC2 | Gibraltar PRV | Intersection of Gibraltar Court and Gibraltar/Yosemite Drive |
| 13 | SC2 | Gibraltar BPS | Piper Dr between Garden Street and Meridian Place |
| 14 | SF3 | Country Club BPS | Country Club Drive, north of BPS |
| 15 | SF3 | Tularcitos Tank | Near 1251 Tularcitos Drive |
| 16 | SF4-1 | Tularcitos N PRV | Near 1772 Country Club Drive |
| 17 | SF4-1 | Tularcitos S PRV | Near 1870 Saint Andrews Court |
| 18 | SF4-1 | Calera Creek Heights PRV | Near 1631 Calera Creek Heights Drive |
| 19 | SF4-2 | Tularcitos BPS | Near 1490 Tularcitos Drive |
| 20 | SF4-2 | Minnis Tank | Near intersection of Monument Peak Road and Downing Road (Launch Site Road?) |

- Proposed HPR Location
- Hydrant
- Turnout
- Pump Station
- Storage Reservoir
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

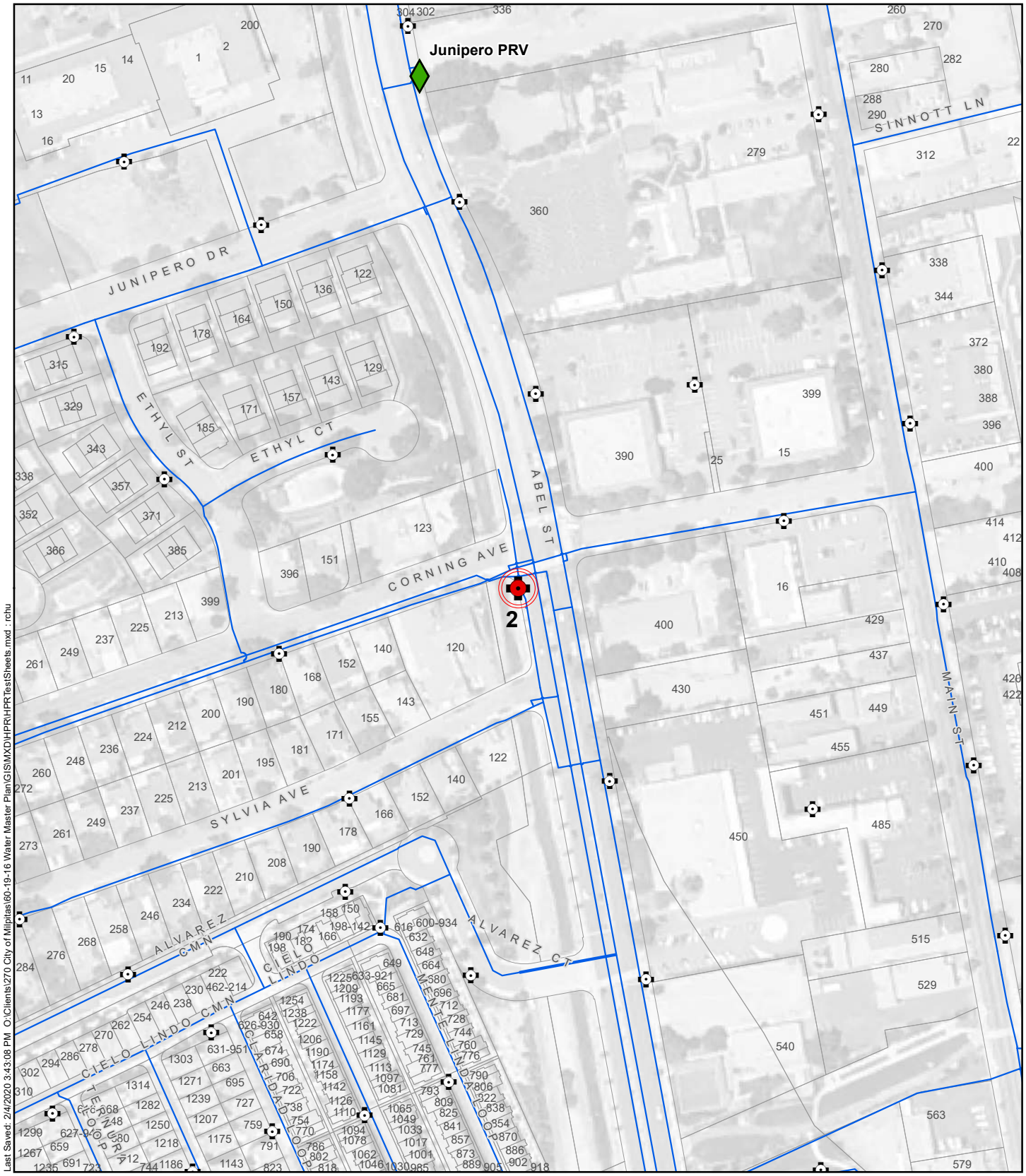
Scale in Feet

WEST YOST ASSOCIATES

**Figure B-1**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update




Proposed HPR Location
Hydrant
Turnout
PS Pump Station
Storage Reservoir
W Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

0 100 200
Scale in Feet

CITY OF MILPITAS CALIFORNIA

WEST YOST ASSOCIATES

**Figure B-2**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

Proposed HPR Location
Hydrant
Turnout
Pump Station
Storage Reservoir
Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

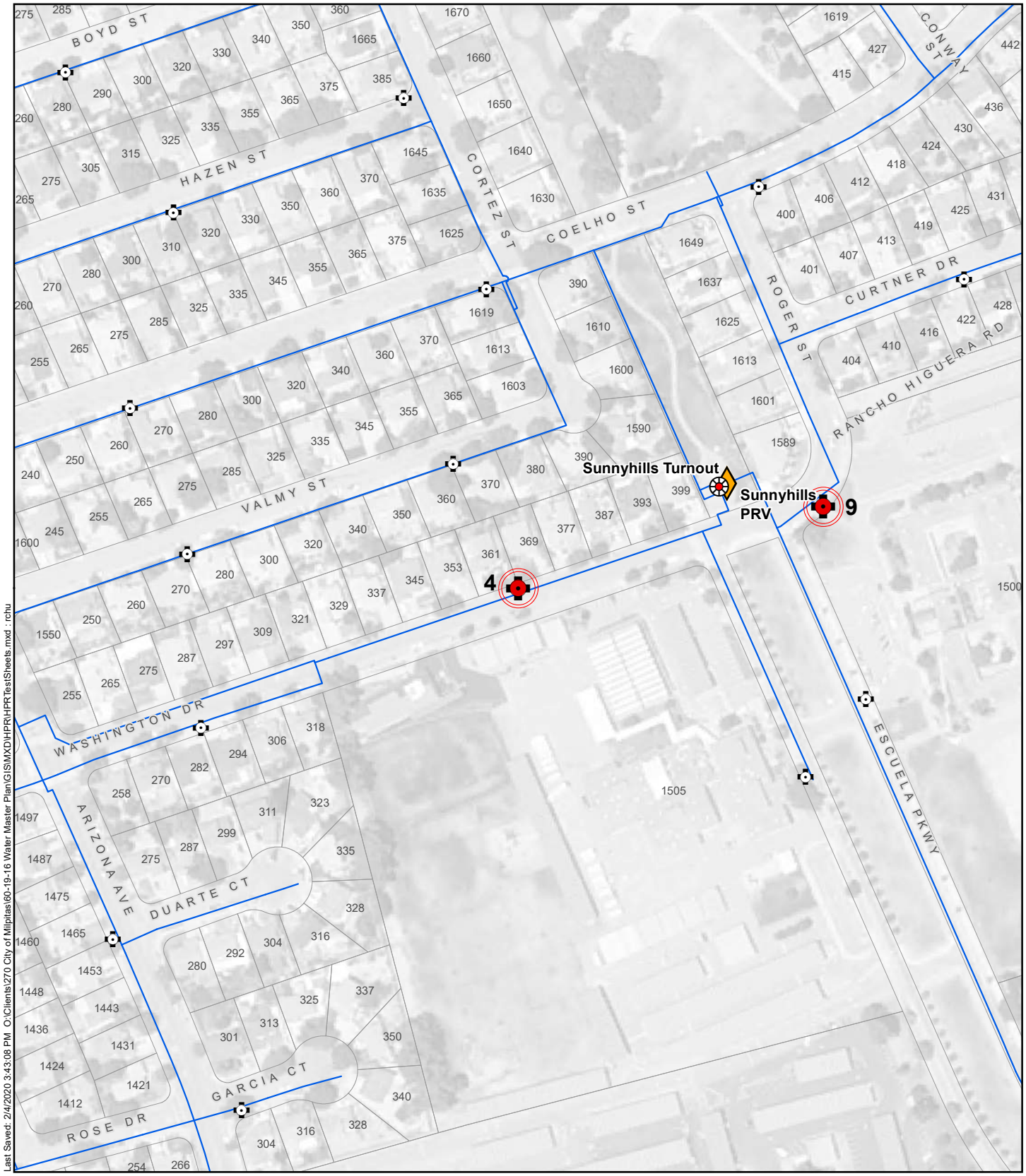
0 100 200
Scale in Feet

WEST YOST ASSOCIATES

**Figure B-3**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- Pump Station
- Storage Reservoir
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

Scale in Feet

WEST YOST ASSOCIATES

**Figure B-4**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

Proposed HPR Location
Hydrant
Turnout
Pump Station
Storage Reservoir
Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

0 100 200

Scale in Feet

**Figure B-5**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- PS Pump Station
- Storage Reservoir
- W Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

Scale in Feet

WEST YOST ASSOCIATES

**Figure B-6**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- PS Pump Station
- Storage Reservoir
- W Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

Scale in Feet

**Figure B-7**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- PS Pump Station
- Storage Reservoir
- W Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

Scale in Feet

WEST YOST ASSOCIATES

**Figure B-8**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

Proposed HPR Location
Hydrant
Turnout
PS Pump Station
Storage Reservoir
W Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

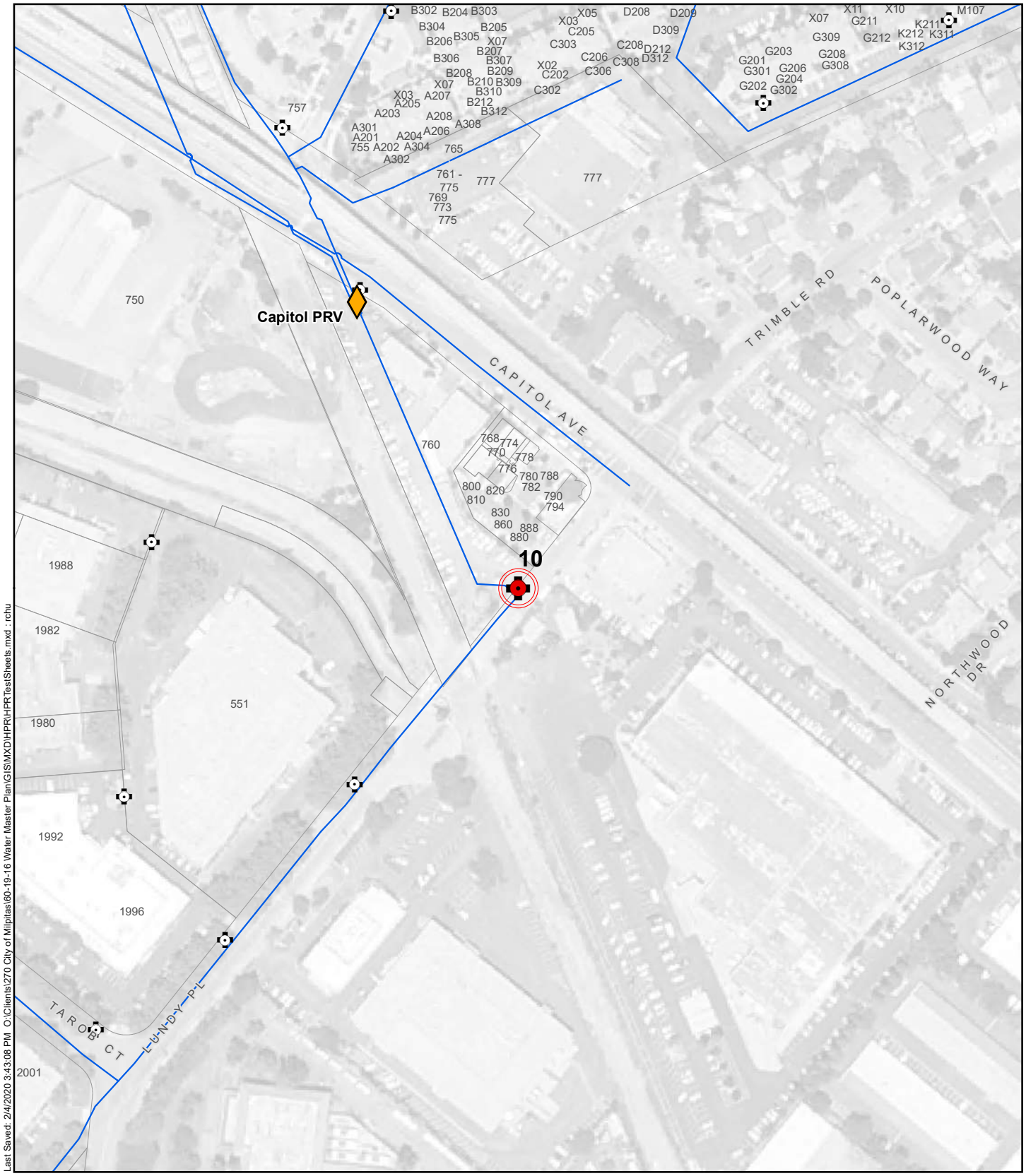
0 100 200
Scale in Feet

WEST YOST ASSOCIATES

**Figure B-9**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update




Proposed HPR Location
Hydrant
Turnout
Pump Station
Storage Reservoir
Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

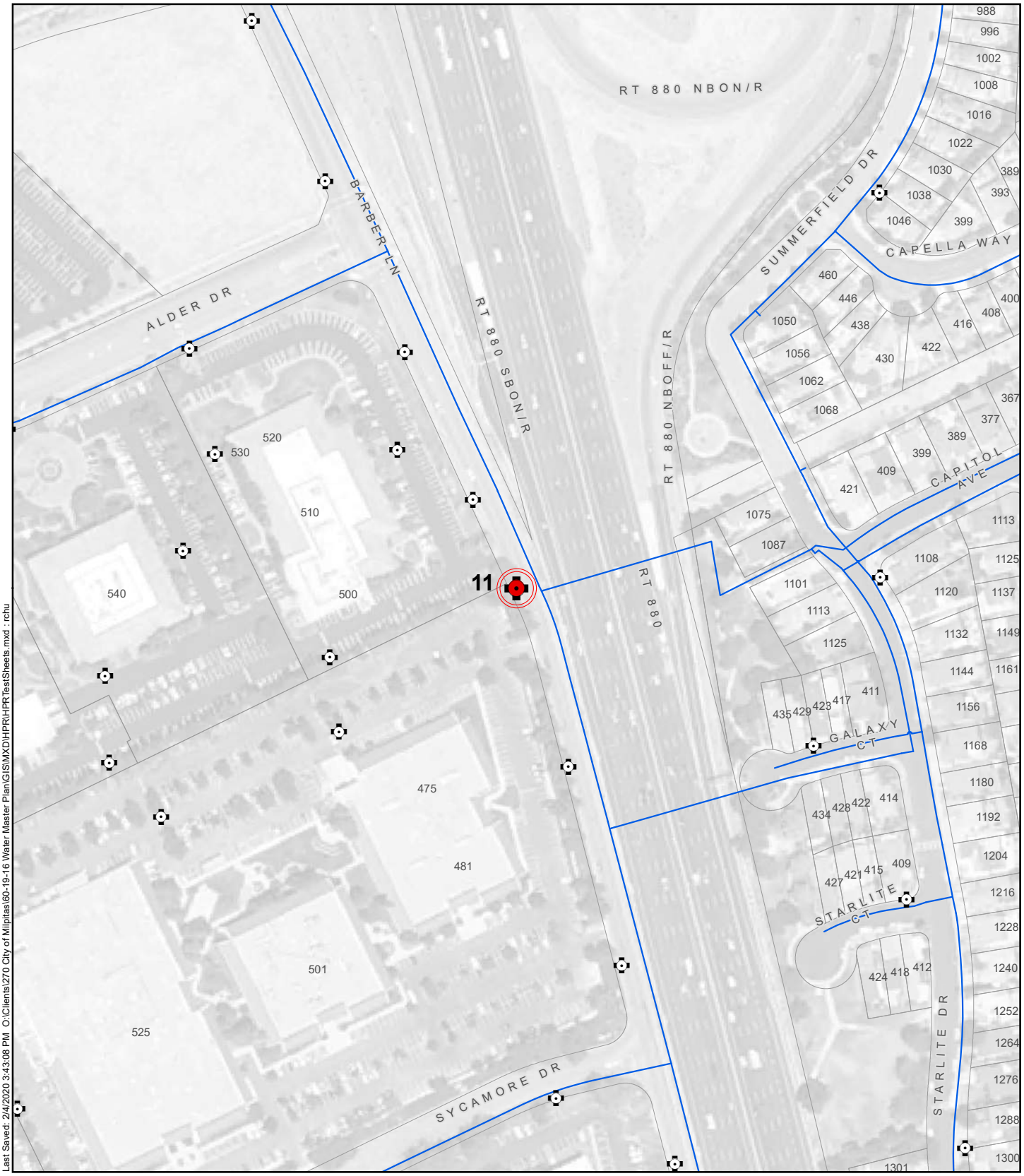
0 100 200
Scale in Feet

WEST YOST ASSOCIATES

**Figure B-10**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- Pump Station
- Storage Reservoir
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

Scale in Feet

WEST YOST ASSOCIATES

**Figure B-11**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- Pump Station
- Storage Reservoir
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

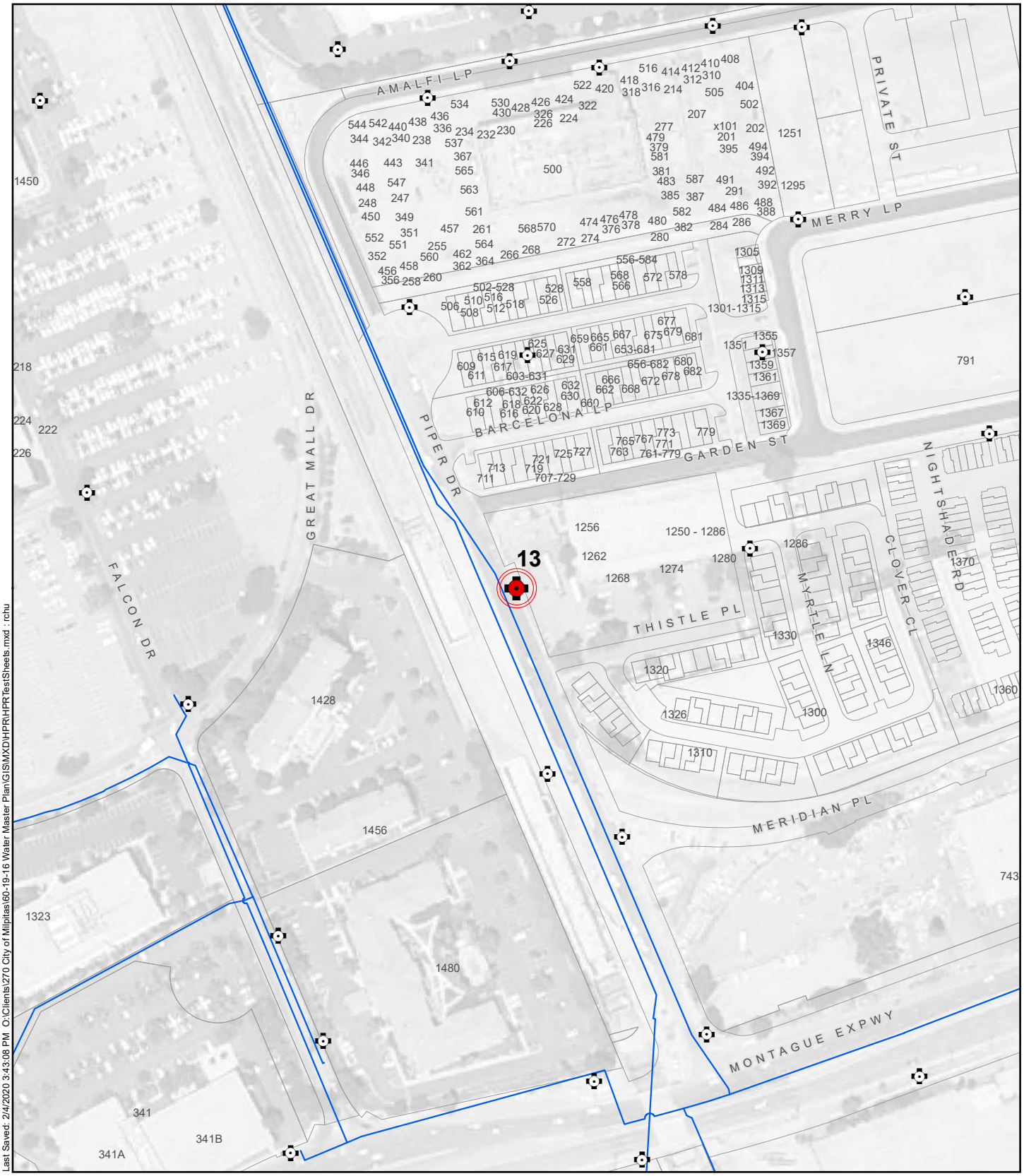
Scale in Feet

WEST YOST ASSOCIATES

**Figure B-12**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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Proposed HPR Location
Hydrant
Turnout
PS Pump Station
Storage Reservoir
W Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

0 100 200
Scale in Feet

WEST YOST ASSOCIATES

**Figure B-13**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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Proposed HPR Location
Hydrant
Turnout
PS Pump Station
Storage Reservoir
W Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

0 100 200

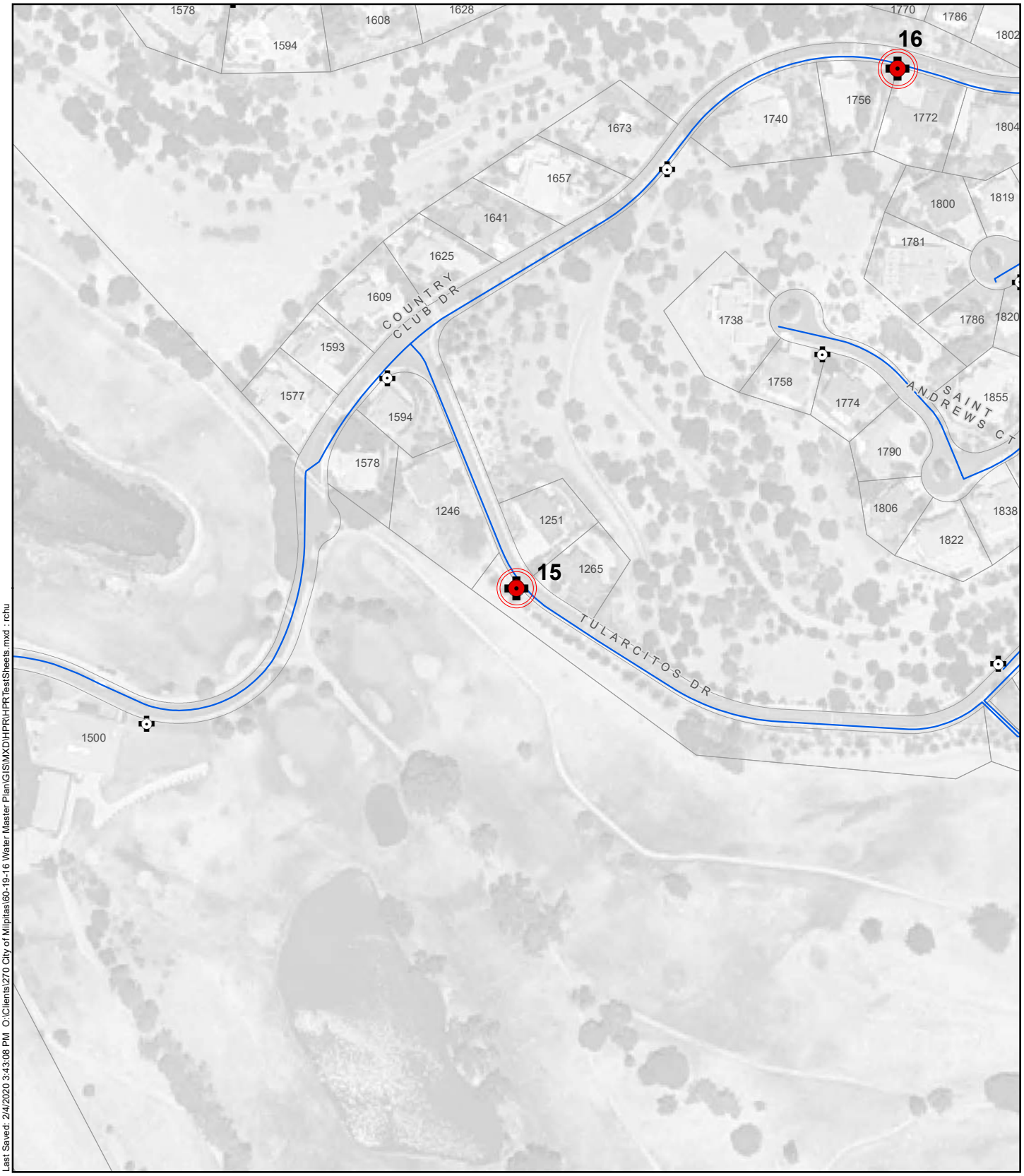
Scale in Feet

WEST YOST ASSOCIATES

**Figure B-14**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- Pump Station
- Storage Reservoir
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

Scale in Feet

WEST YOST ASSOCIATES

**Figure B-15**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- Pump Station
- Storage Reservoir
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

0 100 200

Scale in Feet

WEST YOST ASSOCIATES

**Figure B-16**

**Hydrant Pressure Recorder Locations**

City of Milpitas
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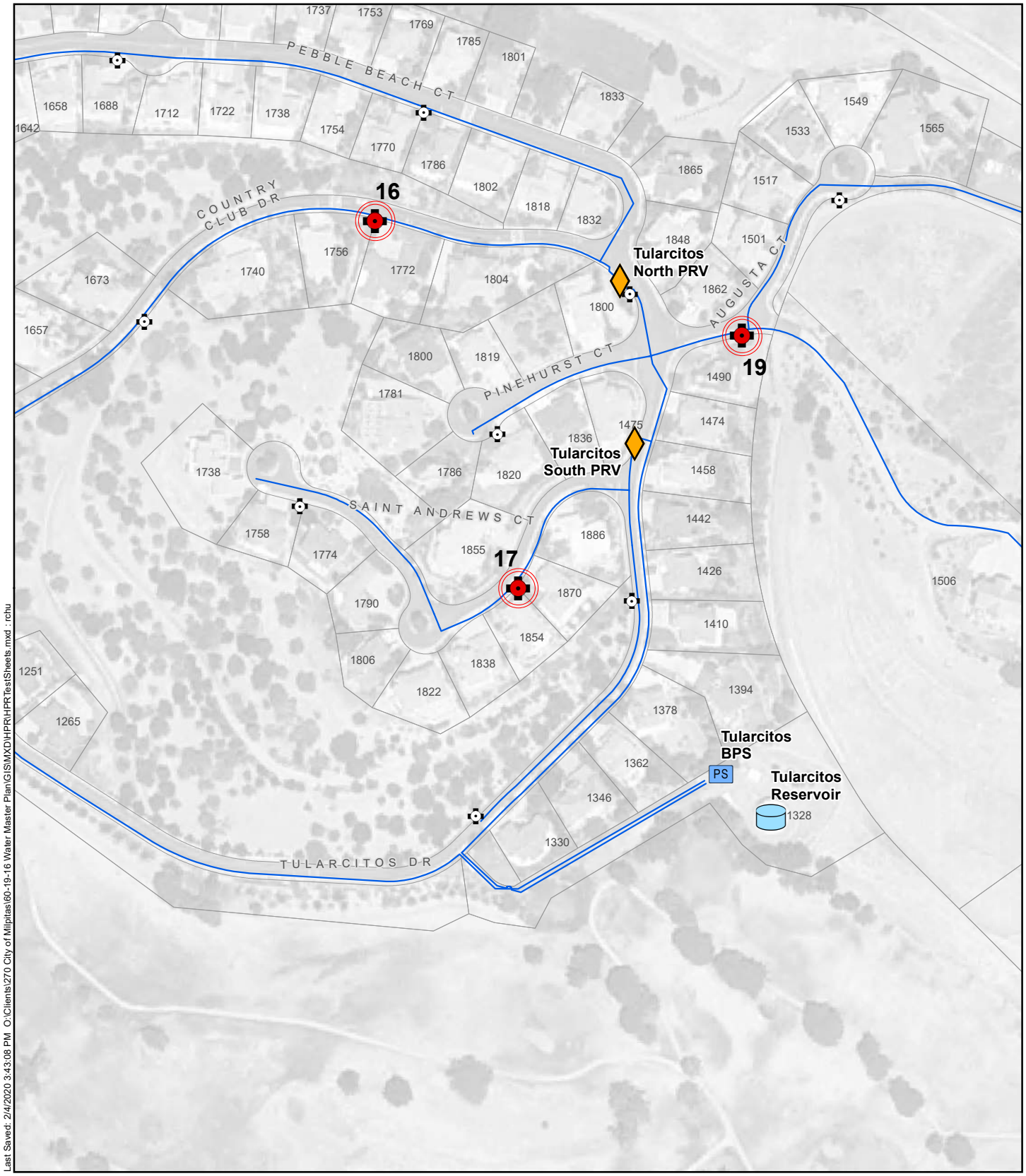


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- Proposed HPR Location
- Hydrant
- Turnout
- Pump Station
- Storage Reservoir
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

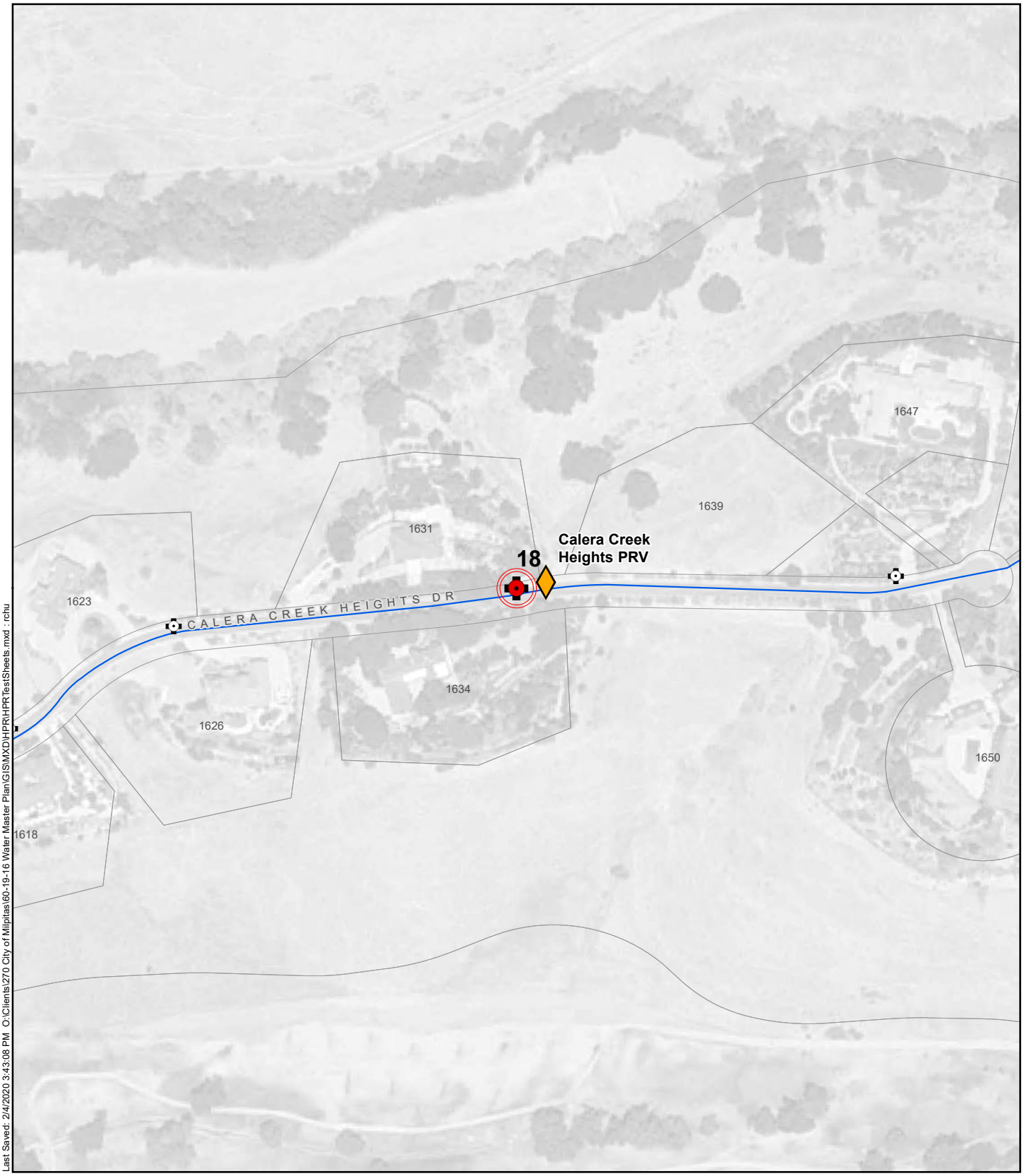
0 100 200

Scale in Feet

**Figure B-17**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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Proposed HPR Location
Hydrant
Turnout
Pump Station
Storage Reservoir
Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

0 100 200

Scale in Feet

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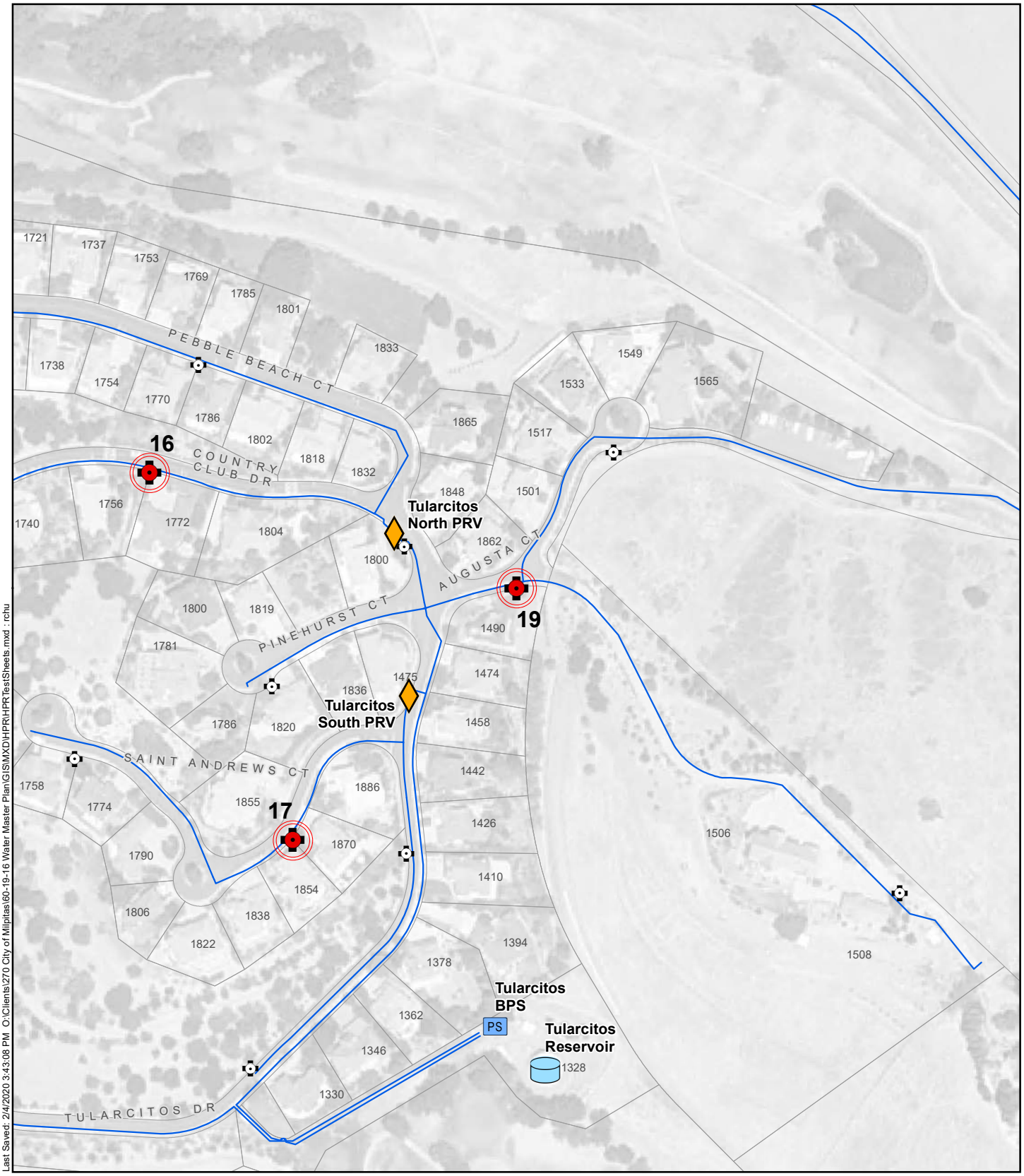
**Figure B-18**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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- Proposed HPR Location
- Hydrant
- Turnout
- Pump Station
- Storage Reservoir
- Well
- Pressure Reducing Valve
- Emergency PRV
- Pipeline

N

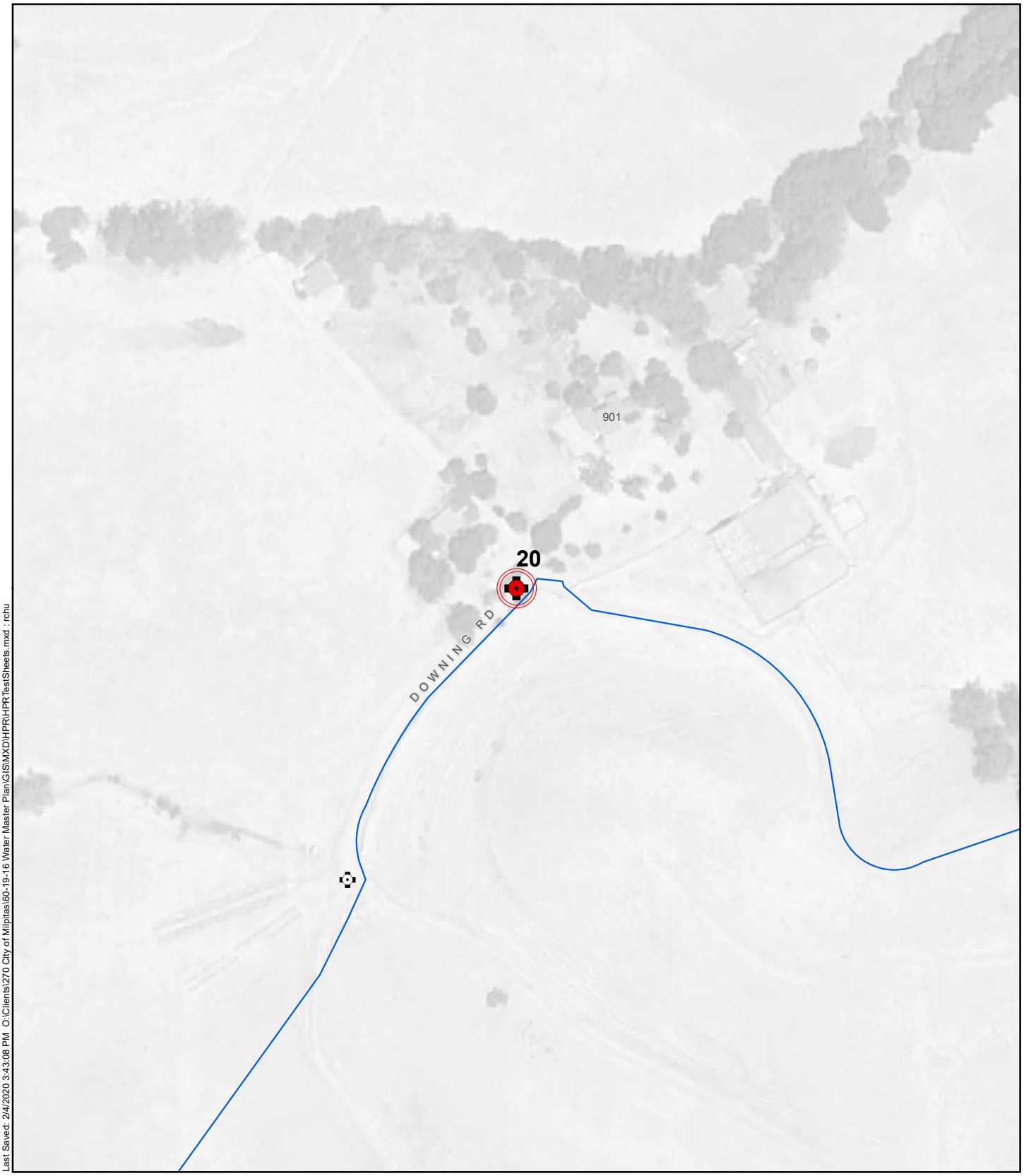
0 100 200

Scale in Feet

**Figure B-19**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

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Proposed HPR Location
Hydrant
Turnout
Pump Station
Storage Reservoir
Well
Pressure Reducing Valve
Emergency PRV
Pipeline

N

0 100 200

Scale in Feet

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**Figure B-20**

**Hydrant Pressure Recorder Locations**

City of Milpitas
2020 Water Master Plan Update

# Appendix D

## Water Utility Condition Assessment

TECHNICAL MEMORANDUM | OCTOBER 2020

# 2020 Water Master Plan
# Water Utility Condition Assessment

**PREPARED FOR**

City of Milpitas

**PREPARED BY**

WEST YOST
Water. Engineered.

# 2020 Water Master Plan
# Water Utility Condition Assessment

**Prepared for**

## City of Milpitas

**Project No. 270-60-19-16**

Michael Zacharia, PE — 10-30-20 Date

Anne Girtz, PE — 10-30-20 Date

QA/QC Review: Elizabeth Drayer PE — 10-30-20 Date

WEST YOST
Water. Engineered.

TECHNICAL MEMORANDUM | OCTOBER

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# 2020 Water Master Plan
# Water Utility Condition Assessment

This Technical Memorandum (TM) summarizes the condition assessment that was performed of the City of Milpitas's (City) water utility assets under Task 3 – Water Utility Asset Condition Assessment of the 2020 Water Master Plan Update (Master Plan). This TM presents assessment methodologies, asset valuations, likelihood and consequence of failure factors, and risk scores as summarized in the following sections:


1.0 Scope of Work

2.0 Review of Existing Information

3.0 Asset Replacement Cost and Current Valuation

4.0 Risk Assessment Framework

5.0 Likelihood of Failure Methodology

6.0 Consequence of Failure Methodology

7.0 Risk Assessment

8.0 Conclusions


## 1.0 SCOPE OF WORK

The scope of this assessment includes:

- Preparing an estimate of remaining useful life and replacement cost of assets;
- Developing a risk policy consisting of likelihood of failure (LOF) factors, consequence of failure (COF) factors, and interpretation of both LOF and COF to define risk; and
- Performing a desktop risk analysis of utility assets.

Each asset was evaluated according to the risk policy, resulting in risk scores for each water system asset. Risk scores and corresponding risk action thresholds can be used for decision making including selection and prioritization of asset renewal or replacement efforts. The analysis results will be used to inform the Task 7 Rehabilitation and Replacement Study of the Master Plan.

The standardized evaluation process established in the risk policy can be used in future assessments of condition, risk, and valuation of water system assets. The policy framework was developed so that risk factor definitions are commensurate across assets from other City utilities and can be applied to other departments. Should new data become available to support additional or refined risk factors (e.g. pipe break data with failure cause, condition assessment data, etc.), these can be developed within the risk framework proposed herein.

# 2.0 REVIEW OF EXISTING INFORMATION

This section describes the existing information upon which the assessments were based, and any data processing required prior to undertaking the assessments.

## 2.1 Asset Data and Asset Registry

The City provided two data sources containing water system asset information: a master inventory spreadsheet and a GIS database.

The master inventory spreadsheet contained information on water facilities including wells, pump stations, reservoirs, PRVs, turnouts, interties, and isolation valves. In addition to facility data, the spreadsheet contained information on select individual assets at each facility (e.g., for a pump station, the pump size(s), manufacturer, model, and other attributes were provided).

The City's existing GIS database was outdated and was updated by HydroScience as part of their work on the City's Sewer Master Plan (being completed concurrently). The updated database contained geospatial and attribute information for horizontal water assets including pipelines, valves, backflow preventers, blow off assemblies, hydrants, and meters.

The master spreadsheet and GIS database were compiled to create an asset registry of all City water system assets. Upon comparison of the two data sources provided by the City, it was observed that several assets were present in both databases. Duplicate entries included: isolation valves (40), PRVs (18), and reservoirs (5). To reconcile the duplicates, a coordinate comparison was performed in GIS to identify duplicate isolation valves; and visual inspection in GIS was performed to identify duplicate PRVs and reservoirs. Duplicates were removed from the respective database prior to compiling the asset registry. The asset registry facilitated the condition and risk assessment discussed herein and provides a database for the City to track and manage their assets moving forward. This database is provided as a separate deliverable which consists of an Excel spreadsheet titled *Asset Registry and Risk Results.xlsx* and may be used to refresh the City's CMMS database.

The final asset registry contained 35,260 entries, consisting of 35,173 horizonal assets and 87 vertical assets. The breakdown of assets by type is presented in Table 1.

| Table 1. Asset Registry – Count of Asset Types | |
|---|---|
| Asset Type | Count |
| Horizontal Assets | |
| Pipelines | 9,575 pipe segments (183 miles) |
| Hydrants | 2,906 |
| Valves | 6,341 |
| Meters | 16,351 |
| **Total Horizontal Assets** | **35,173** |
| Vertical Assets | |
| Fuel Tank | 3 |
| Engine | 4 |
| Generator | 3 |
| Motor | 10 |
| PLC | 2 |
| PRV | 23 |
| Pump | 19 |
| Reservoir | 5 |
| Turnouts and Interties | 7 |
| VFD | 9 |
| Well | 2 |
| **Total Vertical Assets** | **87** |

## 2.2 2002 Utility Depreciation Study

A Utility Depreciation Study (Schaaf and Wheeler) was performed in 2002. The study included the following:

- An inventory of all City water system assets;
- Replacement costs for those elements; and
- A timetable for replacement of water system elements based on anticipated remaining useful life estimates.

This replacement cost analysis assumed unit costs based on a March 2003 ENR Construction Cost Index. Table 2 presents the resulting replacement costs from the 2002 study for the City's water system assets in 2002 dollars.

| Table 2. Water System Replacement Costs, 2002 Utility Depreciation Study (2002 Dollars) | |
|---|---|
| Asset Type | Replacement Cost<br>Million dollars |
| Pipelines | 131 |
| Valves and Couplings | 8.9 |
| ACP Disposal | 80.6 |
| Storage Tanks | 13.4 |
| Pump Stations | 10.6 |
| Wells | 1.1 |
| **Total** | **$245.6** |

## 2.3 2018 Soil Corrosivity Study

In 2018, the City commissioned a soil corrosivity study (JDH Corrosion Consultants, Inc.) to develop a comprehensive database related to corrosion potential of the soils throughout the City. The assessment was focused on water pipelines made of asbestos cement (AC), ductile iron, cast iron, dielectric coated steel, and mortar coated steel materials. Based on in-situ soil resistance measurements and a review of previous soil evaluations, strategies were developed for long-term corrosion control of AC and metallic pipelines.

# 3.0 ASSET REPLACEMENT COST AND CURRENT VALUATION

Asset replacement cost and current valuation estimates are asset management best practices that can afford utility agencies improved decision making. This information provides agencies more accurate and integrated information about their assets, and allows more productive relationships with governing authorities, ratepayers, and other stakeholders because they can provide better information in a more transparent way.

**Asset Replacement Cost** estimates can be used to guide rehabilitation and replacement budgeting. Typically, investment in replacement should cover at a minimum, the deprecation of the assets.

**Asset Current Valuation** estimates are required to support transactions (public-private partnerships, outright sale, etc.), insurance coverage or claims, and rates cases.

## 3.1 Water System Asset Replacement Cost

A water system asset replacement cost estimate was developed which represents the cost to replace the entire system in-kind, at current construction and design standards. Costs were developed based on a combination of data supplied by manufacturers, published industry standard cost data and curves, construction costs for similar facilities built by other public agencies, and construction costs previously estimated by West Yost for similar facilities with similar construction cost indexes. Details on cost estimating assumptions are provided in a separate appendix of the Water Master Plan.

A summary of the water system replacement costs is presented in Table 3a. Detailed replacement costs are provided in the *Asset Registry and Risk Results* Excel workbook.

**Table 3a. Water System Replacement Costs (2020 Dollars)**

| Facility Type | Replacement Cost Million dollars |
|---|---|
| Pipelines | 148.4 |
| Valves | 4.7 |
| Hydrants | 36.2 |
| Meters | 6.9 |
| Storage Tanks | 46.6 |
| Pump Stations | 27.6 |
| Wells | 7.2 |
| PRVs | 5.9 |
| Turnouts and Interties | 4.4 |
| **Total** | **$287.9** |

## 3.2 Water System Current Valuation

Using the 2020 replacement cost estimate presented in Table 3a, a current water system valuation was prepared using asset useful life estimates (discussed in detail in the Asset Useful Life section) and assuming a straight-line value reduction or depreciation. A straight-line depreciation assumes that the value of an existing asset is reduced gradually over its useful life in a linear relationship. For example, a pipe with 50 percent remaining useful life is valued at 50 percent of its total new replacement cost value. The water system asset valuation estimates the value of individual assets only, not the inherent value of the water system as a whole.

The 2020 water system asset valuation assuming straight-line depreciation is presented in Table 3b. Detailed asset valuation costs are provided in the *Asset Registry and Risk Results* Excel workbook.

**Table 3b. Water System Asset Valuation (2020 Dollars)**

| Facility Type | Asset Valuation, Million dollars |
|---|---|
| Pipelines | 43.5 |
| Valves | 1.2 |
| Hydrants | 9.1 |
| Meters | 0.7 |
| Storage Tanks | 16.1 |
| Pump Stations | 2.8 |
| Wells | 2.0 |
| PRVs | 1.5 |
| Turnouts and Interties | 1.1 |
| **Total** | **$78.0** |

# 4.0 RISK ASSESSMENT FRAMEWORK

Understanding the *risk* of each water system asset can help water utilities to prioritize highest-risk assets for renewal or replacement, allowing limited resources to be allocated most effectively. The two components of risk include:

- **Likelihood of Failure (LOF)**, which estimates the probability that a failure will occur in an asset by meeting the end of its physical, design, service, or economic useful life; and
- **Consequence of Failure (COF)**, which estimates the impacts of asset failure expressed either qualitatively or quantitatively, being a loss, injury, or disadvantage from a social, economic, environmental, or regulatory standpoint.

Risk is then estimated using the conventional risk equation:

$$Risk = LOF \times COF$$

The following sections present the LOF and COF methodology that was developed for the City's water system assets, and then calculates asset risk using the risk equation.

# 5.0 LIKELIHOOD OF FAILURE METHODOLOGY

A desktop assessment was performed on existing water utility assets to estimate the LOF of each asset. For this assessment, asset failure is defined by the asset's inability to perform as intended or needed in its application. The primary failure mode utilized for this assessment was physical mortality, which is defined as physical deterioration due to age, usage, or acts of nature. Operational efficiency failure was also evaluated to consider the reduction in pipeline asset performance due to pipe roughness. Supplemental asset data such as failure history and asset condition assessment can also be used to evaluate LOF. This data was not available at the time this analysis was performed.

For each asset type, one or more LOF factors were developed for each failure mode, as presented in Table 4a.

**Table 4a. Asset Failure Modes and LOF Factors**

| Failure Mode | Failure Description | LOF Factor |
|---|---|---|
| Physical Mortality | The percent of useful life remaining considers that older assets are more likely to fail than newer ones due to the age of materials and wear from repeated use. | Remaining Useful Life (for pipelines, considering pipe material, pipe diameter, and soil conditions) |
| | Pipelines that operate at higher working pressures can undergo stress cycles and cause higher failure rates in older pipelines. | Operating Pressure[(a)] |
| Operational Efficiency Failure | The accumulation of corrosion byproducts and suspended particles on the inside wall of aged pipes can increase pipe roughness and reduce pipe diameter, thereby increasing operational costs to overcome to greater hydraulic losses. | Pipe Roughness[(a)] (change in Hazen-Williams C-Factor) |

(a) LOF Factor only applicable to pipelines

LOF ratings were assigned for each factor using standard definitions presented in Table 4b. Ratings and definitions range from 1 – indicating that an asset is in good condition and asset failure is "unlikely", to 4 – indicating that asset is in poor condition and asset failure is "very likely". Finally, each asset was evaluated under each applicable LOF factor to develop an overall LOF rating.

**Table 4b. LOF Definition and Ratings**

| | LOF Rating | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| LOF Definition | Unlikely | Possible | Likely | Very Likely |

The following sections describe the development of each LOF factor utilized in the assessment.

## 5.1 Asset Useful Life Defined

Asset useful life is generally considered to be the time that an asset provides valued service, after which it does not meet its intended service level. End of life is not necessarily indicative of catastrophic failure, and in most cases an asset can still hold functionality when it has reached the end of its useful life. Absent quantifiable condition or performance data, the assumption is that the older the asset, the greater likelihood it will fail.

Municipal water system assets vary by type, manufacture, design, construction, and quality. They have different characteristics in how they operate and, consequently, will have different profiles of how they perform and ultimately fail. Asset useful life expectancies are documented by the American Water Works Association and Water Environment Research Foundation (WERF) in addition to other notable industry associations. Useful life values presented here are nominal and consistent with the water utility industry and are not specific to any geographic region.

### *5.1.1 Non-Pipeline Useful Life*

Table 5a presents a summary of useful life by asset type which were used for the assessment of the City's vertical and non-pipeline horizontal water utility assets. Pipeline assets are discussed separately in the following section.

**Table 5a. Useful Life by Asset Type**

| Asset Type | Useful Life, years |
|---|---|
| Vertical Assets | |
| Fuel Tank | 15 |
| Engine | 15 |
| Generator | 15 |
| Motor | 25 |
| PLC | 15 |
| PRV | 25 |
| Pump | 25 |
| Reservoir | 50 |
| Turnouts and Interties | 30 |
| VFD | 10 |
| Well | 50 |
| Non-Pipeline Horizontal Assets | |
| Hydrants | 50 |
| Meters | 15 |
| Valves | 50 |

### 5.1.2 Pipeline Useful Life

Pipeline useful life can vary significantly based on pipe size, material, and environmental conditions. The City's 2018 soil corrosivity study indicated that the City's AC pipe was more susceptible to failure in clay soils due to the pipe stresses associated with contraction and expansion of the soil. Smaller diameter AC pipes were especially susceptible to failure due to their relatively low resistance to soil movement. The report recommended a range of AC pipe useful lives based on pipe diameter. The investigation also mapped soil corrosivity and found that soils throughout the City were "severely" to "moderately" corrosive to metallic pipes (cast iron, ductile iron, steel).

Table 5b presents the useful lives for pipelines based on industry standards and the JDH report. It includes a base useful life (not considering soil conditions) and an effective useful life for AC pipe in clayey soils and metallic pipes in corrosive soils. Reinforced concrete pipe was considered vulnerable to corrosive soils due to the potential for exposed reinforcement steel.

**Table 5b. Useful Life – Pipelines**

| Pipe Material | Diameter, Inches | Base Useful Life, years | Effective Useful Life, years | | | |
|---|---|---|---|---|---|---|
| | | | Clay Soils | Moderately Corrosive Soils | Corrosive Soils | Severely Corrosive Soils |
| Asbestos Cement | 4-10 | 30 | 24 | - | - | - |
| | 12+ | 90 | 72 | - | - | - |
| Polyvinyl Chloride | all | 70 | - | - | - | - |
| Concrete Cylinder | all | 75 | - | 68 | 64 | 60 |
| Cast Iron | all | 100 | - | 90 | 85 | 80 |
| Ductile Iron | all | 100 | - | 90 | 85 | 80 |
| Steel | all | 95 | - | 86 | 81 | 76 |

### 5.1.3 Asset Remaining Useful Life Defined

The asset useful life estimates discussed above were used to calculate the remaining useful life (RUL) of each asset with the following formulas:

*RUL = Asset Useful Life – Asset Age*

*RUL (%) = (Asset Useful Life – Asset Age) / Asset Useful Life*

### 5.1.4 Estimation of LOF based on Remaining Useful Life

Decay curves can be used to illustrate the progression of asset degradation (decay) over an asset's useful life. The curves in Figure 1 were developed by WERF[1] and represent empirical failure patterns at several

[1] WERF SIMPLE (Sustainable Infrastructure Management Program Learning)

polynomial rates that may be experienced in the water industry. For this assessment, Late Decay 2 curve was selected as the indicator of likelihood of failure based on the following assumptions:

- Once municipal assets are beyond the point of early mortality, only a gradual decline in asset condition is expected to occur for much of the asset life. Early mortality is characterized by asset failure very soon after the asset is commissioned and in service. The occurrence of early mortality is often associated with manufacturing and installation issues.
- Late Decay Curve 2 provides only a 30 percent reduction in asset condition for the first two-thirds of the asset life. This is considered a nominal reduction in condition for a major milestone in the asset lifecycle and represents a suitable objective for asset performance.
- Late Decay Curve 2 provides a progression that is not significantly steep in terms of asset degradation over the final, remaining, one-third lifecycle.

Figure 1 also shows how Late Decay Curve 2 is used to correlate asset remaining useful life with the LOF rating (e.g. for an asset with a % RUL of 30 percent, the LOF rating is 2).

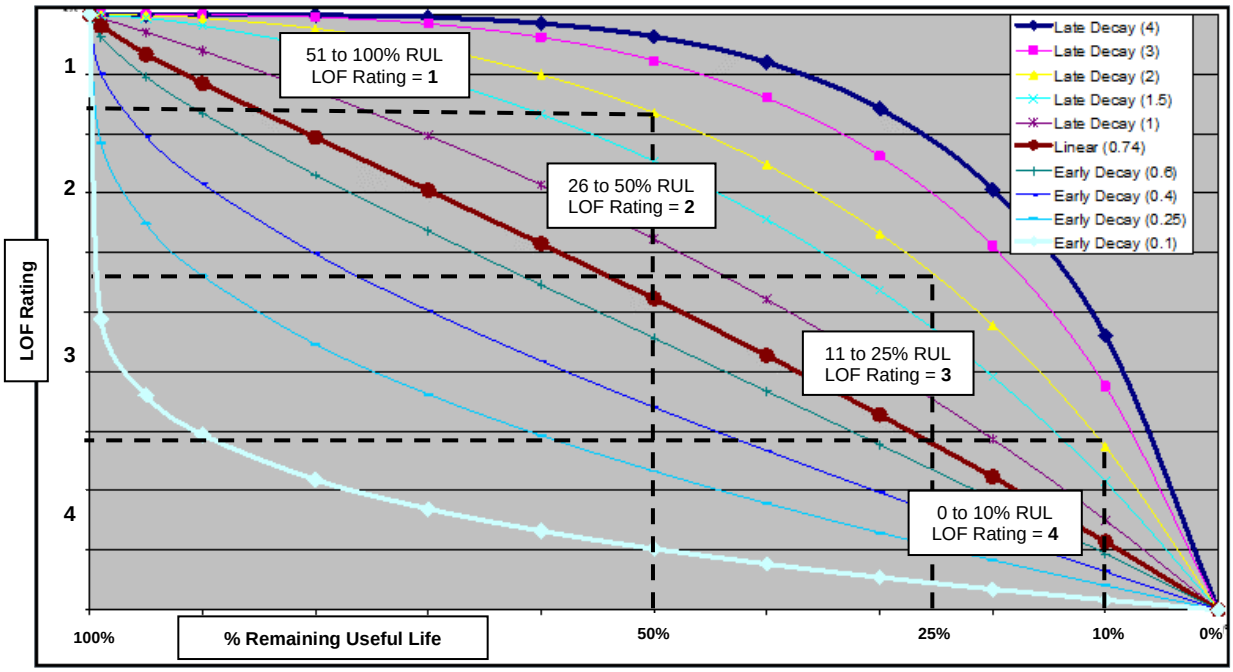



**Figure 1. Percent Remaining Useful Life and LOF Rating**

Several assets in the City databases were missing age or installation dates. These assets were assigned an LOF rating based on the following assumptions:

- AC pipe was assigned a rating of 4 under the assumption that AC pipe was not installed after the mid-1980s (and therefore the % RUL would be zero). 19 miles (894 pipe segments) of AC pipe had an unknown age/installation date.
- Remaining assets of unknown age were assigned a rating of 3 to account for the generally higher risk associated with unknown asset age and condition.

## 5.2 Pipeline Hydraulic Conditions

Pipeline conditions from the hydraulic model were considered to evaluate LOF factors of pipe roughness (operational efficiency failure mode) and operational pressure (physical mortality failure mode).

### *5.2.1 Pipe Roughness*

Hydrant testing was performed over a portion of the distribution system to determine calibrated pipeline roughness, or C-Factors (see Task 4 of the Master Plan, presented in Chapter 6). Calibrated C-Factors from the hydraulic model were used to determine the reduction in C-Factor when compared to the C-Factor of a brand-new pipe of the same material. The result of the C-Factor comparison is presented in Table 6.

**Table 6. Pipe Roughness: C-Factor Comparison**

| Pipe Material | Pipe Sizes | New Pipe C-Factor | Calibrated C-Factor | Percent of New C-Factor |
|---|---|---|---|---|
| Asbestos Cement | Diameter ≤ 8 inches | 140 | 110 | 79% |
| | Diameter > 8 inches | | 120 | 86% |
| Polyvinyl Chloride | Diameter ≤ 8 inches | 150 | 130 | 87% |
| | Diameter > 8 inches | | 140 | 93% |
| Concrete Cylinder | Diameter > 8 inches | 140 | 130 | 93% |
| Cast Iron | Diameter ≤ 8 inches | 130 | 100 | 77% |
| | Diameter > 8 inches | | 110 | 85% |
| Ductile Iron | Diameter ≤ 8 inches | 140 | 130 | 93% |
| | Diameter > 8 inches | | 140 | 100% |
| Steel | Diameter ≤ 8 inches | 140 | 120 | 86% |
| | Diameter > 8 inches | | 130 | 93% |

### *5.2.2 Operating Pressure*

Operating pressure was obtained from the calibrated hydraulic model under an average day scenario, with system pumps operating. Pipeline assets were evaluated for high operating pressure as an influence to increased LOF. Through discussions with the City, pipeline assets operating continually in excess of 135 psi regardless of design class were considered to be at higher risk of failure or increased LOF.

## 5.3 Supplemental Condition Data

Supplemental condition data typically consists of focused condition assessment studies of assets and facilities to determine condition based on an established set of metrics and criteria. Such assessments should be performed at intervals generally less than the asset's useful life to confirm condition and status on the useful life curve. Maintenance records may also capture details from asset failure and problems. This information can be used to document type and frequency of failures that serve as an indication of asset condition and be used in the future to develop additional LOF factors.

## 5.4 Likelihood of Failure Evaluation

Assets were evaluated under each applicable LOF factor to develop an overall LOF rating. Pipeline assets were assessed based on the criteria outlined above consisting of RUL and operating pressure. Non-pipeline assets considered only RUL alone. Since these criteria are baseline and easy to assess they serve as the *fixed* LOF criteria.

Given the availability of supplemental data, the other criteria were incorporated as *modifiers* to the LOF assessment. LOF scores were subjected to the other criteria as potential modifiers that could increase the LOF rating if additional data were available. These modifiers include pipeline roughness, failure history from maintenance or other failure data, and focused condition assessment activities.

Both fixed and modifier LOF factors were assigned a weight based on the relative importance of each factor. For the fixed LOF factors, RUL is weighted to represent 80 percent of the total rating, while operating pressure represents 20 percent of the total rating. The maximum possible weighted rating for the fixed LOF factors is 4. LOF modifiers are only evaluated if the fixed LOF rating is less than 4. LOF modifiers can increase the overall rating up to 1 additional score, resulting in a total possible LOF rating of 4. Table 7 presents the LOF criteria and rating definitions.

**Table 7. LOF Factor and Ratings – Water System Assets**

| Factor | LOF Rating and Definition | | | | Weight | Max Possible Rating |
|---|---|---|---|---|---|---|
| | 1 Unlikely | 2 Possible | 3 Likely | 4 Very Likely | | |
| Fixed LOF Factors | | | | | | |
| Remaining Useful Life (RUL) | 51 to 100% RUL | 26 to 50% RUL | 11 to 25% RUL; Non-AC pipe asset with unknown age | 0 to 10% RUL; AC pipe asset with unknown age | 80% | 3.2 (Pipelines) 4.0 (All other assets) |
| Operating Pressure[(a)] | <84 psi | 85 psi to 99 psi | 100 psi to 1 34 psi | >135 psi | 20% | 0.8 |
| | | | | | **Maximum Rating** | **4.0** |
| LOF Modifiers | | | | | | |
| Pipe Roughness[(a)] | 85% to 100% of new C-Factor Rating | 75% to 84% of new C-Factor Rating | 65% to 74% of new C-Factor Rating | <64% of new C-Factor Rating | 2.5% | 0.10 |
| Failure History | <2 | 3 to 5 | 6 to 9 | >10 | 10% | 0.40 |
| Condition Assessment | New | Used | Worn | Pending Failure | 12.5% | 0.50 |
| | | | | | **Maximum Modifier** | **1.0** |
| | | | | | **Total Possible LOF Rating** | **4.0** |

(a) Factor only applicable to pipelines

## 5.5 Asset LOF Results

Table 8 presents the LOF rating results as a percent of total assets by type (i.e. for hydrants, 8 percent of all hydrants were evaluated to have a LOF rating of 1 and 17 percent of all hydrants have a LOF rating of 2, etc.). Individual asset LOF results are provided in the *Asset Registry and Risk Results* Excel workbook.

**Table 8. Asset LOF Results, Percent of Total Assets by Type**

| | LOF Rating, total assets by type, percent | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Horizontal Assets | | | | |
| Pipelines[(a)] | 25 | 18 | 20 | 37 |
| Hydrants | 8 | 17 | 75 | 0 |
| Meters | 0 | 3 | 22 | 75 |
| Valves | 16 | 23 | 61 | 0 |
| Vertical Assets | | | | |
| Fuel Tank | 0 | 0 | 33 | 67 |
| Engine | 0 | 0 | 0 | 100 |
| Generator | 0 | 0 | 67 | 33 |
| Motor | 0 | 0 | 30 | 70 |
| PLC | 0 | 0 | 50 | 50 |
| PRV | 0 | 4 | 87 | 9 |
| Pump | 0 | 0 | 16 | 84 |
| Reservoir | 0 | 60 | 40 | 0 |
| Turnouts and Interties | 0 | 0 | 100 | 0 |
| VFD | 0 | 0 | 22 | 78 |
| Well | 50 | 0 | 50 | 0 |

(a) Pipeline results are shown as percent of total pipeline length, not pipe segments.

## 5.6 Facility LOF Results

The previous section describes the method for assigning an LOF rating for each asset. For vertical assets, multiple assets can constitute a larger facility; for example, the Ayer Pump Station facility includes a pump, motor, generator, fuel tank, PLC, and VFD. LOF can also be estimated at the facility level by considering the LOF of individual components within that facility. LOF was estimated for Milpitas water system facilities by averaging the associated component LOFs, weighted based on the individual component value. The applied weighting considers the fact that assets of a lower value should have a lesser impact on the overall facility LOF, whereas assets with a higher value should have a greater impact on the overall facility LOF.

$$\text{Facility LOF} = \frac{\sum_{i=1}^{n} Component\ LOF \times Compnent\ Value\ (\$)}{Total\ Facility\ Value\ (\$)}$$

Table 9 presents the LOF rating results for each facility on the same 1 to 4 scale, rounded to the nearest tenth.

**Table 9. Facility LOF Results**

| Facility | LOF Rating |
|---|---|
| Curtis Well | 1.7 |
| Gibraltar Reservoir (SC) | 2.0 |
| Gibraltar Reservoir (SF) | 2.0 |
| Minnis Reservoir | 2.0 |
| ACWD Intertie | 2.4 |
| SJWC Intertie | 2.4 |
| Calera Creek Heights PRV | 2.4 |
| Capitol PRV | 2.4 |
| Main PRV | 2.4 |
| Milpitas PRV | 2.4 |
| Sunnyhills PRV | 2.4 |
| Curtis PRV | 2.5 |
| SCVWD Intertie | 3.0 |
| Gibraltar Turnout | 3.0 |
| Calaveras Turnout | 3.0 |
| Sunnyhills Turnout | 3.0 |
| Main Street Turnout | 3.0 |
| Abel PRV | 3.0 |
| Gibraltar PRV | 3.0 |
| Live Oak PRV | 3.0 |
| McCarthy PRV | 3.0 |
| Montague PRV | 3.0 |
| North Vault PRV | 3.0 |
| Sinclair PRV | 3.0 |
| South Vault PRV | 3.0 |
| Ayer Reservoir | 3.0 |
| Tularcitos Reservoir | 3.0 |
| Country Club Pump Station | 3.2 |
| Tularcitos Pump Station | 3.2 |
| Pinewood Well | 3.4 |
| Ayer Pump Station | 3.6 |
| Gibraltar Pump Station | 3.7 |

# 6.0 CONSEQUENCE OF FAILURE METHODOLOGY

Consequence of failure (COF) rates the severity of consequences should an asset fail. Consequences typically include system performance impacts; economic or social impacts to the City, residents, or the community; safety impacts; and local or regional environmental impacts.

COF factors were developed in collaboration with City staff to reflect both City Council Core Goals and Priority Areas.

## 6.1 Consequence of Failure Framework

The Milpitas City Council has adopted a series of goals and priority areas that identify critical elements important to the City in the services it provides. These Goals and Priority Areas are outlined in the City's 2020 fiscal budget as shown below.

| Core Goals | Priority Areas |
|---|---|
| • Superior Customer Service<br>• Integrity and Accountability<br>• Recognition and Celebration<br>• Open Communication<br>• Trust and Respect | • Public Safety<br>• Transportation and Transit<br>• Neighborhoods and Housing<br>• Governance and Administration<br>• Environment<br>• Economic Development and Job Growth<br>• Community Wellness and Open Space |

Council objectives such as these can typically align with the critical objectives of a utility's performance and can therefore be related to asset performance and the consequence of an asset failing. A COF framework was developed based on the Council Goals and Priority Areas. Each goal and priority area were evaluated for applicability to asset COF and, for those that could be developed, were categorized, measured, and rating definitions developed. Every objective except for: Recognition and Celebration; Open Communication; Neighborhoods and Housing; and Community Wellness and Open Space were developed into factors within the COF framework. Table 10 presents the COF framework and eight proposed COF factors.

**Table 10. COF Framework**

| Council Goals and Priority Areas | Category | COF Factor | Rating and Metric | | | |
|---|---|---|---|---|---|---|
| | | | 1<br>Negligible | 2<br>Minimal | 3<br>Moderate | 4<br>Severe |
| Superior Customer Service | Reliable, High Quality Customer Service in General | (1) Water Service Interruptions | Negligible Impact to Water Service | Water pressure below 30 psi | Interruption of Water Service Over Localized Area | Interruption of Water Service Over Large Area |
| Integrity and Accountability | Public Perception/Response | (2) Magnitude and Method of Public Response | No Public Response | May result in telephone calls | May Result in Social Media Coverage | May Result in Local or Greater Media Coverage or Public Comment |
| Trust and Respect | | | | | | |
| Public Safety | Health and Safety of Public and City Employees | (3) Severity of Injury or Illness | No Health or Safety Impact | Minor Injury, First Aid | Injury, Medical Attention | Severe Injury or Loss of Life |
| Environment | Compliance with Environmental Regulations or other Water Quality Concern | (4) State and Federal Regulatory Violations or Public Response | No Impact | Reportable violation, no enforcement action | May Result in Strong Warning or Fine | Non-compliance resulting in administrative or consent order |
| Transportation and Transit | Public Transit Service | (5) Public Transit Service Interruptions | No Impact | Minor Detours | Bus Service is impacted >15% to sensitive groups/locations | Community Access to BART is Interrupted<br><br>Requires Coordination with Outside Agencies i.e., County, CalTrans, VTA, etc. |
| Economic Development and Job Growth | Economic Impacts | (6) Local Business Impact | No Impact | Localized Short-term Business Impact, no Adverse Impact on Economic Vitality | | Long-term or Area-wide Economic Impact, Adverse Impact to Economic Vitality |
| Governance and Administration | Utility Operations | (7) Response Time to Restore an Asset | Recovery measured in days | Recovery could require up to Two (2) weeks | Recovery Could Require up to One (1) Month | Recovery Requires Greater Than One (1) Month |
| | | (8) Restoration Costs or Impact on Utility Rates | Can be absorbed within fiscal budget without adjustment | Could impact multiple budget objects | May Require Council Action | May Impact Reserves |

## 6.2 Consequence of Failure Rating Defined

The COF framework presented in Table 10 was further developed into a model to assess COF for both horizontal and vertical assets by defining rating interpretations for all factors. Interpretations were developed into metrics such that COF ratings could easily be assigned with asset characteristics or geospatial data, avoiding manual evaluation of individual assets. For horizontal assets, this included assessment based on pipe size, street classification, land use, and hydraulic modeling. For vertical assets this included similar assessment criteria along with asset type.

COF ratings were assigned for each factor using standard definitions presented in Table 11. Ratings range from 1 – indicating the consequence of asset failure would be "negligible", to 4 – indicating the consequence of asset failure would be "severe". Tables 11 and 12 present the COF factors, metrics, and ratings for horizontal and vertical assets, respectively.

**Table 11. COF Definition and Ratings**

| | LOF Rating | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| COF Definition | Negligible | Minimal | Moderate | Severe |

**Table 12. COF Factors and Ratings – Horizontal Assets (Pipes, Valves, Hydrants, Meters)**

| Factor | Description | Data Source | Rating and Metric | | | |
|---|---|---|---|---|---|---|
| | | | 1<br>Negligible | 2<br>Minimal | 3<br>Moderate | 4<br>Severe |
| (1) Water Service Interruption | Asset failure may cause interruptions to water service | GIS Pipe Diameter[c];<br>GIS Meter Size | Pipes ≤8-inch | Pipes 10 to 12-inch;<br>All Other Meters | Pipes 14 to 18-inch;<br>Meters 6 to 8-inch | Pipes >18-inch |
| (2) Magnitude and Method of Public Response | Asset failure may cause a loss in public confidence | GIS Pipe Diameter[c];<br>Critical Facilities[a] | - | Pipes ≤8-inch;<br>All Other Meters | Pipes 10 to 12-inch;<br>Meters 6 to 8-inch | Pipes >14-inch within 500 feet of a Critical Facility |
| (3) Severity of Injury or Illness | Asset failure may cause injury or illness to public or utility operations staff | GIS Pipe Diameter[c] | Pipes ≤8-inch;<br>All Other Meters | Pipes 10 to 12-inch;<br>Meters 6 to 8-inch | Pipes 14 to 18-inch | Pipes >18-inch |
| (4) State and Federal Regulatory Violations or Public Response | Asset failure may result in violation of state or federal environmental regulations | Asset Type | All Valves;<br>All Meters | All Pipes;<br>All Hydrants | - | - |
| (5) Public Transit Service Interruptions | Asset failure may cause an impedance to public and private transportation function | GIS Road Speed; GIS Land Use; BART stations; and Sensitive Groups/Locations[b] | Streets with speeds up to 25 mph | Streets with speeds from 30-50 mph in Residential LU | Streets with speeds from 30-50 mph in Non-Residential LU; or Adjacent to a Sensitive Group/ Location | Highways, Highway crossings, or Within 100-feet of BART station |
| (6) Local Business Impact | Asset failure may have a negative impact to the City economy | GIS Land Use (LU) | All Other LU Types | - | LU types including PF, RRMU, M | LU types including TWC, VHDMU, GNC, RSC, INP, MFG, PAO |
| (7) Response Time to Restore an Asset | The City's ability to respond depends on the location of the asset | GIS Road Speed | Streets with speeds up to 25 mph | Streets with speeds from 30-50 mph in Residential LU | Streets with Speeds from 30-50 mph in Non-Residential LU | Highways or Highway Crossings |
| (8) Restoration Costs or Impact to Utility Rates | The asset failure may have an impact to utility fiscal performance | GIS Pipe Diameter[c] | Pipes ≤12-inch;<br>All Meters | Pipes 14 to 16-inch | Pipes 18 to 24-inch | Pipes >24-iinch or Highway Crossings |

(a) Critical Facilities include Schools, Fire Stations, and Hazardous Pipelines.
(b) Sensitive Groups/Locations include Fire Stations and Schools.
(c) Hydrants were assigned the rating of adjacent/service pipeline; Valves were assigned the rating of connecting pipeline.

**Table 13. COF Factors and Ratings – Vertical Assets**

| Factor | Description | Data Source | Rating and Metric | | | |
|---|---|---|---|---|---|---|
| | | | 1<br>Negligible | 2<br>Minimal | 3<br>Moderate | 4<br>Severe |
| (1) Water Service Interruption | Asset failure may cause interruptions to water service | Asset Type | - | - | PRVs | Interties, Turnouts, Reservoirs, Pumping Stations, Wells, Emergency PRVs |
| (2) Magnitude and Method of Public Response | Asset failure may cause a loss in public confidence | Asset Type | - | - | - | Interties, Turnouts, Reservoirs, Pumping Stations, Wells, PRVs |
| (3) Severity of Injury or Illness | Asset failure may cause injury or illness to public or utility operations staff | Asset Type | - | - | PRVs | Interties, Turnouts, Reservoirs, Pumping Stations, Wells, Emergency PRVs |
| (4) State and Federal Regulatory Violations or Public Response | Asset failure may result in violation of state or federal environmental regulations | Asset Type and location | All Others | - | Wells | Wells within 50-feet to a surface water source and Surface Water Interties |
| (5) Public Transit Service Interruptions | Asset failure may cause an impedance to public and private transportation function | GIS Road Speed; GIS Land Use; BART stations; and Sensitive Groups/Locations[(b)] | Streets with speeds up to 25 mph | Streets with speeds from 30-50 mph in Residential LU | Streets with speeds from 30-50 mph in Non-Residential LU; or Adjacent to a Sensitive Group/ Location | Highways, Highway crossings, or Within 100-feet of BART station |
| (6) Local Business Impact | Asset failure may have a negative impact to the City economy | GIS Land Use | All Other LU Types | - | LU types including PF, RRMU, M | LU types including TWC, VHDMU, GNC, RSC, INP, MFG, PAO |
| (7) Response Time to Restore an Asset | The City's ability to respond depends on the location of the asset | Asset Type | - | PRVs, Interties | Turnouts | Reservoirs, Pumping Stations, Wells |
| (8) Restoration Costs or Impact to Utility Rates | The asset failure may have an impact to utility fiscal performance | Asset Type | PRVs, Interties | Turnouts | - | Reservoirs, Pumping Stations, Wells |

(a) Sensitive Groups/Locations include Fire Stations and Schools

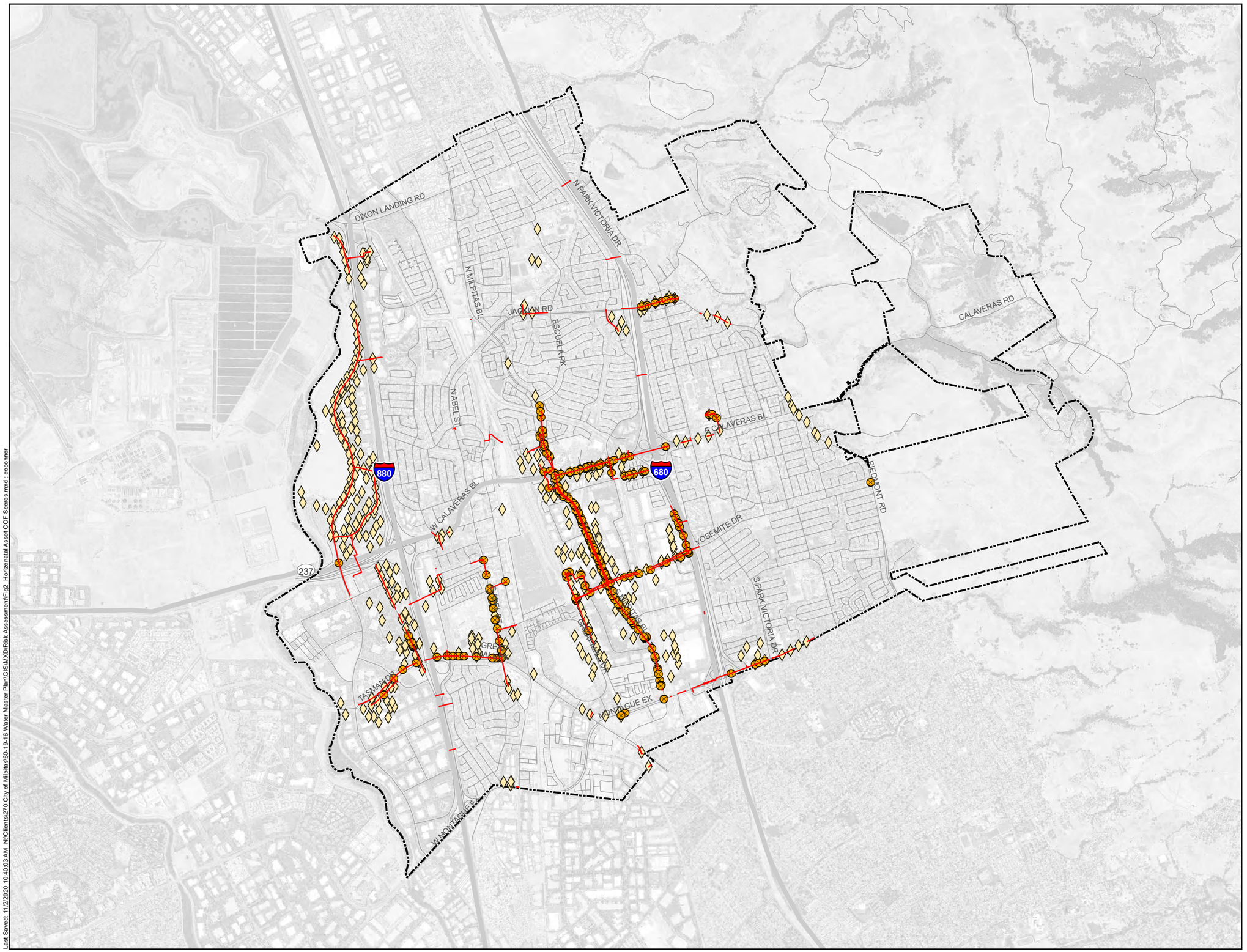
## 6.3 Horizontal Asset COF Results

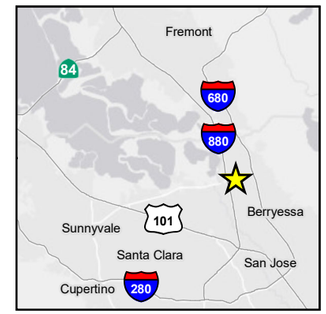
The eight asset COF ratings were averaged to obtain an overall COF rating on the 1 to 4 scale. Table 14 presents the COF rating results for horizontal assets, summarized by percent of total asset type (i.e. for hydrants, 32 percent of all hydrants were evaluated to have a COF rating of 1). Horizontal assets with a moderate (3) COF rating are shown spatially in Figure 2. Individual asset COF results are provided in the *Asset Registry and Risk Results* Excel workbook.

**Table 14. Horizontal Asset COF Results, Percent of Total Asset by Type**

| Horizontal Assets | COF Rating, percent | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Pipelines[(a)] | 45 | 46 | 9 | 0 |
| Hydrants | 32 | 53 | 15 | 0 |
| Meters | 100 | 0 | 0 | 0 |
| Valves | 43 | 52 | 5 | 0 |

(a) Pipeline results are shown as percent of total pipeline length.




N

0 1,500 3,000

Scale in Feet

- Valves
- Hydrants
- Pipelines
- City Limits

**Figure 2**

**Existing Horizontal Assets with COF Score ≥ 3**

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2020 Water Master Plan Update

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## 6.4 Facility COF Results

For vertical assets, COF ratings were assigned at the facility level (i.e. pump station, reservoir, well, etc.), with all facility components inheriting the COF rating of its parent facility. Table 15 presents the overall COF rating results for each facility on the same 1 to 4 scale, rounded to the nearest decimal.

**Table 15. Facility COF Results**

| Facility | COF Rating |
|---|---|
| Live Oak PRV | 2.0 |
| Main PRV | 2.0 |
| North Vault PRV | 2.0 |
| South Vault PRV | 2.0 |
| Calera Creek Heights PRV | 2.0 |
| SCVWD Intertie | 2.3 |
| SJWC Intertie | 2.3 |
| Abel PRV | 2.3 |
| Gibraltar PRV | 2.4 |
| McCarthy PRV | 2.4 |
| Sinclair PRV | 2.4 |
| Sunnyhills PRV | 2.4 |
| Milpitas PRV | 2.5 |
| Main Street Turnout | 2.5 |
| ACWD Intertie | 2.6 |
| Capitol PRV | 2.6 |
| Curtis PRV | 2.6 |
| Montague PRV | 2.6 |
| Calaveras Turnout | 2.8 |
| Sunnyhills Turnout | 2.8 |
| Country Club Pump Station | 2.9 |
| Tularcitos Pump Station | 2.9 |
| Minnis Reservoir | 2.9 |
| Tularcitos Reservoir | 2.9 |
| Gibraltar Turnout | 2.9 |
| Ayer Reservoir | 3.1 |
| Gibraltar Pump Station | 3.3 |
| Gibraltar Reservoir (SC) | 3.3 |
| Gibraltar Reservoir (SF) | 3.3 |
| Curtis Well | 3.3 |
| Pinewood Well | 3.3 |
| Ayer Pump Station | 3.4 |

# 7.0 RISK ASSESSMENT

Risk combines both LOF and COF to determine the resulting level of risk exposure that an agency is likely to confront through a potential failure of an asset. Assets with the highest risk have both a high likelihood of failure (i.e., poor condition or increased potential to underperform) and a high consequence of failure (i.e., significant consequences should failure occur).

The conventional risk equation, which was employed in this assessment, is the product of LOF and COF:

*Risk = COF x LOF*

## 7.1 Risk Interpretation

Individual COF and LOF factor definitions were combined to define the overall risk of each asset, interpreted as a Low, Medium, Medium-High, or High risk level. Table 16 presents the risk level matrix and risk definitions.

**Table 16. Risk Level Matrix**

| | | LOF Rating and Definition | | | |
|---|---|---|---|---|---|
| | | 1 Unlikely | 2 Possible | 3 Likely | 4 Very Likely |
| COF Rating and Definition | 1 Negligible | Low | Low | Low | Low |
| | 2 Minimal | Low | Low | Medium | Med-High |
| | 3 Moderate | Medium | Medium | Med-High | High |
| | 4 Severe | Medium | Med-High | High | High |

## 7.2 Risk Results

The risk results are summarized in the tables below, including notation of the median risk rating for each asset type.

### *7.2.1 Pipelines*

Table 17 presents the risk results for pipelines by percent of total pipeline length in each risk level. Table 18 presents the detailed LOF and COF ratings by pipeline length. The median risk level for pipelines is Low, with an associated LOF of 3 and COF of 1. Pipeline risk is also presented spatially in Figure 3.

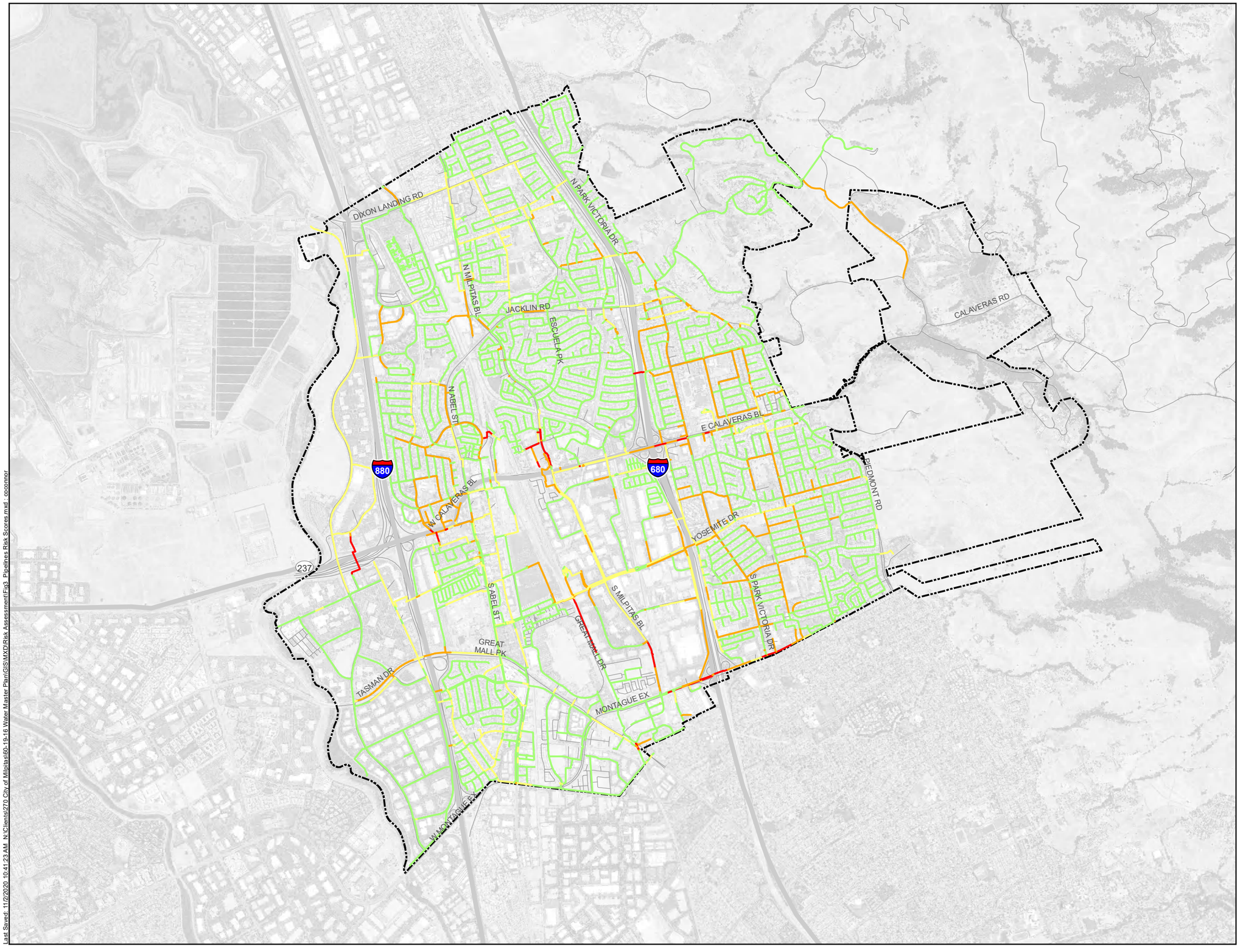
**Table 17. Pipeline Risk, Percent of Total Pipeline Length by Risk Level**

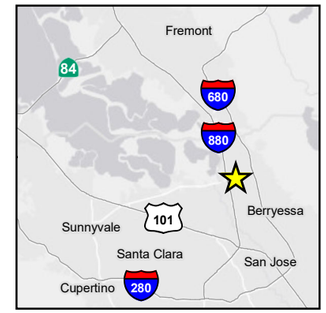
| Risk Level | Percent |
|---|---|
| Low | 71 |
| Medium | 15 |
| Medium-High | 13 |
| High | 1 |

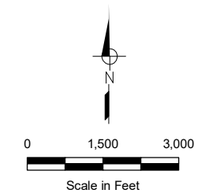
**Table 18. Pipeline Risk by LOF and COF, Miles of Pipeline**

| | | LOF | | | | Total Length |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| COF | 1 | 15.1 | 3.0 | 17.2[(a)] | 46.4 | 81.8 |
| | 2 | 23.6 | 24.7 | 15.7 | 19.8 | 83.8 |
| | 3 | 5.7 | 5.6 | 2.9 | 1.9 | 16.2 |
| | 4 | 0.3 | 0.2 | 0.4 | 0.1 | 0.9 |
| **Total** | | **44.7** | **33.5** | **36.2** | **68.2** | **183** |

(a) Denotes the median risk score for all pipelines




- City Limits
- Low
- Medium
- Med-High
- High

**Figure 3**

**Existing Pipelines Risk Classifications**

City of Milpitas
2020 Water Master Plan Update

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### 7.2.2 Hydrants

Table 19 presents the risk results for hydrants by percent of total hydrants in each risk level. Table 20 presents the detailed LOF and COF ratings for all hydrants. The median risk level for hydrants is Low, with an associated LOF of 2 and COF of 2.

**Table 19. Hydrant Risk, Percent of Total Hydrants by Risk Level**

| Risk Level | Percent |
|---|---|
| Low | 78 |
| Medium | 22 |
| Medium-High | <0.5 |
| High | 0 |

**Table 20. Hydrant Risk by LOF and COF, Count of Hydrants**

| | | LOF | | | | Total Hydrants |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| COF | 1 | 71 | 523 | 329 | 0 | 923 |
| | 2 | 114 | 1,219[(a)] | 216 | 0 | 1,549 |
| | 3 | 54 | 376 | 4 | 0 | 434 |
| | 4 | 0 | 0 | 0 | 0 | 0 |
| **Total** | | **239** | **2,118** | **549** | **0** | **2,906** |

(a) Denotes the median risk score for all pipelines

### 7.2.3 Valves

Table 21 presents the risk results for valves by percent of total valves in each risk level. Table 22 presents the detailed LOF and COF ratings for all valves. The median risk level for valves is Low, with an associated LOF of 2 and COF of 2.

**Table 21. Valve Risk, Percent of Total Valves by Risk Level**

| Risk Level | Percent |
|---|---|
| Low | 87 |
| Medium | 13 |
| Medium-High | <0.5 |
| High | 0 |

**Table 22. Valve Risk by LOF and COF, Count of Valves**

| | | LOF | | | | Total Valves |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| COF | 1 | 412 | 1,370 | 967 | 0 | 2,749 |
| | 2 | 509 | 2,248[(a)] | 549 | 0 | 3,296 |
| | 3 | 83 | 187 | 26 | 0 | 296 |
| | 4 | 0 | 0 | 0 | 0 | 0 |
| **Total** | | **1,004** | **3,794** | **1,542** | **0** | **6,341** |

(a) Denotes the median risk score for all pipelines

### *7.2.4 Meters*

Table 23 presents the risk results for meters by percent of total meters in each risk level. Table 24 presents the detailed LOF and COF ratings for all meters. The median risk level for meters is Low, with an associated LOF of 4 and COF of 1.

**Table 23. Meter Risk, Percent of Total Meters by Risk Level**

| Risk Level | Percent |
|---|---|
| Low | >99.9 |
| Medium | <0.1 |
| Medium-High | <0.1 |
| High | 0 |

**Table 24. Meter Risk by LOF and COF, Count of Meters**

| | | LOF | | | | Total Meters |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| COF | 1 | 0 | 476 | 3,555 | 12,312[(a)] | 16,343 |
| | 2 | 0 | 2 | 4 | 2 | 8 |
| | 3 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 |
| **Total** | | **0** | **478** | **3,559** | **12,314** | **16,351** |

(a) Denotes the median risk score for all pipelines

### 7.2.5 Vertical Assets

Table 25 presents the risk results for all vertical assets by percent of total assets in each risk level. Table 26 presents the detailed LOF and COF ratings for all vertical assets. The median risk level for all vertical assets is Medium-High, with an associated LOF of 3 and COF of 3.

**Table 25. Vertical Asset Risk, Percent of Vertical Assets by Risk Level**

| Risk Level | Percent |
|---|---|
| Low | 1 |
| Medium | 25 |
| Medium-High | 25 |
| High | 48 |

**Table 26. Vertical Asset Risk by LOF and COF, Count of Vertical Assets**

| | | LOF | | | | Total Vertical Assets |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| COF | 1 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 13 | 0 | 13 |
| | 3 | 1 | 4 | 29[(a)] | 40 | 74 |
| | 4 | 0 | 0 | 0 | 0 | 0 |
| **Total** | | **1** | **4** | **38** | **40** | **87** |

(a) Denotes the median risk score for all pipelines

### 7.2.6 Facility Risk Results

The risk for each facility was evaluated based on the resulting facility LOF and COF ratings discussed previously and the risk equation. Table 27 presents the detailed LOF and COF ratings for each facility. Note the four-by-four risk matrix has been expanded to one decimal to provide greater granularity. The overall facility risk scores (LOF x COF) and risk levels are shown in Table 28 from lowest to highest risk.

**Table 27. Risk of Facilities by LOF and COF**

| COF \ LOF | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 |
|---|---|---|---|---|---|---|---|---|
| 0.5 | -- | -- | -- | -- | -- | -- | -- | -- |
| 1.0 | -- | -- | -- | -- | -- | -- | -- | -- |
| 1.5 | -- | -- | -- | -- | -- | -- | -- | -- |
| 2.0 | -- | -- | -- | -- | Calera Creek Heights PRV, Main PRV | Curtis Well, Live Oak PRV, North Vault PRV, South Vault PRV | -- | -- |
| 2.5 | -- | -- | -- | -- | SJWC Intertie, Sunnyhills PRV, Milpitas PRV, ACWD Intertie, Capitol PRV, Curtis PRV | Abel PRV, SCVWD Intertie, Gibraltar PRV, McCarthy PRV, Sinclair PRV, Main Street Turnout, Montague PRV | -- | -- |
| 3.0 | -- | -- | -- | Minnis Reservoir | -- | Calaveras Turnout, Sunnyhills Turnout, Tularcitos Reservoir, Gibraltar Turnout, Country Club Pump Station, Tularcitos Pump Station, Ayer Reservoirs | -- | -- |
| 3.5 | -- | -- | -- | Gibraltar Reservoir (SC), Gibraltar Reservoir (SF) | -- | -- | Pinewood Well, Gibraltar Pump Station, Ayer Pump Station | -- |
| 4.0 | -- | -- | -- | -- | -- | -- | -- | -- |

**Table 28. Facilities by Risk Score and Risk Level**

| Facility | Risk Score (LOF x COF) | Risk Level |
|---|---|---|
| Calera Heights PRV, Main PRV | 4.8 | Medium |
| SJWC Intertie | 5.4 | Medium |
| Curtis Well | 5.5 | Medium |
| Minnis Reservoir | 5.8 | Medium |
| Live Oak PRV, North Vault PRV, South Vault PRV, | 6.0 | Medium |
| ACWD Intertie, Capitol PRV | 6.3 | Medium-High |
| Gibraltar Reservoir (SC), Gibraltar Reservoir (SF) | 6.5 | Medium-High |
| Curtis PRV | 6.6 | Medium-High |
| Abel PRV, SCVWD Intertie | 6.8 | Medium-High |
| Gibraltar PRV, McCarthy PRV, Sinclair PRV | 7.1 | Medium-High |
| Sunnyhills PRV | 5.7 | Medium-High |
| Milpitas PRV | 6.0 | Medium-High |
| Main Street Turnout | 7.5 | Medium-High |
| Montague PRV | 7.9 | Medium-High |
| Calaveras Turnout, Sunnyhills Turnout | 8.3 | Medium-High |
| Tularcitos Reservoir, Gibraltar Turnout | 8.6 | Medium-High |
| Country Club Pump Station, Tularcitos Pump Station | 9.2 | Medium-High |
| Ayer Reservoir | 9.4 | Medium-High |
| Pinewood Well | 11.1 | High |
| Gibraltar Pump Station | 12.0 | High |
| Ayer Pump Station | 12.2 | High |

# 8.0 CONCLUSIONS

## 8.1 Horizontal Assets

The desktop analysis indicates the horizontal infrastructure of the water system is well into its useful life curve with most assets rated 3 ("likely" asset failure) or higher for LOF.

The consequence of failure analysis indicates that horizontal assets expose mostly a negligible to minimal impact should they fail, with a small percentage of assets potentially yielding a moderate impact.

Overall, the majority (71%) of pipeline assets have a risk rating of Low, with a high LOF and low COF. There is a significant risk exposure to pipeline failure due to this high LOF, which is primarily due to asset age. Hydrants, valves, and meters are also at a Low risk level with generally advanced age contributing to a higher LOF but a relatively low COF.

## 8.2 Vertical Assets – Facilities

Facilities were generally rated 2 or higher for LOF. The City has developed most of its newer infrastructure in well and reservoir facilities (Curtis Well, Gibraltar Reservoirs, Minnis Reservoir), which are rated with an LOF of less than 3. Remaining facility LOF was consistently rated between 2.4 and 3, except for the Country Club Pump Station, Tularcitos Pump Station, Pinewood Well, Ayer Pump Station and Gibraltar Pump Station which were rated from 3.2 to 3.7. These higher LOF values are indicative of higher asset values with advanced age, suggesting a greater and more immediate investment need in asset renewal.

Facility COF ratings ranged from 2 to 3.4, with the highest ratings assigned to pump stations, reservoirs, and wells. PRVs, interties, and turnouts were all rated below 2.9.

## 8.3 System Level Risk Summary

The overall risk of the water system is low for horizontal infrastructure and medium-high for facilities. Table 29 illustrates the risk at the distribution system level, allocated by each asset type. Note that some facility types are noted in multiple risk levels.

**Table 29. Risk at Water System Level**

| | | LOF | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| COF | 1 | -- | -- | Pipelines | Meters |
| | 2 | -- | Hydrants<br>Valves | Well<br>PRVs | -- |
| | 3 | -- | Reservoir | PRVs<br>Turnouts<br>Reservoirs<br>Pump Stations | Well<br>Pump Stations |
| | 4 | -- | Reservoirs | -- | -- |

# Appendix E

## Seismic Risk Assessment

WEST YOST
Water. Engineered.

8950 Cal Center Drive
Bldg. 1, Suite 363
Sacramento CA 95826

916.306.2250 phone
530.756.5991 fax
westyost.com

# TECHNICAL MEMORANDUM

DATE: October 28, 2020

Project No.: 270-60-19-16
SENT VIA: EMAIL

TO: Harris Siddiqui

FROM: Whitney Sandelin, PE, RCE #86703
Amara Cairns

REVIEWED BY: Mel Damewood III, PE

SUBJECT: City of Milpitas - Summary of Methodologies and Results from Hazus® Earthquake Model and American Lifelines Alliance® Analysis

## PURPOSE AND INTRODUCTION

The purpose of this technical memorandum (TM) is to document the methodologies used to estimate consequences and risks associated with an earthquake event affecting the City of Milpitas (City) water system. The results of this analysis conclude in the estimation of the direct consequence of a representative earthquake scenario for the City. The consequence estimates presented herein do not include consideration of community economic losses (e.g. indirect or induced) that may occur due to extended periods without water service.

This TM is organized as follows:

- Introduction to Hazus and American Lifelines Alliance (ALA) Methodologies
- Earthquake Scenario Selection
- Estimated Damage States and Restoration Times
- Estimated Service Denial
- Conclusion and Disclaimer
- References

## INTRODUCTION TO HAZUS AND ALA METHODOLOGIES

The Federal Emergency Management Agency (FEMA) has developed a standardized methodology for estimating losses from certain natural hazards, including earthquakes. The methodology, known as Hazus, addresses flooding, hurricanes, coast surge, tsunamis and earthquakes. Specifically, the Hazus Earthquake Model is designed to "produce loss estimates for use by federal, state, regional and local governments in planning for earthquake risk mitigation, emergency preparedness, response and recovery".

The American Water Works Association (AWWA) J100 Standard, *Risk and Resilience Management of Water and Wastewater System* (J100 Standard), recommends the Hazus methodology to estimate the damage states and restoration times for individual facilities, such as pump stations and storage tanks. However, West Yost understands that the draft version of the forthcoming update to the J100 Standard recommends the use of the ALA methodology for estimating damages to pipelines and distribution systems under a selected earthquake event. The authors of Hazus acknowledge its limitation for pipelines. As described in the "Message to Users" section of the Hazus Manual, while the Hazus methodology has been tested against the judgment of experts and, to the extent possible, against records from several past earthquakes, limited and incomplete data about actual earthquake damage precludes complete calibration of the methodology.

Although the revised J100 Standard has not yet been released by AWWA, West Yost considers it to reflect best management practices for conducting earthquake consequence analyses for public water systems. Therefore, West Yost is using two methods in this analysis:

- Hazus for non-linear assets (i.e., storage tanks, pump stations, and treatment facilities). The methodologies presented herein are based on the *Hazus Multi-Hazard Technical Manual, Version 2.1* (Hazus Manual).
- *ALA Seismic Fragility Formulations for Water Systems, Part 1, April 2001 (ALA Manual)* for linear assets.

Hazus deals with all aspects of the built environment, including water system infrastructure. Chapter 8 focuses on direct damage to Utility Systems, including a loss estimation methodology for water system supply, storage, transmission, and distribution components. The ALA Manual provides recommended pipe vulnerability functions and fragility curves in Chapter 4.

The following sections document the specific steps taken to estimate consequences associated with an earthquake event, using the Hazus and ALA methodologies to assess select assets within the City's water system.

## EARTHQUAKE SCENARIO SELECTION

In order to apply the Hazus and ALA methodologies, a user must first identify specific parameters associated with a potential ground shaking event, including peak ground acceleration (PGA), peak ground velocity (PGV), and peak ground deformation (PGD). The United States Geological Survey (USGS) Earthquake Scenario Catalogs (also referred to as ShakeMaps) were examined to identify a relevant earthquake scenario for the utility's service area.

The earthquake scenario selected for the City of Milpitas is the Hayward-Rodgers Creek event described in the USGS Northern California Legacy Catalog. At magnitude 6.8, this event represents the largest magnitude event described by ShakeMap in relatively close proximity to key City utilities. The scenario map from the USGS site is shown on Figure 1; the scenario selected for the utility is highlighted in blue. According to USGS, this event has an estimated annual probability of approximately 0.74 percent (i.e., a 0.74 percent chance of occurring in any given year), and an approximately 31.02 percent chance of occurrence within the next 50 years. This event is a scenario (i.e., it is not a historical event) and is intended for planning purposes only.

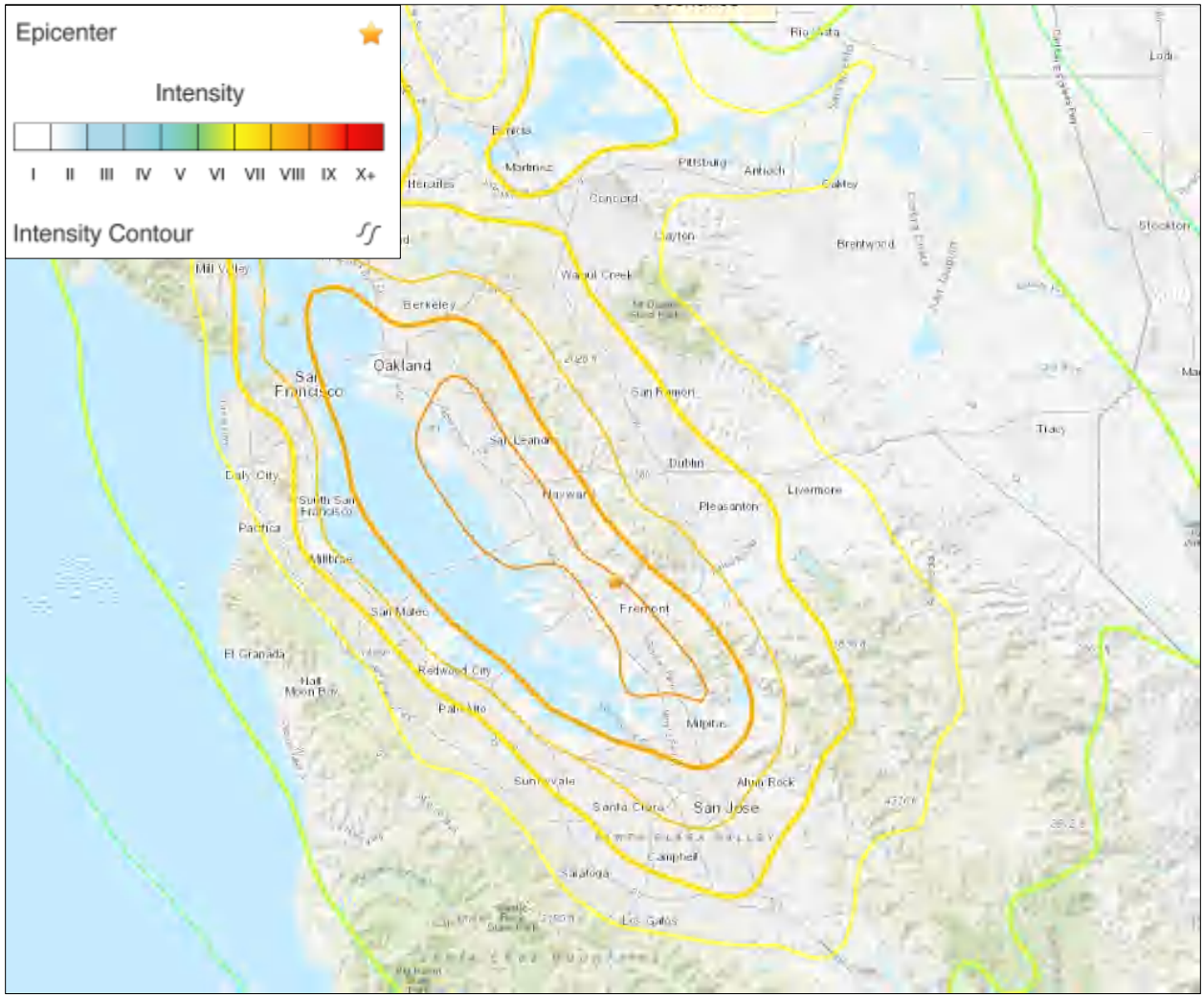


**Figure 1. USGS ShakeMap—6.8 Magnitude Earthquake Event for the City of Milpitas**

Utilizing the interactive geospatial data interface provided by USGS, ground motion contours were examined based on the scenario epicenter and fault location(s). Values for PGA and PGV were visually interpolated for the location of each asset. For the selected scenario, PGD values were not specified on the USGS ShakeMaps. Table A-1 of Attachment A shows the PGA values assigned to each of the City's selected non-linear assets.

# ESTIMATED DAMAGE STATES AND RESTORATION TIMES

The Hazus and ALA methodologies are intended to provide a high-level estimate of damage states for select assets. The purpose of this evaluation is to identify and prioritize more detailed evaluation and mitigation measures in the future.

Based on the PGA and asset type, the Hazus methodology yields an estimate of the damage state for each non-linear asset, along with an associated restoration time as part of the Hazus program. Damage states estimated in this analysis include moderate and extensive for both pump stations and storage tanks. Descriptions of these damage states are included below.

Pump Stations

- **Extensive damage** for pump stations is defined as extensive damage to facility buildings or damage to pumps beyond repair.
- **Moderate damage** for pump stations is defined by the loss of electric power for approximately one-week, considerable damage to mechanical and electrical equipment, or moderate damage to buildings.

Storage Tanks

- **Extensive damage** for storage tanks is defined as damage to the tank extensive enough to require removal of the tank from service, including, for example, elephant foot buckling for steel tanks with loss of content or shearing of concrete tank walls.
- **Moderate damage** for storage tanks is defined by the tank being considerably damaged but with only minor loss of content. Examples of moderate damage include elephant foot buckling for steel tanks without loss of content, or moderate cracking of concrete tanks with minor loss of content.

Similarly, the ALA methodology yields estimated numbers of breaks and leaks among linear assets, based on PGV, PGD, and specific asset attributes (e.g., pipeline material, joint type, etc.). The following sections describe these methodologies and the results of their application to the City's assets in greater detail.

## Restoration Times

Restoration time is defined as the time to restore the facility to a functioning level. This analysis considered the time to restore select assets owned and operated by the City. Assets which are required for the delivery of both San Francisco Public Utilities Commission (SFPUC) and Valley Water (VW) source water from the wholesaler to the City were not included in this analysis; it should be noted that, on a regional level, an earthquake event could disrupt supply infrastructure from SFPUC and VW to the City's distribution system, limiting the City's capacity to any wells that are repaired or remain functional.

In this analysis, total restoration time consists of the time to repair the damage (construction and repair activities) plus the preconstruction activities, such as the time involved with the immediate post event, pre-restoration assessment, planning, and mobilization activities. The total restoration time is estimated by using construction/repair duration provided in the Hazus method and adding to this an estimate of the time required for preconstruction activities. Engineering judgement and input from the City were utilized

to fine tune the total restoration times. For linear assets (Pipelines) engineering judgement and input from the City were utilized to estimate restoration times.

Hazus conducted statistical analyses method to provide estimate of the amount of time needed to conduct construction and repair activities for a variety of non-linear assets and a range of damage states. They provide the "mean restoration time" and the standard deviation. This analysis is using the "mean restoration time" provided by Hazus.

## Methodology Summary

The overall methodology to this analysis is to estimate the damage to non-linear and linear utility assets from an earthquake, estimate the restoration time for each damaged asset, and then calculate cost to restore the system based on the restoration time needed for each asset. Repair and replacement costs are calculated using the crew size available to the City, the labor rate, the shift duration and order of magnitude material costs for the City. The next section describes how damage is estimated for non-linear and linear assets.

## Non-Linear Assets: Reservoirs, Pump Stations, and Key City Properties

Non-linear assets include reservoirs, pump stations, and key city properties. Each facility was assigned a Hazus "facility classification." Classifications are generally based on the type of facility and whether the facility features anchored components/equipment. Hazus defines anchored as "equipment designed with special seismic tiedowns or tiebacks," while unanchored equipment refers to equipment designed with no special considerations other than the manufacturer's normal requirements. Based on review of previously prepared seismic facility assessments and observations made during site visits, all of the utility's assets were assigned to the anchored component facility classification.

The resulting Hazus facility classifications for the City's assets are presented in Table A-1. Hazus Tables 8.3, 8.6, 8.7 and 8.9 (reproduced in Figures A-1 through A-4 in Attachment A) were used to assign damage states based on PGA or PGV values obtained for the selected earthquake event. In the utility's case, there are several non-linear facility classifications deemed susceptible to PGD, including reservoirs and pump stations.

Hazus Table 8.1.a (reproduced as Figure A-5 of Attachment A) was used to estimate the damage state and associated mean restoration time for each facility. Hazus-recommended restoration time estimates are based on Hazus restoration function curves and represent an average time for the facility classification. In addition to the restoration time suggested by Hazus, three days were added to account for the immediate post-event, pre-restoration assessment, planning, and mobilization activities. Table A-1 shows the resulting estimated restoration time for each asset.

## Non-Linear Asset Damage State

Using the Hazus Method for non-linear assets, the Hayward-Rogers Creek 6.8 magnitude earthquake scenario is estimated to cause moderate damage to the City's pump stations, storage tanks, and buildings. This is primarily due to the high Peak Ground Acceleration and Velocity (PGA, PGV) that the earthquake will produce in the City's service area. Liquefaction susceptibility ranges from very low to moderate for non-linear assets in the City's service area as well. Probabilities are assigned to each liquefaction susceptibility, as described in Table 3.

The Country Club, Tularcitos, and Ayer pump stations are expected to have extensive damage and require approximately seventeen days for restoration. Extensive damage for pump stations is defined as extensive damage to facility buildings or damage to pumps beyond repair. The Gibraltar pump station (SFPUC and VW) is expected to have moderate damage and take approximately six days for restoration. Moderate damage for pump stations is defined by the loss of electric power for approximately one-week, considerable damage to mechanical and electrical equipment, or moderate damage to buildings. By deploying portable generators in the event of an outage, the City can reduce service losses and associated costs lower than estimated using the Hazus Method.

The Tularcitos, Minnis, and Ayer reservoirs are expected to have extensive damage and require approximately 96 days each for restoration. Extensive damage for storage tanks is defined as damage to the tank extensive enough to require removal of the tank from service, including, for example, elephant foot buckling for steel tanks with loss of content or shearing of concrete tank walls.

Moderate damage was estimated for the Gibraltar Reservoirs (SFPUC and VW) and each are estimated to require six days for restoration. Moderate damage for storage tanks is defined by the tank being considerably damaged but with only minor loss of content. Examples of moderate damage include elephant foot buckling for steel tanks without loss of content, or moderate cracking of concrete tanks with minor loss of content.

The City Hall and Corporation Yard buildings are expected to have moderate damage and take approximately six days for restoration. Moderate damage could include rotation of steel members at connections, cracks through welds, or broken bolts for steel frame buildings; hairline cracks on beams and columns; and larger flexural cracks and concrete spalling. Buildings with red or yellow tags cannot be occupied until an onsite assessment is made by an engineer and will require additional time as needed for restoration.

### *Reservoir Sloshing Wave Assessment*

To supplement the Hazus assessment, a review of the maximum operating levels of each of the City's water storage reservoirs was performed to determine if operating levels are appropriately set to mitigate against the impact of seismically induced sloshing waves. When operating levels within reservoirs are too high, the sloshing wave within the reservoir that is produced by the seismic forces can cause damage to the significant reservoir structure, including potential roof collapse.

The site-specific seismic design parameters for each reservoir site are summarized in Table 1; these parameters were used to calculate the height of the sloshing wave.

**Table 1. Site-Specific Seismic Design Parameters**

| Reservoir | Seismic Risk Category | Site Soil Class[a] | TL[b] | SD1[c] | SDs[d] |
|---|---|---|---|---|---|
| Ayer | IV | D – Stiff Soil | 12 | 0.82 | 1.341 |
| Gibraltar | IV | D – Stiff Soil | 12 | 0.682 | 1.147 |
| Minnis | IV | C – Very Dense Soil and Soft Rock | 8 | 0.886 | 1.638 |
| Tularcitos | IV | C – Very Dense Soil and Soft Rock | 8 | 0.828 | 1.535 |

(a) Site soil class from *City of Milpitas Seismic Isolation Study*, ABR Engineers, January 2002. Additional study of the site-specific soil conditions could change the soil classification, which would in turn impact the seismic design parameters.
(b) Long-period transition period
(c) Design spectral response acceleration parameter at a period of 1-s
(d) Design spectral response acceleration parameter at short periods

Typically, a reservoir is constructed so that the distance between the overflow and the reservoir roof is great enough to accommodate the full height of the produced sloshing wave. In concrete reservoirs, the concrete roof may be designed to withstand some of the force of the sloshing wave, allowing for less distance to be provided between the overflow and reservoir roof (potentially up to half of the sloshing wave height). West Yost reviewed the maximum operating water levels and reservoir roof heights for each of the reservoirs and compared this distance to the sloshing wave height. A sloshing wave height that is greater than the distance between the maximum water level and the roof indicates that that the standard is not met, and the sloshing wave could collide with the roof structure, potentially causing structural damage. The results of the sloshing wave analysis are presented in Table 2. The analysis shows that none of the City's reservoirs currently meet the standard for sloshing waves.

**Table 2. Sloshing Wave Analysis**

| Reservoir | Inside Diameter, ft | Normal Operating Range (el.) | Overflow Height (el.) | Roof Height (el.) | Sloshing Wave Height, ft | Sloshing Wave Assessment |
|---|---|---|---|---|---|---|
| Ayer | 181 | 78.2 – 83 | 85.0 | 89.96 | 14.2 | Does not meet standard [a] |
| Gibraltar | 158 | 37 – 46.5 | 48.0 | 49.7 | 10.4 | Does not meet standard [b] |
| Minnis | 51 | 900.5 – 907 | 908.5 | 909.5 | 10.0 | Does not meet standard [c] |
| Tularcitos | 48 | 559.2 – 565.7 | 567.2 | 568.2 | 9.2 | Does not meet standard [d] |

(a) A distance of 4.96 ft is provided between the reservoir roof and the overflow, and a distance of 6.96 ft is provided between the reservoir roof and the high operational level; the calculated sloshing wave height of 14.2 ft exceeds both distances. The concrete tank roof may be capable of withstanding the force of the sloshing wave, but additional structural analysis is needed to confirm this.
(b) A distance of 1.7 ft is provided between the reservoir roof and the overflow, and a distance of 3.2 ft is provided between the reservoir roof and the high operational level; the calculated sloshing wave height of 10.4 ft exceeds both distances. The concrete tank roof may be capable of withstanding the force of the sloshing wave, however, as a rule of thumb, the roof is typically assumed to be capable of withstanding a maximum of only half of the sloshing wave height.
(c) A distance of 1.5 ft is provided between the reservoir roof and the overflow, and a distance of 2.5 ft is provided between the reservoir roof and the high operational level; the calculated sloshing wave height of 10.0 ft exceeds both distances.
(d) A distance of 1.0 ft is provided between the reservoir roof and the overflow, and a distance of 2.5 ft is provided between the reservoir roof and the high operational level; the calculated sloshing wave height of 9.2 ft exceeds both distances.

For steel tanks (e.g., the Minnis and Tularcitos Reservoirs), the tank may be retrofitted to meet the sloshing wave standard by adding a steel ring to the top of the tank, thereby increasing the total tank height so that the height of the sloshing wave may be accommodated. Steel tanks typically have a distance between the tank overflow and the tank roof of the sloshing wave height plus one additional foot. When preparing detailed tank retrofit plans, other damage mechanisms should be considered to better reinforce the structure against potential risks, not limited to shearing off inlet/outlet pipes, anchorage system failure causing uplift, and tank shell failure.

## Non-Linear Asset Restoration Time

Hazus Table 8.1.a (reproduced as Figure A-3 of Attachment A) was used to estimate the associated mean restoration time for each facility, using the damage state from Hazus Tables 8.6 and 8.9. Hazus-recommended restoration time estimates are based on Hazus restoration function curves and available crews for restoration and represent an average time for the facility classification. In addition to the restoration time suggested by Hazus, three days were added to account for the immediate post-event, pre-restoration assessment, planning, and mobilization activities. Table A-1 shows the resulting estimated restoration time for each asset.

Two, four- person crews working 12-hour days were assumed to be available to repair and restore facilities following the selected earthquake event. This assumption forms the basis of the overall restoration time for repair and replacement work. This assumption does not include utilizing mutual aid via the Water/Wastewater Agency Response Network (WARN). Utilizing WARN can significantly reduce the time of restoration, which is scalable in the results. The number of days vary based on the size and damage state severity of the facility. Table A-1 shows the resulting estimated restoration time for each asset.

## Non-Linear Consequences Cost Estimates

Utility lost water production and utility economic loss were calculated using the total restoration time and service level for each facility, along with the City of Milpitas' cost of water ($7,981/million gallons). Replacement costs for reservoirs and pump stations were calculated using the replacement costs documented in the 2020 WY Asset Management TM scaled to reflect the severity of damage (50% for extensive and 25% for moderate damage). This value was selected to represent the repair/replacement cost for all reservoirs and pump stations.

As shown in Table A-1, the analysis found that Ayer Reservoir, Gibraltar Pump Stations (SFPUC and VW) and Gibraltar Reservoirs (SFPUC and VW) had the largest repair and replacement costs and water lost costs of all non-linear assets for the selected earthquake event. Repair and replacement costs are calculated using crew size, labor rate, shift duration and order of magnitude material costs.

The total cost consequence of the non-linear assets is $5,967,160. This cost includes the total cost of repair and the total cost of water loss.

## Linear Assets: Pipelines

The City owns and maintains 183 miles of pipelines, with pipe sizes ranging in diameter from 6 inches to 24 inches. Based on available pipeline material information contained in the utility's pipeline geographic information system (GIS), the majority of the system is made up of asbestos cement (approximately 133.5 miles by length) and polyvinyl chloride (PVC) (approximately 27.4 miles by length) pipe. The system also contains concrete cylinder, cast iron, ductile iron, and steel pipelines. Using the ALA methodology,

West Yost assed the distribution system as a whole to estimate the number of anticipated leaks and breaks. The results of this assessment are presented in Table B-2.

The City had previously identified a select subset of pipelines within the City's service area and designated it as the "backbone". The "backbone" pipelines are pipelines which transmit water from the sources to all parts of the service area. West Yost broke the "backbone" pipeline network into 28 individual pipeline reaches and assessed the individual reach to estimate the number of anticipate leaks and breaks that would occur on the individual pipeline reaches as a result of a seismic event. Pipeline reaches are identified in Figure B-1. The results of this assessment are presented in Table B-1.

## Linear Asset Damage State

The ALA methodology considers two damage states for buried pipelines: leaks and breaks. The methodology assumes that damage due to seismic waves (represented by PGV) will consist of 80 percent leaks and 20 percent breaks, while damage due to ground failure (represented by PGD) will consist of 20 percent leaks and 80 percent breaks. Two damage algorithms are used to estimate the number of leaks and breaks:

1. **For Ground Shaking**: $Repair\ Rate/_{1000\ ft} = K_1 \times 0.00187 \times PGV$

   Where $K_1$ is a fragility constant related to the expected performance of a given pipe material[1]. Units for PGV are inches per second. Assigned $K_1$ values can be found on table B-1 and B-2 in Attachment B.

2. **For Peak Ground Deformation**: $Repair\ Rate/_{1000\ ft} = K_2 \times 1.06 \times PGD^{0.319} \times L_S$

   Where $K_2$ is a fragility constant related to the expected performance of a given pipe material[2], and $L_S$ is the estimated probability that PGD will occur during ground shaking. Units for PGD are inches. Assigned $K_2$ values can be found on table B-1 and B-2 in Attachment B.

ShakeMap information was used to obtain an average PGV value for all pipelines. Spatial liquefaction susceptibility data published by USGS were used to identify areas within the distribution system with "very low", "low", "moderate", "high" and "very high" susceptibility to liquefaction (and therefore, PGD). The estimated probabilities of liquefaction occurring in each liquefaction susceptibility category are listed in Table 3 below. For very low, low, moderate, and high liquefaction susceptibility areas, a PGD of six inches was assumed in accordance with J100 Standard recommendations; for very high liquefaction susceptibility areas, a PGD of 12 inches was assumed. The PGV and PGD calculations were considered additive, and resulted in conservative estimates for breaks and leaks, as summarized on Tables B-1 and B-2 in Attachment B.

[1] See Figure B-1 in Attachment B for a reproduction of $K_1$ values recommended by the ALA methodology.
[2] See Figure B-2 in Attachment B for a reproduction of $K_2$ values recommended by the ALA methodology.

**Table 3. Liquefaction Susceptibility and Probability**

| Liquefaction Susceptibility | Probability of Liquefaction |
|---|---|
| Very High | 0.50 |
| High | 0.25 |
| Moderate | 0.10 |
| Low | 0.05[(a)] |
| Very Low | 0.02[(a)] |

(a) Hazus recommends using 0.05 for low and 0.02 for very low liquefaction susceptibility.

Two, four-person crews working 12-hour days were assumed to be available to repair breaks and leaks following the selected earthquake event. This assumption forms the basis of the overall restoration time for leaks and breaks. An additional 3 days were added to the resulting total to account for the immediate post-disaster assessment, planning, and mobilization time. Total restoration time and total pipeline repair labor and material cost is summarized on Table B-3 in Attachment B.

Using the ALA methodology for linear assets, the Hayward-Rodgers Creek - 6.8 magnitude earthquake scenario is estimated to cause 192 breaks and 58 leaks to the collective transmission pipeline and distribution pipeline. Break and leak estimates and total restoration time for transmission pipelines and distribution pipelines is summarized on Table B-2 in Attachment B. It is estimated to take approximately 113 days to reach total restoration. This includes 3 days for the immediate post-disaster assessment but does not assume the utilization of mutual aid for pipeline restoration, which would shorten the time of restoration significantly if pipe repair crews were to be brought in from other entities in an isolated event. However, the regional impacts of the anticipated earthquake scenario pose a threat to the availability of mutual aid resources, which consequently may need to be sourced from a significant distance away. The City's emergency response preparation should consider the regional impacts of this earthquake scenario.

## Estimated Service Denial

Using the Hazus Method for non-linear assets, the Hayward-Rodgers Creek 6.8 magnitude earthquake scenario is estimated to cause extensive damage to the City's facilities due to an estimated maximum peak ground acceleration of 0.65 g, with g being earth's gravitational acceleration. Hazus predicts significant damage to City facilities would equate to loss of electrical power and backup power and extensive damage to pumping stations and storage tanks. It is also assumed that a loss of water quality would be imminent. Due to the damage anticipated it is expected that there would be a loss of service equivalent to approximately 165 million gallons.

## Linear Consequences Cost Estimates

The analysis found the City's trunk lines could have 8 breaks and 32 leaks, as shown in Table B-1. The overall distribution system was estimated to experience 192 breaks and 58 leaks, as shown in Table B-2. Repair and replacement costs are calculated using crew size, labor rate, shift duration and order of magnitude material costs.

The direct linear consequence costs by type of pipeline are presented in Table B-3. The total cost consequence of the linear assets is $334,173 for the trunk lines and $2,515,349 for the overall distribution system. This total includes the cost of the estimated water loss and the cost of repair labor and material.

## Consequence Costs Summary

The Hayward-Rodgers Creek - 6.8 magnitude earthquake is estimated to cause significant damage to the City's non-linear and linear assets, with a total consequence cost of approximately $10,322, 527. The consequence cost of all linear assets is approximately $4,355,366, and the consequence cost of all non-linear assets is approximately $5,967,160. The Hazus Method estimates moderate damage to the buildings and moderate/severe damage to the pump stations and reservoirs. The ALA Method estimates 8 breaks and 32 leaks from the trunk lines and 192 breaks and 58 leaks from the distribution pipelines. Table 4 below shows the consequence costs of each asset from the Hayward-Rodgers Creek earthquake. For the purposes of this TM, the costs indicated below reflect the repair and replacement costs and loss of service. See Table A-1 for a breakdown of these individual cost components.

**Table 4. Earthquake Threat Asset Pair Consequence Costs**

| Threat | Asset | Consequence Cost, dollars |
|---|---|---|
| Earthquake / Landslide | Tularcitos Reservoir | 1,550,471 |
| Earthquake / Landslide | Minnis Reservoir | 1,690,507 |
| Earthquake / Landslide | Country Club Pump Station | 1,235,196 |
| Earthquake / Landslide | Tularcitos Pump Station | 1,390,946 |
| Earthquake / Liquefaction | City Hall | 50,020 |
| Earthquake / Liquefaction | Corporation Yard | 50,020 |
| Earthquake / Liquefaction | Reach 1 / McCarthy PRV | 106,632 |
| Earthquake / Liquefaction | Reach 2 / California Circle PRV | 26,291 |
| Earthquake / Liquefaction | Reach 3 | 12,984 |
| Earthquake / Liquefaction | Reach 4 / Junipero PRV | 34,911 |
| Earthquake / Liquefaction | Reach 5 / Live Oak PRV | 4,631 |
| Earthquake / Liquefaction | Reach 6 | 11,516 |
| Earthquake / Liquefaction | Reach 7 / Main PRV | 14,069 |
| Earthquake / Liquefaction | Reach 8 / Parc Metro PRV | 8,335 |
| Earthquake / Liquefaction | Reach 9 / Curtis PRV | 13,982 |
| Earthquake / Liquefaction | Reach 10 | 17,501 |
| Earthquake / Liquefaction | Reach 11 | 31,285 |
| Earthquake / Liquefaction | Reach 12 / Gibraltar PRV / Gibraltar Turnout | 23,650 |
| Earthquake / Liquefaction | Reach 13 / Capitol PRV | 20,874 |
| Earthquake / Liquefaction | Reach 14 | 8,672 |
| Earthquake / Liquefaction | Reach 15 / Sunnyhills PRV | 17,575 |
| Earthquake / Liquefaction | Reach 16 | 2,569 |
| Earthquake / Liquefaction | Reach 17 | 6,297 |
| Earthquake / Liquefaction | Reach 18 | 4,424 |
| Earthquake / Landslide | Reach 19 / Calera Creek Heights & Tularcitos PRVs | 9,028 |
| Earthquake / Liquefaction | Reach 20 / North Milpitas PRV | 21,612 |
| Earthquake / Liquefaction | Reach 21 / Montague PRV | 4,882 |

| Table 4. Earthquake Threat Asset Pair Consequence Costs | | |
|---|---|---|
| Threat | Asset | Consequence Cost, dollars |
| Earthquake / Liquefaction | Reach 22 | 11,495 |
| Earthquake / Liquefaction | Reach 23 / Yosemite PRV | 14,714 |
| Earthquake / Liquefaction | Reach 24 | 3,830 |
| Earthquake / Liquefaction | Reach 25 | 12,547 |
| Earthquake / Liquefaction | Reach 26 | 6,210 |
| Earthquake / Liquefaction | Reach 27 | 2,952 |
| Earthquake / Liquefaction | Reach 28 | 7,433 |
| Earthquake / Liquefaction | Distribution System | 3,894,466 |
| | **Total** | **10,322,527** |

# CONCLUSION AND DISCLAIMER

The methodology and results presented in this TM were based on the Hazus Earthquake Model Methodology and Manual and the ALA Methodology. The Hazus and ALA methodologies have been utilized as best management practice, as recommended in the J100 Standard. Data and assumptions used in the analysis were based on best available information. The methodologies have been interpreted to best suit specific City assets and site conditions. Also note that the ALA pipeline damage results are subject to a range of minus 50 percent to plus 100 percent in accuracy.

# REFERENCES

ABR Engineers. City of Milpitas Seismic Isolation Study, January 2002.

American Lifelines Alliance. Seismic Fragility Formulations for Water Systems Part 1 – Guideline. April 2001.

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USGS Earthquake Hazards Program. M 6.8 Scenario Earthquake – Hayward-Rodgers Creek. https://earthquake.usgs.gov/scenarios/eventpage/nclegacyhaywardrodgerscreekhsm6p8_se/executive

Attachment A

# Hazus Methodology Results for Non-Linear Assets

**Table A-1. HAZUS Methodology Results for Non-Linear Assets**

| Facility/Asset | Year Built | Service Level, MGD | ShakeMap PGA, g | ShakeMap PGV, cm/s | Liquefaction Susceptibility, % | Assumed PGD, In | HAZUS Damage State, PWT1 | HAZUS Mean Restoration Time, d | Days to assess and plan (pre-restoration time), d | Total Time to Restoration, d | Lost Water Production, MG | Utility Economic Loss – Water, $ | Repair / Replacement Crew Cost, $/d | Repair / Replacement Cost, $ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reservoirs | | | | | | | | | | | | | | |
| Tularcitos Reservoir | 1980 | 0.06 | 0.42 | 41 | 2%, Very Low | - | extensive | 93 | 3 | 96 | 5.76 | 45,971 | 8,200 | 1,504,500[(a)] |
| Minnis Reservoir | 1980 | 0.17 | 0.42 | 41 | 5% Low | - | extensive | 93 | 3 | 96 | 16.32 | 130,250 | 8,200 | 1,560,258[(a)] |
| Ayer Reservoir | 1993 | 4.14 | 0.4 | 40 | 10%, Moderate | 6 | extensive | 93 | 3 | 96 | 397.44 | 3,171,969 | 8,200 | 7,145,000[(a)] |
| Gibraltar Reservoir (SFPUC) | 1991 | 4.03 | 0.35 | 37 | 10%, Moderate | 6 | moderate | 3.1 | 3 | 6.1 | 24.58 | 196,197 | 8,200 | 3,272,500[(a)] |
| Gibraltar Reservoir (VW) | 1991 | 5.99 | 0.35 | 37 | 10%, Moderate | 6 | moderate | 3.1 | 3 | 6.1 | 36.54 | 291,618 | 8,200 | 3,272,500[(a)] |
| Pump Stations | | | | | | | | | | | | | | |
| Country Club Pump Station | 1981 | 0.06 | 0.42 | 49 | 2%, Very Low | - | extensive | 13.5 | 3 | 16.5 | 0.99 | 7,901 | 8,200 | 1,227,295[(a)] |
| Tularcitos Pump Station | 1981 | 0.17 | 0.42 | 41 | 2%, Very Low | - | extensive | 13.5 | 3 | 16.5 | 2.81 | 22,387 | 8,200 | 1,368,560[(a)] |
| Ayer Pump Station | 1995 | 4.14 | 0.4 | 40 | 10%, Moderate | 6 | extensive | 13.5 | 3 | 16.5 | 68.31 | 545,182 | 8,200 | 2,489,563[(a)] |
| Gibraltar Pump Station (SFPUC) | 1993 | 4.03 | 0.35 | 37 | 10%, Moderate | 6 | moderate | 3.1 | 3 | 6.1 | 24.58 | 196,197 | 8,200 | 4,366,522[(a)] |
| Gibraltar Pump Station (VW) | 1993 | 5.99 | 0.35 | 37 | 10%, Moderate | 6 | moderate | 3.1 | 3 | 6.1 | 36.54 | 291,618 | 8,200 | 4,366,522[(a)] |
| Other | | | | | | | | | | | | | | |
| City Hall | 2000 | - | 0.365 | 39 | 10%, Moderate | 6 | moderate | 3.1 | 3 | 6.1 | - | - | 8,200 | 50,020[(b)] |
| Corporation Yard | - | - | 0.38 | 40 | 10%, Moderate | 6 | moderate | 3.1 | 3 | 6.1 | - | - | 8,200 | 50,020[(b)] |
| **Total** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **613.87** | **$4,899,288** | | **30,673,259** |

(a) Cost based on percentage of replacement cost as documented in the 2020 WY Asset Management TM (50% for extensive damage and 25% for moderate damage).
(b) Costs based on (Total Time to Restoration) X (Repair/Replacement Crew Cost)

**Table 8.3: Damage Algorithms for Small Water Treatment Plants**

| Peak Ground Acceleration | | | |
|---|---|---|---|
| **Classification** | **Damage State** | **Median (g)** | **β** |
| Plants with anchored subcomponents (PWT1) | slight/minor | 0.25 | 0.50 |
| | moderate | 0.38 | 0.50 |
| | extensive | 0.53 | 0.60 |
| | complete | 0.83 | 0.60 |
| Plants with unanchored subcomponents (PWT2) | slight/minor | 0.16 | 0.40 |
| | moderate | 0.27 | 0.40 |
| | extensive | 0.53 | 0.60 |
| | complete | 0.83 | 0.60 |

**Figure A-1. Hazus Table 8.3**

**Table 8.6: Damage Algorithms for Small Pumping Plants**

| Peak Ground Acceleration | | | |
|---|---|---|---|
| **Classification** | **Damage State** | **Median (g)** | **β** |
| Plants with anchored subcomponents (PPP1) | slight/minor | 0.15 | 0.70 |
| | moderate | 0.36 | 0.65 |
| | extensive | 0.66 | 0.65 |
| | complete | 1.50 | 0.80 |
| Plants with unanchored subcomponents (PPP2) | slight/minor | 0.13 | 0.60 |
| | moderate | 0.28 | 0.50 |
| | extensive | 0.66 | 0.65 |
| | complete | 1.50 | 0.80 |

**Figure A-2. Hazus Table 8.6**

**Table 8.7: Damage Algorithms for Medium/Large Pumping Plants**

| Peak Ground Acceleration | | | |
|---|---|---|---|
| **Classification** | **Damage State** | **Median (g)** | **β** |
| Plants with anchored subcomponents (PPP3) | slight/minor | 0.15 | 0.75 |
| | moderate | 0.36 | 0.65 |
| | extensive | 0.77 | 0.65 |
| | complete | 1.50 | 0.80 |
| Plants with unanchored subcomponents (PPP4) | slight/minor | 0.13 | 0.60 |
| | moderate | 0.28 | 0.50 |
| | extensive | 0.77 | 0.65 |
| | complete | 1.50 | 0.80 |

**Figure A-3. Hazus Table 8.7**

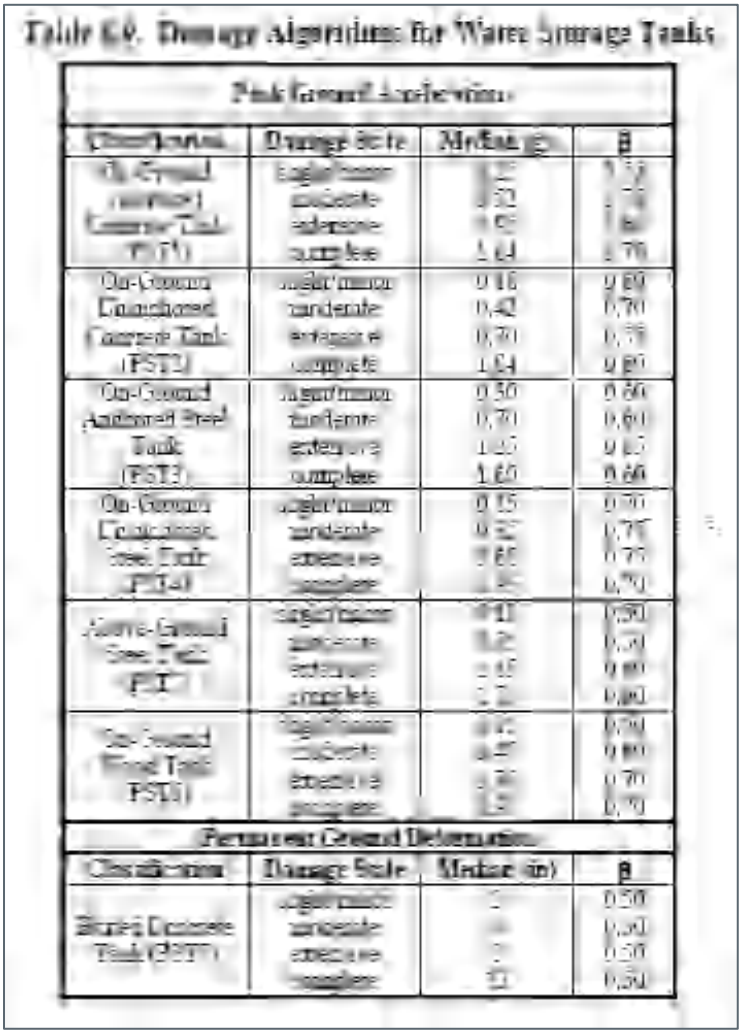


Figure A-4. Hazus Table 8.9

**Table 8.1.a: Continuous Restoration Functions for Potable Water Systems (After ATC-13, 1985)**

| Restoration Functions (All Normal Distributions) | | | |
|---|---|---|---|
| **Classification** | **Damage State** | **Mean (Days)** | **σ (days)** |
| Water Treatment Plants | slight/minor | 0.9 | 0.3 |
| | moderate | 1.9 | 1.2 |
| | extensive | 32.0 | 31.0 |
| | complete | 95.0 | 65.0 |
| Pumping Plants | slight/minor | 0.9 | 0.4 |
| | moderate | 3.1 | 2.7 |
| | extensive | 13.5 | 10.0 |
| | complete | 35.0 | 18.0 |
| Wells | slight/minor | 0.8 | 0.2 |
| | moderate | 1.5 | 1.2 |
| | extensive | 10.5 | 7.5 |
| | complete | 26.0 | 14.0 |
| Water Storage Tanks | slight/minor | 1.2 | 0.4 |
| | moderate | 3.1 | 2.7 |
| | extensive | 93.0 | 85.0 |
| | complete | 155.0 | 120.0 |

Figure A-5. Hazus Table 8.1.a

# Attachment B

## ALA Methodology Results for Linear Assets

**Table B-1. Trunk Pipeline Lengths and Fragility**

| Pipe Reach | Total Pipe Length, miles | Average Pipe Diameter, inches | Most Common Pipe Type | K1 | K2 | Average PGV, cm/s | No. Leaks | | | No. Breaks | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Ground Shaking | Ground Deformation | Total | Ground Shaking | Ground Deformation | Total |
| 1 | 3.9 | 13 | DIP | 0.5 | 0.6 | 35.5 | 0.6 | 11.4 | 11.9 | 0.1 | 2.8 | 3.0 |
| 2 | 1.6 | 12 | ACP | 0.5 | 0.8 | 40.8 | 0.3 | 2.5 | 2.7 | 0.1 | 0.6 | 0.7 |
| 3 | 0.5 | 11 | ACP | 0.5 | 0.7 | 39.8 | 0.1 | 1.3 | 1.4 | 0.0 | 0.3 | 0.3 |
| 4 | 3.3 | 12 | ACP | 0.5 | 0.8 | 36.5 | 0.5 | 2.9 | 3.4 | 0.1 | 0.7 | 0.8 |
| 5 | 0.4 | 11 | ACP | 0.5 | 0.7 | 33.8 | 0.1 | 0.2 | 0.3 | 0.0 | 0.1 | 0.1 |
| 6 | 1.0 | 12 | DIP | 0.5 | 0.6 | 34.3 | 0.1 | 0.5 | 0.6 | 0.0 | 0.1 | 0.2 |
| 7 | 0.5 | 18 | ACP | 0.5 | 0.7 | 36.5 | 0.1 | 0.6 | 0.7 | 0.0 | 0.2 | 0.2 |
| 8 | 0.7 | 19 | DIP | 0.5 | 0.5 | 36.3 | 0.1 | 0.3 | 0.4 | 0.0 | 0.1 | 0.1 |
| 9 | 1.1 | 18 | DIP | 0.5 | 0.5 | 36.3 | 0.1 | 0.6 | 0.7 | 0.0 | 0.1 | 0.2 |
| 10 | 0.9 | 14 | ACP | 0.5 | 0.6 | 36.5 | 0.1 | 0.7 | 0.9 | 0.0 | 0.2 | 0.2 |
| 11 | 0.2 | 24 | STL | 0.3 | 0.3 | 36.3 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| 12 | 0.1 | 12 | ACP | 0.5 | 0.8 | 36.3 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| 13 | 1.2 | 17 | ACP | 0.5 | 0.7 | 34.5 | 0.2 | 0.6 | 0.8 | 0.0 | 0.2 | 0.2 |
| 14 | 1.4 | 14 | ACP | 0.5 | 0.6 | 35.8 | 0.2 | 0.2 | 0.4 | 0.1 | 0.1 | 0.1 |
| 15 | 3.5 | 11 | ACP | 0.5 | 0.8 | 38.5 | 0.5 | 0.6 | 1.2 | 0.1 | 0.2 | 0.3 |
| 16 | 0.0 | 10 | ACP | 0.5 | 0.8 | 41.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 17 | 1.1 | 10 | ACP | 0.5 | 0.8 | 41.4 | 0.2 | 0.1 | 0.3 | 0.0 | 0.0 | 0.1 |
| 18 | 0.3 | 12 | ACP | 0.5 | 0.8 | 41.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 19 | 2.0 | 11 | ACP | 0.5 | 0.8 | 41.0 | 0.3 | 0.3 | 0.6 | 0.1 | 0.1 | 0.1 |
| 20 | 2.9 | 15 | ACP | 0.5 | 0.7 | 37.3 | 0.4 | 1.2 | 1.7 | 0.1 | 0.3 | 0.4 |
| 21 | 0.4 | 10 | ACP | 0.5 | 0.8 | 35.3 | 0.0 | 0.2 | 0.3 | 0.0 | 0.1 | 0.1 |
| 22 | 0.8 | 18 | DIP | 0.5 | 0.5 | 37.0 | 0.1 | 0.3 | 0.4 | 0.0 | 0.1 | 0.1 |
| 23 | 1.8 | 14 | ACP | 0.5 | 0.6 | 37.3 | 0.3 | 0.8 | 1.1 | 0.1 | 0.2 | 0.3 |
| 24 | 0.3 | 16 | DIP | 0.5 | 0.6 | 39.3 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 25 | 1.3 | 12 | ACP | 0.5 | 0.8 | 38.8 | 0.2 | 0.5 | 0.7 | 0.1 | 0.1 | 0.2 |
| 26 | 0.3 | 22 | STL | 0.2 | 0.2 | 38.3 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 27 | 0.1 | 18 | DIP | 0.5 | 0.5 | 39.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 28 | 0.8 | 11 | ACP | 0.5 | 0.8 | 39.5 | 0.1 | 0.4 | 0.5 | 0.0 | 0.1 | 0.1 |
| **Total** | **32.6** | - | - | - | - | - | **4.8** | **26.7** | **31.5** | **1.2** | **6.7** | **7.9** |

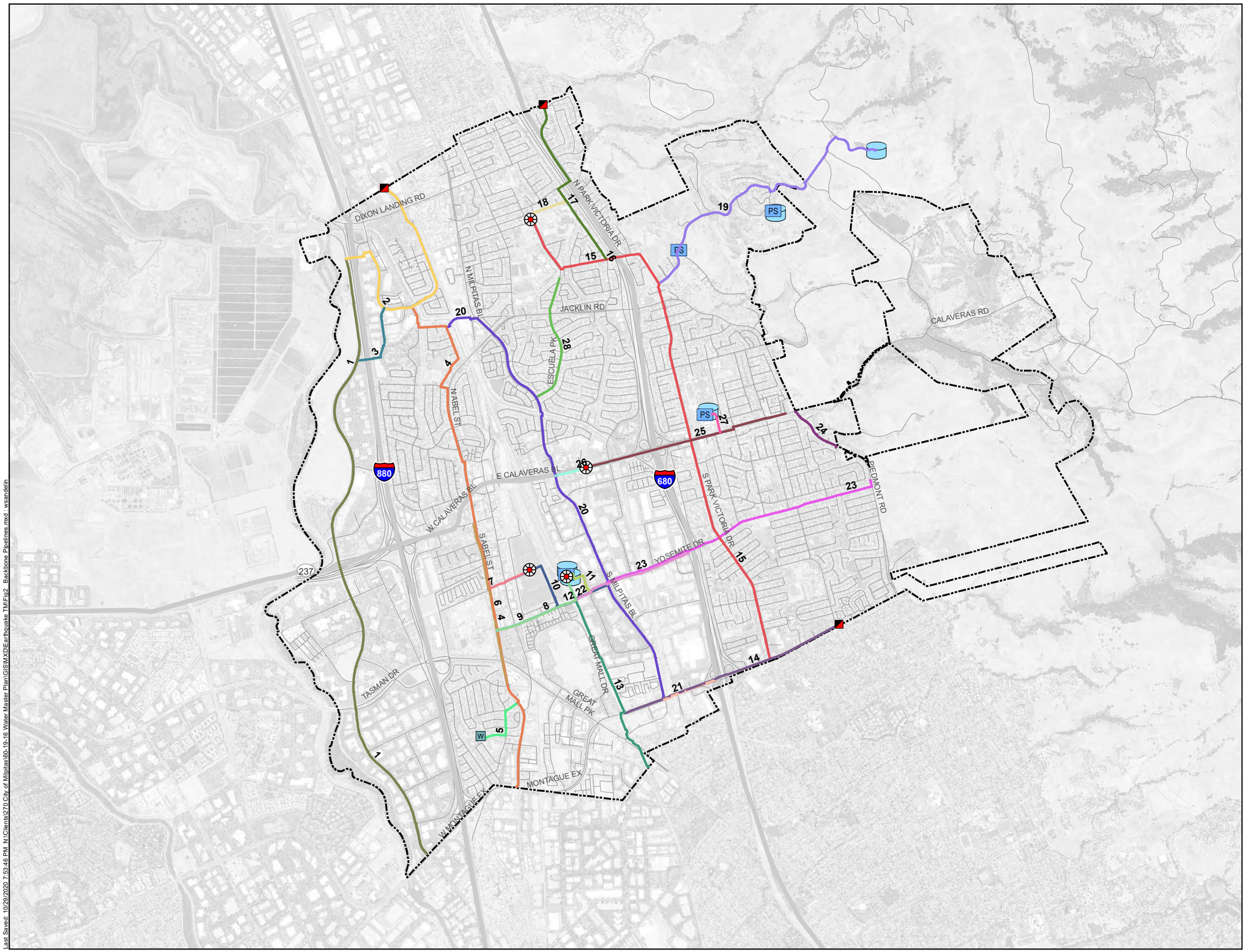
**Table B-2. Overall Pipeline Distribution Lengths and Fragility**

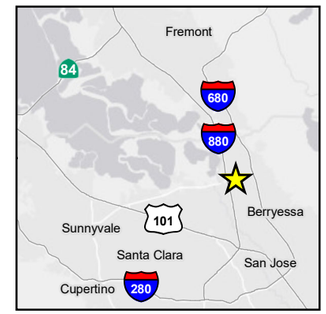
| Pipe Material | Total Pipe Length, miles | Average Pipe Diameter | K1 | K2 | Average PGV, cm/s | No. Leaks | | | No. Breaks | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ground Shaking | Ground Deformation | Total | Ground Shaking | Ground Deformation | Total |
| AC/ACP | 133.5 | Small | 0.5 | 0.8 | 36.1 | 7.4 | 36.2 | 43.7 | 1.9 | 144.9 | 146.8 |
| CCP | 0.2 | Small | 0.8 | 1.0 | 36.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.2 | 0.2 |
| CIP | 0.9 | Small | 0.8 | 0.8 | 36.1 | 0.1 | 0.3 | 0.3 | 0.0 | 1.0 | 1.1 |
| DIP | 15.3 | Large | 0.5 | 0.5 | 36.1 | 0.3 | 0.9 | 1.2 | 0.1 | 3.5 | 3.5 |
| PVC | 27.4 | Small | 0.5 | 1.0 | 36.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.5 | 0.5 |
| STL | 5.3 | Large | 0.15 | 0.15 | 36.1 | 0.0 | 0.1 | 0.1 | 0.0 | 0.4 | 0.4 |
| **Total** | **182.6** | - | - | - | **36.1** | **10.3** | **47.2** | **57.5** | **2.6** | **188.9** | **191.4** |

**Table B-3. Pipeline Repair Cost Estimates**

| Evaluation | Total Repair Time, crew days | Total Pipeline Repair Labor and Material Cost, dollars |
|---|---|---|
| Trunk Lines | 14.8 | $334,173 |
| Overall Distribution | 113.0 | $2,515,349 |

(a) Total Pipeline Repair Labor and Material Cost based on crew size 4 workers, 2 crews, $150/hr labor cost, $2500/crew day material cost, and a $50,000 administrative adder.




N

0 1,500 3,000

Scale in Feet

- Turnout
- Well
- Emergency Intertie
- Pump Station
- Storage Reservoir
- City Limits

**Figure B-1**

**Backbone Pipeline Reaches**

City of Milpitas

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| Pipe Material | Joint Type | Soils | Diam. | $K_1$ | Reference Sections |
|---|---|---|---|---|---|
| Cast iron | Cement | All | Small | 1.0 | 4.4.2 |
| Cast iron | Cement | Corrosive | Small | 1.4 | 4.4.2 |
| Cast iron | Cement | Non-corrosive | Small | 0.7 | 4.4.2 |
| Cast iron | Rubber gasket | All | Small | 0.8 | 4.4.2 |
| Welded steel | Lap - Arc welded | All | Small | 0.6 | 4.4.4 |
| Welded steel | Lap - Arc welded | Corrosive | Small | 0.9 | 4.4.4 |
| Welded steel | Lap - Arc welded | Non-corrosive | Small | 0.3 | 4.4.4 |
| Welded steel | Lap - Arc welded | All | Large | 0.15 | 4.4.4 |
| Welded steel | Rubber gasket | All | Small | 0.7 | 4.4.6 |
| Welded steel | Screwed | All | Small | 1.3 | 4.4.6 A.3.11 |
| Welded steel | Riveted | All | Small | 1.3 | 4.4.6 |
| Asbestos cement | Rubber gasket | All | Small | 0.5 | 4.4.3 4.4.5 |
| Asbestos cement | Cement | All | Small | 1.0 | 4.4.3 |
| Concrete w/Stl Cyl. | Lap - Arc Welded | All | Large | 0.7 | 4.4.6 |
| Concrete w/Stl Cyl. | Cement | All | Large | 1.0 | 4.4.6 |
| Concrete w/Stl Cyl. | Rubber Gasket | All | Large | 0.8 | 4.4.6 |
| PVC | Rubber gasket | All | Small | 0.5 | 4.4.6 |
| Ductile iron | Rubber gasket | All | Small | 0.5 | 4.4.5 4.4.6 |

*Table 4-5. Ground Shaking - Constants for Fragility Curve*

**Figure B-2. ALA-Recommended $K_1$ Fragility Constants for Pipelines**

| Pipe Material | Joint Type | $K_2$ | Reference Sections |
|---|---|---|---|
| Cast iron | Cement | 1.0 | 4.4.2 |
| Cast iron | Rubber gasket | 0.8 | 4.4.2 |
| Cast iron | Mechanical restrained | 0.7 | 4.4.2 |
| Welded steel | Arc welded, lap welds (large diameter, non corrosive) | 0.15 | 4.4.4 |
| Welded steel | Rubber gasket | 0.7 | 4.4.3 |
| Asbestos cement | Rubber gasket | 0.8 | 4.4.3 |
| Asbestos cement | Cement | 1.0 | 4.4.6 |
| Concrete w/Stl Cyl. | Welded | 0.6 | 4.4.6 |
| Concrete w/Stl Cyl. | Cement | 1.0 | 4.4.6 |
| Concrete w/Stl Cyl. | Rubber Gasket | 0.7 | 4.4.6 |
| PVC | Rubber gasket | 0.8 | 4.4.6 |
| Ductile iron | Rubber gasket | 0.5 | 4.4.6 |

*Table 4-6. Permanent Ground Deformations - Constants for Fragility Curve*

**Figure B-3. ALA-Recommended $K_2$ Fragility Constants for Pipelines**

# Appendix F

## Cost Estimating Assumptions

# Appendix F
# Cost Estimating Assumptions

This appendix details West Yost's assumptions for estimating probable construction costs for the recommended water system facilities. Construction costs were developed based on a combination of data supplied by manufacturers, published industry standard cost data and curves, construction costs for similar facilities built by other public agencies, and construction costs previously estimated by West Yost for similar facilities with similar construction cost indexes.

The costs presented in this appendix are for construction only and do not include estimating or construction uncertainties (e.g., variations in final quantities) or cost estimates for engineering, legal services, environmental review, inspections, and/or contract administration. Some of these items are referred to as contingency costs and are addressed in the last section of this appendix. Construction costs presented in this appendix represent capital infrastructure costs and do not include costs for purchase of additional surface water supplies, supply reliability, or operation and maintenance.

All estimated construction costs have been adjusted to reflect August 2020 dollars for San Francisco, California. These costs should be used for conceptual cost estimates only and should be updated regularly. Construction costs presented in this appendix are not intended to represent the lowest prices in the industry for each type of construction; rather they are representative of average or typical construction costs. These planning-level construction cost estimates have been prepared for guidance in evaluating various facility improvement options and are intended only for budgetary purposes within the context of this master planning effort.

The following sections of this appendix describe the assumptions used to estimate the probable construction costs for the planning and design of recommended water system facilities for the City's water system:

- Water System Construction Costs
- Design and Construction Contingencies and Other Project Costs

## WATER SYSTEM CONSTRUCTION COSTS

The following sections present the construction cost estimates used to project probable construction costs for recommended water system facilities in the City's water system and are categorized by type of improvement, including the following:

- Treated Water Storage Reservoirs
- Municipal Groundwater Production Wells
- Treated Water Pump Stations
- Potable Water Pipelines
- Turnouts
- Pressure Reducing Valves and Isolation Valves
- Backup Power Generators

## Treated Water Storage Reservoirs

Table 1 summarizes the estimated construction costs for above-ground concrete and steel treated water storage reservoirs between 1.0 and 6.0 million gallons (MG). These costs generally include the installation of the storage tank, site piping, earthwork, paving, instrumentation, and related sitework. These costs are representative of construction under normal excavation and foundation conditions and would be significantly higher for special or difficult foundation requirements.

**Table 1. Construction Costs for Treated Water Storage Reservoirs[a]**

| Capacity, MG | Estimated Construction Cost, million dollars(b) | |
|---|---|---|
| | Above-ground Concrete | Above-ground Steel |
| 1.0 | 3.4 | 2.4 |
| 2.0 | 4.5 | 3.3 |
| 3.0 | 5.6 | 4.2 |
| 4.0 | 6.7 | 5.1 |
| 5.0 | 7.8 | 6.0 |
| 6.0 | 8.9 | 6.9 |

(a) Based on August 2020 CCI for San Francisco (12,920.6).

(b) Estimated construction costs do not reflect an adjustment to account for the current economic bidding climate and do not include design and construction contingencies or other project costs. See Table 5 for recommended application of contingency and other project costs.

## Municipal Groundwater Production Wells

Well construction consists of pilot hole drilling, water quality/soil sampling, pilot hole reaming, well construction, well development and providing the necessary housing, pump, motor, automatic control equipment, discharge piping, supervisory control and data acquisition (SCADA), and disinfection equipment. Costs also assume a backup power generator will be installed.

Construction costs for new groundwater wells are estimated to be approximately $3,500,000 per well (assuming a well capacity between 500 – 1,000 gallons per minute [gpm]). These estimates are based on recent bids for similarly sized wells and representative of construction under normal drilling conditions. Costs would be significantly higher for special or difficult locations, or if specialized wellhead treatment is required.

## Treated Water Pump Stations

Pump stations will be required at ground-level and below-grade reservoirs to lift water to the hydraulic grade of the City distribution system. Estimated construction costs for distribution pumping stations, as shown in Table 2, are based on enclosed stations with architectural and landscaping treatment suitable for residential areas. Pump station costs can vary considerably, depending on architectural design, pumping head, and pumping capacity. Therefore, these costs presented below are representative of construction under common or normal conditions and would be significantly higher for special or difficult conditions.

Pump station cost estimates include the installation of the pumps, site piping, earthwork, paving, a chemical feed system (hypochlorite), on-site backup/standby power generator, SCADA, and related sitework.

**Table 2. Construction Costs for Treated Water Pump Stations[a]**

| Firm Capacity[b], mgd | Estimated Construction Cost, million dollars[c] |
|---|---|
| 0.5 | 1.5 |
| 1 | 1.5 |
| 2 | 1.7 |
| 3 | 1.9 |
| 5 | 2.3 |
| 10 | 3.2 |
| 15 | 4.2 |

(a) Based on August 2020 CCI for San Francisco (12,920.6).

(b) Equal to the total pumping capacity with the largest pump out of service or on standby.

(c) Estimated construction costs do not reflect an adjustment to account for the current economic bidding climate and do not include design and construction contingencies or other project costs. See Table 5 for recommended application of contingency and other project costs.

## Potable Water Pipelines

Unit construction costs for potable water pipelines 8 through 36 inches in diameter are provided in Table 3Table 3. These unit costs are categorized by typical pipeline construction either in developed (e.g., in urban or suburban roads) or undeveloped (e.g., across open fields or in rural roads) areas and are representative of pipeline construction under common or normal conditions. Special or difficult conditions would increase costs significantly.

The unit construction costs presented below generally include pipeline materials, trenching, placing and jointing pipe, valves, fittings, hydrants, service connections, placing imported pipe bedding, native backfill material, and partial asphalt pavement replacement, if required. However, the costs presented in Table 3 do not include jacking and boring pipe or constructing boring and receiving pits. Jack and bore costs are shown in Table 4 and should be added where required.

**Table 3. Unit Construction Costs for Pipelines[a]**

| Pipeline Diameter, inches | Unit Construction Cost, dollars/linear foot[b] | |
|---|---|---|
| | Developed Areas | Undeveloped Areas |
| 8 | 135 | 90 |
| 10 | 165 | 110 |
| 12 | 185 | 130 |
| 14 | 200 | 145 |
| 16 | 220 | 165 |
| 18 | 240 | 185 |
| 20 | 265 | 190 |
| 24 | 290 | 225 |
| 30 | 365 | 315 |
| 36 | 470 | 420 |

(a) Based on August 2020 CCI for San Francisco (12,920.6).

(b) Estimated construction costs do not reflect an adjustment to account for the current economic bidding climate and do not include design and construction contingencies or other project costs. See Table 5 for recommended application of contingency and other project costs.

**Table 4. Unit Construction Costs for Jack and Bore[a]**

| Pipeline Size | Unit Construction Cost, dollars/linear foot[b] |
|---|---|
| 12-inch pipe (24-inch casing) | 935 |
| 16-inch pipe (30-inch casing) | 1,170 |
| 18-inch pipe (32-inch casing) | 1,250 |
| 24-inch pipe (36-inch casing) | 1,405 |

(a) Based on August 2020 CCI for San Francisco (12,920.6).

(b) Estimated construction costs do not reflect an adjustment to account for the current economic bidding climate and do not include design and construction contingencies or other project costs. See Table 5 for recommended application of contingency and other project costs.

## Turnouts

Additional turnouts are recommended to increase supply reliability. The construction cost for a new turnout is estimated to be approximately $313,000. This cost is representative of construction under normal conditions and would be significantly higher for special or difficult conditions.

The construction cost estimate for a turnout includes the installation of control valve(s), a concrete utility vault, access hatches, site piping, earthwork, paving, SCADA, and related sitework.

## Pressure Reducing Valves and Isolation Valves

Pressure reducing valves are required to supply water between pressure zones during peak demands and/or emergency conditions. The construction cost for a pressure reducing valve is estimated to be approximately $282,000. This cost is representative of construction under normal conditions and would

be significantly higher for special or difficult conditions. The construction cost for a new isolation valve is estimated to be approximately $8,000.

The construction cost estimate for a pressure reducing valve includes the installation of control valve(s), a concrete utility vault, access hatches, site piping, earthwork, paving, SCADA, and related sitework.

### Backup Power Generators

On-site backup power generators are recommended so pumps can continue delivering water to the distribution system in the event of a power outage. These generators should be sized to meet the power demands of the pumps. The construction cost for a new, on-site backup power generator is estimated to be approximately $200,000. This cost is representative of construction under normal conditions and would be significantly higher for special or difficult conditions.

## DESIGN AND CONSTRUCTION CONTINGENCIES AND OTHER PROJECT COSTS

Contingency and other project costs must be reviewed on a case-by-case basis, because they will vary considerably with each project. However, to assist City staff with budgeting for the recommended water system facility improvements, standard contingencies (as percentages of the base construction cost) are recommended and are divided into two categories: Design and Construction Contingency Costs and Other Project Costs.

- **Design and Construction Contingency Costs**: 35 percent
  The construction costs presented above are representative of the construction of water system facilities under normal construction conditions and schedules; consequently, it is appropriate to allow for estimating, design, and construction uncertainties unavoidably associated with the conceptual planning of projects at the master planning level. Factors such as unexpected construction conditions, the need for unforeseen mechanical items, and variations in final quantities are only a few of the items that can increase project costs. An allowance of 35 percent of the base construction cost will be included to cover such project related design and construction contingencies.
- **Other Project Costs:** 35 percent
  Other project fees have been divided into three (3) subcategories, totaling 35 percent: 10 percent engineering, 15 percent construction management, and 10 percent program implementation.
  - Engineering costs associated with new facilities include preliminary investigations and reports, right-of-way acquisition, foundation explorations, preparation of drawings and specifications during construction, surveying and staking, sampling of testing material, and start-up services. For this study, engineering costs are assumed to be 10 percent of the base construction cost estimate.
  - Construction management covers such items as contract management and inspection during construction. The cost of these items can also vary, but for the purpose of this study, it is assumed that construction management charges will equal approximately 15 percent of the base construction cost estimate.
  - Program implementation costs cover items such as legal fees, environmental/CEQA compliance requirements, financing expenses, administrative costs, and interest during construction. The cost of these items can also vary, but for the purpose of this study, it is assumed that program implementation costs will equal approximately 10 percent of the base construction cost estimate.

An example application of these standard mark-ups to a project with an assumed base construction cost of $1.0 million is shown in Table 5. As shown, the total cost of all project construction contingencies (construction contingency, engineering, construction management, and program implementation costs) is 70 percent of the base construction cost for each construction project.

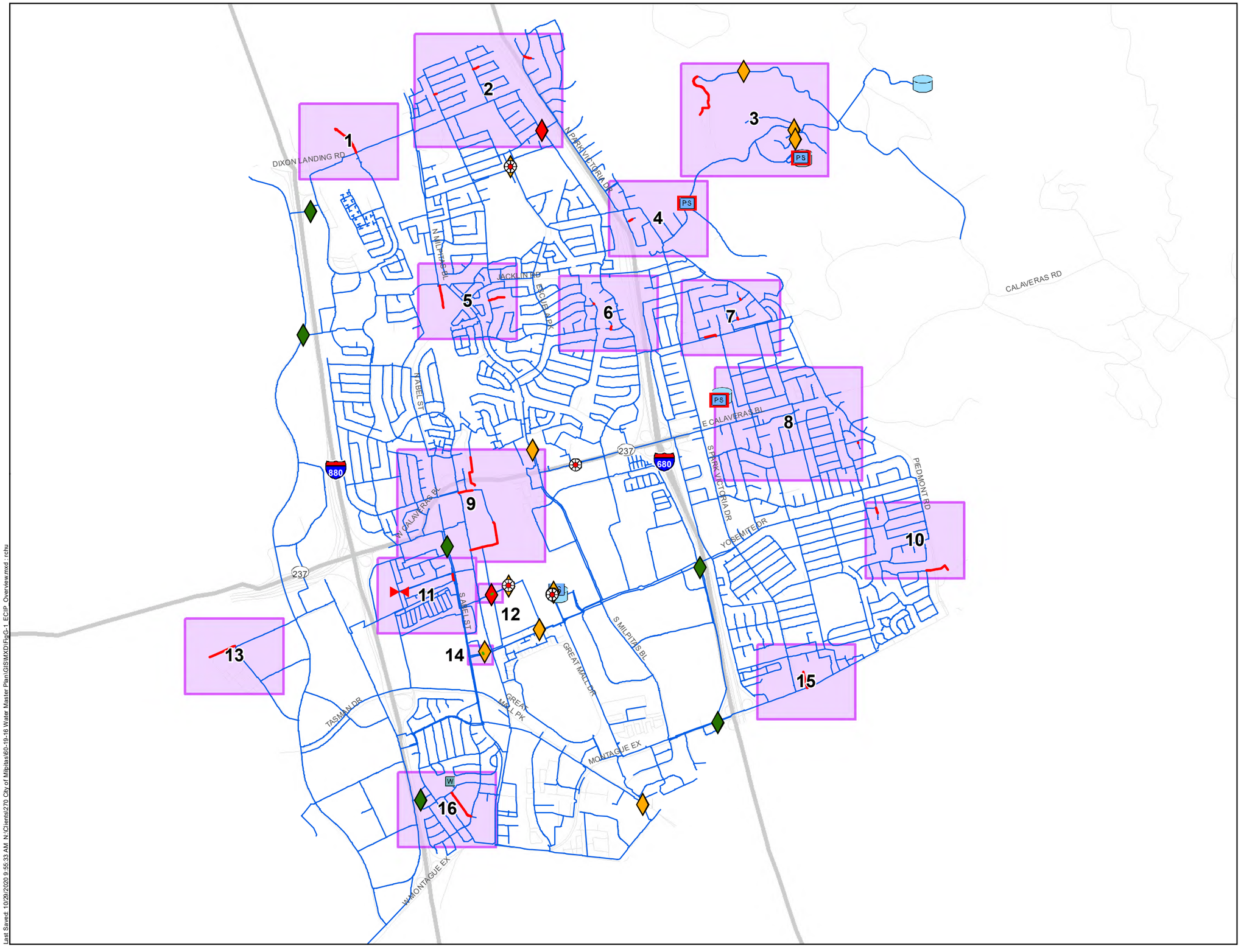
**Table 5. Example Application of Contingency and Other Project Costs**

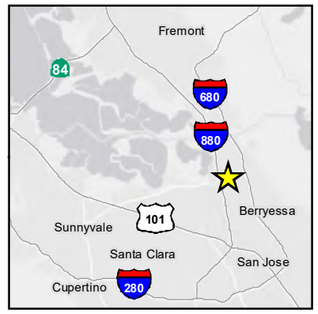
| Cost Component | Percent | Cost, dollars |
|---|---|---|
| Estimated Base Construction Cost before Mark-ups[(a)] | | 1,000,000 |
| Design and Construction Contingencies | 35 | 350,000 |
| Other Project Costs | | |
| Engineering | 10 | 100,000 |
| Construction Management | 15 | 150,000 |
| Program Implementation | 10 | 100,000 |
| **Estimated Total Project Cost** | | **$1,700,000** |

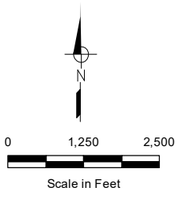
(a) Assumed cost of an example project.

# Appendix G

## Capital Improvement Program
## Mapbook and Project Summary Sheets




**Recommended Facilities**

- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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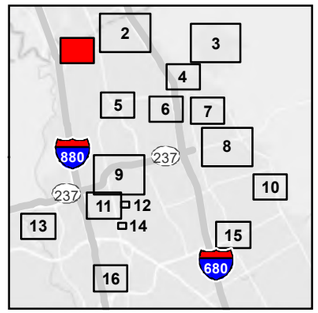


N

0 100 200

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

CITY OF MILPITAS CALIFORNIA

WEST YOST

**Figure G-1.1**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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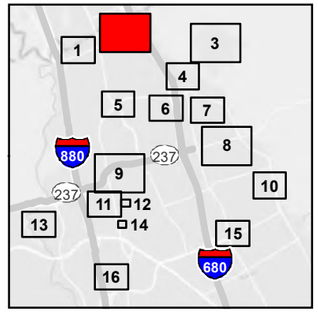


N

0 150 300

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.2**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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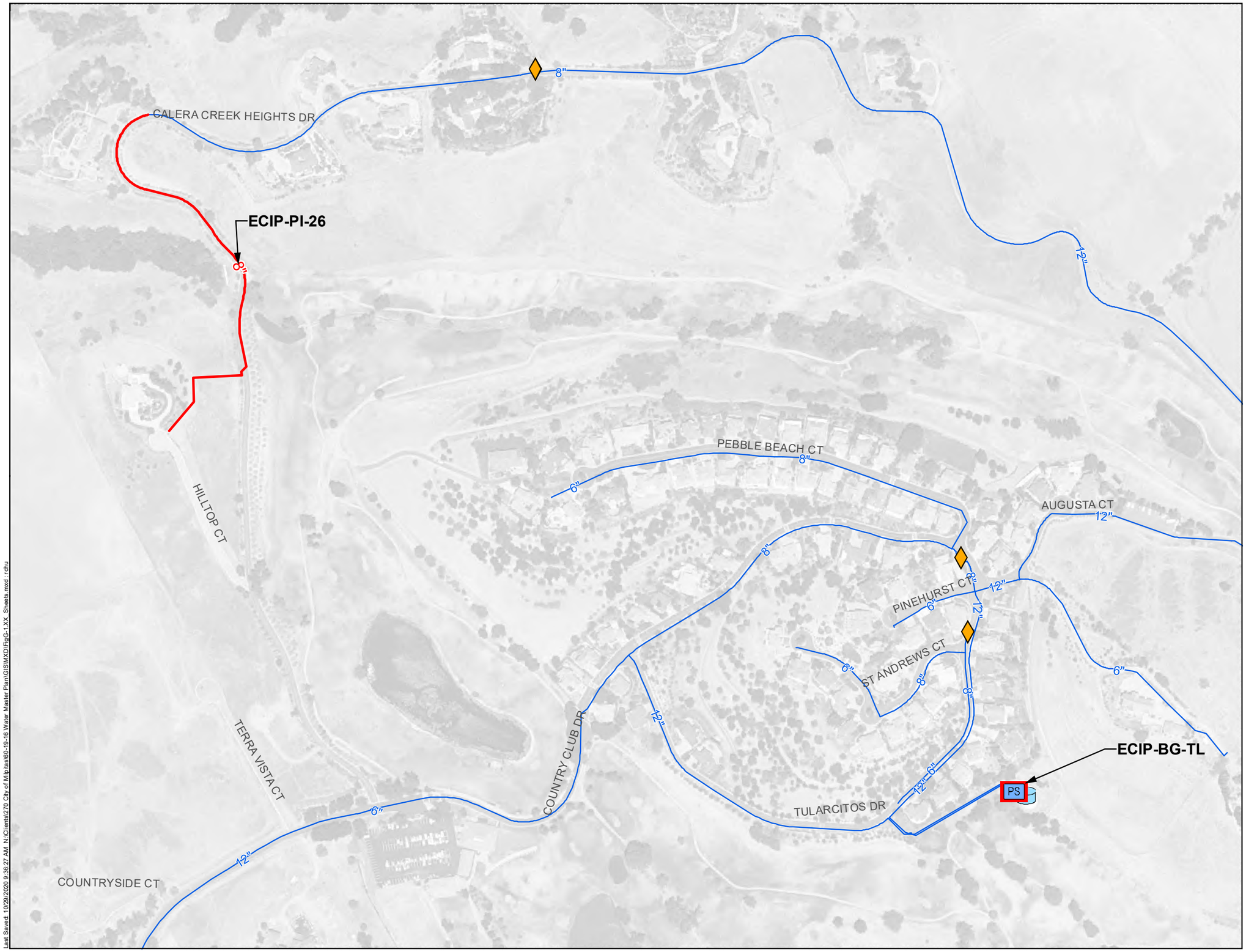


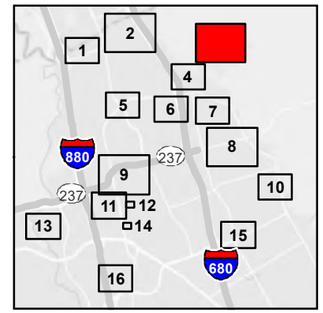


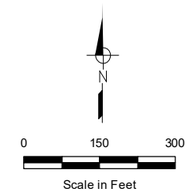


**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.3**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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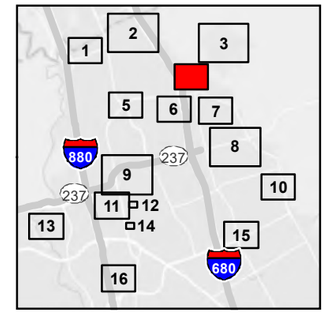


N

0 100 200

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.4**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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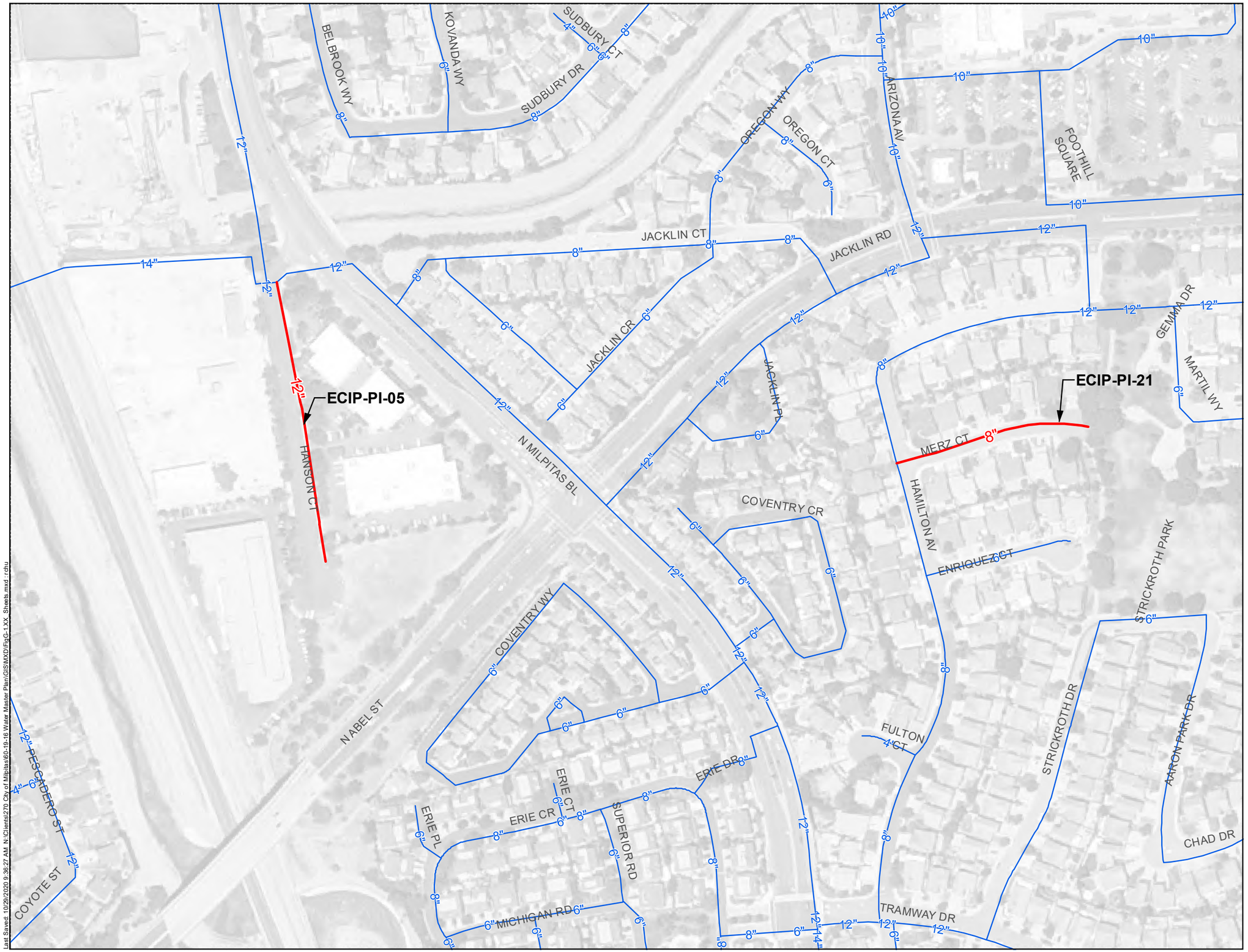


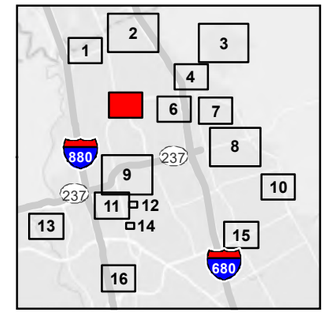


N

0 100 200

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

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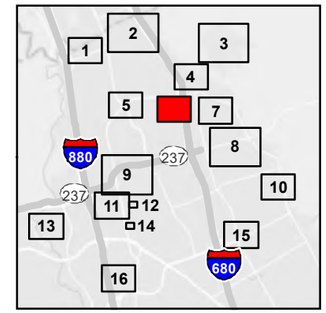
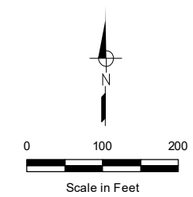
**Figure G-1.5**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan




**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

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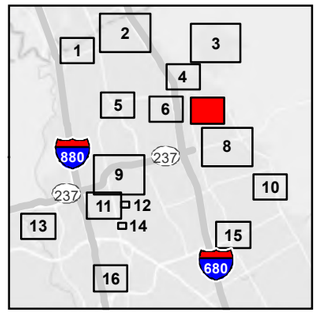
**Figure G-1.6**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan




N

0 100 200

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

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**Figure G-1.7**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.8**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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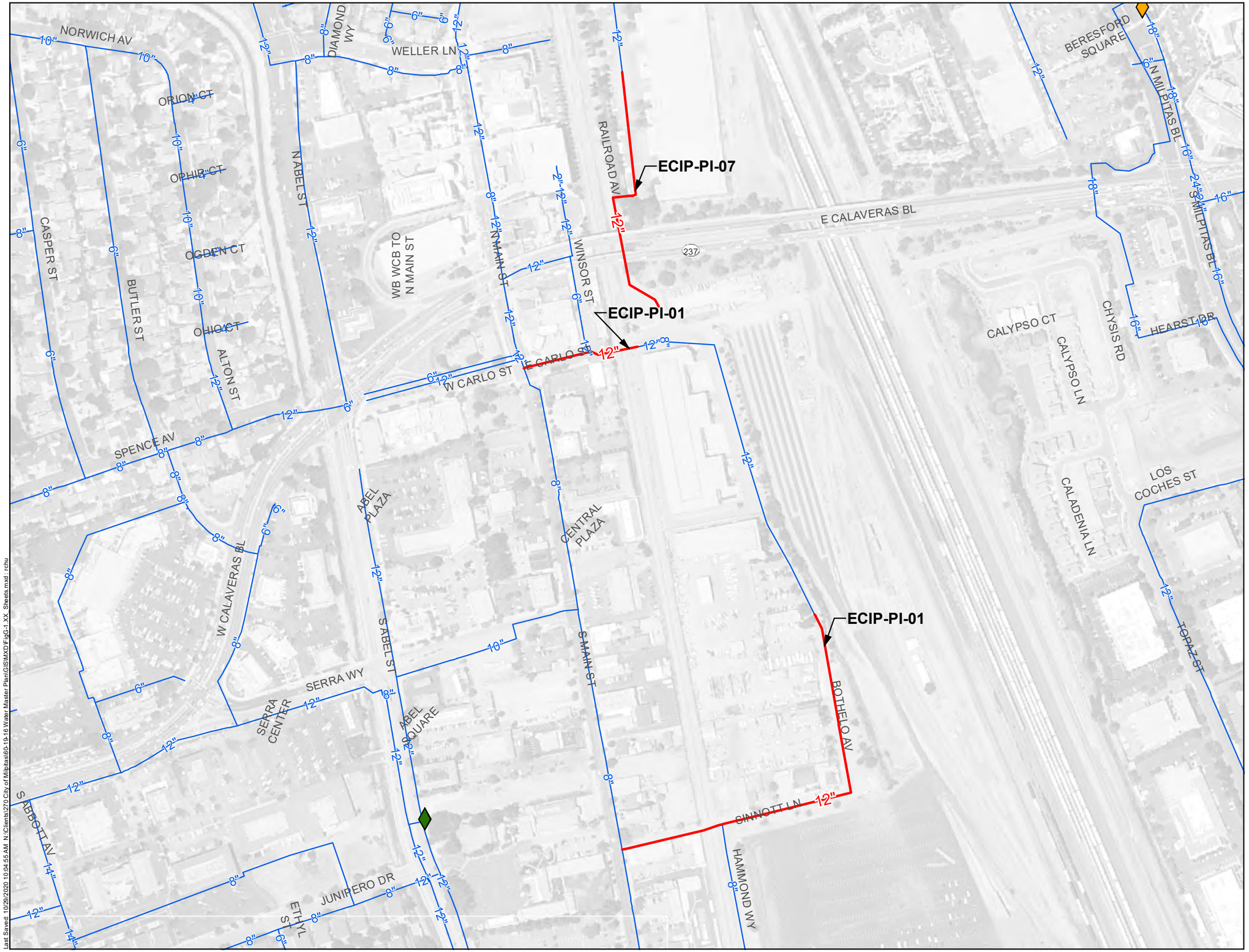


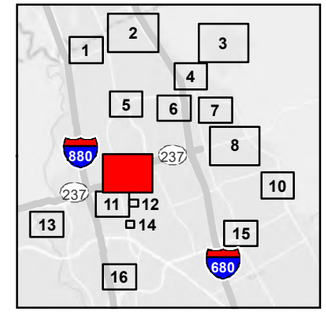


N

0 150 300

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

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**Figure G-1.9**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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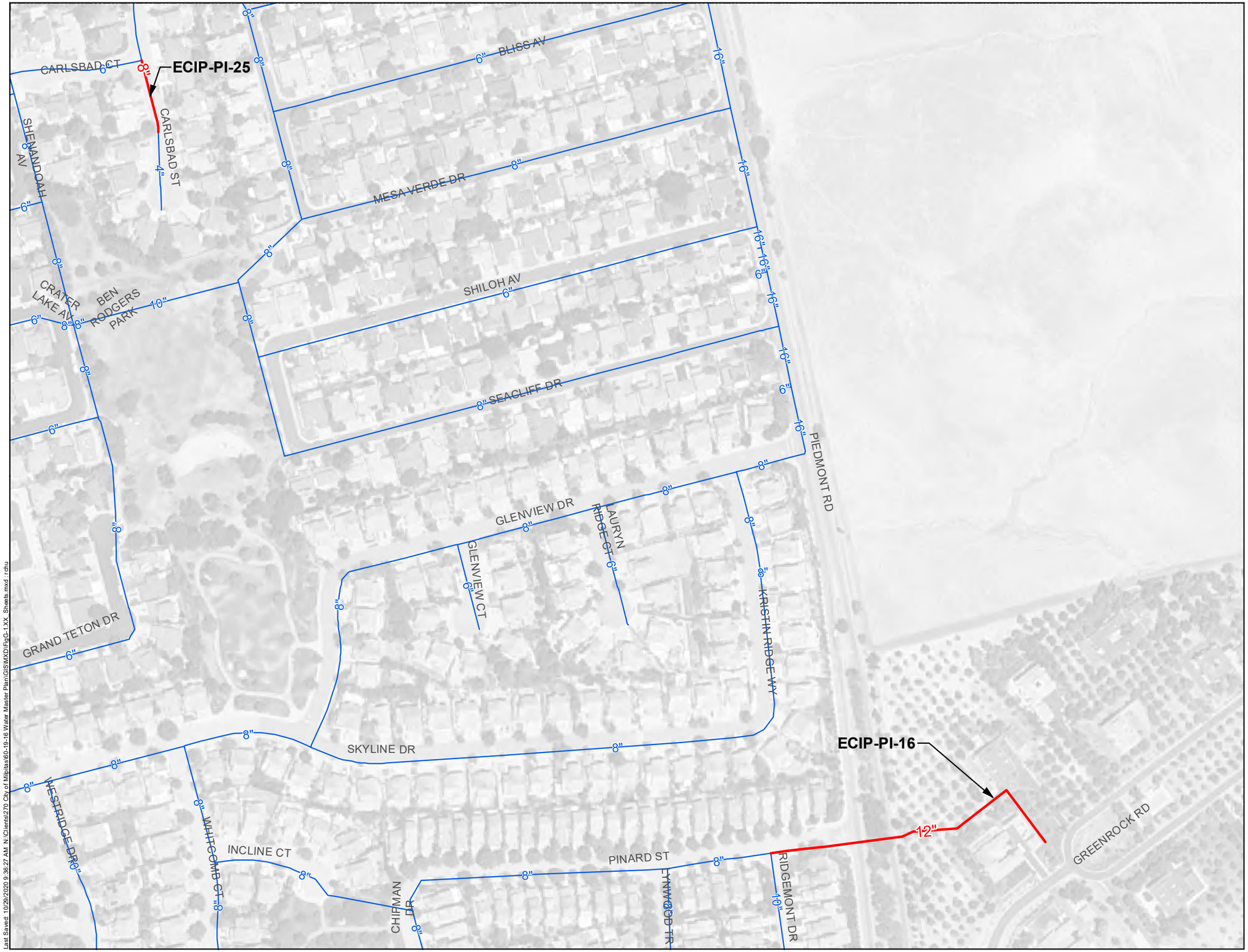


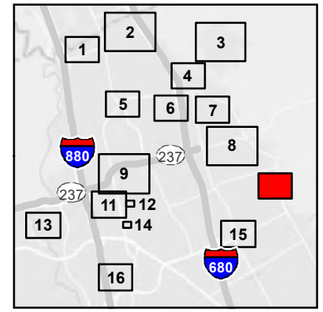


N

0 100 200

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.10**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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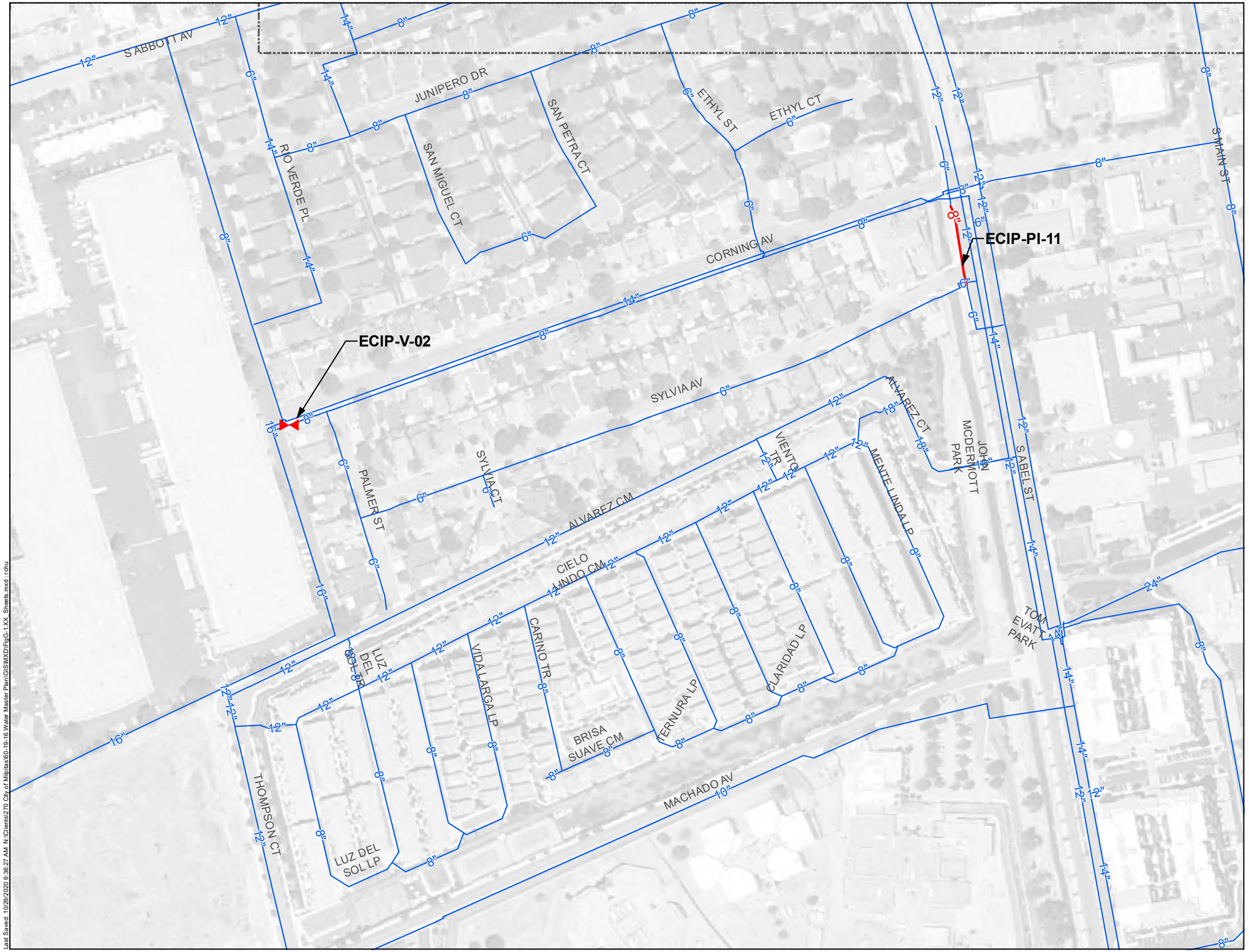


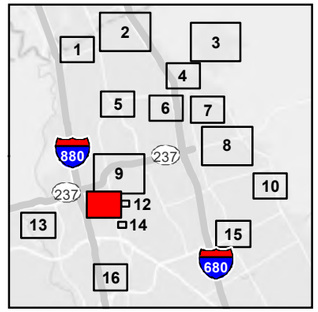


0 100 200

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.11**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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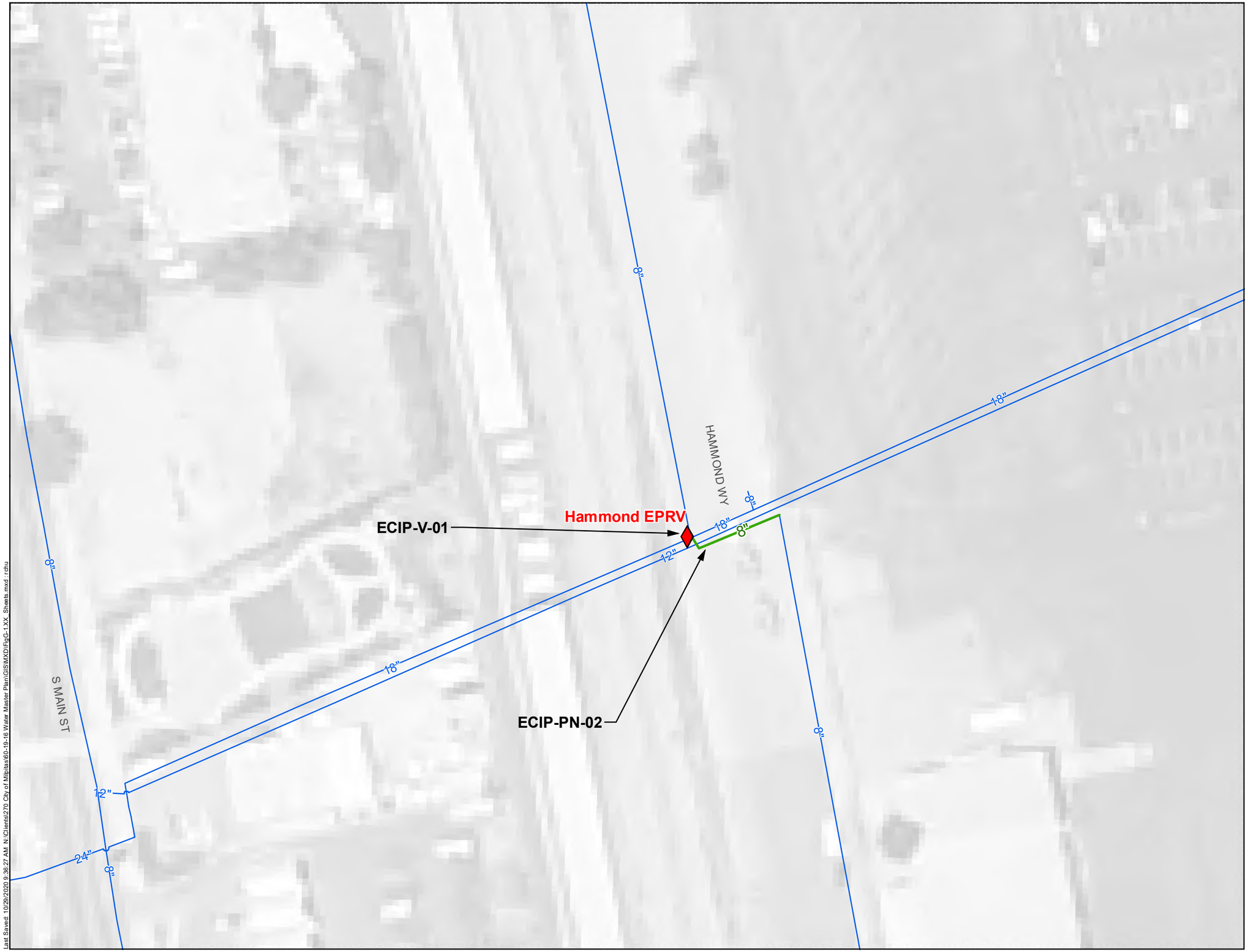


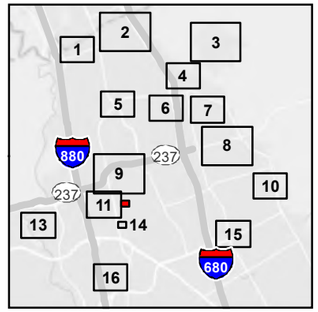


N

0 25 50

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.12**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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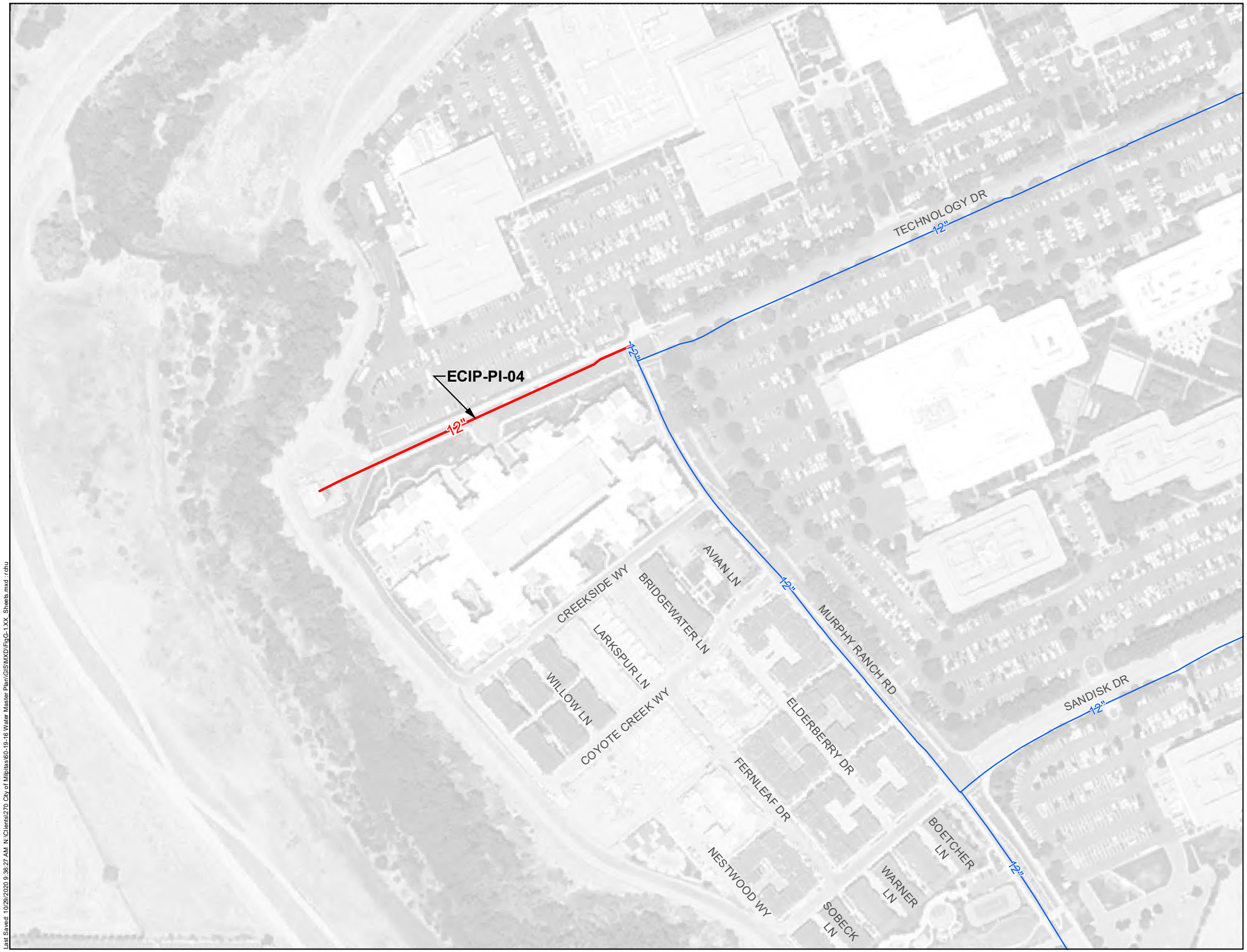


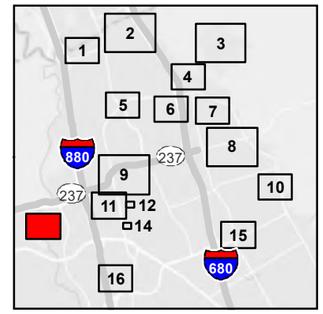


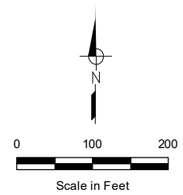


**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.13**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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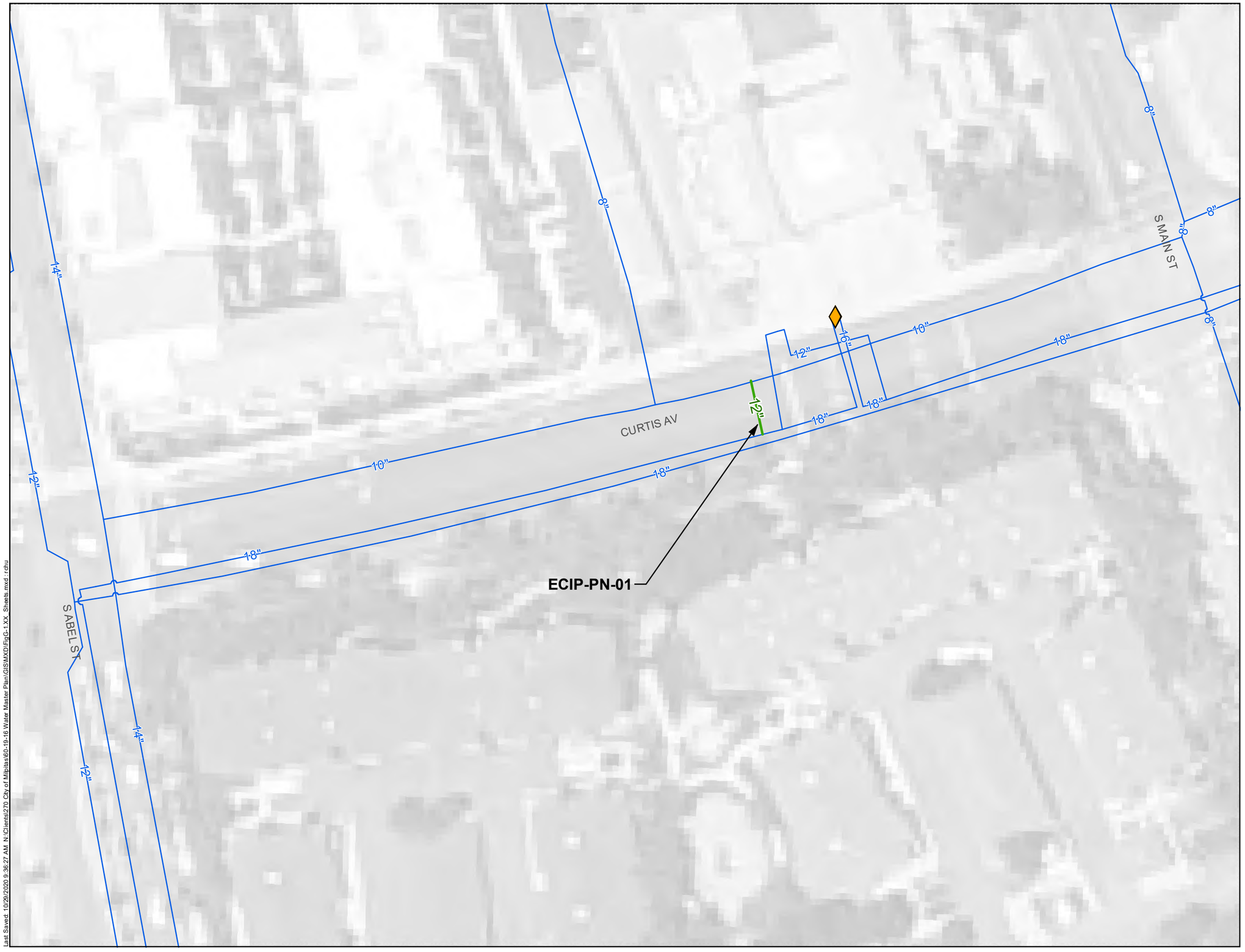


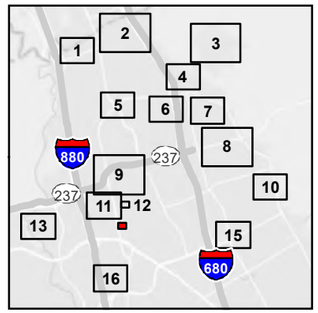


N

0 25 50

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

**Figure G-1.14**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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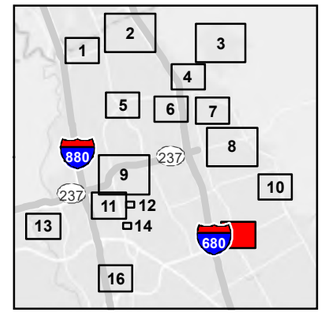


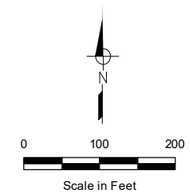


**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

## Figure G-1.15

## Recommended Improvements for Existing Water System

City of Milpitas
2020 Water Master Plan

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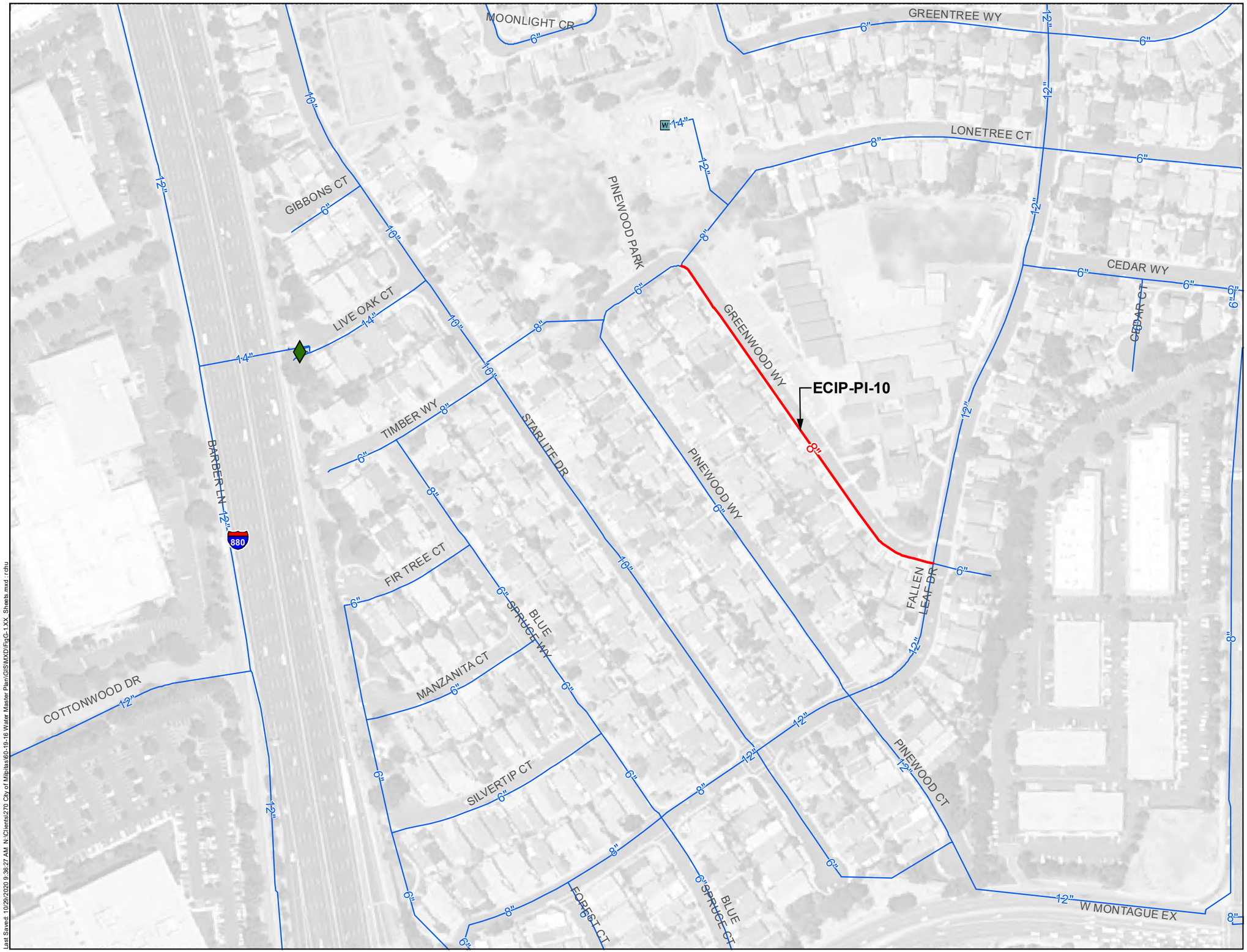


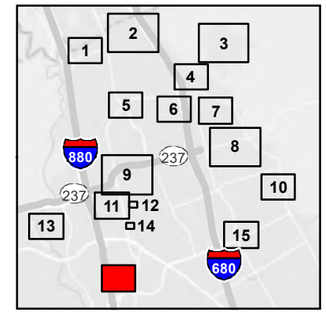


N

0 100 200

Scale in Feet

**Recommended Facilities**

- Emergency PRV
- PS — Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

**Existing Facilities**

- Existing Turnout
- W — Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- PS — Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline

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**Figure G-1.16**

**Recommended Improvements for Existing Water System**

City of Milpitas
2020 Water Master Plan

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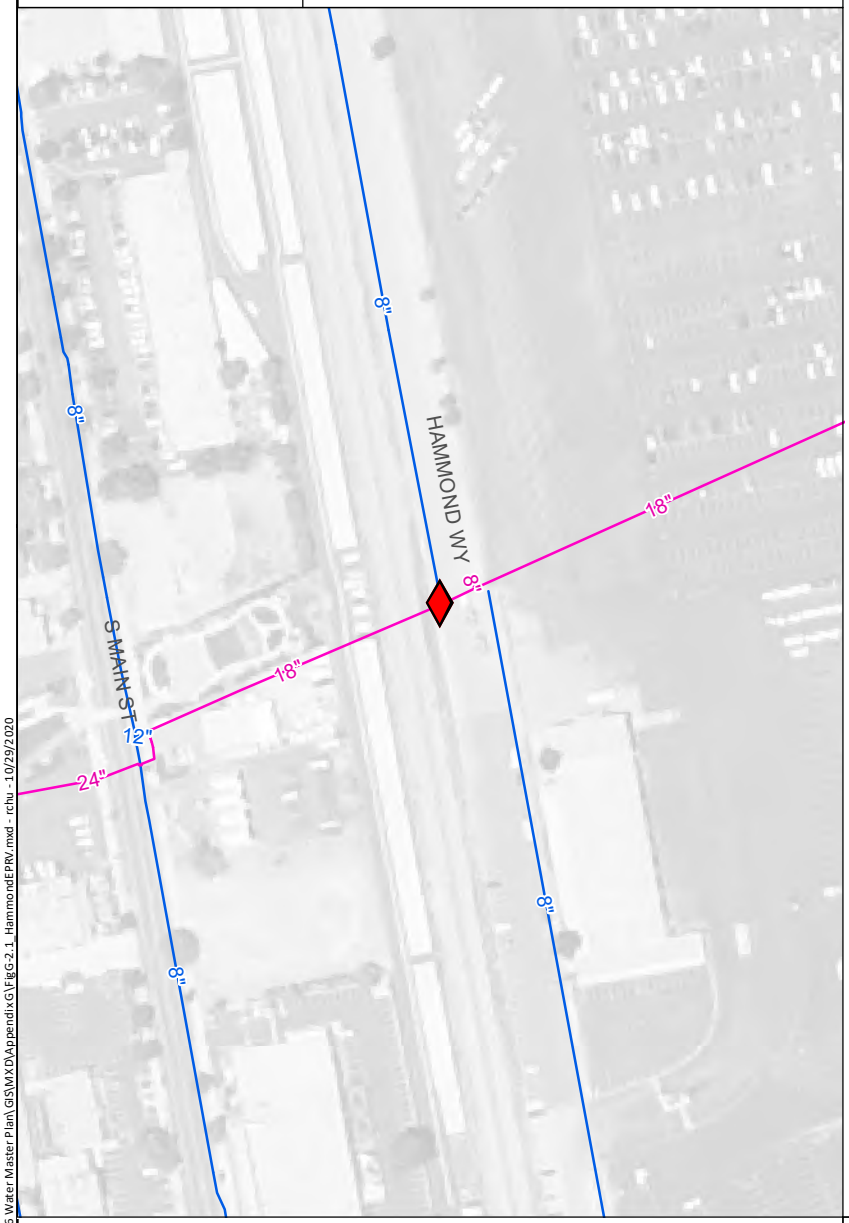
# ECIP-V-01
# Hammond Emergency PRV

| | |
|---|---|
| CONSTRUCTION COST | $ 282,000 |
| CAPITAL COST | $ 479,000 |
| PRIORITY | High |
| PURPOSE | Fire Flow |
| LOCATION | Hammond Way near Tom Evatt Park |
| PRESSURE ZONE | SF1/VW1 |




Legend

- Emergency PRV
- Existing SF1 Pipeline
- Existing VW1 Pipeline

N

1 inch = 200 feet

RECOMMENDED IMPROVEMENT SIZE

8-inch diameter PRV and piping.

REASON FOR IMPROVEMENT

Provide fire flows from Zone SF1 to Zone VW1.

PLANNING ASSUMPTIONS

Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

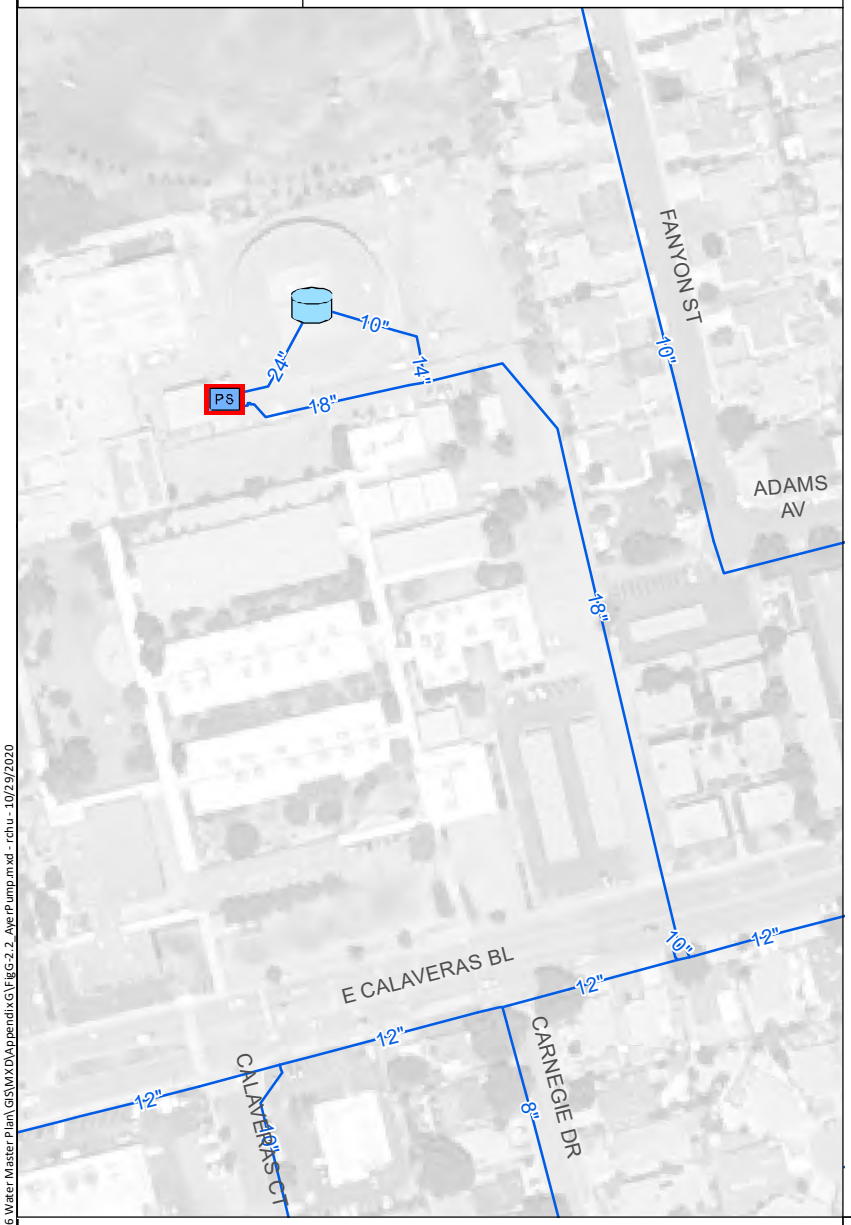
PRV costs include the installation of control valve(s), a concrete utility vault, access hatches, site piping, earthwork, paving, SCADA, and related sitework.

**Figure G-2.1**
**City of Milpitas**
**Project Summary Sheet (ECIP-V-01)**

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Appendix G\FigG-2.1_HammondEPRV.mxd - rchu - 10/29/2020

# ECIP-PS-AY
# New Fire Pump at Ayer Pump Station

| | |
|---|---|
| CONSTRUCTION COST | $ 1,216,733 |
| CAPITAL COST | $ 2,068,000 |
| PRIORITY | Medium |
| PURPOSE | Fire Flow Backup |
| LOCATION | Ayer Pump Station |
| PRESSURE ZONE | SF2 |




Legend

- PS — Improvement at Pump Station
- Existing Storage Reservoir
- Existing Pipeline

N

1 inch = 200 feet

RECOMMENDED IMPROVEMENT SIZE

Install one new fire pump at the existing Ayer Pump Station. Capacity shall be 4,00 gallons per minute (gpm) (5.76 million gallons per day (mgd)).

REASON FOR IMPROVEMENT

Provide fire flows to Zone SF2 in the event of an SFPUC supply outage.

PLANNING ASSUMPTIONS

Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

Pump station costs are based on enclosed stations with architectural and landscaping treatment suitable for residential areas. Since this improvement entails adding a pump to an existing pump station, costs for a new pump station (5.76 mgd firm capacity) have been discounted by 50 percent.

**Figure G-2.2**
**City of Milpitas**
**Project Summary Sheet (ECIP-PS-AY)**

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Appendix G\FigG-2.2_AyerPump.mxd - rchu - 10/29/2020

# ECIP-V-03
# Diel Emergency PRV

| | |
|---|---|
| CONSTRUCTION COST | $ 282,000 |
| CAPITAL COST | $ 479,000 |
| PRIORITY | Medium |
| PURPOSE | Fire Flow Backup |
| LOCATION | Intersection of Coelho Street and Diel Drive |
| PRESSURE ZONE | SF2/SF1 |

Legend

- Emergency PRV
- Existing SF1 Pipeline
- Existing SF2 Pipeline

N

1 inch = 200 feet

RECOMMENDED IMPROVEMENT SIZE

8-inch diameter PRV and piping.

REASON FOR IMPROVEMENT

Supplement existing Sunnyhills PRV in providing fire flows from Zone SF2 to Zone SF1.

PLANNING ASSUMPTIONS

Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

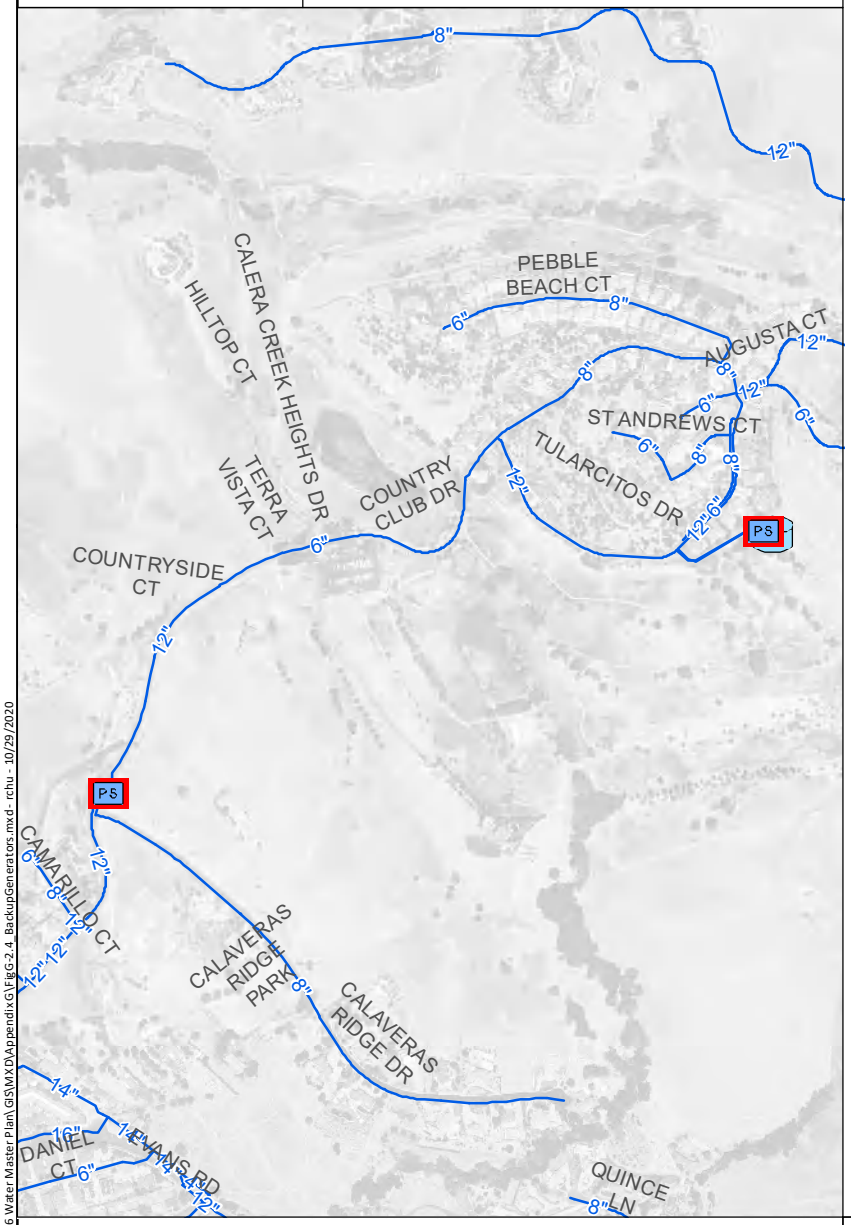
PRV costs include the installation of control valve(s), a concrete utility vault, access hatches, site piping, earthwork, paving, SCADA, and related sitework.

**Figure G-2.3**
**City of Milpitas**
**Project Summary Sheet (ECIP-V-03)**

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\AppendixG\FigG-2.3_DielEPRV.mxd - rchu - 10/29/2020

# ECIP-BG-CC and ECIP-BG-TL
# Backup Generators at Country Club and Tularcitos Pump Stations

| | |
|---|---|
| CONSTRUCTION COST | $ 200,000 per generator ($400,000 total) |
| CAPITAL COST | $ 340,000 per generator ($680,000 total) |
| PRIORITY | Low |
| PURPOSE | General Reliability |
| LOCATION | Country Club and Tularcitos Pump Stations |
| PRESSURE ZONE | SF3 and SF4 |




Legend

- PS — Improvement at Pump Station
- Existing Storage Reservoir
- Existing Pipeline

N

1 inch = 900 feet

RECOMMENDED IMPROVEMENT SIZE

Generators shall be sized to meet the power demands of each pump station.

REASON FOR IMPROVEMENT

Ensure continued pump operation in the event of a power outage.

PLANNING ASSUMPTIONS

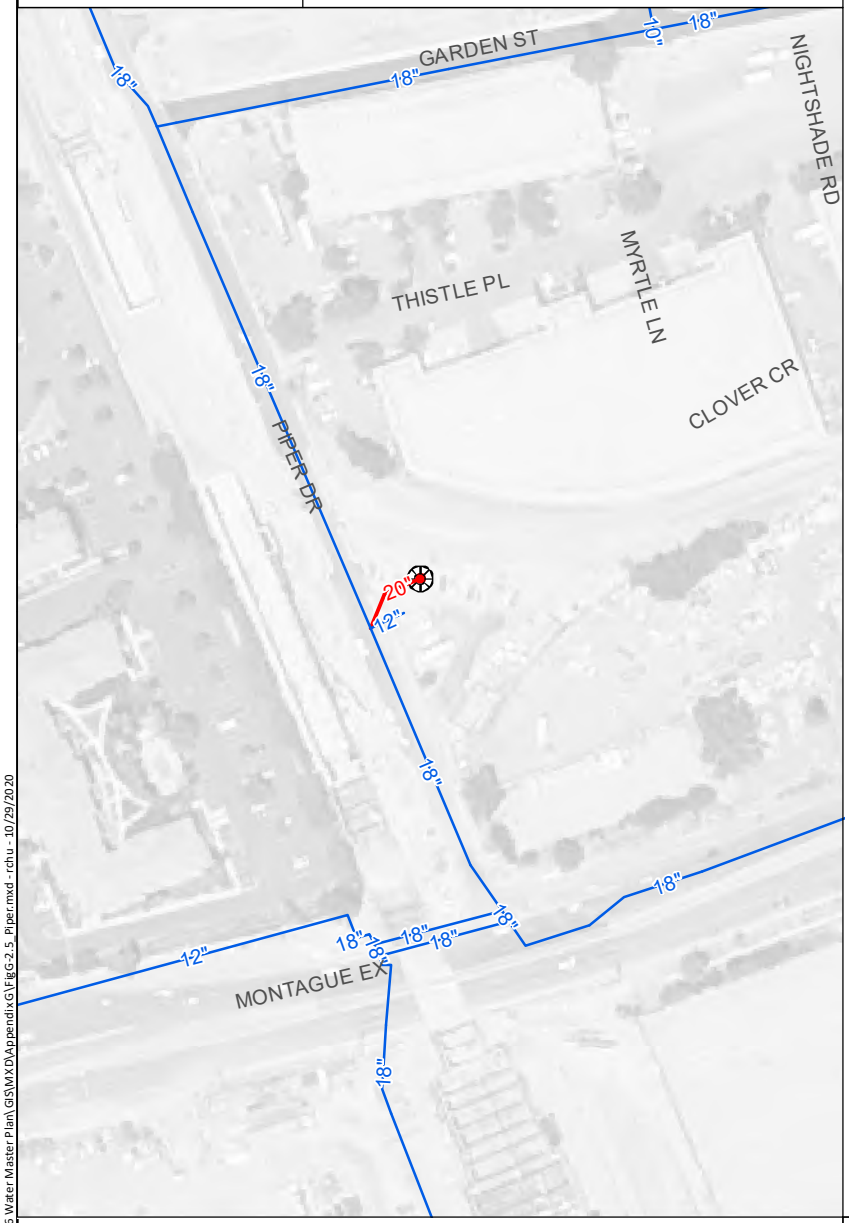
Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

**Figure G-2.4**
**City of Milpitas - Project Summary Sheet (ECIP-BG-CC and ECIP-BG-TL)**

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Appendix G\Fig G-2.4_BackupGenerators.mxd - rchu - 10/29/2020

# BCIP-TO-01
# Piper Turnout

| | |
|---|---|
| CONSTRUCTION COST | $ 313,000 |
| CAPITAL COST | $ 532,000 |
| PRIORITY | High |
| PURPOSE | Firm Supply Capacity |
| LOCATION | Piper Drive south of Garden Street |
| PRESSURE ZONE | VW2 |




Legend

- Turnout
- Turnout Pipeline
- Existing Pipeline

N

1 inch = 200 feet

RECOMMENDED IMPROVEMENT SIZE

Same capacity as the existing Gibraltar turnout: 10,000 gallons per minute (gpm) (14.4 million gallons per day (mgd)).

Connection from the turnout to the existing 18-inch diameter transmission main on Piper Drive shall be a 20-inch diameter pipeline.

REASON FOR IMPROVEMENT

Insufficient firm supply capacity in the Valley Water service area at buildout.

PLANNING ASSUMPTIONS

Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

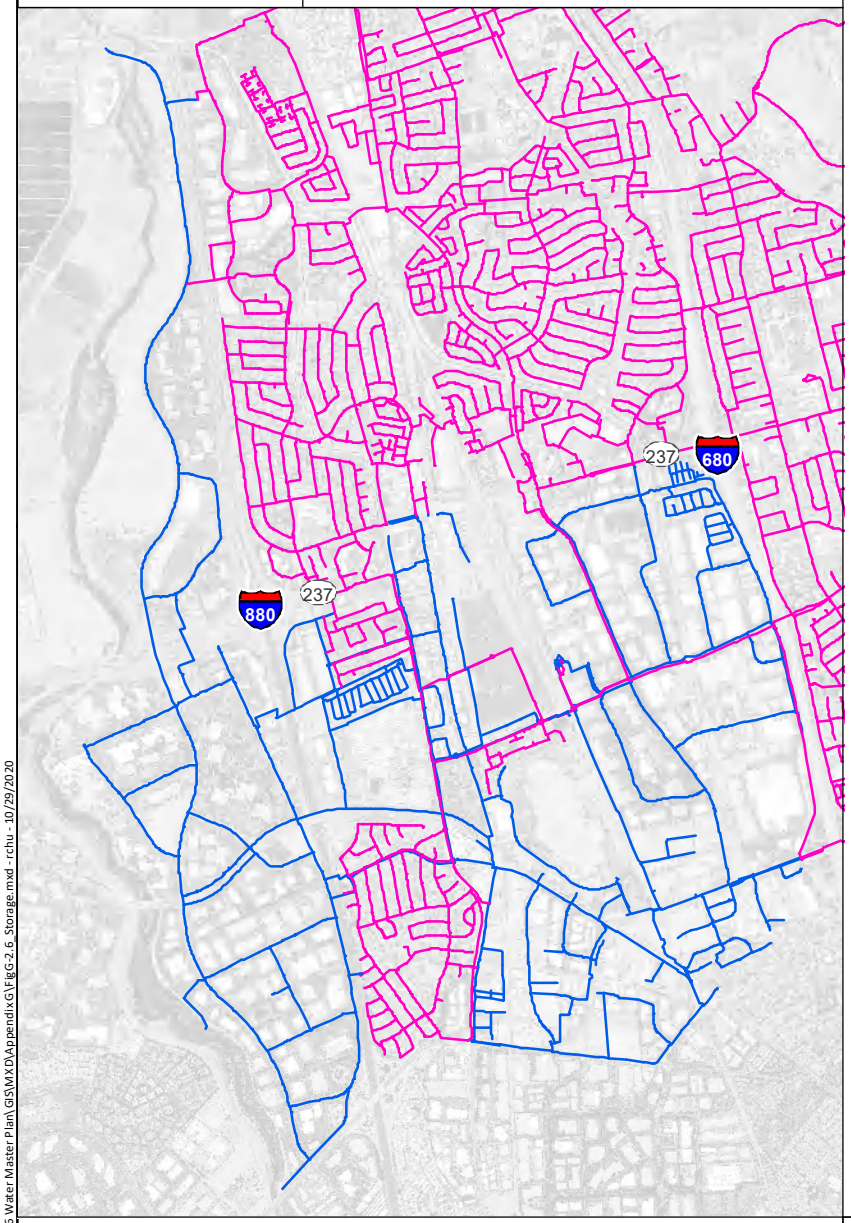
Turnout costs include the installation of control valve(s), a concrete utility vault, access hatches, site piping, earthwork, paving, SCADA, and related sitework.

**Figure G-2.5**
**City of Milpitas**
**Project Summary Sheet (BCIP-TO-01)**

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\AppendixG\FigG-2.5_Piper.mxd - rchu - 10/29/2020

# BCIP-S-01
# Storage Reservoir in Valley Water Service Area

| | |
|---|---|
| CONSTRUCTION COST | $ 3,254,000 |
| CAPITAL COST | $ 5,532,000 |
| PRIORITY | High |
| PURPOSE | Storage Capacity |
| LOCATION | Valley Water Service Area (Specific Location TBD) |
| PRESSURE ZONE | VW1 or VW2 |




Legend

Existing SFPUC Pipeline

Existing VW Pipeline

N

1 inch = 3,500 feet

RECOMMENDED IMPROVEMENT SIZE

2.0 million gallons (MG).

REASON FOR IMPROVEMENT

Insufficient storage capacity in the Valley Water service area at buildout.

PLANNING ASSUMPTIONS

Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

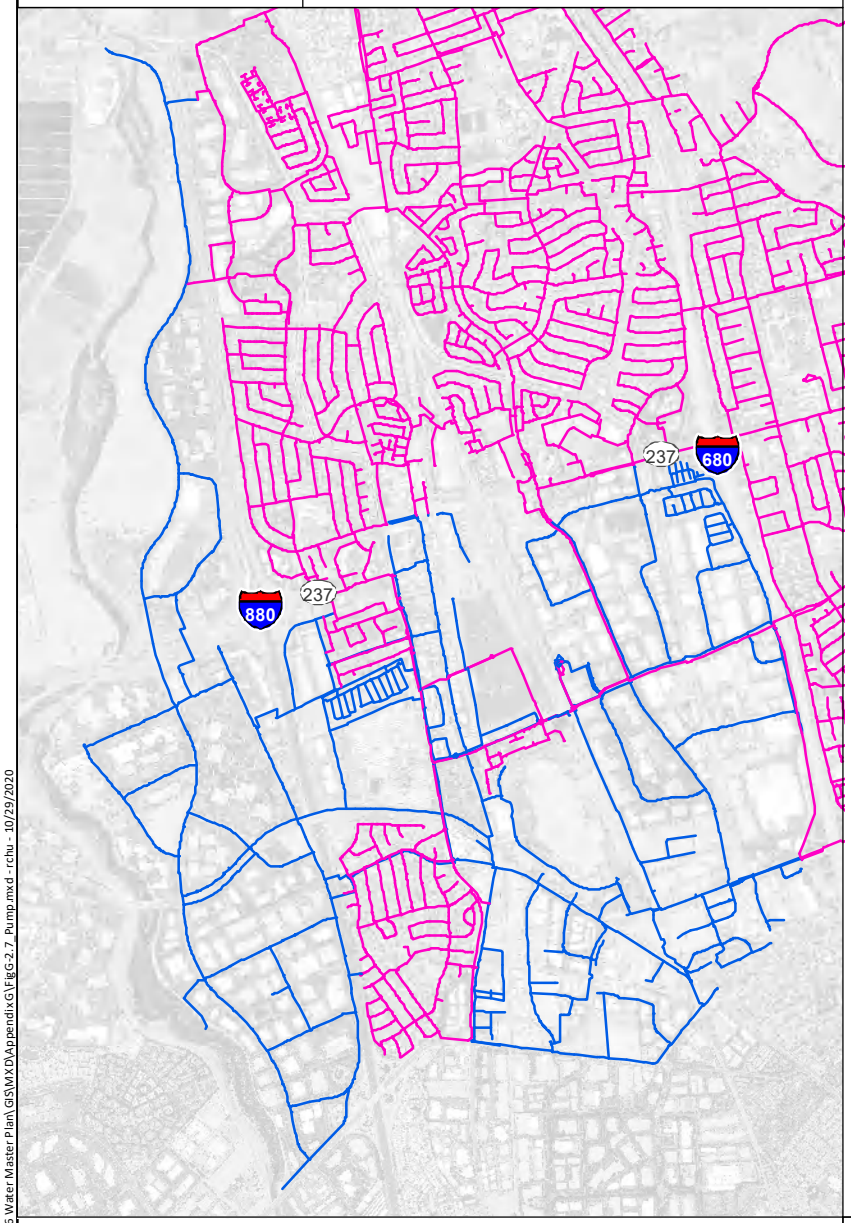
Storage reservoir will be aboveground steel tank. Costs include installation of the storage tank, site piping, earthwork, paving, instrumentation, and related sitework.

**Figure G-2.6**
**City of Milpitas**
**Project Summary Sheet (BCIP-S-01)**

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\AppendixG\FigG-2.6_Storage.mxd - rchu - 10/29/2020

# BCIP-PS-01
# Pump Station for Reservoir in Valley Water Service Area

| | |
|---|---|
| CONSTRUCTION COST | $ 2,433,466 |
| CAPITAL COST | $ 4,137,000 |
| PRIORITY | High |
| PURPOSE | Deliver Stored Water from New Reservoir |
| LOCATION | Valley Water Service Area (Specific Location TBD) |
| PRESSURE ZONE | VW1 or VW2 |




Legend

Existing SFPUC Pipeline

Existing VW Pipeline

N

1 inch = 3,500 feet

RECOMMENDED IMPROVEMENT SIZE

4,000 gallons per minute (gpm) firm capacity.

REASON FOR IMPROVEMENT

Pump station for recommended storage reservoir (BCIP-S-01).

PLANNING ASSUMPTIONS

Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

Costs assume an enclosed pump station with architectural and landscaping treatment suitable for residential areas.

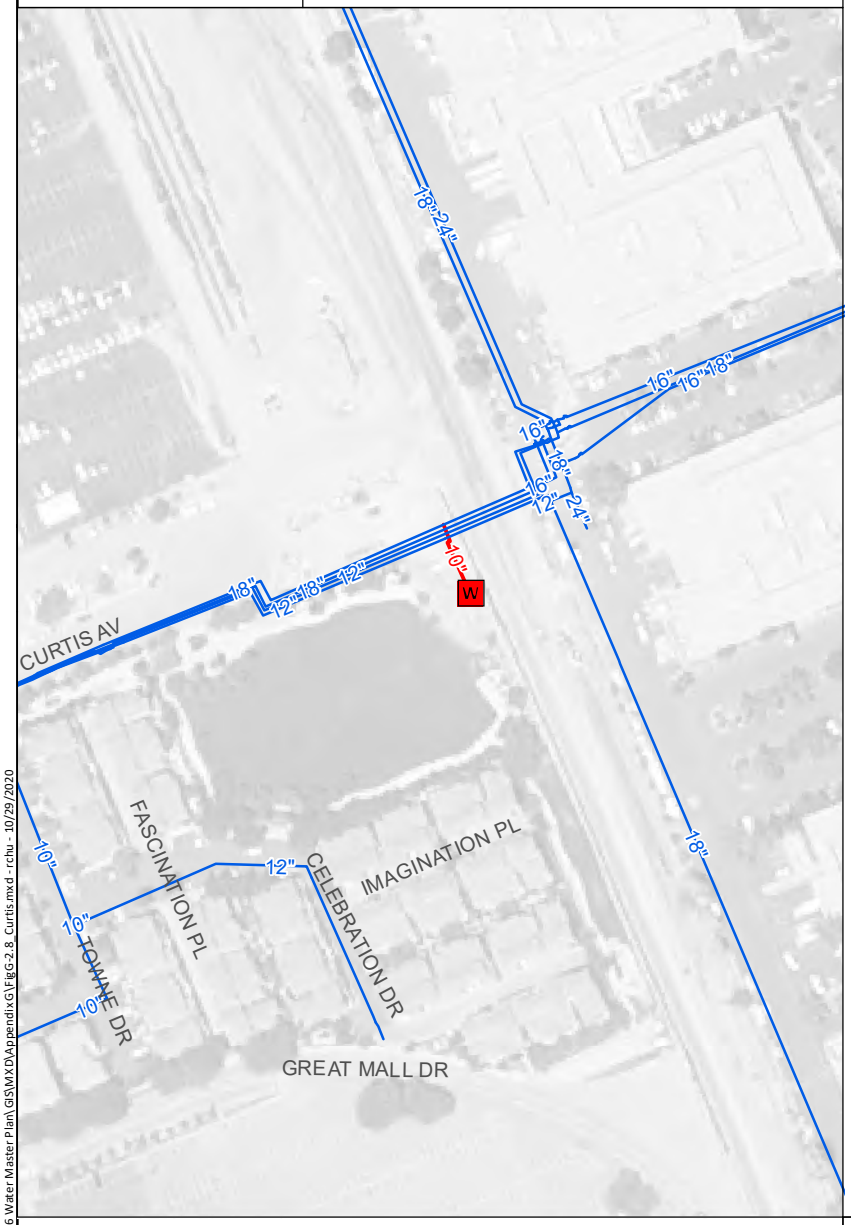
**Figure G-2.7**
**City of Milpitas**
**Project Summary Sheet (BCIP-PS-01)**

WEST YOST

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\AppendixG\FigG-2.7_Pump.mxd - rchu - 10/29/2020

# BCIP-W-01
# Curtis Well

| | |
|---|---|
| CONSTRUCTION COST | $ 3,500,000 |
| CAPITAL COST | $ 5,950,000 |
| PRIORITY | High |
| PURPOSE | Storage Capacity (Groundwater Credit) |
| LOCATION | Curtis Avenue near Parc Metro East |
| PRESSURE ZONE | VW2 |




Legend

- W — Groundwater Well
- Well Pipeline
- Existing Pipeline

N

1 inch = 200 feet

## RECOMMENDED IMPROVEMENT SIZE

Well capacity will be based on subsequent groundwater analysis that is not part of this report.

## REASON FOR IMPROVEMENT

Increase supply reliability and reduce storage requirement via emergency groundwater storage credit.

## PLANNING ASSUMPTIONS

Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

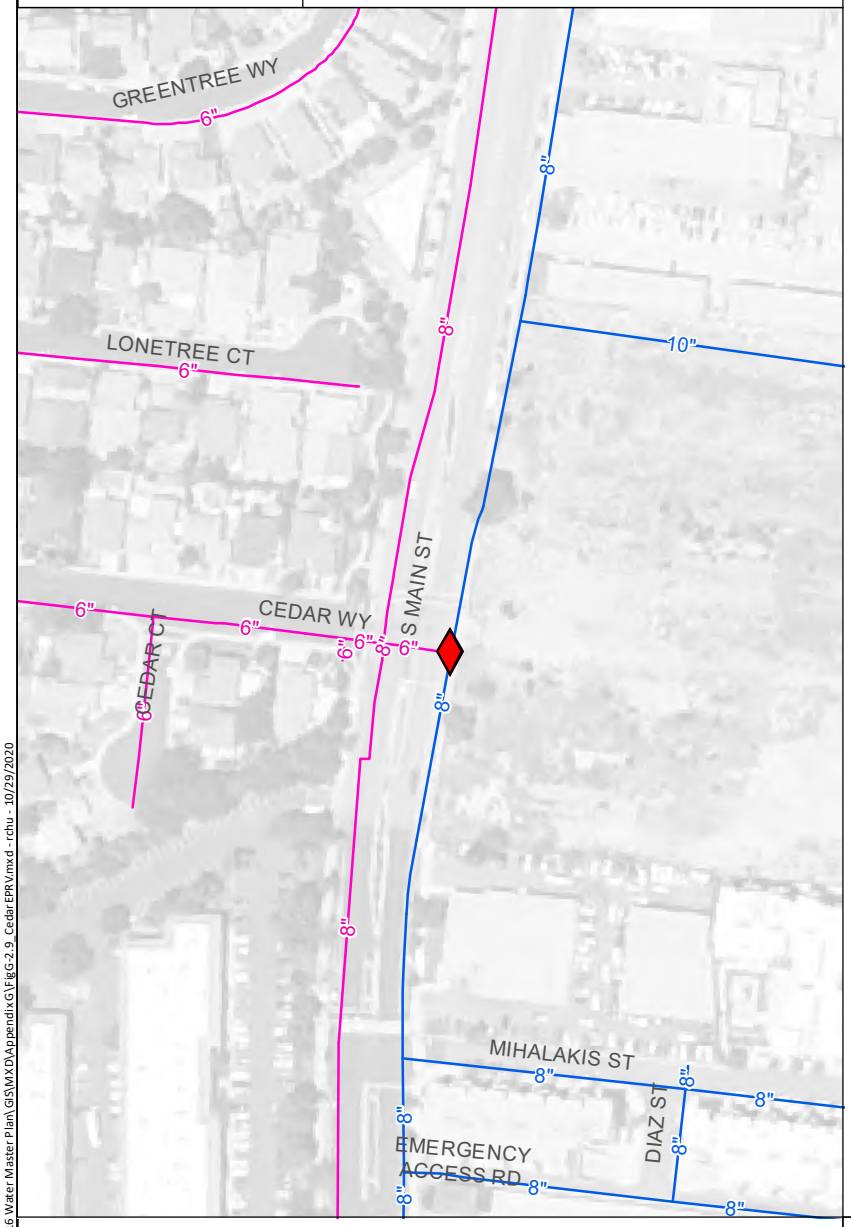
Well construction consists of pilot hole drilling, water quality/soil sampling, pilot hole reaming, well construction, well development and providing the necessary housing, pump, motor, automatic control equipment, discharge piping, supervisory control and data acquisition (SCADA), disinfection equipment, and a backup power generator. Costs assume a well capacity between 500 and 1,000 gpm. A higher capacity may increase costs.

**Figure G-2.8**
**City of Milpitas**
**Project Summary Sheet (BCIP-W-01)**

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Appendix G\FigG-2.8_Curtis.mxd - rchu - 10/29/2020

# BCIP-V-01
# Cedar Emergency PRV

| | |
|---|---|
| CONSTRUCTION COST | $ 282,000 |
| CAPITAL COST | $ 479,000 |
| PRIORITY | High |
| PURPOSE | Fire Flow |
| LOCATION | Intersection of Cedar Way and South Main Street |
| PRESSURE ZONE | SF1/VW1 |




RECOMMENDED IMPROVEMENT SIZE

8-inch diameter PRV and piping.

REASON FOR IMPROVEMENT

Provide fire flows from Zone SF1 to Zone VW1.

PLANNING ASSUMPTIONS

Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering: 10 percent; Construction Management: 15 percent; and Program Implementation: 10 percent).

PRV costs include the installation of control valve(s), a concrete utility vault, access hatches, site piping, earthwork, paving, SCADA, and related sitework.

**Figure G-2.9**
**City of Milpitas**
**Project Summary Sheet (BCIP-V-01)**

WEST YOST

WEST YOST - N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Appendix G\FigG-2.9_CedarEPRV.mxd - rchu - 10/29/2020

**WE** SUPPORT OUR COMMUNITIES

**WE** ARE WATER FOCUSED

**WE** TAKE PRIDE IN WHAT WE DO

**WE** STRIVE TO BECOME OUR BEST

**WE** DO WHAT'S RIGHT

**WE** BELIEVE IN QUALITY

**WE** LISTEN

**WE** SOLVE CHALLENGING PROBLEMS

**WE** SEE THE BIGGER PICTURE

**WE** TAKE OWNERSHIP

**WE** COLLABORATE

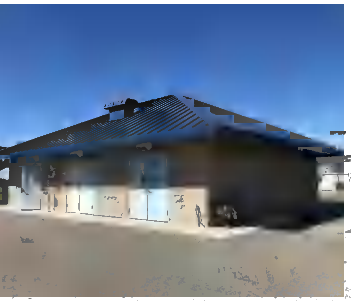
**WE** HAVE FUN

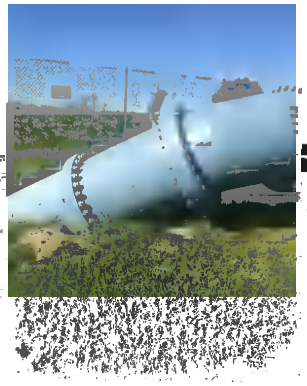
# WE ARE WEST YOST

WEST YOST

Water. Engineered.

# City of Milpitas Sewer Master Plan





# City of Milpitas Sewer Master Plan

January 2021 | DRAFT

HydroScience

City of Milpitas

# Sewer Master Plan

Prepared by HydroScience Engineers, Inc.

January 2021

HydroScience

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# ABBREVIATIONS

| | |
|---|---|
| A | Amperes |
| ABS | Acrylonitrile-Butadiene-Styrene |
| AIC | Ampere Interrupting Capacity |
| BRE | Business Risk Exposure |
| BSF | Base sanitary flow |
| CCTV | Closed caption television |
| CEQA | California Environmental Quality Act |
| CIP | Capital Improvement Plan/Capital Improvement Program, Cast Iron Pipe |
| CIPP | Cured-in-Place Pipe |
| City | City of Milpitas |
| CoF | Consequence of failure |
| d | Wastewater depth |
| D | Pipe diameter |
| DEM | Digital elevation model |
| DIP | Ductile Iron Pipe |
| DU | Dwelling unit |
| DWF | Dry weather flow |
| ESDC | Engineering services during construction |
| FM | Flow meter |
| ft, ‘ | Foot, feet, linear feet |
| ft/s | Feet per second |
| FY | Fiscal year |
| GIS | Geographic Information Systems/ArcGIS geodatabase |
| GP | General Plan |
| gpd | Gallons per day |
| GWI | Groundwater infiltration |
| HDPE | High-Density Polyethylene |
| HGL | Hydraulic grade line |
| Hp | Horsepower |
| IAP | InfoAsset Planner by Innovyze® |
| in, “ | Inch, inches |
| InfoWorks | InfoWorks ICM by Innovyze® |
| kV | Kilovolt |
| kVA | Kilovolt-ampere |
| LAFCO | Local Agency Formation Commission |
| LoF | Likelihood of failure |
| Main LS | Milpitas Main Lift Station |
| MGD | Millions of gallons per day |
| MH | Manhole |
| NASSCO | National Association of Sewer Service Companies |

| | |
|---|---|
| NAVD 88 | North American Vertical Datum of 1988 |
| NEMA | National Electrical Manufacturers Association |
| NGVD 29 | National Geodetic Vertical Datum of 1929 |
| NOAA | National Oceanic and Atmospheric Administration |
| O&M | Operations & Maintenance |
| P | Pole |
| PACP | Pipeline Assessment Certification Program |
| ph | phase |
| PVC | Polyvinyl Chloride |
| QC | Quality control |
| RCP | Reinforced Concrete Pipe |
| RDI/I | Rainfall dependent inflow and infiltration |
| RG | Rain gauge |
| ROW | Right-of-way |
| RWF | San Jose-Santa Clara Regional Wastewater Facility |
| RWQCB | Regional Water Quality Control Board |
| SBWR | South Bay Water Recycling |
| SFPUC | San Francisco Public Utility Commission |
| SMP | Sewer Master Plan |
| SOI | Sphere of Influence |
| SSMP | Sanitary Sewer Management Plan |
| SSO | Sanitary sewer overflow |
| TASP | Transit Area Specific Plan |
| UF | Unit flow |
| UGB | Urban Growth Boundary |
| USA | Urban Service Area |
| USGS | United States Geological Survey |
| V | Volts |
| VCP | Vitrified Clay Pipe |
| Venus Way LS | Venus Way Lift Station |
| VFD | Variable frequency drive |
| W | Watts |
| WDR | RWQCB General Waste Discharge Requirements |
| WWF | Wet weather flow |

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# EXECUTIVE SUMMARY

HydroScience Engineers, Inc. (HydroScience) was retained by the City of Milpitas (City), to prepare the City Sewer Master Plan (SMP) and develop a Capital Improvement Plan (CIP) based on the current (2020) and future (2040) planning horizons. This executive summary provides a concise discussion of the project elements including background information, analyses conducted, and recommendations.

## Services and Service Area

The City is in Santa Clara County and is bounded by the cities of Fremont to the north, San Jose to the south and west, and unincorporated Santa Clara County to the east. The City encompasses 14 square miles and is approximately 45 miles southeast of San Francisco (see **Figure ES-1**). The City provides wastewater collection services to a population of 77,961 according to the Department of Finance.

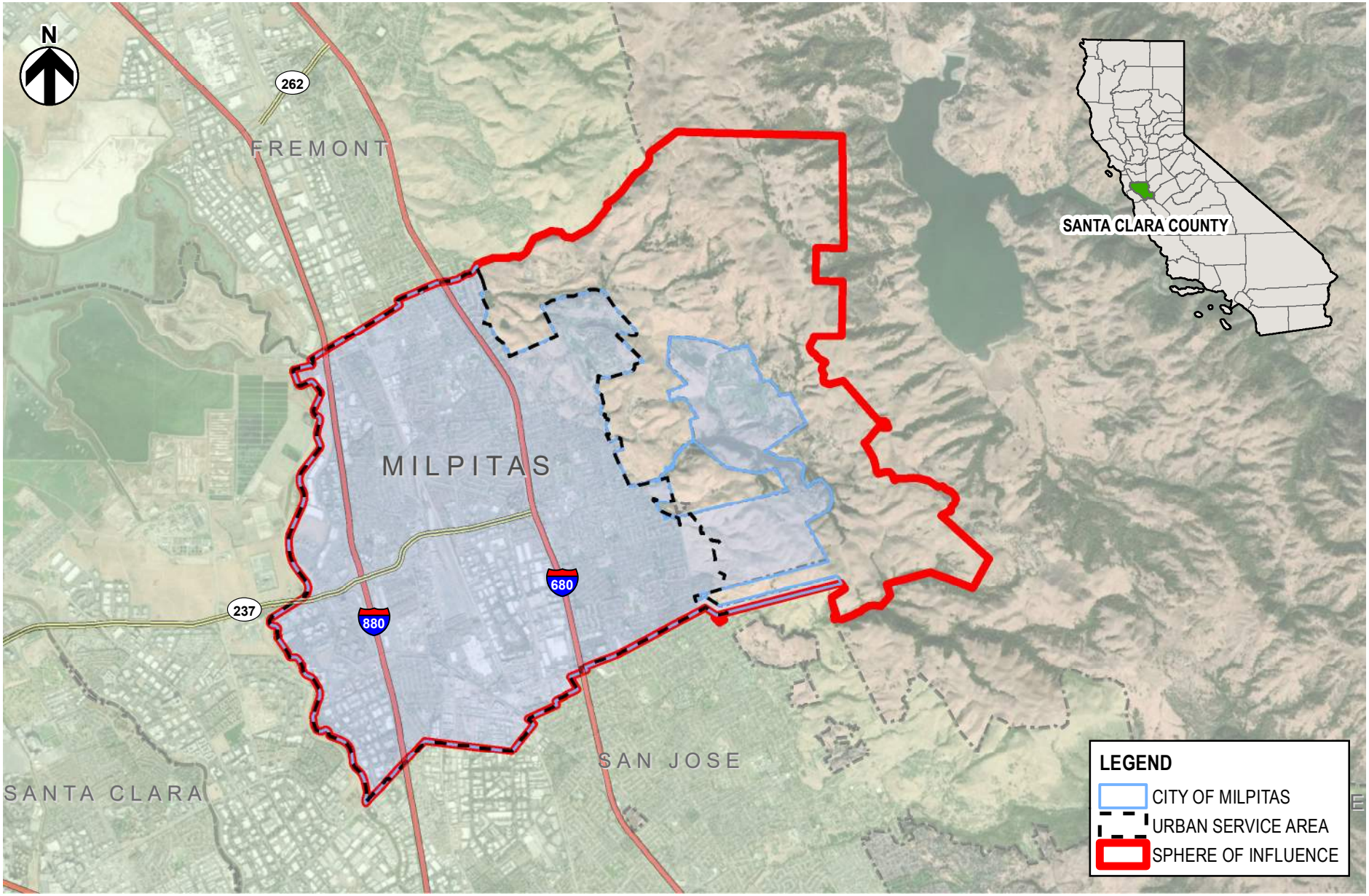
The wastewater collection system consists of approximately 160 miles of gravity sewers, with pipe diameters ranging from 4- to 66-inches. The collection system generally flows from east to west and south to north towards the San Francisco Bay. Most of the collection system flows by gravity to the Milpitas Main Lift Station (Main LS) then is pumped to the San Jose-Santa Clara Regional Wastewater Facility (RWF) through dual force mains. The Venus Way Lift Station (Venus Way LS) pumps sewage from a small portion of the City that is at a lower elevation up to a higher elevation where it then flows by gravity to the Main LS. **Figure ES-2** provides an overview of the wastewater collection system.

The City's wastewater collection system includes pipelines and structures of varying age, size, and material. According to the City's ArcGIS geodatabase (GIS), most the City's wastewater collection system pipelines are vitrified clay pipe (VCP) and 4- to 12-inches in diameter, and approximately 70% of all pipelines were built before 1990. The collection system also includes almost 3,000 manholes, of which approximately 60% were built before 1990. Of these manholes, 177 were identified as flow splits – manholes that allow outflow via two or more pipes.

## Condition Assessment

As part of the City's Master Plan project, a *Sewer Utility Asset Renewal and Replacement Study* (R&R Study) was conducted. The study documents the City's Business Risk Exposure (BRE) based on the physical condition and desktop assessment of the City's collection system applying a set of factors developed to determine the relative risk of failure for each pipeline segment.

The first element of the study involved performing a field investigation using closed-circuit television (CCTV) to assess the condition of key pipeline segments in the collection system. National Plant Services Inc. (NPS) successfully inspected 105,211 ft (approximately 20 miles) of pipeline. For each pipeline segment inspected, structural and operations and maintenance (O&M) related defects were identified and graded on a scale of one (least severe) to five (most severe) based on the type and severity of the defect in accordance with the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP).




HydroScience

**FIGURE ES-1**
CITY OF MILPITAS
SEWER MASTER PLAN
PROJECT LOCATION MAP

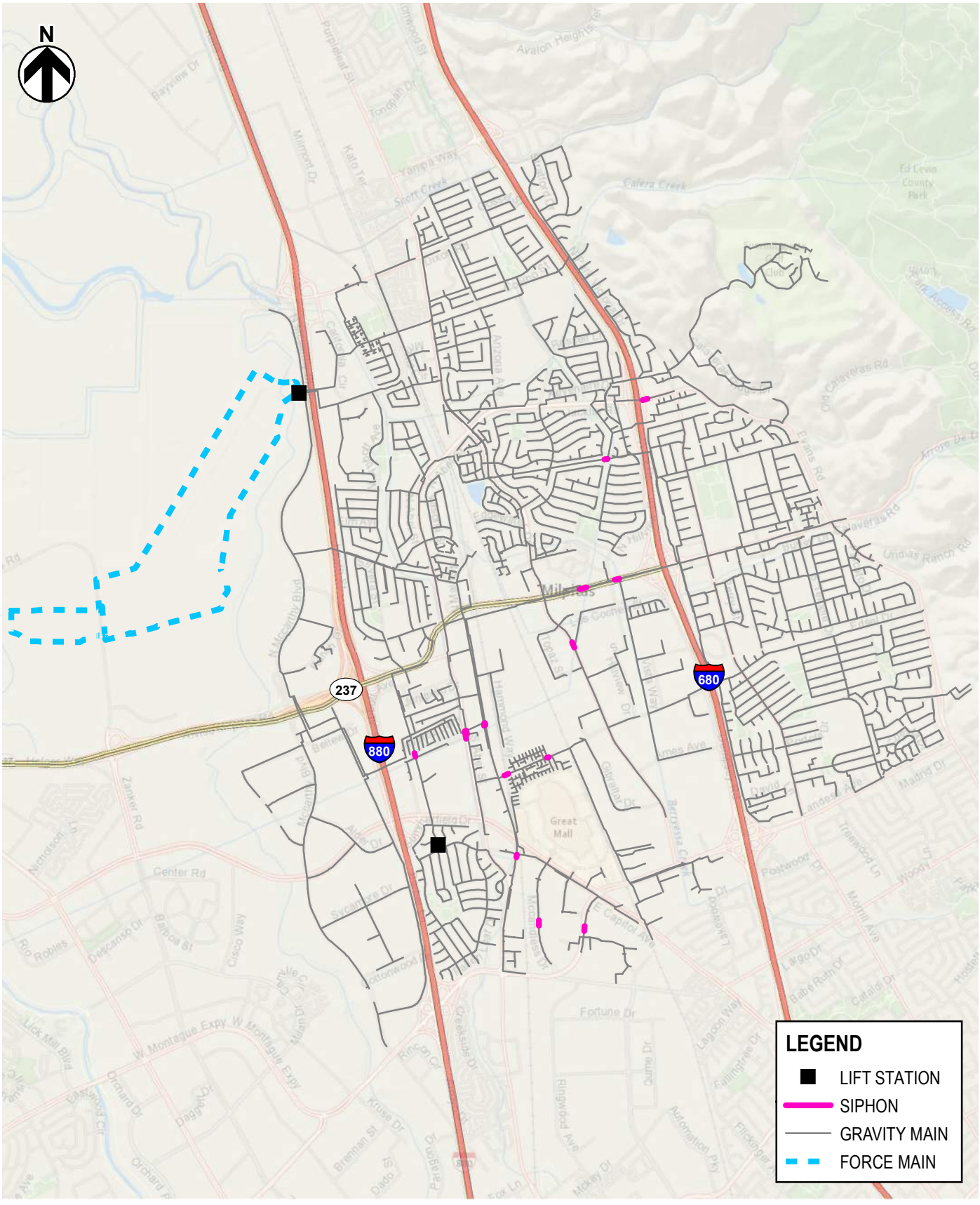



**FIGURE ES-2**
CITY OF MILPITAS
SEWER MASTER PLAN
WASTEWATER COLLECTION SYSTEM OVERVIEW

HydroScience

The second element of the study involved a desktop assessment of the entire collection system based on relative risk of failure of each pipeline segment. A pipeline's risk of failure is determined by a combination of the *likelihood* and the *consequence* of the failure of the segment.

Likelihood of failure (LoF) and consequence of failure (CoF) scores were assigned to each pipeline segment by considering various factor ratings with assigned factor weightings. Factor ratings were given on a scale of one (least likely to fail/least consequential) to five (most likely to fail/most consequential). The weighting of each factor was assigned based on the relative criticality of that factor, with higher weighting factors assigned to the most critical factors. The following factors, typical for sewer renewal/replacement, were selected for this Study:

**LoF Factors:**

- Pipe age
- Pipe material
- Structural condition
- Presence of pipe obstructions
- Required pipe cleaning
- Proximity to landslide zones
- Proximity to earthquake faults

Local geology (liquefaction)

**CoF Factors:**

- Sewer size (pipe diameter)
- Proximity to critical facilities
- Road type (impact to transit/traffic)
- Railroad proximity
- Easement (access restriction)
- Pipeline depth
- Proximity to waterway or waterbody

The following equations were used to calculate a risk score for each pipeline segment:

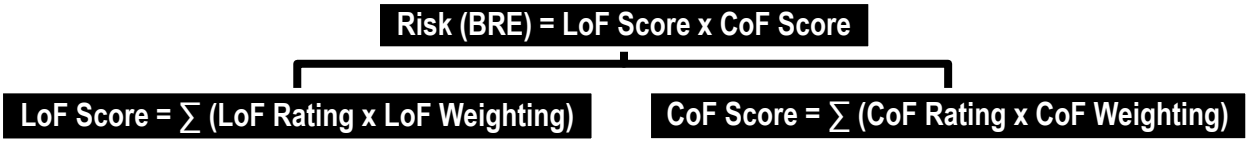



**Figure ES-3** presents the resulting BRE scores for all pipelines in the entire city.

## Hydraulic Model Land Use and Network Development

To develop base sanitary flows (BSF) – the flow directly contributed by the customer – wastewater flows were assigned to every contributing parcel in the City. For planning level analysis, parcels of similar land use types are estimated to have similar wastewater flow rates either on a per parcel basis (gpd/parcel) or per acre basis (gpd/acre) and similar diurnal patterns. City General Plan (GP) land use designations were reviewed for each parcel in the City. For modeling purposes, some modifications to the land uses were warranted to ensure relevance to the sewer analysis. Land use types expected to generate similar wastewater flows were consolidated into model-based land use designations to facilitate unit flow (UF) analysis (listed in **Table 5-1**). Land uses that have little to no contribution to the sewer system were excluded from further analysis. **Figure ES-4** presents the City according to the model-based land designations.

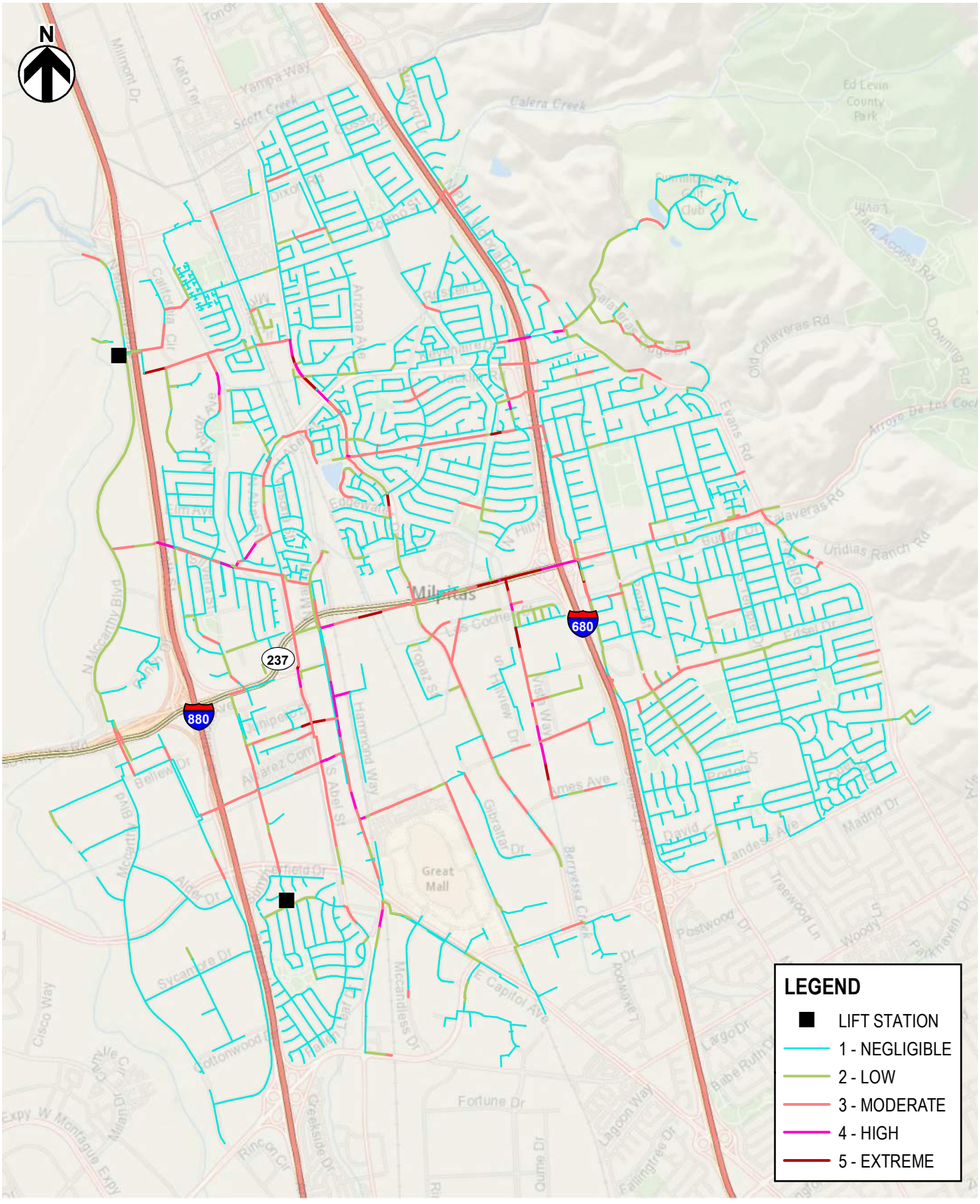



**FIGURE ES-3**
CITY OF MILPITAS
SEWER MASTER PLAN
BUSINESS RISK EXPOSURE SCORE MAP

HydroScience

The City has identified "Opportunity Areas" which refers to parcels identified within the City that may be considered for future redevelopment. The future land uses identified in the "Opportunity Areas" were reviewed and assigned the model-based land use designations listed in **Table ES-1** according to the anticipated use, density, and wastewater flow rates.

**Table ES-1: Model-Based Land Use Designations for Existing Conditions**

| GP Land Use | Code | Model-Based Land Use | Code |
|---|---|---|---|
| Hillside Very Low Density | HVL | Hillside Single-Family Low Density | HSFL |
| Hillside Low Density | HLD | | |
| Hillside Medium Density | HMD | Hillside Single Family Medium Density | HSFM |
| Valley Floor Single-Family Low Density | SFL | Valley Floor Single-Family Low Density | SFL |
| Valley Floor Single-Family Medium Density | SMD | Valley Floor Single-Family Medium Density | SFM |
| Multi-Family Medium Density | MFM | | |
| Multi-Family High Density | MFH | Valley Floor Multi-Family High Density | MFH |
| Multi-Family Very High Density | VHD | Valley Floor Multi-Family Very High Density | MFVH |
| Mobile Home Park | MHP | Mobile Home Park | MHP |
| Mixed Use | MXD | Mixed Use | MXD |
| Boulevard Very High-Density Mixed Use | BVMU | High Density Mixed Use | HDMU |
| Residential-Retail Mixed Use | RRMU | | |
| Professional & Administrative Offices | PAO | Professional & Administrative Offices | PAO |
| General Commercial | GNC | Commercial | COM |
| Retail Sub-Center | RSC | | |
| Industrial Park | INP | Industrial Park | INP |
| Manufacturing | MFG | Manufacturing | MFG |
| Public Facilities | PF | Public Facilities[1] | PF |
| | | Elmwood Correctional Facility[2] | COR |
| TWC, MXD, GNC, INP, HWS, RSC | | Hotels[3] | HOTEL |
| Park Open Space | POS | NF | |
| Waterways | WATERWAYS | NF | |
| Highway Services | HWS | Parcels reviewed and model-based land use designation assigned, as appropriate. | |
| Town Center | TWC | | |
| Urban Residential | URR | | |
| Parcels with no land use designation | - | | |

Notes:
1. Includes schools, churches, health facilities, libraries, and fire stations.
2. The correctional facility is categorized as PF in the GP. For modeling purposes, it was given a distinct code.
3. Hotels are categorized under various land uses in the GP. They were identified and assigned a distinct code.

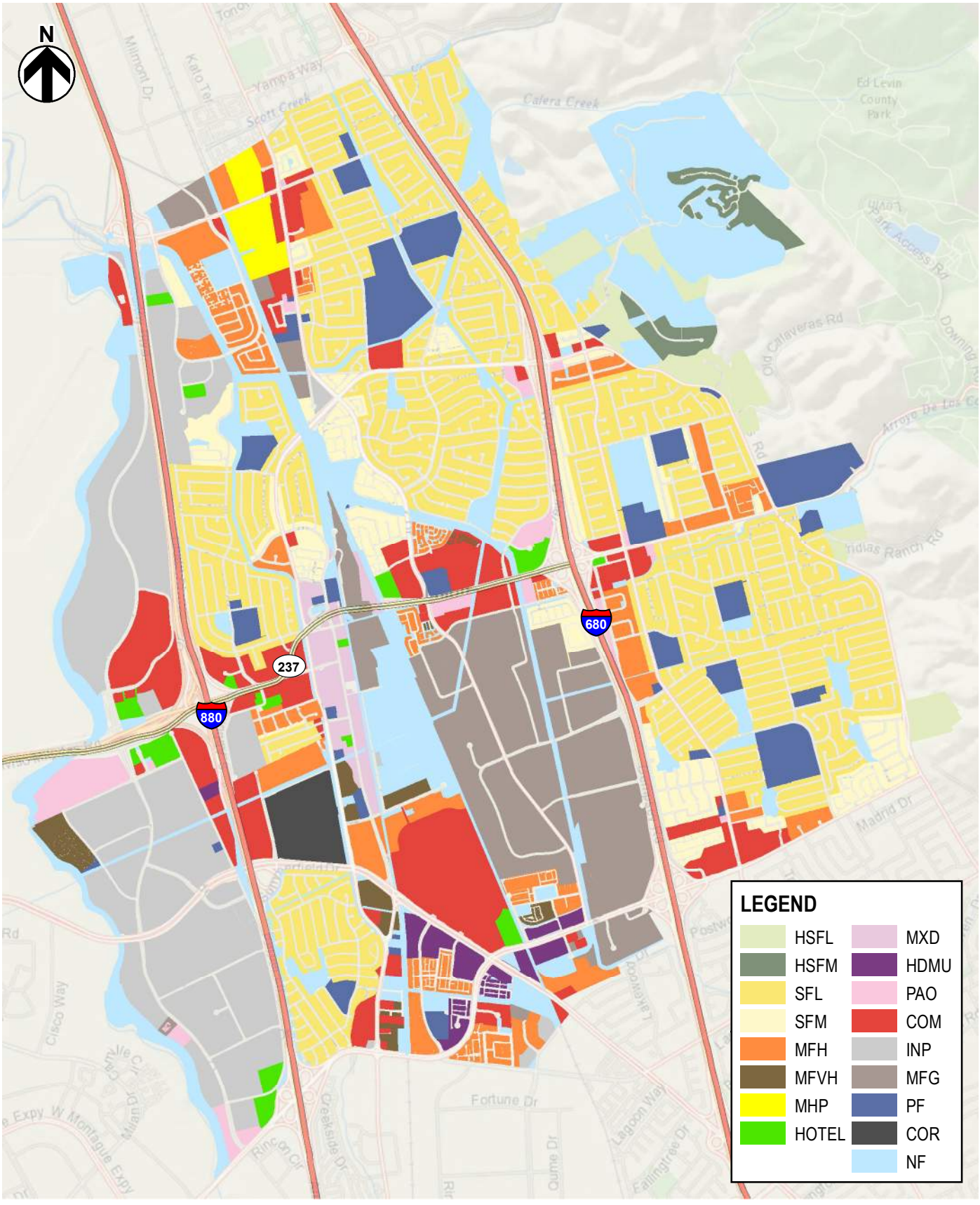



**FIGURE ES-4**
CITY OF MILPITAS
SEWER MASTER PLAN
MODEL-BASED LAND USE DESIGNATIONS - EXISTING

HydroScience

## Wastewater Flow Analysis

The City contracted with ADS Environmental Services (ADS) to perform dry and wet weather flow monitoring within the City collection system. ADS installed 23 FlowShark Triton flow meters throughout the City and monitored flow between November 16, 2019 and March 9, 2020. The collection system was divided into 21 sub-basins based on the location of the flow meters, and the data from the flow monitoring program was used to calibrate the hydraulic model. Dry weather flow data from the flow monitoring program was used to develop dry weather groundwater infiltration (GWI) for each sub-basin and BSF. For modeling purposes, this document defines GWI as any, and all sources of constant flow. GWI is comprised both of groundwater infiltration and any other constant flow that is generally detected during low flow periods. BSF is represented by a combination of UF factors and diurnal patterns for a given land use. The dry weather calibration involved comparing modeled flows to observed flows and iteratively adjusting GWI values, UF factors, and diurnal patterns until modeled flows were reflective of observed flows. **Table ES-2** summarizes the UF factors developed for each land use type and the total modeled dry weather flows for both existing and future conditions.

**Table ES-2: UF Factor Summary by Land Use**

| Land Use Designation | UF Factor (gpd) | Existing Quantity | Future Quantity | Quantity Units | Existing Model BSF (MGD) | Future Model BSF (MGD) |
|---|---|---|---|---|---|---|
| HSFL | 400 | 56 | 56 | Parcel | 0.022 | 0.022 |
| HSFM | 465 | 107 | 107 | Parcel | 0.050 | 0.050 |
| SFL | 200 | 9619 | 9677 | Parcel | 1.924 | 1.935 |
| SFM | 1200 | 266 | 264 | Acre | 0.319 | 0.316 |
| MFH | 1500 | 292 | 449 | Acre | 0.438 | 0.674 |
| MFVH | 2000 | 56 | 187 | Acre | 0.113 | 0.373 |
| MHP[1] | - | - | - | Acre | - | - |
| HOTEL | 4000 | 60 | 24 | Acre | 0.244 | 0.095 |
| MXD | 1000 | 67 | 71 | Acre | 0.067 | 0.071 |
| HDMU | 2200 | 64 | 175 | Acre | 0.141 | 0.385 |
| PAO | 500 | 65 | 520 | Acre | 0.031 | 0.260 |
| COM | 900 | 467 | 367 | Acre | 0.420 | 0.330 |
| INP | 450 | 727 | 236 | Acre | 0.327 | 0.106 |
| MFG | 1500 | 550 | 499 | Acre | 0.825 | 0.748 |
| PF | 190 | 310 | 305 | Acre | 0.059 | 0.058 |
| COR[1] | - | - | - | - | - | - |
| Large Dischargers[2] | | 38 | 32 | Discharger | 1.176 | 1.006 |
| **Total** | **-** | **-** | **-** | **-** | **6.157[3]** | **6.249[3]** |

Notes:
1. Mobile home parks (3) and the correctional facility were considered large dischargers and assigned flows based on water use data.
2. Large dischargers are defined as those customers that discharge a disproportionately large volume of wastewater for the parcel size and use type. They were assigned a diurnal pattern based on the original parcel land use codes.
3. Represents the total BSF. The total BSF plus the total GWI is the total DWF.

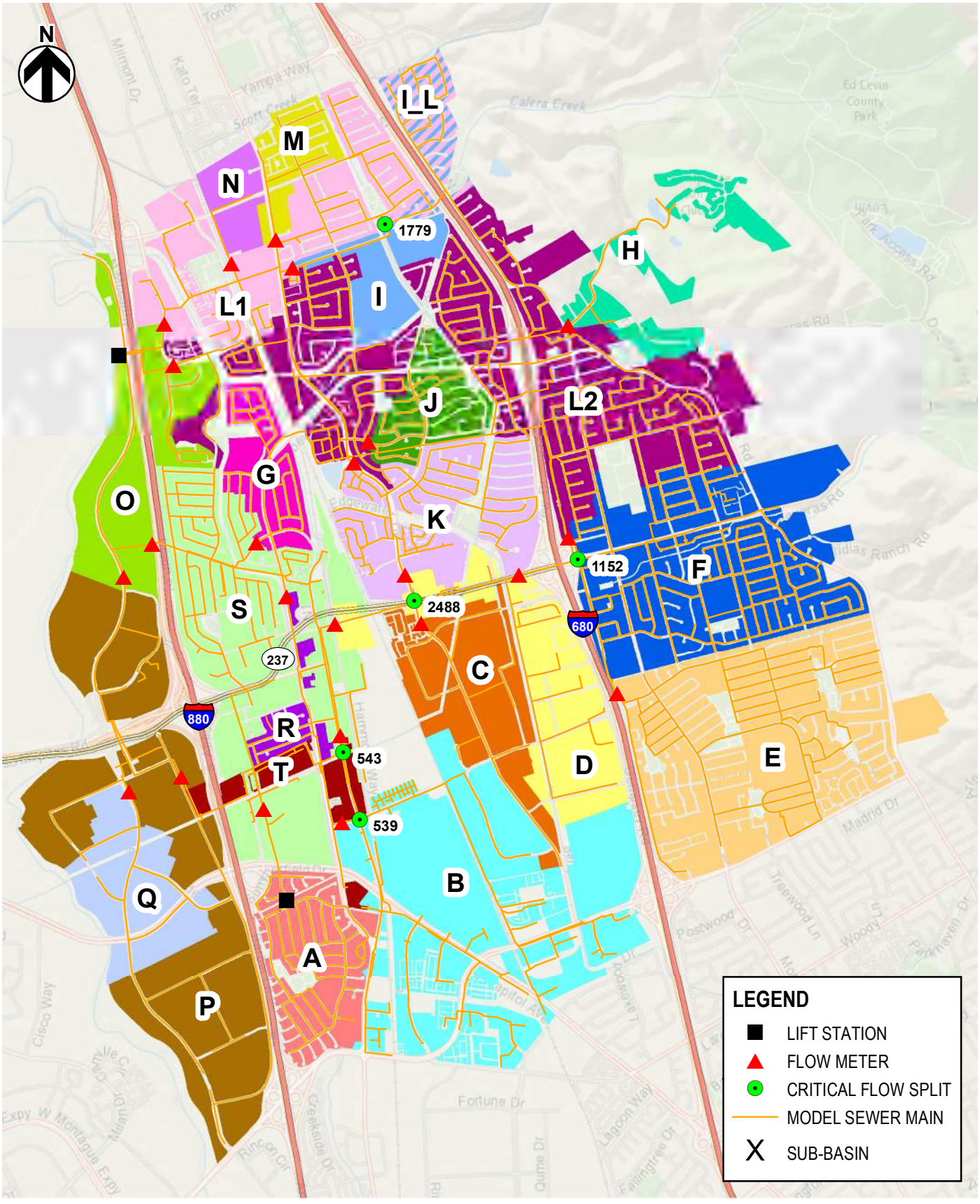



**FIGURE ES-5**
CITY OF MILPITAS
SEWER MASTER PLAN
SUB-BASIN DELINEATION

HydroScience

The largest storm identified during the flow monitoring period occurred on December 7, 2019 (Storm event 1); this was used to estimate the extent of rainfall-dependent inflow and infiltration (RDI/I) in each sub-basin. RDI/I is characterized by an R-factor, which represents the percentage of rainfall volume that enters the sewer system. GWI also tends to fluctuate throughout the wet season as the groundwater table rises and falls. Modeled flows were compared to observed flows for Storm event 1, and wet weather GWI values and R-factors were iteratively adjusted until modeled flows were reflective of observed flows. **Table ES-3** summarizes the calibrated R-Factors for each of the 21 sub-basins.

**Table ES-3: R-Factor Summary by Sub-Basin**

| Sub-Basin | Total R-Factor |
|---|---|
| A | 1.48% |
| B | 1.59% |
| C | 0.30% |
| D | 1.90% |
| E | 0.60% |
| F | 0.86% |
| G | 3.40% |
| H | 0.24% |
| I | 0.42% |
| J | 2.17% |
| K | 0.81% |
| L1 | 0.40% |
| L2 | 0.31% |
| M | 1.39% |
| N | 2.06% |
| O[1] | 1.50% |
| P | 1.26% |
| Q | 0.60% |
| R | 3.71% |
| S | 1.64% |
| T | 0.64% |

Notes:
1. There is no flow meter at the outfall for sub-basin O. Values were estimated based on surrounding sub-basins.

## Capacity Analysis

To estimate wet weather wastewater flows, a design storm is applied to the model and wet weather flows are represented based on the calibrated R-factors for each sub-basin. Under this condition, the existing and future performance of the wastewater collection system can be evaluated. For this Study, the collection system performance was evaluated using the typical 10-year 24-hour storm with a peak hour coinciding with the peak of the typical diurnal curve.

The initial deficiency criteria used to evaluate the capacity of the modeled pipes under design flow conditions was the ratio of wastewater flow depth (d) to pipe diameter (D), or d/D. In InfoWorks, if d/D is greater than one, this means the pipe is flowing full under pressure and the hydraulic grade line (HGL) is higher than the crown of the pipe. InfoWorks reports a "surcharge state" for each pipe, which is defined in **Table ES-4**.

**Table ES-4: InfoWorks Surcharge States**

| Surcharge State | Definition | Deficiency if: |
|---|---|---|
| < 1 [1] | When depth of flow is less than the diameter of the pipe | Not considered hydraulically deficient |
| = 1 | Pipe is surcharged due to backwater from a downstream deficiency. | Not considered hydraulically deficient |
| = 2 | Pipe is hydraulically under capacity and needs to be upsized. | Freeboard < 5 feet |

Notes:
1. Surcharge State = d/D

In the hydraulic model, the HGL reaching the ground surface indicates a potential SSO. Even for a pipe flowing under capacity or surcharged, if the freeboard – the distance between the ground surface and the HGL – is five feet or greater, the risk of SSO is minimal. Where pipes were shown as surcharged due to inadequate hydraulic capacity (surcharge state of "2"), a pipe was identified as deficient if the freeboard in these locations is also less than five feet.

There is a 6% increase from existing to future conditions, from 7.5 MGD to 7.9 MGD, in average dry weather flow at the outfall. **Table ES-5** presents the total system flows for all modeled conditions.

**Table ES-5: Model Flow Summary**

| Scenario | Average Dry Weather Flow (MGD) | Peak Dry Weather Flow (MGD) | Peak Wet Weather Flow (MGD) |
|---|---|---|---|
| Existing | 7.5 | 10.4 | 14.9 |
| Future | 7.9 | 11.0 | 18.5 |

There were no major capacity deficiencies identified as part of this analysis. There were six pipeline segments with a recorded surcharge state of "2" indicating that they are under capacity. Of these six segments, five of them have freeboard values greater than five feet, so they do not fulfill the criteria for a deficiency, and thus are not considered hydraulically deficient. There were no additional capacity deficiencies identified under future conditions that were not seen under existing conditions.

There is a single pipeline segment that has a freeboard of 4.7 ft., slightly less than the freeboard criteria; however, for a single pipe reach that is considered marginally deficient, replacement is not recommended without further cause. It is recommended that the City monitor this location for potential surcharging. This location (MH GID 1392) is a good candidate for installing a SmartCover to monitor the wastewater level to prevent SSOs.

## Capital Improvement Plan

The City's capital improvement program (CIP) is intended to serve as a comprehensive planning tool for budgeting and carrying out capital projects. Capital projects are designed to adhere to the City Council goals and priorities; among them is to maintain a superior level of service to the community. To that end, a compilation of improvement projects was identified as part of the detailed risk and condition assessment. The PACP peak scores from the CCTV inspection and the risk scores calculated from the LoF/CoF desktop condition assessment drive the pipeline rehabilitation selection process. Using the defect coding assigned by NPS and the desktop assessment software, the pipe segments with defects were assigned a defect-level rehabilitation method.

With the rehabilitation method established for each defect code, a decision tree was established to determine the final overall rehabilitation method for the pipeline. This decision tree was prepared based on the following factors:

- CCTV structural peak score and overall peak score;
- Number of point repairs and lining recommendations by the defect-level rehabilitation methods module;
- Number of defects;
- Length of major (score of 4 or 5) and/or minor (score of 3) defects; and
- Presence of specific defects such as infiltration drippers (ID) or Reinforcement Corroded Chemical (SRCC).

Of the approximately 105,000 ft (449 segments) of sewer pipeline inspected, approximately 50,000 ft (178 segments) requires improvement. Recommended improvements include:

- Pipe Replacement
- Full Cured-In-Place Pipe (CIPP)
- Point Repair(s) by Excavation
- Sectional Liner(s)

It is noted that some pipeline segments include more than one recommended rehabilitation method.

For segments without CCTV inspection data, risk scores and diameter were used to develop a prioritized set of segments that are recommended for CCTV inspection and further analysis.

Projects are prioritized based on risk of failure along with consideration for type of proposed rehabilitation and project location. The general strategy is to address the highest risk/highest priority projects in the near-term (Years 1-5) with lower risk projects deferred to the medium- (Years 6-10) and long-term (Years 11-20).

Costs were developed to represent capital construction costs along with soft costs. Soft costs consisting of engineering design and consulting; permitting and obtaining right-of-way; and ESDC, construction management and inspection services are included in the capital project costs.

Provided below in **Table ES-6** is a proposed budget and schedule for the CIP and recommended projects over 20-years in 5-year increments. The most critical projects are scheduled for earlier implementation. It is noted that the timing of projects can be adjusted based on results of CCTV and future operating conditions. **Figure ES-6** presents the proposed improvement projects in 5-year increments.

**Table ES-6: Proposed CIP Schedule and Budget**

| Projects | 5-Year (2022-2026) | 10-Year (2027-2031) | 15-Year (2032-2036) | 20-Year (2037-2041) |
|---|---|---|---|---|
| **Existing Projects** | | | | |
| 6124 Pump Station Rehabilitation Program | $200,000[1] | -- | -- | -- |
| 6126 Minor Sewer Projects | $200,000[2] | -- | -- | -- |
| 6130 Main Lift Station Odor Emissions Control | $200,000 | -- | -- | -- |
| 6131 Sanitary Sewer Cathodic Protection Improvements | $500,000 | -- | -- | -- |
| 6134 On-Call Sewer Maintenance & Repair Services | $98,000 | -- | -- | -- |
| **Total Existing Projects** | **$1,198,000** | **--** | **--** | **--** |
| **Proposed Projects** | | | | |
| CCTV large diameter and high-risk assets | $400,000 | -- | -- | -- |
| Highest Priority Improvements | $1,562,000 | -- | -- | -- |
| Medium- to High- Priority Improvements | $5,266,000 | $6,424,000 | -- | -- |
| Low Priority Improvements | -- | -- | $6,888,000 | $1,240000 |
| Allocation for improvements identified from ongoing CCTV | $1,250,000 | $1,250,000 | $1,250,000 | $1,250,000 |
| **Total Proposed Projects** | **$8,478,000** | **$7,674,000** | **$8,138,000** | **$2,490,000** |
| **Existing and Proposed Projects** | **$9,676,000** | **$7,674,000** | **$8,138,000** | **$2,490,000** |

Notes:
1. Original allocation is $200,000 through 2023 with $148,000 in prior year funding from Sewer Infrastructure Fund to be allocated for other projects in FY2020-21.
2. Original allocation is $200,000 with $37,000 in prior year funding from Sewer Infrastructure Fund to be allocated for other projects in FY2020-21.

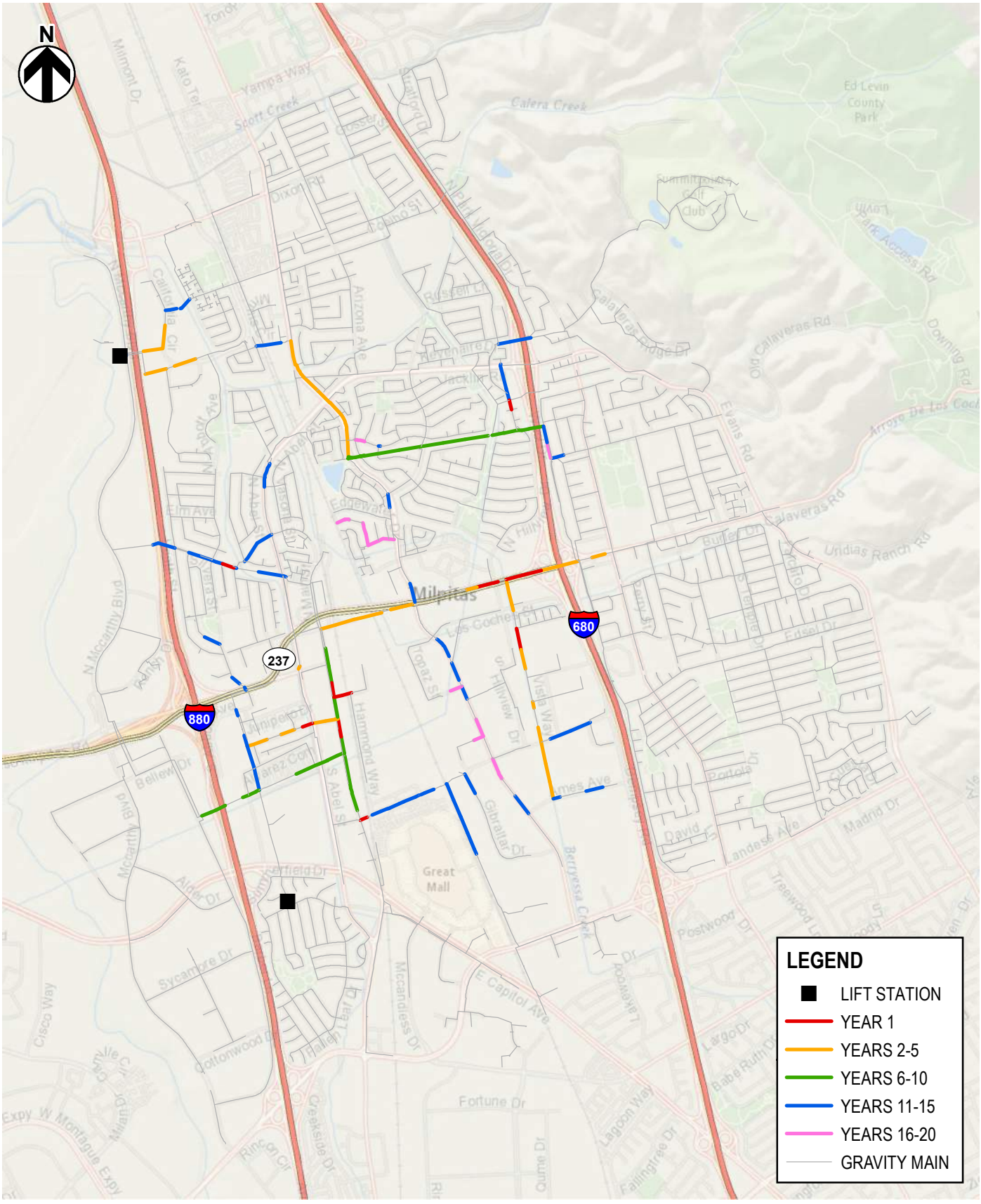



**FIGURE ES-6**
CITY OF MILPITAS
SEWER MASTER PLAN
CAPITAL IMPROVEMENT PROJECTS

HydroScience

# SECTION 1 – INTRODUCTION AND PURPOSE

HydroScience Engineers (HydroScience) was retained by the City of Milpitas (City), to prepare the City Sewer Master Plan (SMP), which includes development of a Capital Improvement Plan (CIP) based on the current (2020) and future (2040) planning horizons. This section outlines the background and SMP objectives.

## 1.1 Background

The City's wastewater system infrastructure was constructed in the 1950s when the City was established, and it was expanded with the growth of the City. Today, the City is essentially built out. The most recent SMP was completed in 2002 with a revision completed in 2004 and an update completed in 2009.

### 1.1.1 Previous Studies/Existing Documents

The following is a brief description of previous studies and documents reviewed and used in the preparation of this SMP.

- **City of Milpitas Capital Improvement Program 2020-2025 Final Report, July 2020:** Every year the City prepares a five-year Capital Improvement Program (CIP) that provides the City Council, staff, and the public with a comprehensive planning tool for budgeting and carrying out a range of capital projects. Also known as a Capital Budget, this document enables the City to identify estimated costs, priorities and schedules, funding sources and financing methods necessary for delivering critical services to meet community demands. The CIP is a necessary first step for planning the implementation and construction of new capital assets including public facilities such as water, sewer, and storm, and for repairs and replacements of aging infrastructure. The CIP reflects Council's priorities and policies to ensure that the needs of the community are met. The CIP documents the existing planned sewer related projects and the allocated funding for each project.
- **City of Milpitas Sewer Master Plan Revision, RMC, August 2004:** This study assessed the capacity of the wastewater collection system as well as investigated the conditions of the system. The SMP Revision updated the 2002 SMP, also completed by RMC. It provided information required for the City planning and financial efforts and defined the sanitary sewer system improvements necessary to accommodate the City's future land use development plans to the year 2018. During this study, the hydraulic model built using Hydra for the 2002 SMP was updated based on a wet weather flow monitoring program.
- **City of Milpitas Sewer Master Plan Update, RMC, December 2009:** This study was an update to the 2004 SMP Revision to reevaluate the City's sewer system capacity needs as a result of several development projects that were not considered for the 2004 SMP Revision. The Hydra hydraulic model was updated using updated large discharger information as well as updated future land use conditions. A CIP was developed to address any projected capacity deficiencies based on this updated modeling analysis.
- **Sewer System Management Plan 2016 Update, City of Milpitas, December 2016:** In accordance with the requirements of the Regional Water Quality Control Board (RWQCB), public wastewater collection system agencies are required to develop a sanitary sewer management plan (SSMP) that designates sewer system management practice to minimize

sanitary sewer overflows (SSOs) and provide reliable sewer service to the public. The 2016 SSMP describes the City's specific maintenance protocols to meet and exceed all requirements and documentation of the requirements set forth by the RWQCB General Waste Discharge Requirements (WDR).

- **Milpitas General Plan Update – Land Use Alternatives Report, De Novo Planning Group, September 2018:** State law requires that every city and county in California prepare and maintain a general planning document. As part of the General Plan (GP) update process, the City must update its GP Land Use Map. This Land Use Alternatives Report was developed as a tool to identify and evaluate a range of geographic locations ("Opportunity Areas") within the City where some changes to existing land uses may be appropriate.

The following studies were completed in conjunction with the Master Plan Study and are incorporated as appendices to the Master Plan. Where appropriate, details and summaries of findings have been included in the body of the Master Plan Study. For additional detail, the reader is directed to the appendices.

- **Sewer Utility Asset Renewal and Replacement Study, Brown and Caldwell, August 2020 (R&R Study):** This study was conducted as part of this Master Plan Study to assess the current condition of the City's wastewater collection system. This includes CCTV inspection results, an assessment of the relative risk of failure of all pipe segments in the City, as well as lift station inspection results. The purpose of this study is to provide the City with a set of priorities for asset renewal and replacement. This study is included as **Appendix A**.
- **Main and Venus Way Lift Station Inspections Report, Brown and Caldwell, May 2020 (LS Report):** This study was conducted as part of the Master Plan Study to assess the current operations and condition of the Main Lift Station (Main LS) and Venus Way Lift Station (Venus Way LS). This study presents the results of the on-site inspection performed for these two facilities. It is included as part of **Appendix A** (R&R Study App. K [App. K]).
- **Milpitas Sewer Flow Monitoring Report 2019-2020, ADS Environmental Services, April 2020:** This program was completed for the months of November 2019 – March 2020 for the purposes of measuring wastewater flows in the City's collection system. Both wet weather and dry weather flows were captured, and the resulting data was used for the calibration of the hydraulic model for this Study. This report is included as **Appendix B**.

## 1.2 Objectives

The objectives of this Master Plan project are:

- To perform a condition assessment on the current state of the collection system;
- To evaluate the hydraulic performance of the system under current conditions and under projected future conditions;
- To identify any hydraulic capacity deficiencies or pipes in poor condition, and
- To develop a CIP to address physical and hydraulic deficiencies.

These objectives were developed in collaboration with City Staff through technical review of available asset data and development of a hydraulic model. Through these analyses, projects were identified to help maintain the City's collection system level of service standards..

## 1.3 Report Organization

This Master Plan consists of ten sections followed by appendices that provide supporting documentation for the analyses present in the body of the SMP. The sections are as follows:

- **SECTION 1 – Introduction and Purpose**: This section presents the background leading to the development of this SMP, a description of previous work, and objectives and organization of the SMP.
- **SECTION 2 – Service Area and Wastewater Services**: This section describes the City as well as the related wastewater services.
- **SECTION 3 – Existing Wastewater Collection System**: This section describes the existing wastewater collection system and the overall system operation within the service area.
- **SECTION 4 – Condition Assessment**: This section presents the results of the condition assessment performed as part of the SMP, including the results of the closed-circuit television (CCTV) inspections.
- **SECTION 5 – Analysis of Land Uses for Hydraulic Modeling**: This section outlines the land use categories identified by the GP and details the methodology for using these land use categories for the development and calibration of the hydraulic model.
- **SECTION 6 – Hydraulic Model Development**: This section presents the process and assumptions associated with building the hydraulic model infrastructure and filling in any existing data gaps.
- **SECTION 7 – Wastewater Flow Analysis**: This section presents the results of the flow monitoring program and analysis of that data. This section also presents the development of the wastewater flows used to develop and calibrate the hydraulic model and the results of the model calibration.
- **SECTION 8 – Capacity Analysis**: This section presents identified hydraulic capacity-related deficiencies under existing and future modeled conditions.
- **SECTION 9 – Project Development**: This section presents the recommended improvements resulting from the condition assessment and the basis for cost development.
- **SECTION 10 – Capital Improvement Plan**: This section presents the recommended capital improvement projects, costs, and timeline for implementation.

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# SECTION 2 – SERVICE AREA AND WASTEWATER SERVICES

The City provides wastewater collection services to all customers within the City boundary. This section describes the service area and related wastewater services.

## 2.1 Service Area

The City is located along the northern boundary of Santa Clara County at the southern tip of the San Francisco Bay, approximately 45 miles southeast of San Francisco. It is bounded by the Cities of Fremont to the north, San Jose to the south and west, and unincorporated Santa Clara County to the east (see **Figure 2-1**).

Incorporated in 1954, the City encompassed 2.9 square miles and housed a population of 825. The Ford Motor Company assembly plant was built in 1955 and this brought the start of the City's rapid growth period; this growth was maintained by the high technology industry in the 1970s. By 1992, the City encompassed 13.6 square miles, which is approximately its current area. Today, the City is almost completely built out, so any future increases in wastewater flows would come from increases in density or changes in land use through redevelopment.

Today, the City encompasses 14 square miles and provides wastewater collection services to a population of 77,961 according to the Department of Finance. There are two distinct areas of the City referred to as the "valley floor," which is relatively flat, and the "hillside" on the eastern edge of the City limits. Elevations gently slope from west to east along the valley floor from approximately 10 ft to 120 ft and up to approximately 700 ft in the hillside area. The valley floor includes a mixture of industrial, manufacturing, commercial, and residential land uses, while the hillside is reserved solely for residential use. Parks and open spaces are scattered throughout the residential areas.

The following boundaries are identified on **Figure 2-1**:

- **City Limits:** The City Limits includes the area within the City's corporate boundary, over which the City exercises land use authority and provides public services.
- **Urban Service Area (USA):** In 1998, voters in the City established an Urban Growth Boundary (UGB) limiting development in its eastern hill areas. The initiative was set to expire in 2018 but was extended through the recent passage of Measure I by Milpitas voters in November 2016. Contiguous with the UGB the USA restricts the extension of public service and infrastructure to new development in eastern areas of the City Limits.
- **Sphere of Influence (SOI):** An SOI is the probable physical boundary and service area of a local agency, as adopted by a Local Agency Formation Commission (LAFCO). An SOI includes both incorporated and unincorporated areas within which a city or special district will have primary responsibility for the provision of public facilities and services. The SOI also coincides with the Planning Area – the area included in the analysis and planning for the 20-year horizon of the City's proposed GP.

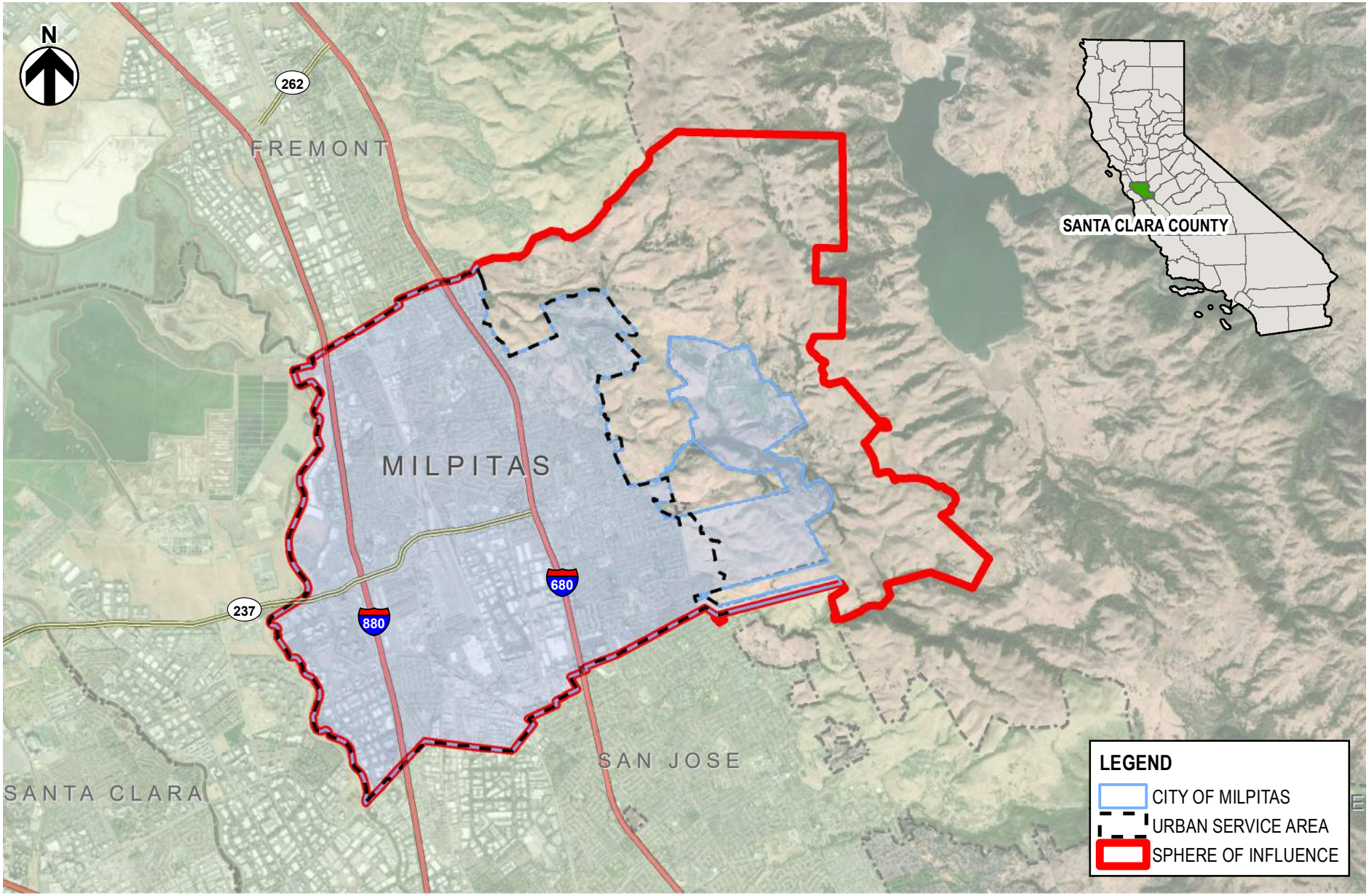


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**FIGURE 2-1**
CITY OF MILPITAS
SEWER MASTER PLAN
PROJECT LOCATION MAP

### 2.1.1 Land Use

The City's current land uses, according to the GP, are listed in **Table 2-1** and displayed in **Figure 2-2**. These land uses served as the basis for the model-based land use designations and analysis, which are described in **SECTION 5**.

**Table 2-1: General Plan Land Use Categories**

| GP Land Use Categories | Land Use Code |
|---|---|
| Hillside Very Low Density | HVL |
| Hillside Low Density | HLD |
| Hillside Medium Density | HMD |
| Single-Family Low Density | SFL |
| Single-Family Medium Density | SMD |
| Multi-Family Medium Density | MFM |
| Multi-Family High Density | MFH |
| Multi-Family Very High Density | VHD |
| Mobile Home Park | MHP |
| Urban Residential | URR |
| Mixed Use | MXD |
| Boulevard Very High-Density Mixed Use | BVMU |
| Residential-Retail Mixed Use | RRMU |
| General Commercial | GNC |
| Retail Sub-Center | RSC |
| Highway Services | HWS |
| Town Center | TWC |
| Industrial Park | INP |
| Manufacturing | MFG |
| Professional & Administrative Offices | PAO |
| Public Facilities | PF |
| Park Open Space | POS |
| Waterways | WATERWAYS |

Source: Milpitas General Plan Update – Land Use Alternatives Report, September 2018

There are several "Opportunity Areas" identified throughout the City as areas of potential growth and/or redevelopment; these "Opportunity Areas" are identified on **Figure 2-2**. The Midtown Specific Plan and Metro Specific Plan are detailed below:

- **Midtown Specific Plan**: This plan, updated in 2010, provides a new vision for approximately 589 acres of land which is currently undergoing changes related to its growing role as a housing and employment center in Silicon Valley. This plan presents an opportunity to reinvigorate the "historic" commercial and industrial core of Milpitas and bring it into the life of the City. The overall strategy of the Midtown Specific Plan is to create a mixed-use community

that includes high-density, transit-oriented housing and a central community "gathering place," while maintaining needed industrial, service, and commercial uses. This plan provides for up to 2,328 new dwelling units and supporting retail development, new office developments at key locations; bicycle and pedestrian trails linking the areas together and new parks to serve residential development.

- **Metro Specific Plan**: Of the 443 acres of the Metro Specific Plan, approximately 403 acres were previously included as part of the Midtown Specific Plan but have since been broken off into a new standalone specific plan. The goal of the Metro Specific Plan is to bring about an attractive and livable neighborhood that takes advantage of public investment in light rail and BART, and to transform an older light industrial district to meet high demand for housing, offices, and shopping in the Bay Area. The plan creates a structure for a walkable, transit-oriented area with a mix of land uses, which encourages walking, biking, and transit trips and minimizes vehicle trips. This type of development can accommodate substantial growth, minimize impacts on local roadways, and reduce urban sprawl at the periphery of the region.

## 2.2 Wastewater Treatment and Disposal

Wastewater from the City's collection system is conveyed to and treated by the San Jose-Santa Clara Regional Wastewater Facility (RWF). Eight tributary agencies contribute flow to the RWF including the City of Santa Clara, Cupertino Sanitary District, West Valley Sanitation District, the City of San Jose, County Sanitation District 2-3, Burbank Sanitary District, and the City of Milpitas.

The City of Milpitas pays a share of the capital cost of the RWF, based on the City's capacity rights in proportion to the 167 MGD total capacity of the RWF. The City also pays a share of the operating cost, based on the volume of wastewater discharged to RWF. The City has rights to discharge 14.25 MGD to the RWF under its current allotment.

To calculate dry weather flows from each agency, the RWF identifies the peak week – five-day period during June through October with the highest flows based on the plant's influent data – and each tributary agency is asked to provide an estimate of their average flow for the peak week.

## 2.3 Recycled Water

The City purchases recycled water from the South Bay Water Recycling (SBWR) Program. The SBWR Program is an on-going, multi-year effort to use high quality recycled water produced at the RWF and distribute for irrigation, industrial, and other purposes. The SBWR Program is administered through the City of San José's Environmental Services Division.

The City uses recycled water for irrigating public and private areas such as parks, medians, and industrial uses to supplement potable water use. The City's existing recycled water pipeline system connects to the SBWR system near Technology Drive and Coyote Creek, southeast of the State Route 237/Interstate-880 interchange. Recycled water provided by the SBWR Program is delivered through an existing transmission line. It is then distributed through a series of mains that provide landscape irrigation to business/retail areas surrounding McCarthy Ranch and Oak Creek Industrial Park, and to central Milpitas. The City maintains and operates approximately 22.4 miles of SBWR-owned recycled water lines that serve approximately 224 service connections. The City has an agreement with SBWR to be reimbursed for its costs to operate and maintain the SBWR-owned system within the City.

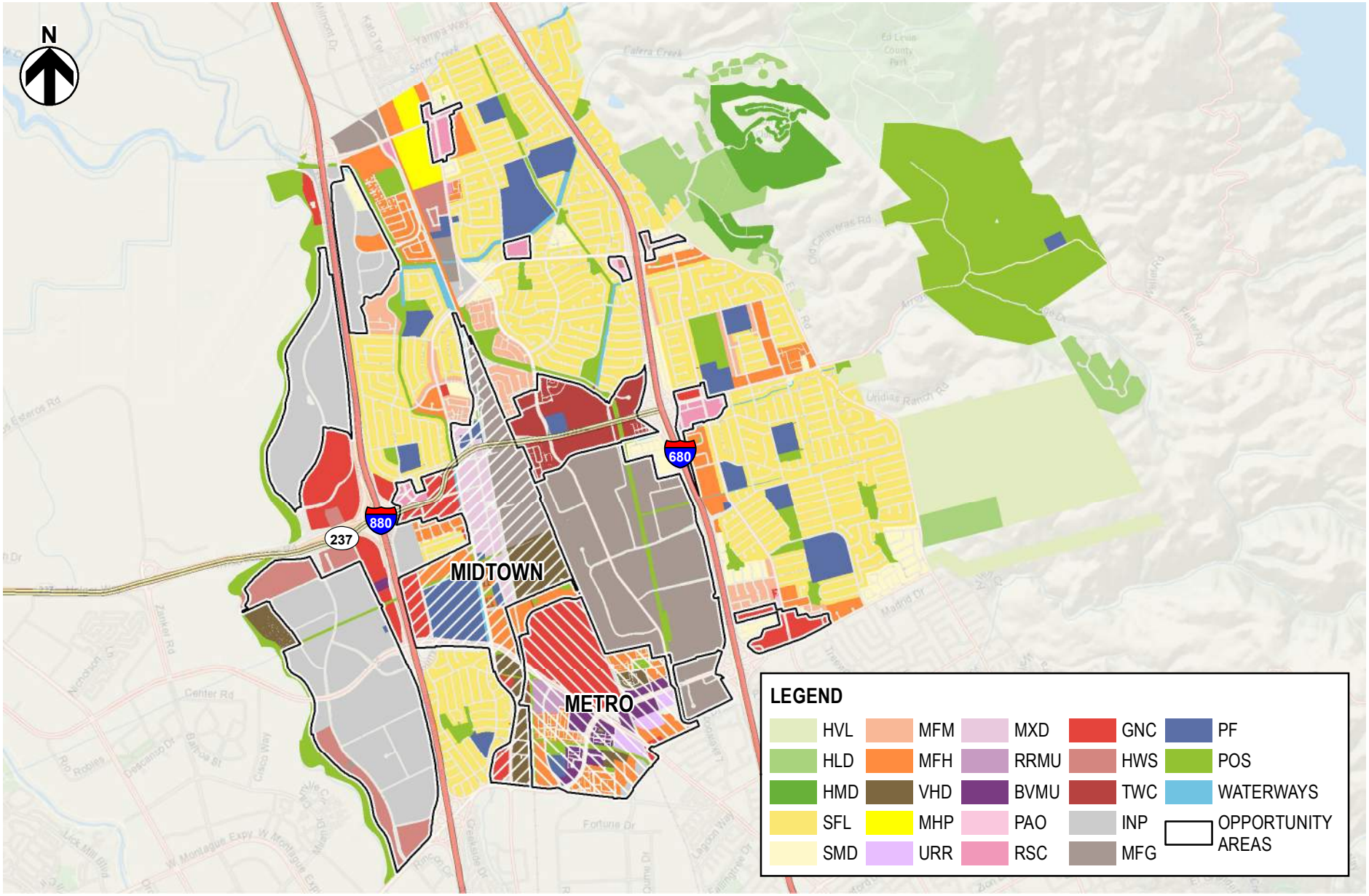


**FIGURE 2-2**
CITY OF MILPITAS
SEWER MASTER PLAN
CITY GENERAL PLAN LAND USE

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# SECTION 3 – EXISTING WASTEWATER COLLECTION SYSTEM

This section describes the City's existing wastewater collection and conveyance system. Information from previous studies, regulatory documentation, field investigation, and discussions with the City Planning Department Staff were compiled herein. A wholesale review and update of the City's ArcGIS geodatabase (GIS) was conducted using an extensive database of record drawings. A summary of the updates made to the GIS is included in **Appendix C**.

## 3.1 Wastewater Collection System

According to the updated GIS, the wastewater collection system consists of 844,114 feet (ft) (approximately 160 miles) of gravity sewers ranging from pipe diameters of 4- to 66-inches. The eastern side of the City has predominantly residential customers, with the western side of the City on the valley floor dominated by industrial and manufacturing. Commercial and mixed use are scattered throughout the valley floor as well. The topography is generally flat on the valley floor, with gradual elevation drops from the southeast to the northwest. The entire system flows to the Milpitas Main Lift Station (Main LS) in the northwestern corner of the City where it is pumped to the RWF through two force mains. An additional lift station, located on Venus Way, connects a small portion of low-elevation flow to the higher-elevation gravity system. **Figure 3-1** contains an overview of the City's wastewater collection system.

### 3.1.1 Pipelines and Manholes

The City's wastewater collection system includes pipelines and structures of varying age, size, and material. According to the City's GIS, the majority of the City's wastewater collection system pipelines are vitrified clay pipe (VCP) and 4- to 12-inches in diameter. Approximately 70% of the system was built before 1990. **Table 3-1**, **Table 3-2**, and **Table 3-3** provide breakdowns of the distribution of existing pipe material, size, and age according to the City's GIS, and are reflected in **Figure 3-2**, **Figure 3-3**, and **Figure 3-4**.

As part of the preventative maintenance program, City Staff schedule weekly cleaning for high problem areas of the system. Areas with a moderate frequency of problems receive cleaning on a monthly or biannual basis, and low problem areas including the remainder of the system are cleaned on a recurring 18-month basis.

Based on review of record drawings and existing GIS, 15 siphons were identified throughout the collection system that divert flow under the San Francisco Public Utility Commission (SFPUC) water supply pipeline, creeks, and highways. The siphons are shown in **Figure 3-1**. As part of the preventative maintenance schedule, one problem siphon is cleaned weekly, and the others are cleaned quarterly.

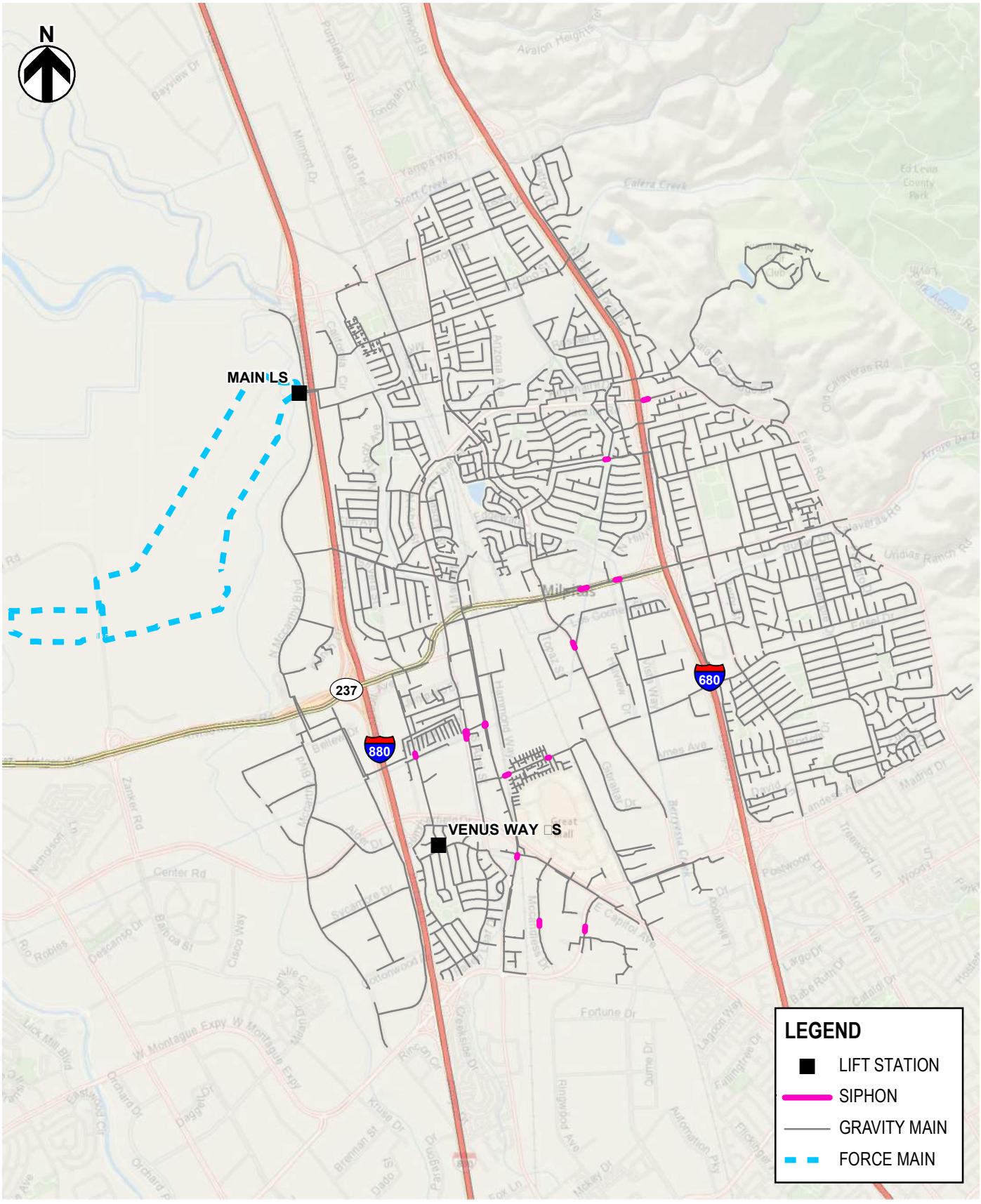


**FIGURE 3-1**
CITY OF MILPITAS
SEWER MASTER PLAN
WASTEWATER COLLECTION SYSTEM OVERVIEW

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**Table 3-1: Collection System Pipeline Material**

| Pipe Material | Total Length (ft) | Length as Percentage |
|---|---|---|
| Acrylonitrile-Butadiene-Styrene (ABS) | 13,812 | 1.64% |
| Cast Iron Pipe (CIP) | 2,027 | 0.24% |
| Ductile Iron Pipe (DIP) | 2,017 | 0.24% |
| High-Density Polyethylene (HDPE) | 15,898 | 1.88% |
| Polyvinyl Chloride (PVC) | 59,188 | 7.01% |
| Reinforced Concrete Pipe (RCP) | 36,414 | 4.32% |
| Vitrified Clay Pipe (VCP) | 650,411 | 77.05% |
| VCP/ABS | 14,337 | 1.70% |
| Unspecified | 50,011 | 5.92% |
| **Total** | **844,114** | **100.00%** |

**Table 3-2: Collection System Pipeline Diameter**

| Pipe Diameter (in) | Total Length (ft) | Length as Percentage |
|---|---|---|
| < 8 | 392,365 | 46.48% |
| 8-12 | 300,557 | 35.61% |
| 15-18 | 49,886 | 5.91% |
| 21-24 | 20,400 | 2.42% |
| 27-30 | 24,421 | 2.89% |
| 33-37 | 36,479 | 4.32% |
| 39-42 | 5,756 | 0.68% |
| 48-66 | 5,970 | 0.71% |
| Unspecified | 8,280 | 0.98% |
| **Total** | **844,114** | **100.00%** |

**Table 3-3: Collection System Pipeline Age**

| Installation Date | Total Length (ft) | Length as Percentage |
|---|---|---|
| 1951-1959 | 82,527 | 9.78% |
| 1960-1969 | 173,537 | 20.56% |
| 1970-1979 | 146,186 | 17.32% |
| 1980-1989 | 196,192 | 23.24% |
| 1990-1999 | 63,195 | 7.49% |
| 2000-2009 | 58,136 | 6.89% |
| 2010-2019 | 23,611 | 2.80% |
| Unspecified | 100,729 | 11.93% |
| **Total** | **844,114** | **100.00%** |

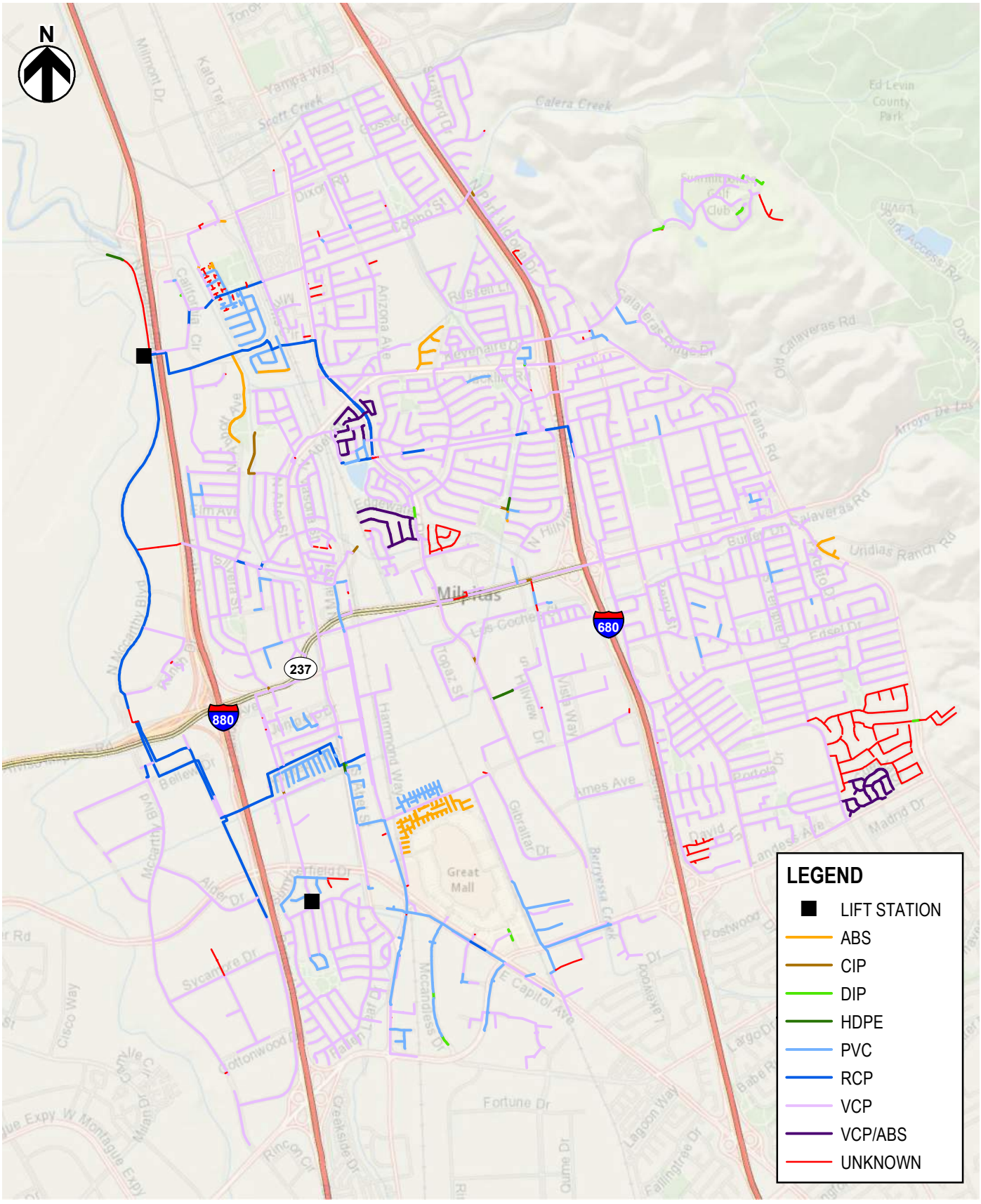


**FIGURE 3-2**
CITY OF MILPITAS
SEWER MASTER PLAN
COLLECTION SYSTEM PIPELINE MATERIAL

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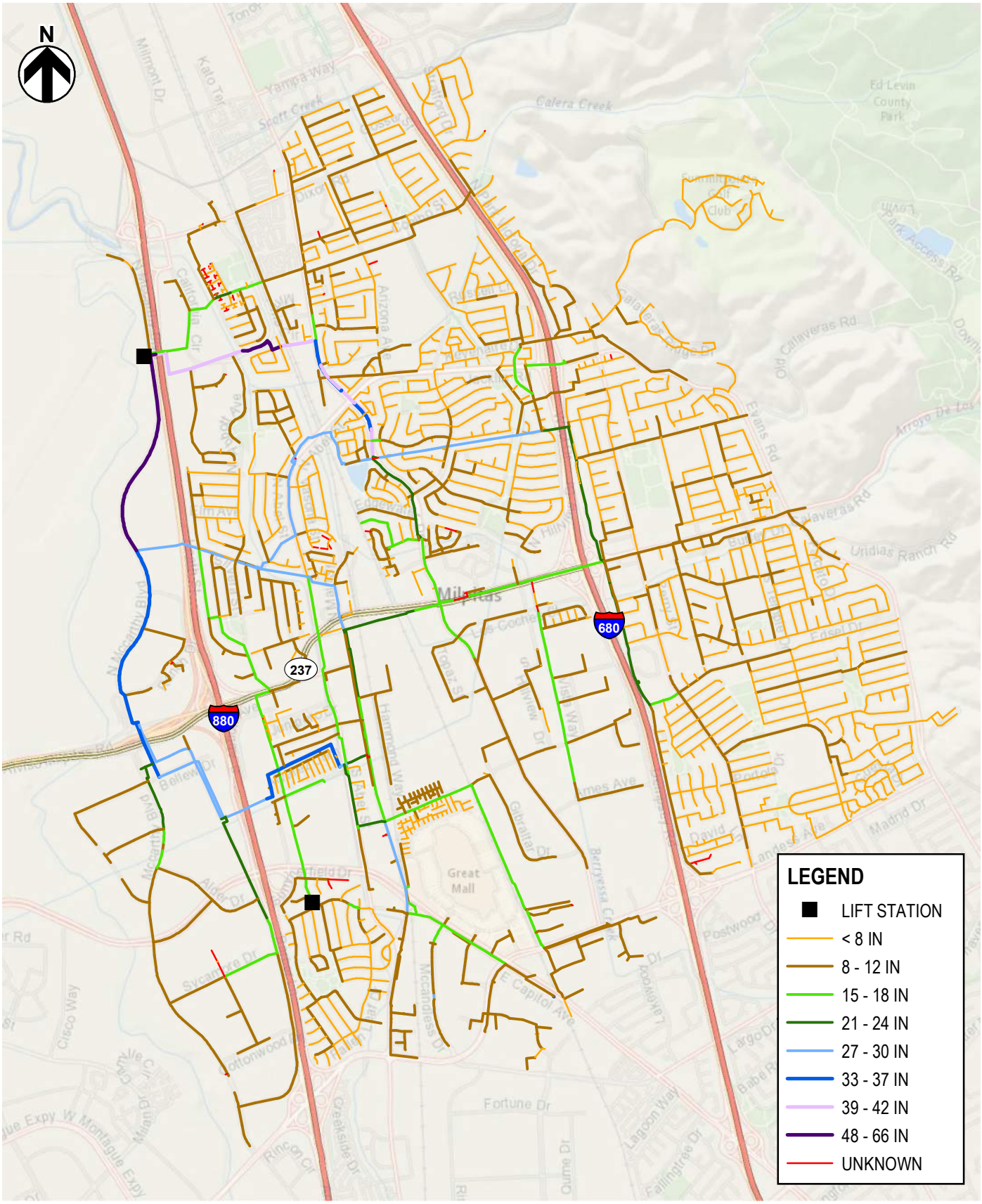


**FIGURE 3-3**
CITY OF MILPITAS
SEWER MASTER PLAN
COLLECTION SYSTEM PIPELINE DIAMETER

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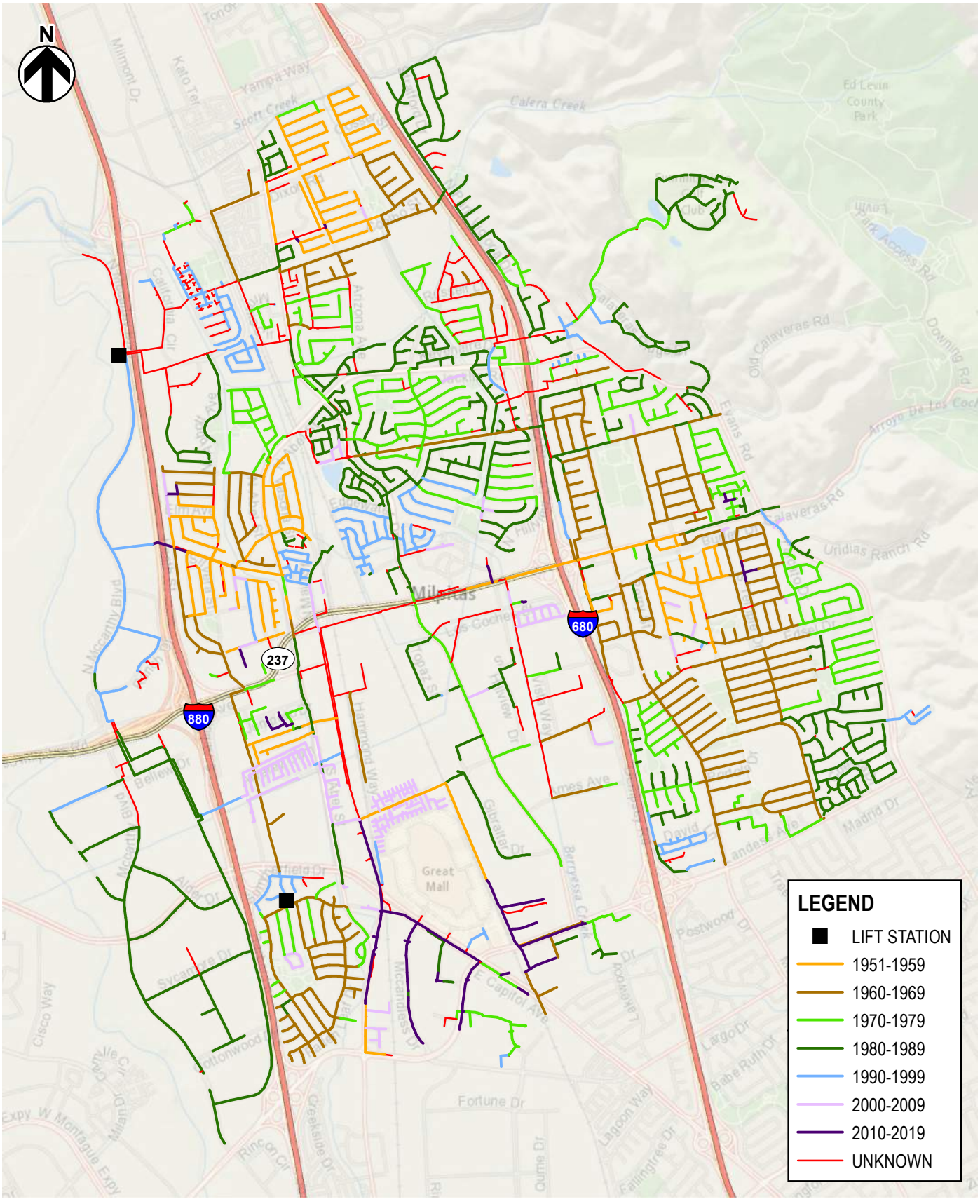


**FIGURE 3-4**
CITY OF MILPITAS
SEWER MASTER PLAN
COLLECTION SYSTEM PIPELINE AGE

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Based on the City's GIS, the collection system includes almost 3,000 manholes. Of these manholes, approximately 60% were built before 1990. **Table 3-4** provides a breakdown of the age distribution of the existing manholes based on the City's GIS.

**Table 3-4: Collection System Manhole Age**

| Installation Date | Total Count | Count as Percentage (%) |
|---|---|---|
| 1951-1959 | 229 | 7.69% |
| 1960-1969 | 440 | 14.77% |
| 1970-1979 | 415 | 13.93% |
| 1980-1989 | 631 | 21.18% |
| 1990-1999 | 286 | 9.60% |
| 2000-2009 | 204 | 6.85% |
| 2010-2019 | 125 | 4.20% |
| Unspecified | 649 | 21.78% |
| **Total** | **2,979** | **100.00%** |

To facilitate operations and maintenance and prevent SSOs, the City has implemented SmartCover technology to monitor the wastewater collection system. They have installed 33 SmartLevel™ Monitoring Systems in sewer manholes throughout the City to provide real-time remote level monitoring to operations staff. SmartCovers can be installed under any manhole lid and can be moved to monitor areas of concern, as needed.

## Flow Splits

There are 177 identified flow splits throughout the City's collection system. Flow splits are manholes that allow outflow via two or more pipes. There are three types of flow splits within the City's collection system, including:

- **High point flow splits** – high points from which sewage flows in opposing directions (see **Figure 3-5**);
- **Even flow splits** – manholes where incoming flow is split proportionally in two (or more) directions where downstream pipes have matching inverts (see **Figure 3-6**); and
- **Overflow flow splits** – manhole flow splits with overflow. At an overflow split during normal flow conditions, the flow takes one path and during high flow conditions, if the manhole begins to surcharge and flow reaches a certain depth, there is an "overflow" pipeline that is activated and will carry flow (see **Figure 3-7**).

As part of the network review and hydraulic model calibration processes, three flow diversion structures (MH 1053, MH 2578, and MH 1152) were identified for inclusion in the hydraulic model. These were identified by reviewing record drawings and available CCTV information. They are described as follows:

- **Flow diversion structure** – alters an existing even flow split to mimic an overflow flow split. A typical flow diversion structure is depicted in **Figure 3-8**. As can be seen in the figure, during normal dry weather operating conditions, all inflow is directed to one outflow pipe by the diversion structure. During higher flow conditions as the manhole begins to surcharge, the diversion structure is overtopped, and some flow is diverted to an overflow pipe. To represent these structures in the model, the height of the overflow pipe invert was adjusted to match the height of the diversion structure.

All identified flow splits and flow diversion structures are displayed on **Figure 3-9**.

**Figure 3-5: Example High Point Flow Split**

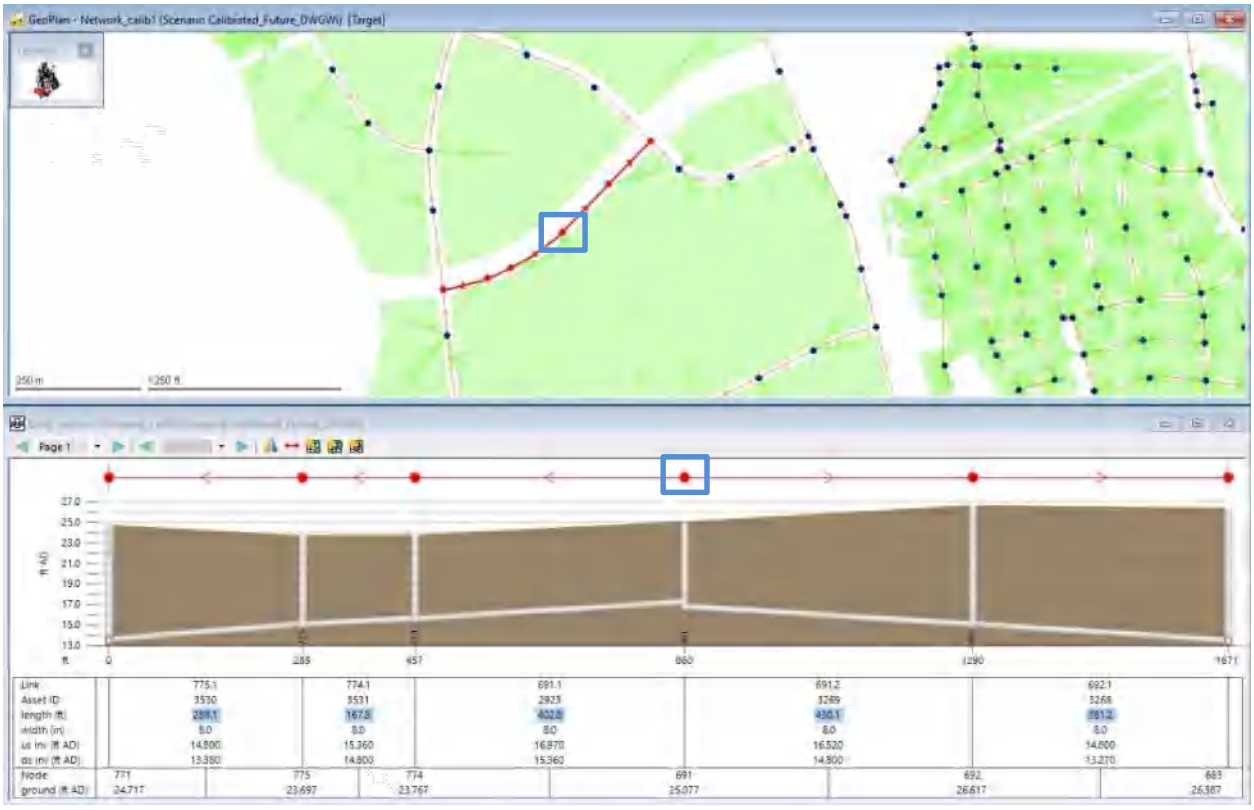


**Figure 3-6: Example Even Flow Split**

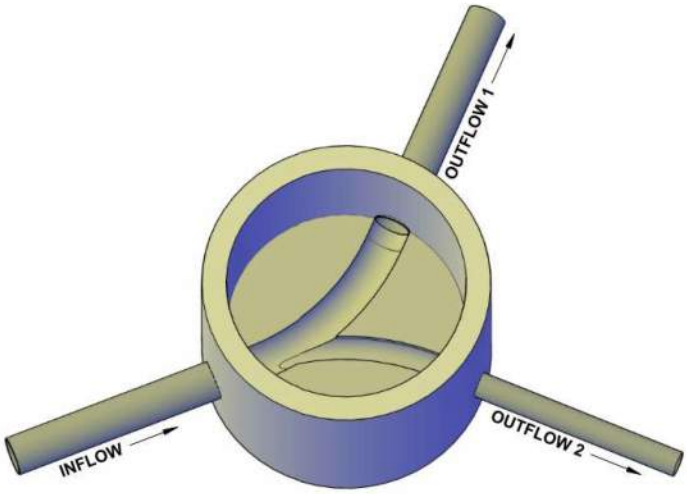



**Figure 3-7: Example Overflow Flow Split**

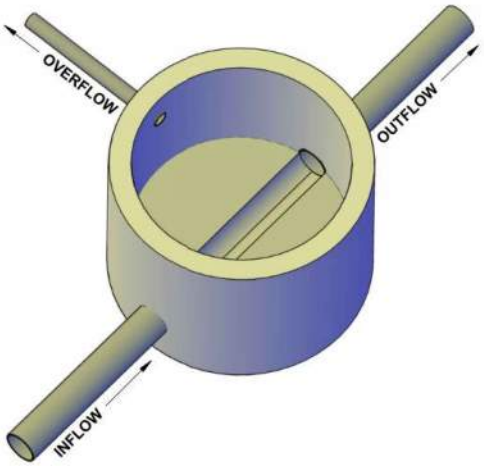
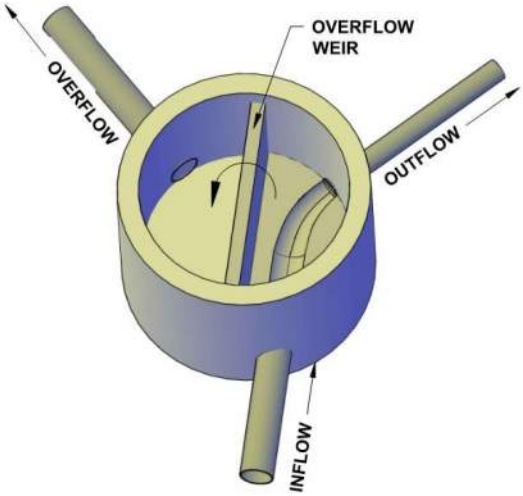



**Figure 3-8: Example Flow Diversion Structure**



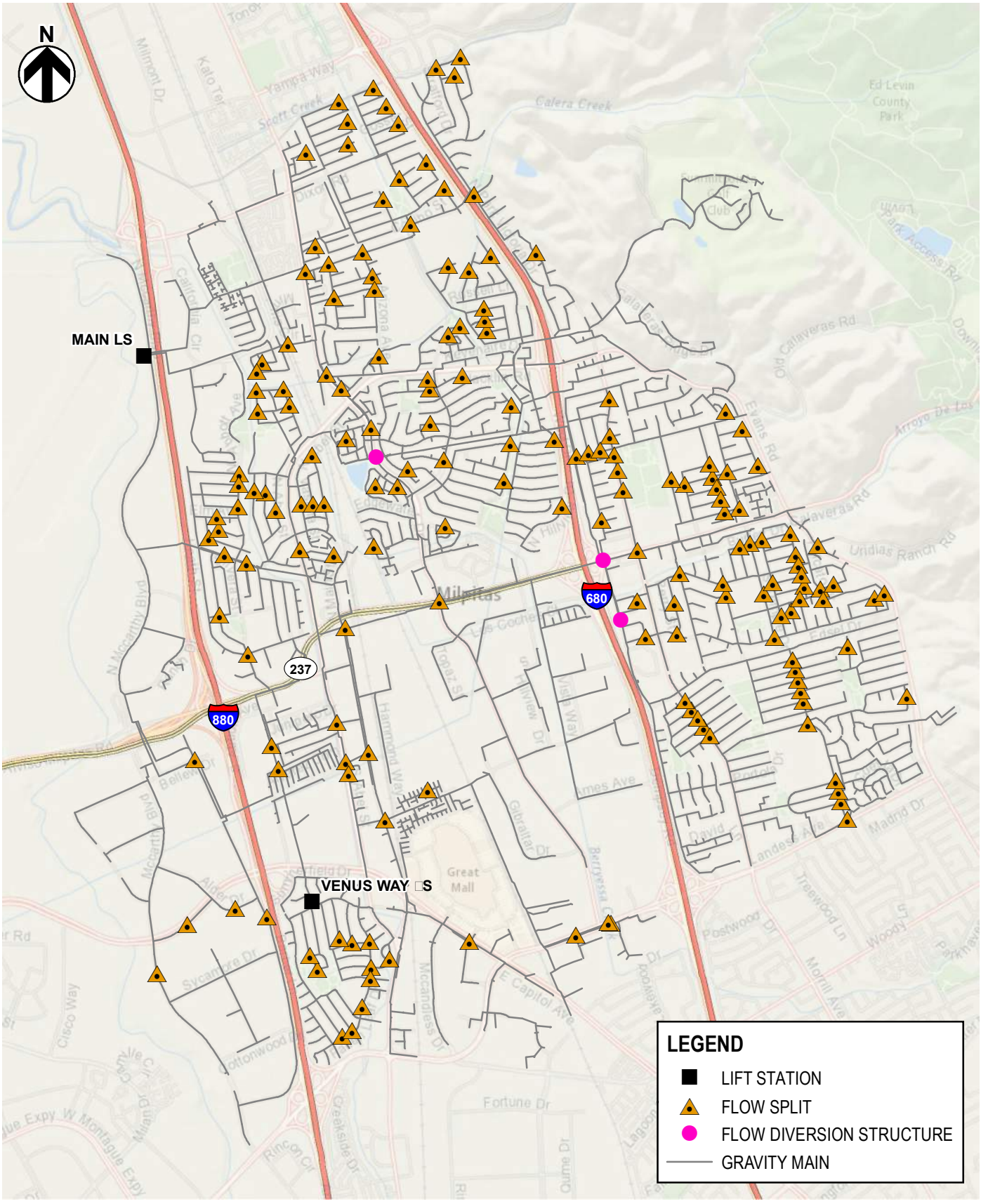



**FIGURE 3-9**
CITY OF MILPITAS
SEWER MASTER PLAN
FLOW SPLITS AND DIVERSION STRUCTURES

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### 3.1.2 Lift Stations

In February and March 2020, a condition assessment of the two lift stations was conducted as part of the Master Plan effort. An inspection report detailing the assessment and a full asset inventory list of the lift stations are included as part of **Appendix A** (R&R Study App. K, LS Report).

The Venus Way Lift Station (Venus Way LS) serves approximately 1,200 single-family homes surrounding Pinewood Park in the southwestern corner of the City. It is designed to lift wastewater collected from the lower elevations and transmit it the collector main parallel to, and to the east of, Interstate 880. It is a single pump (with stand-by pump) lift station, equipped with two 5 hp 3-phase 540 gpm non-clog sewage pumps in a packaged dry-well plus wet-well configuration. The wet well is a 72-inch diameter RCP wet well equipped with an aluminum hatch and safety grate. The City rehabilitated this lift station during 2008. As part of the preventative maintenance program, the Venus Way LS is inspected annually. **Table 3-5** provides a summary of the asset inventory list for the Venus Way LS; a detailed asset inventory is provided in **Appendix A** (R&R Study App. K, LS Report Sections 2.2 and 4.1).

**Table 3-5: Venus Way LS Asset Inventory List**

| Asset Name | Asset Description | Asset Type | Year Installed |
|---|---|---|---|
| **Mechanical** | | | |
| Pumps (2) #1 & #2 | FLYGT CP3102-441, 5 hp 3-PH 230 V Submersible Pump | Pump | 2008 |
| Pump Guide Rails | Reinstalled in 2008 | | 2008 |
| 8” Gate Valves (3), Pumps 1 & 2 | 8” Gate Valve, Pump 1 & 2 | Valve | 2008 |
| 8” Check Valves (2), Pump 1 & 2 | 8” Check Valve, Pump 1 & 2 | Valve | 2008 |
| 4” Flap Gate | 4’ Flap Gate in Wet Well | Valve | 2008 |
| 2” Combo Air/Vacuum Valve | 2” Combo Air/Vacuum Valve | Valve | 2008 |
| **Electrical** | | | |
| Utility Transformer | 240/120 V, 3-Ph, 3 W | Transformer | 2000 |
| Service Pedestal | Service Disconnect and Metering | | 2008 |
| Pump Control Panel | Starter Panel for Pumps 1 & 2 (each 5 hp) | Panel | 2008 |
| **Instrumentation** | | | |
| Level Instrument | Wet Well Level Sensor | Level Switch | 2008 |
| **Structural** | | | |
| Wet Well | 72” Diameter RCP | Tank | 1964 |
| Valve Vault | | Vault | 1964 |
| Aluminum Hatch-Vault | Aluminum Hatch, slide-in | Vault | 2008 |
| Aluminum Hatch-Wet Well | Aluminum Hatch w/ safety grate | Vault | 2008 |

All wastewater is collected at the Main LS, the terminal point in the gravity collection system, where it is pumped to the RWF. The Main LS is located to the west of Interstate 880 between North McCarthy Blvd and Coyote Creek Trail. Flow enters the lift station site through a single 54-inch diameter RCP pipe.

The site consists of three buildings that house the lift station components. The Main LS consists of four grinders and four large submersible 170 hp 3 phase 705 rpm pumps with variable frequency drives (VFDs). Pumps #1 and #6 are slated for future installation though the base assembly, piping, and rail system were installed under Project 6103/2-1066. Grinders #5-8 are also slated for future installation. According to the City's 2016 SSMP, the Main LS has a wet weather capacity of 45 MGD. **Table 3-6** provides a summary of the asset inventory list for the Main LS; a detailed asset inventory is provided in **Appendix A** (R&R Study App. K, LS Report Sections 2.2 and 3.1).

**Table 3-6: Main LS Asset Inventory Summary**

| Asset Name | Asset Description | Asset Type | Year Installed |
|---|---|---|---|
| **Mechanical** | | | |
| Pig Launchers (2) A & B | 36" Pig Launcher | Pig Launcher | 2002 |
| Pinch Valves (3) 1-3 | 36" Pinch Valve | Valve | 2002 |
| Mag Meter (Flow Meter A) | 24" Magnetic Meter | Flow Meter | 2002 |
| Venturi Meter – Removed in 2008 | 36" Venturi Meter (taken out) | Flow Meter | 1975 |
| Butterfly Valve | 36" Butterfly Valve, FM interconnect | Valve | 1970 |
| Manifold Piping Butterfly Valve | 36" diameter BFV, middle of manifold | Valve | 2008 |
| Manifold Piping Plug Valve #1 | 36" diameter PV, pumps 1, 2, 3 | Valve | 2008 |
| Manifold PV #1 & #2 Actuators (2) | plug valve electric actuator | Actuator | 2008 |
| Manifold Piping Plug Valve #2 | 36" diameter PV, pumps 4, 5, 6 | Valve | 2008 |
| Pumps (3) #2-4 | FLYGT CP3531-775, 170 hp Submersible Pump | Pump | 2008 |
| Pumps (4) #2-5 Piping | 20" Ductile Iron Vertical Discharge Pipe, 20" Ductile Iron 90 Elbow, 20" Flanged Coupling Adapter | Piping | 2008 |
| Pumps (4) #2-5 Check Valves | 20" Diameter Spring Loaded Check Valve | Valve | 2008 |
| Pumps (4) #2-5 Plug Valves | 20" Diameter Plug Valve | Valve | 2008 |
| Pump #5 (not installed yet) | FLYGT CP3531-775, 170 hp Submersible Pump | Pump | |
| Main Head Gate | 54" sluice gate with manual actuator | Gate | 2008 |
| Head Gate (4) #1-4 | 48" sluice gate with electric actuator | Gate | 2008 |
| Grinder (2) #1 & #4 | 5-hp electric driven | Grinder | 2008 |
| Grinder (2) #2 & #3 | 10-hp electric driven | Grinder | 2008 |
| 2" combo air/vac valve | | | |
| Force Main A B Flow Recorder | | | |
| Flow Meter B | This is for force main B | | |
| Main Transformer | 1000 kVA, 12 kV-480 V, 3-ph (PG&E) | Transformer | 2000 |
| Outdoor Utility Disconnect and Metering Panel | Outdoor NEMA 3R Enclosure | Panel | 2000 |
| Main Switchgear | Located in Existing Generator Building | Switchgear | 2000 |

| Asset Name | Asset Description | Asset Type | Year Installed |
|---|---|---|---|
| Variable Frequency Drives (4) P2-P5 | VFD for Pump (170 hp) | VFD | 2008 |
| Local Disconnect for Engine Jacket Water Heater | 30A/3P | Switch | 2000 |
| Motor Control Center (2) 2 & 2A | 600 A, 480 V, 3-ph, 3W, 65000 AIC | MCC | 2000 |
| Dry Type Transformers (2) | 30 kVA, 480-208/120 V, Dry Type | Transformer | 2000 & 2008 |
| Lighting panel (LP-1) | | Panel | 2008 |
| Lighting panel (LA) | 100 A, 1-ph, 3 Wire | Panel | 2000 |
| Motor Control Center (2) A &B | 400 A, 480 V, 3-ph, 3W, 65000 AIC | MCC | 2008 |
| Dry Type Transformer | 10 kVA, 480-240/120 V, Dry Type | Transformer | 2008 |
| Distribution panels (2) (DP-1 & DP-2) | 125 A, NEMA Type 1 | Panel | 2008 |
| Dry Type Transformer | 75 kVA, 480-208/120 V, Dry Type | Transformer | 2008 |
| Local Control Panels (4) for Grinders #1-4 | LCP grinder 1 | Panel | 2008 |
| Local Disconnects (4) for CU-1 (for FC-1), EF-1 (for Control Room), HP-1 (for FC-2) & FC-1 (for Control Room) | 30A/3P | Switch | 2008 |
| Local Disconnects (2) for EF-5 & SF-1 (for Wet Well) | 60A/3P | Switch | 2008 |
| Generator | 1000 kVA, 480 V Diesel Driven Engine Generator | Generator | 2000 |
| Automatic Transfer Switch | ATS, 1600 A | Switch | 2000 |
| **Instrumentation** | | | |
| Level Switch | Level High High | Level Switch | 2008 |
| Level Switches (2) | Ultrasonic level | Level Switch | 2008 |
| **Structural** | | | |
| Pinch Valve Vaults (3) 1-3 | Pinch Valve Vault | Vault | 2002 |
| Mag Meter Vault | 24" Magnetic Meter Vault | Vault | 2002 |
| Venturi Meter Vault | 36" Venturi Meter Vault | Vault | 1975 |
| Butterfly Valve Vault | 36" Butterfly Valve Vault | Vault | 1997 |
| Fuel Tank (bulk) | 2,000-gal UL-2085 above ground vault tank | Tank | 2008 |
| Fuel Tank (day) | | Tank | 2000 |
| Grit Chamber/Inflow Structure | | Tank | 2008 |
| Wet Well | | Tank | 2008 |

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# SECTION 4 – CONDITION ASSESSMENT

As mentioned in **Section 1.1.1**, as part of the City's Master Plan project, a *Sewer Utility Asset Renewal and Replacement Study* (R&R Study) was conducted. Included in this study is a condition assessment of the City's current collection system based on a set of factors developed to determine the relative risk of failure for each pipeline segment. This section describes the development of the factors established for the Business Risk Exposure (BRE) analysis and the results of the collection system condition assessment. The R&R Study is attached as **Appendix A**.

## 4.1 CCTV Condition Assessment

Part of evaluating the condition of the City's collection system is understanding the pipe condition based on the level of structural and/or operations and maintenance (O&M) related defects. For this part of the condition assessment, key segments of the system were selected for closed-circuit television (CCTV) investigation based on the following criteria:

- Diameter greater than 8-inches;
- Older pipe (pre-1990) and pipe materials susceptible to corrosion/failure (RCP, VCP);
- Located within high traffic areas; and
- Located within commercial/industrial areas.

**Figure 4-1** presents the segments selected for CCTV inspection based on these criteria. The pipelines indicated as "Contract" were the priority for inspection while the "Misc" were completed as time and budget permitted.

National Plant Services Inc. (NPS) was contracted to complete the CCTV assessment (168,180 ft, 31 miles, approximately 20% of the entire system) and performed this inspection between March and May 2020. Additional details regarding the planned scope of the assessment can be found in the **Appendix A** (R&R Study Section 2.1). It is expected that additional CCTV assessment will be performed by City forces in the future as part of a City-wide CCTV program.

### 4.1.1 CCTV Inspection Results

As part of the assessment work performed by NPS, NPS inspected 105,221 ft. (approximately 20 miles) of pipeline. This constitutes approximately 12% of the entire system. **Figure 4-1** shows the pipelines fully inspected by NPS in green.

There were some pipe segments where NPS attempted inspection but was unable to conduct or complete inspection. NPS reported various reasons for not completing inspection of pipe segments including the presence of siphons; manholes that were paved over or did not exist; and obstructions such as root balls, grease, and rocks. These pipe segments are shown in **Figure 4-2** in red; this includes segments for which inspection was only partially completed. Where there were obstructions observed, the survey was attempted from the next manhole in the opposite direction.

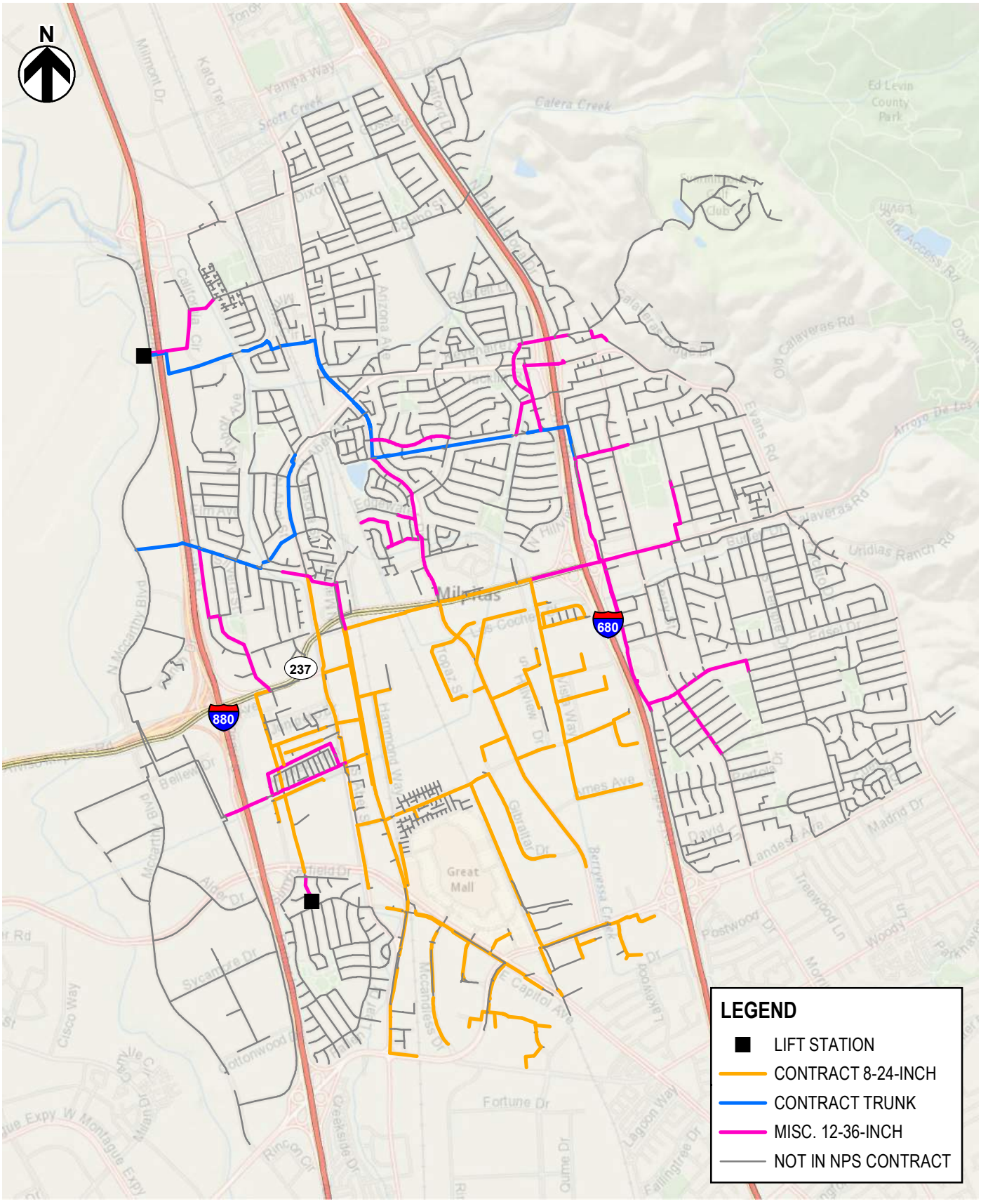


**FIGURE 4-1**
CITY OF MILPITAS
SEWER MASTER PLAN
NPS CCTV INSPECTION PLAN

HydroScience

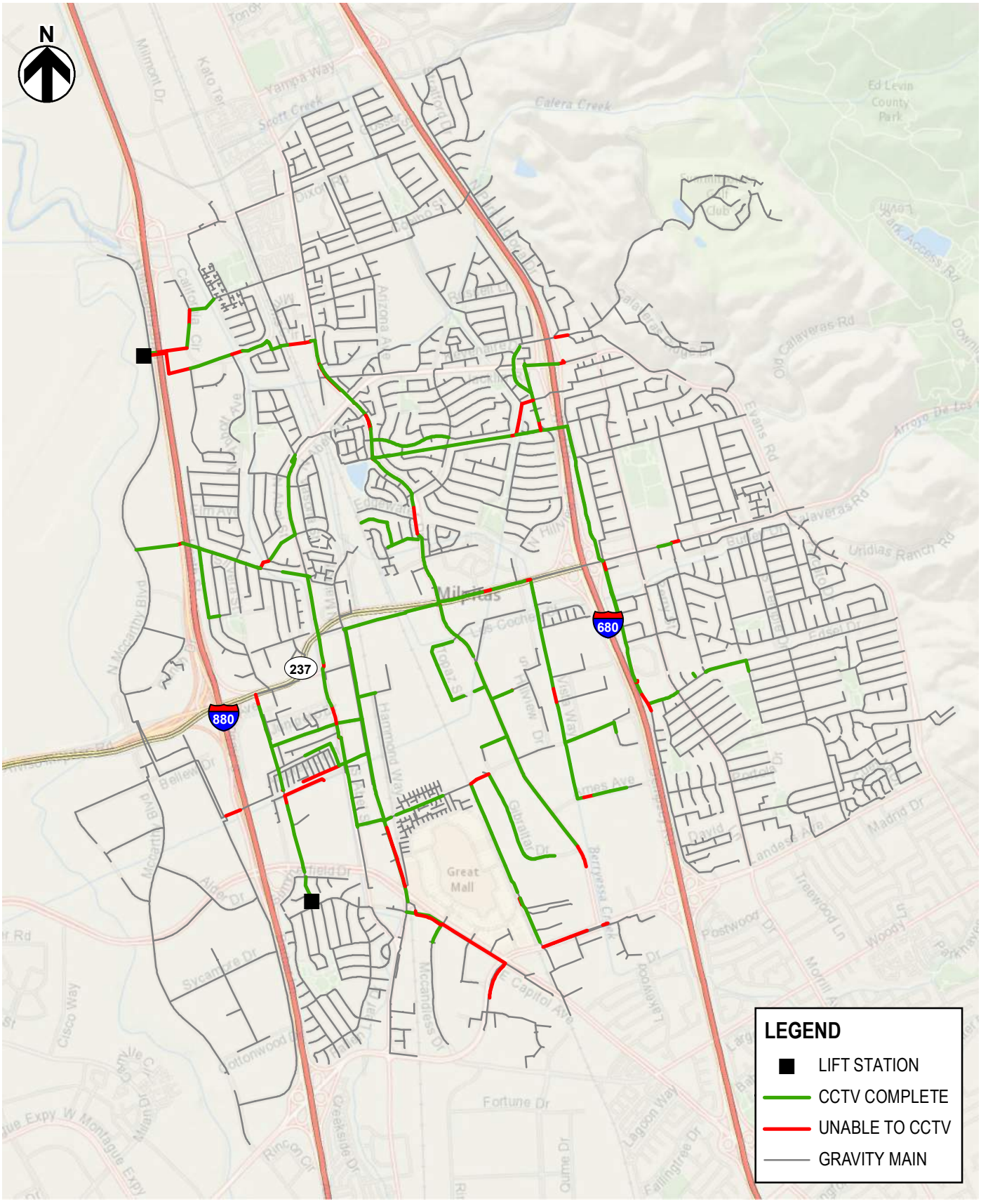


**FIGURE 4-2**
CITY OF MILPITAS
SEWER MASTER PLAN
COMPLETED CCTV INSPECTION

HydroScience

A breakdown of the completed segments by pipe diameter is presented in **Table 4-1**.

**Table 4-1: Completed CCTV Inspection by Pipe Diameter**

| Pipe Diameter (in) | Length Inspected (ft) |
|---|---|
| 8 | 8,221 |
| 10 | 3,540 |
| 12 | 19,003 |
| 15 | 25,552 |
| 16 | 195 |
| 18 | 15,292 |
| 21 | 10,268 |
| 24 | 1,995 |
| 27 | 5,337 |
| 30 | 7,393 |
| 33 | 574 |
| 39 | 2,487 |
| 42 | 2,547 |
| 66 | 1,037 |
| Unspecified | 1,788 |
| **Total** | **105,221** |

## Defect Coding

Defects were identified and sewer pipeline conditions were assessed according to the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP). PACP-certified NPS staff coded all inspected pipelines. As part of the quality control (QC) process, approximately 20% (89 out of 449 pipe segments) of inspection CCTV and PACP reports were additionally reviewed by PACP-certified staff. A detailed description of the QC process can be found in **Appendix A** (R&R Study Section 2.3).

For the condition assessment, the following steps were taken for each pipeline segment, which is defined from manhole to manhole:

1. Defects identified through review of CCTV footage.
2. Individual grade assigned based on the type and severity of defect(s).
3. Overall condition grade developed by assessing the type and number of defects along the segment.
4. Final condition rating assigned based on the condition grades and the potential for further deterioration and/or failure.

Per NASSCO PACP, each defect is categorized as either structural or O&M-related. Structural defects directly impair the structural condition of the pipe and are typically addressed through repairs, rehabilitation, or replacement. O&M-related conditions are those that directly affect the performance of the sewer or are indicative of potential future structural defects and are typically

addressed through maintenance, though some (such as infiltration) may require additional rehabilitation.

Both structural and O&M-related condition grades range from one to five. **Table 4-2** provides a description of each rating as well as some examples of structural and O&M-related defects at each rating.

**Table 4-2: Condition Grade Definitions**

| Condition Grade | Condition Rating | Structural Examples | O&M Examples |
|---|---|---|---|
| 1 | Minor defect grade | Circumferential crack; roughness increased due to surface damage; spalling of coating | Fine roots at lateral, connection, or joint; infiltration stains on barrel, lateral, connection, or joint; vermin cockroach |
| 2 | Minor to moderate defect grade | Spiral or longitudinal crack; circumferential fracture; aggregate visible due to surface damage | Factory tap intruding <10%; infiltration weeper on barrel, lateral, connection, or joint; vermin rat |
| 3 | Moderate defect grade | spiral or longitudinal fracture, lining feature blistered; medium joint offset | Deposits (grease, rags, gravel, etc.) attached 10-20%; medium roots at lateral, connection, or joint |
| 4 | Significant defect grade | Broken pipe; surface damage with aggregate missing; large joint offset | Deposits attached 20-30%; medium roots at barrel; infiltration runner at barrel, lateral, connection, or joint |
| 5 | Most significant defect grade | Broken pipe with visible void; flexible pipe deformed >10%; collapsed pipe | Deposits attached >30%; root ball at barrel; infiltration gusher at barrel, lateral, connection, or joint |

Each defect identified along a pipeline segment is categorized and rated according to **Table 4-2**. The condition of each pipeline segment is ultimately given the following three scores:

- **Structural Peak Score** – The most severe condition grade for structural defects present in a pipeline segment.
- **O&M Peak Score** – The most severe condition grade for O&M-related defects present in a pipeline segment.
- **Overall Peak Score** – The greater of the two peak scores, either the structural or O&M peak score.

The structural and O&M peak scores are used in the BRE analysis. The structural and overall peak scores developed from this CCTV condition assessment are used to develop project recommendations for the City's CIP (see **Section 9.1.1**).

**Figure 4-3** presents the overall peak scores resulting from this PACP condition assessment. Additional detail including breakdown by pipe diameter of the structural and O&M peak scores and maps of the structural and O&M peak scores can be found in **Appendix A** (R&R Study Section 2.2.1 and Appendices D and E).

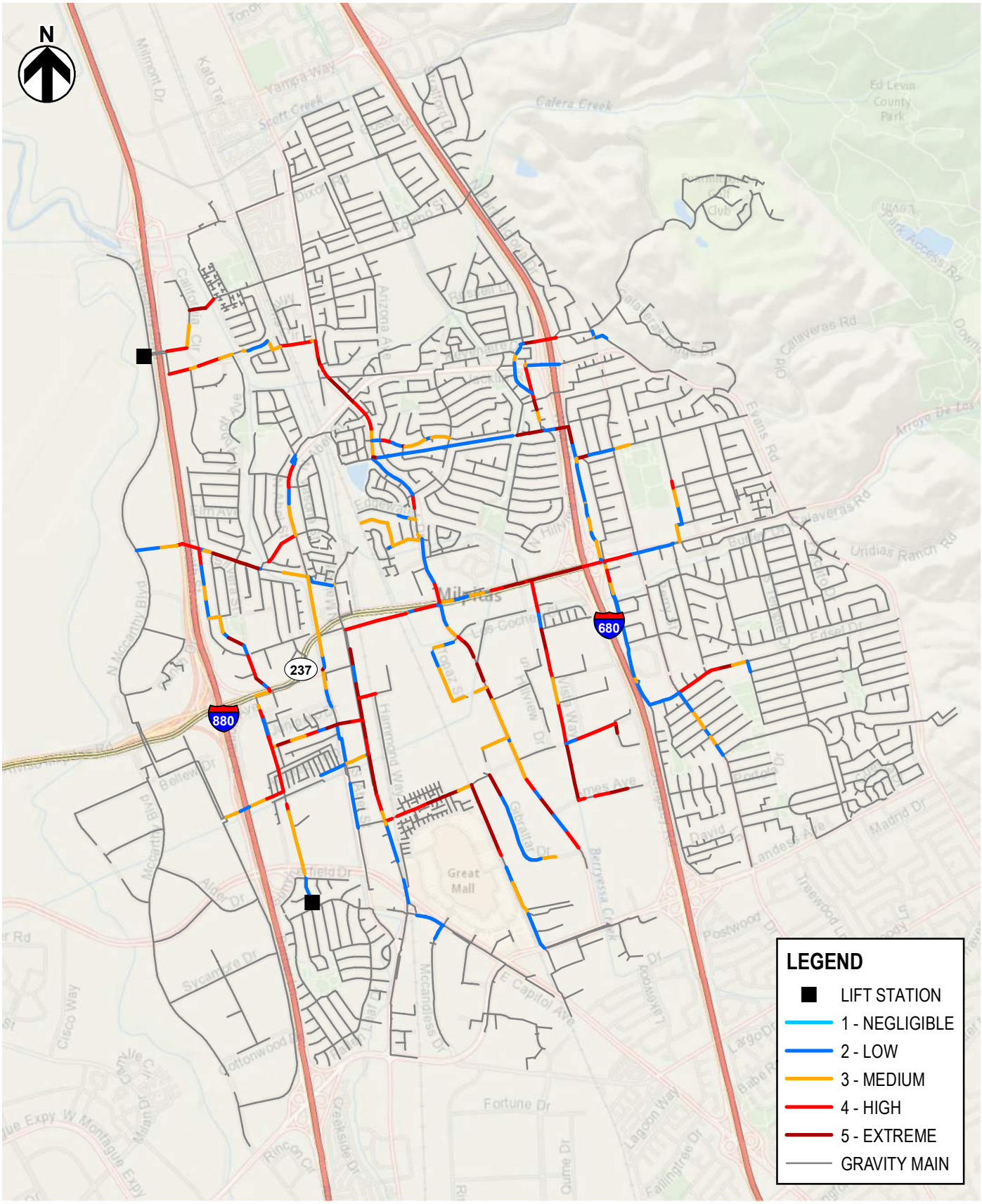


**FIGURE 4-3**
CITY OF MILPITAS
SEWER MASTER PLAN
PACP OVERALL PEAK SCORES

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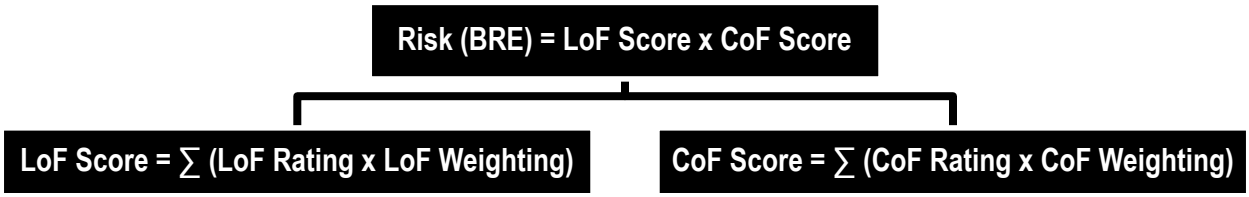
## 4.2 Desktop Condition Assessment

In addition to the PACP condition assessment performed using the CCTV footage, a desktop condition assessment was performed to determine the relative risk of failure of each pipeline segment. A pipeline's risk of failure is determined by a combination of the *likelihood* and the *consequence* of the failure of the pipe segment. The results of this assessment represent the City's BRE.

Likelihood of failure (LoF) and consequence of failure (CoF) scores were assigned to each pipeline segment by considering various factor ratings with assigned factor weightings. LoF and CoF ratings were given on a scale of one (least likely to fail/least consequential) to five (most likely to fail/most consequential). The weighting of each factor was assigned based on the relative criticality of that factor, with higher weighting factors assigned to the most critical LoF/CoF factors.

Both the factors and the weightings were established by industry standard along with input from the City Staff through a workshop between BC, HydroScience, and City Staff in April 2020. A summary of the discussion at this workshop can be found in **Appendix A** (R&R Study Section 3.4).

The following equations were used to calculate a risk score for each pipeline segment:




### 4.2.1 Likelihood of Failure (LoF)

The first factor in determining the relative risk of failure of a pipeline was the *likelihood* that the segment is unable to provide the function for which it was installed. This was determined by assigning LoF criteria and ratings based on characteristics, condition, and location of each pipeline. In cases where pipeline characteristics (age and material) were missing or unavailable, medium risk was assigned as this is the equivalent to "neutral." The following criteria were selected for this analysis and are typical for sewer renewal/replacement projects:

- **Pipe age** – In general, as a pipe ages, it has a higher likelihood to fail.
- **Pipe material** – Different pipe materials have different life expectancies and failure modes.
- **Structural condition** – Known structural defects based on 2020 CCTV inspection by NPS.
- **Presence of pipe obstructions** – Known O&M-related defects based on 2020 CCTV inspection by NPS.
- **Required pipe cleaning** – Pipe requiring more frequent cleaning are typically subject to chronic O&M issues (i.e., oil, grease, and roots) when not maintained. However, the act of cleaning with high pressure water jets can contribute to premature failure of older or compromised pipe and inadvertently remove the top layer of corroded concrete or metal pipe.

- **Proximity to landslide zones** – Landslides can pose a threat to pipe segments that are buried at a depth of three feet or less. This factor also accounts for the impact of smaller seismic events on pipe structural integrity.
- **Proximity to earthquake faults** – Pipes located in the Hayward Fault Zone are given a higher LoF rating. This factor also accounts for the impact of smaller seismic events on pipe structural integrity.
- **Local geology (liquefaction)** – A liquefaction layer from County GIS provides soil resiliency ratings to seismic events. This factor also accounts for the impact of smaller seismic events on pipe structural integrity.

Sources include the City's GIS; the City's collection system maintenance schedule; and landslide, fault, and liquefaction zoning provided by the County of Santa Clara Department of Planning and Development. The basis of scoring and weighting of each criteria is detailed in **Table 4-3**.

**Table 4-3: LoF Criteria and Ratings**

| Broad Category | Criteria | LoF Rating (← Least likely to fail 1 | 2 | 3 | 4 | Most likely to fail → 5) | Criteria Weighting |
|---|---|---|---|---|---|---|---|
| Asset Characteristics | **Installation Year** | After 2000 | 1985 -1999 | 1970 – 1984[1] | 1955 – 1969 | Before 1954 | 2 |
| | **Pipe Material** | Force Main, HDPE, PVC | VCP[1] | RCP, STL, DIP, ABS, PPR | - | ACP, CIP | 2 |
| Asset Condition | **Structural PACP Grade/ Defect Type** | Grade 2 defect(s) or lower | Grade 3 defect(s) (except hinge defects) | One Grade 4 defect (except hinge defects) OR Grade 3 hinge defect | One Grade 5 defect (except soil/void/collapse deformation >10%) OR multiple Grade 4 defects OR Grade 4 hinge defect | Multiple Grade 5 defects OR one Grade 5 defect (soil/void/ collapse deformation >10%) | 5 |
| | **O&M PACP Grade** | Grade 2 defect(s) or lower | Grade 3 defect(s) | One Grade 4 defect | One Grade 5 defect or multiple Grade 4 defects | Multiple Grade 5 defects | 5 |
| | **Required Pipe Cleaning** | - | Require annual cleaning | Requires quarterly cleaning | Requires monthly cleaning | Requires weekly cleaning | 5 |
| Asset Location | **Proximity to Landslide Zone** | Not within landslide zone | - | - | - | Within landslide zone | 3 |
| | **Proximity to Earthquake Faults** | Not within fault area | - | - | - | Crossing or within fault area | 3 |
| | **Likelihood of Liquefaction** | - | - | Prone to liquefaction | High likelihood of liquefaction | Very high likelihood of liquefaction | 3 |

Notes:
1. Unknown or unspecified characteristics were classified at this rating.

### 4.2.2 Consequence of Failure (CoF)

The second factor in calculating the relative risk of failure of a pipeline is the CoF, or the predicted impacts resulting from the failure of the segment. Similar to the LoF analysis, CoF criteria and ratings were assigned based on the following groups: service interruption potential, repair/overflow potential, impact to transportation/transit, response time to potential failure, cost of potential failure, and environmental impacts. The criteria were selected to align with City Council core values and priorities and are typical for sewer renewal/replacement projects.

The CoF criteria and the relationship to City Council core values and priorities are summarized in **Table 4-4**.

**Table 4-4: Council Core Values/Priorities and Related CoF Criteria**

| Council Core Value/Priority Area | Organization Category | Measure of Failure | CoF Criteria |
|---|---|---|---|
| Superior Customer Service | Community | Sewer service interruptions to large areas | Pipe diameter |
| Integrity and Accountability | | Sewer service interruptions to critical and educational facilities | Critical facilities (proximity) |
| Trust and Respect | | Magnitude and method of public response (sewer size) | Pipe diameter |
| Transportation and Transit | | Public transit service and traffic interruptions | Road type |
| | | Railroad interruptions | Railroad proximity |
| Governance and Administration | Finance | Response time to restore an asset | Easement (access restriction), road type |
| | | Restoration costs or impact on utility rates | Pipe diameter and depth |
| Environment | Environment | State and Federal regulatory violations or public response (discharge to surface water) | Waterway/waterbody (proximity) |

Below is a more detailed description of the selected CoF criteria outlined in **Table 4-4**:

- **Sewer size (pipe diameter)** – Larger diameter pipes are more expensive to replace and provide service to a larger service area than smaller diameter pipes.
- **Proximity to critical facilities** – Pipe proximity to an educational, police, fire, or health facility was calculated and rated for CoF. Pipelines servicing critical facilities were approximated by using a buffer of 500 feet. For context, the facility addresses were plotted as a point, so the buffer of 500 feet accounts for building size and nearby critical pipes.
- **Road type** – Different road types such as arterial or highway will impact more people than a neighborhood street. Therefore, locations where pipe intersects with major traffic conveyance routes such as freeways, state routes, arterial streets, or major roads were identified.
- **Railroad proximity** – Impacts to railroad operations and repairs on railroad property have significant cost and permitting impacts.
- **Easement (access restriction)** – Access restrictions were determined by overlaying the City GIS over an aerial basemap and manually assigning pipes which appeared to be within easements through private property or restricted areas. For example, the parking lot of a shopping mall would be assigned private but not restricted. However, if a pipe is near a swale between a park and a neighborhood, or between two properties, it was assigned "restricted access." In a further analysis, parcels with easement information could provide a more refined outcome.
- **Pipeline depth** – Pipes that are buried deeper require more time and effort to excavate and as a result can be more costly to repair or replace.
- **Proximity to waterway or waterbody** – There are significant permitting impacts for repair or cleanup of failed pipes that discharge into a waterway or waterbody.

Data sources include the City's GIS, Google Maps, major road locations provided by the County of Santa Clara Department of Planning and Development, and railroad and waterbody locations provided by the United States Geological Survey (USGS).

For a more detailed explanation of the City Council core values and how each criterion was rated, see Appendix A (R&R Study Section 3.2). The basis of scoring and weighting of each criteria is summarized in **Table 4-5**.

**Table 4-5: CoF Criteria and Ratings**

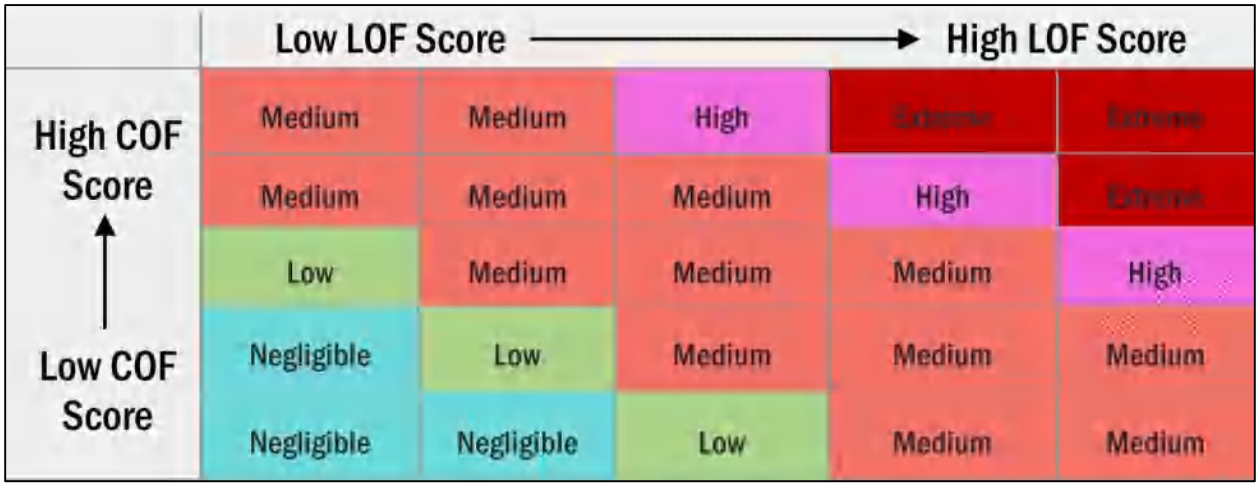
| Organization Category | Group | Criteria | CoF Rating (← Negligible consequence 1 | 2 | 3 | 4 | Critical consequence → 5) | Criteria Weighting |
|---|---|---|---|---|---|---|---|---|
| Community | Service Interruptions and Overflow Potential | **Pipeline Diameter[1,2]** | < 6 in | 8 – 12 in[4] | 14 – 18 in | 18 – 24 in | > 24 in | 1 |
| | | **Critical Facilities** | - | - | School | Fire/Police | Hospital | 1 |
| | Transportation/ Transit | **Road Type[1,3]** | Neighborhood streets | Collector streets | Arterial streets | Expressway and state routes | Freeways | 1 |
| | | **Railroad Proximity** | Not crossing or within 50' of railroad | - | - | - | Crossing or within 50' of railroad | 1 |
| Financial | Response Time | **Access Restriction** | Public right-of-way | - | Private property | - | Limited access | 2 |
| | | **Road Type[1,3]** | Neighborhood streets | Collector streets | Arterial streets | Expressway and state routes | Freeways | 2 |
| | Pipeline Cost | **Pipeline Diameter[1,2]** | < 6 in | 8 – 12 in[4] | 14 – 18 in | 18 – 24 in | > 24 in | 1 |
| | | **Pipeline Depth** | All others | - | - | - | Greater than 10' (or special configuration requiring substantial excavation) | 1 |
| Environment | Environment | **Waterway or Waterbody** | - | Within 250' of waterway or waterbody | Within 100' of waterway or waterbody | Within 50' of waterway or waterbody | Crossing waterway or waterbody | 3 |

Notes:
1. Pipe diameter and road type affect the CoF in both the broad community and financial categories.
2. Pipe Diameter weighting = 1+1 = 2; 1 (Service Interruptions and Overflow Potential) + 1 (Pipeline Cost) = 2 (overall Pipe Diameter weighting).
3. Road Type weighting = 1+2 = 3; 1 (Transportation/Transit) + 2 (Response Time) = 3 (overall Road Type weighting).
4. Unknown or unspecified characteristics were classified at this rating.

### 4.2.3 Business Risk Exposure (BRE, Risk of Failure)

The LoF and CoF scores, as described above, were automatically calculated based on the criteria and weightings laid out in **Table 4-3** and **Table 4-5** using the InfoAsset Planner (IAP) software by Innovyze, a GIS extension risk assessment tool. As described at the beginning of **Section 4.2**, the relative risk was given by the product of the LoF and CoF scores calculated by IAP. **Figure 4-4** illustrates the risk assignment for each LoF and CoF pairing.

**Figure 4-4: Risk of Failure Assessment Matrix**




Total risk scores were normalized within the dataset from one (negligible risk) to five (extreme risk). **Table 4-6** provides a breakdown of the distribution of risk scores as a portion of the total length of pipe; for a more detailed breakdown of the risk scores, see **Appendix A** (R&R Study Section 3.6). **Figure 4-5** presents a map of the resulting risk scores for the entire city, and these were used to provide CCTV recommendations (see **Section 9.1.2**).

**Table 4-6: Business Risk Exposure Score Distribution by Length**

| Risk Score | Length of Pipe (ft) | % of Total |
|---|---|---|
| 1 – Negligible | 610,497 | 77 |
| 2 – Low | 77,844 | 10 |
| 3 – Medium | 80,247 | 10 |
| 4 – High | 9,674 | 1 |
| 5 – Extreme | 5,922 | 1 |
| Blank (no facility ID) | 4,935 | < 1 |
| **Total** | **789,119** | **100** |

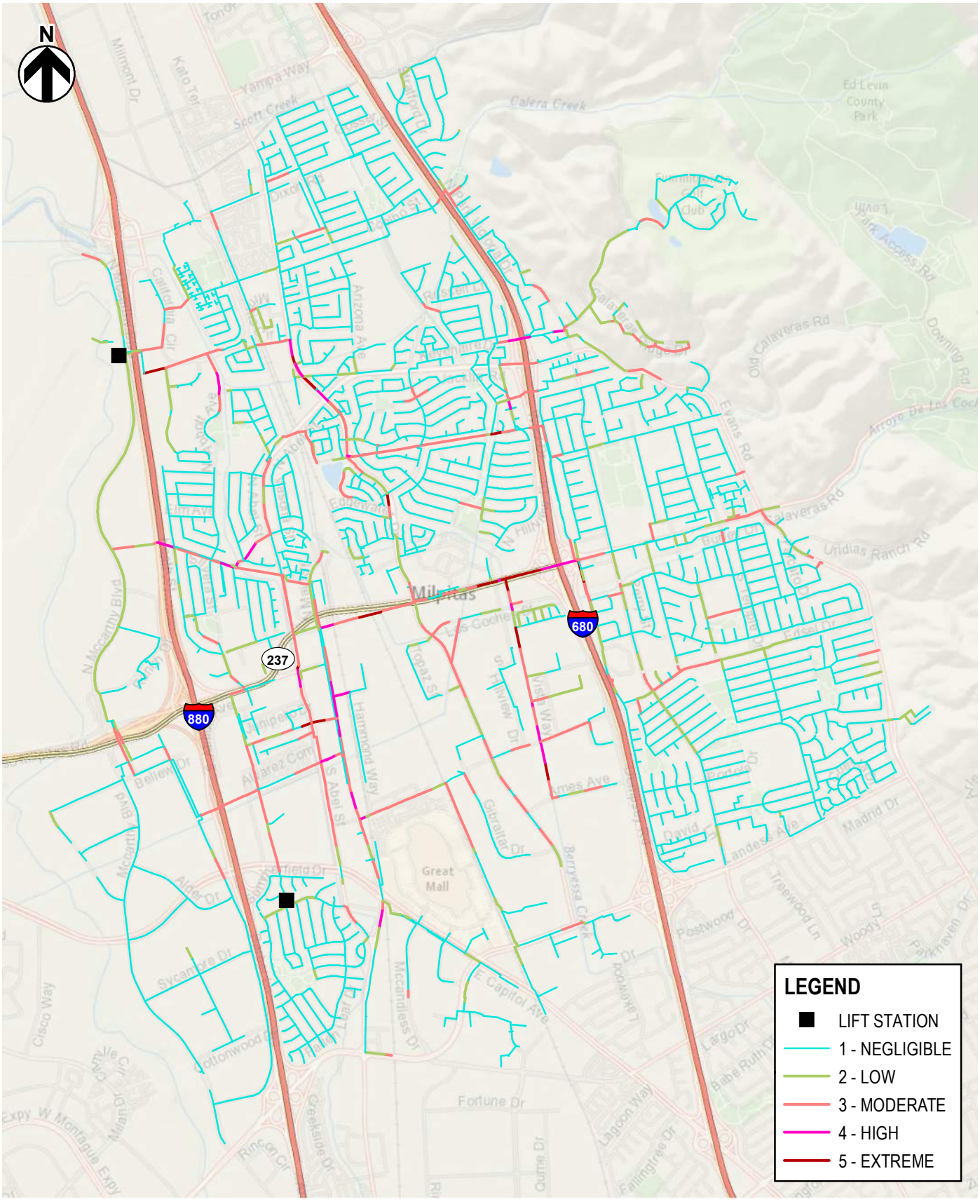



**FIGURE 4-5**
CITY OF MILPITAS
SEWER MASTER PLAN
BUSINESS RISK EXPOSURE SCORE MAP

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## 4.3 Lift Station Condition Assessment

As part of the R&R Study, BC also performed an on-site inspection of the collection system's two lift stations – the Main LS and Venus Way LS – described in **Section 3.1**. The results of this inspection are presented in the *Main and Venus Way Lift Station Inspections Report* (LS Report) which is included in **Appendix A** (R&R Study App. K). Assets in the following categories were evaluated during the inspection of these lift stations:

- Mechanical;
- Electrical;
- Instrumentation;
- Civil; and
- Structural.

Further breakdown of these categories and the specific assets evaluated are detailed in the LS Report.

Field inspections were completed on February 11 and March 11, 2020. Each asset inspected was reported with a condition score and a performance score from one to five; the breakdown of each score is summarized in **Table 4-7**.

**Table 4-7: Condition and Performance Score Definitions**

| Score | Description | Condition Score Meaning | Performance Score Meaning |
|---|---|---|---|
| 1 | Excellent/Good | No defects observed. | Functioning as intended. |
| 2 | Fair | Only minor defects observed. | In service, but higher than expected O&M. |
| 3 | Neutral | | |
| 4 | Poor | Major defects observed. Asset integrity may be compromised. | In service, but function is highly impaired. |
| 5 | Failing or Failed | Asset integrity is compromised. Asset may be out of service. | Not functioning as intended or out of service. |

### 4.3.1 Main LS Inspection

**Table 4-8** presents the major deficiencies identified at the Main LS that require timely attention. A summary asset inventory list is provided in **Table 3-6**. A comprehensive list of the inspection notes and scoring for all Main LS components are included in **Appendix A** (R&R Study App. K, LS Report Section 3).

**Table 4-8: Main LS Deficiencies**

| Asset Name | Field Assessment/Comments | Condition Score | Performance Score |
|---|---|---|---|
| Mag Meter (Flow Meter A)[1] | Not in operation | 4 | 4 |
| Manifold PV #2 Actuator | Does not work | 5 | 5 |
| Pump #3 | Has exceeded useful life[2] | 4 | 4 |
| Grinder #1 | Excessive vibration and inadequate supports | 5 | 5 |
| 2" Combination Air/Vacuum Valve | None | 4 | 4 |
| Flow Meter B[1] | Operable, but not accurate | 4 | 4 |
| Air Vacuum 1 to 15 | Cavitation, coating failure, and inadequate supports | 5 | 5 |
| Variable Frequency Drive P2 | No corrosion identified, arc flash labels missing | 4 | 2 |
| Variable Frequency Drive P3 | No corrosion identified, confirmed by City that IGBT was replaced in 2019, arc flash labels missing | 4 | 2 |
| Variable Frequency Drive P4 | No corrosion identified, arc flash labels missing | 4 | 2 |
| Variable Frequency Drive P5 | No corrosion identified, confirmed by City that cooling fans were replaced in 2019, arc flash labels missing | 4 | 2 |

Notes:
1. The City is replacing these meters as part of CIP Project 6131: Sanitary Sewer Cathodic Protection Improvements.
2. This pump has logged over 50,000 hours.

### 4.3.2 Venus Way LS Inspection

Condition and performance scores for all assets inspected were rated as 1 – no defects and functioning as intended. A summary asset inventory list is provided in **Table 3-5**. A comprehensive list of the inspection notes and scoring for the Venus Way LS can be found in **Appendix A** (R&R Study App. K, LS Report Section 4).

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# SECTION 5 – ANALYSIS OF LAND USES FOR HYDRAULIC MODELING

To develop base sanitary flows (BSF) – the flow directly contributed by the customer – wastewater flows were assigned to every contributing parcel in the City. For planning level analysis, parcels of similar land use types are estimated to have similar wastewater flow rates either on a per parcel basis (gpd/parcel) or per acre basis (gpd/acre) and similar diurnal patterns. Thus, common land use types were consolidated, where appropriate. This section discusses the land use data used for planning level wastewater modeling.

## 5.1 Land Use Designations for Model Analysis – Existing Condition

City land use designations were available as a parcel GIS shapefile containing GP land use information for each parcel in the City. For modeling purposes, some modifications to the land uses are warranted to ensure relevance to the sewer analysis. Land use types expected to generate similar wastewater flows were consolidated into general categories to facilitate unit flow (UF) analysis. Land uses that have little to no contribution to the sewer system were excluded from further analysis.

It is noted that the consolidations made for the purpose of this Study might not correspond directly to the land use categories used for the Water Master Plan Study because these categories were established based on expected similar wastewater flow generation, which do not always directly correspond to water use.

Data cleaning was necessary to assure an accurate representation of wastewater flow from individual parcels/customers. Below is a description of the GP land use categories that required further review in order to assign the appropriate model-based land use designation (see **Table 2-1**):

- The following GP Land Use categories and parcel types were assigned as “NF” (no flow) and excluded from this analysis;
    - POS, WATERWAYS, parcels consisting of train tracks, streets, parking lots, or other open space; and parcels located in the City of San Jose or unincorporated areas not serviced by the City’s sewer system.
- All parcels with location specific land use codes (HWS, TWC, and URR) were reviewed using Google Earth Satellite and Street Views and assigned a model-based land use according to facilities present on each parcel as listed in **Table 5-1**.
- Some parcels with GP land use of BVMU were assigned to COM if commercial facilities appeared to be present;
- All hotels in the City were identified and parcels assigned to a new model-based land use code: HOTEL;
- Elmwood Correctional Facility was assigned to its own model-based land use code: COR; and
- All residential GP land use categories with parcels greater than one acre were reviewed to ensure the model-based land use designations were representative according to expected wastewater generation rates. Updated model-based land use designations were assigned, as appropriate.

**Table 5-1** summarizes the GP land uses and associated codes included in the data set, and the model-based land uses developed for use in the model for this Study. **Figure 5-1** presents the City according to the model-based land use designations.

**Table 5-1: Model-Based Land Use Designations for Existing Conditions**

| GP Land Use | Code | Model-Based Land Use | Code |
|---|---|---|---|
| Hillside Very Low Density | HVL | Hillside Single-Family Low Density | HSFL |
| Hillside Low Density | HLD | | |
| Hillside Medium Density | HMD | Hillside Single Family Medium Density | HSFM |
| Valley Floor Single-Family Low Density | SFL | Valley Floor Single-Family Low Density | SFL |
| Valley Floor Single-Family Medium Density | SMD | Valley Floor Single-Family Medium Density | SFM |
| Multi-Family Medium Density | MFM | | |
| Multi-Family High Density | MFH | Valley Floor Multi-Family High Density | MFH |
| Multi-Family Very High Density | VHD | Valley Floor Multi-Family Very High Density | MFVH |
| Mobile Home Park | MHP | Mobile Home Park | MHP |
| Mixed Use | MXD | Mixed Use | MXD |
| Boulevard Very High-Density Mixed Use | BVMU | High Density Mixed Use | HDMU |
| Residential-Retail Mixed Use | RRMU | | |
| Professional & Administrative Offices | PAO | Professional & Administrative Offices | PAO |
| General Commercial | GNC | Commercial | COM |
| Retail Sub-Center | RSC | | |
| Industrial Park | INP | Industrial Park | INP |
| Manufacturing | MFG | Manufacturing | MFG |
| Public Facilities | PF | Public Facilities[1] | PF |
| | | Elmwood Correctional Facility[2] | COR |
| TWC, MXD, GNC, INP, HWS, RSC | | Hotels[3] | HOTEL |
| Park Open Space | POS | NF | |
| Waterways | WATERWAYS | NF | |
| Highway Services | HWS | Parcels reviewed and model-based land use designation assigned, as appropriate. | |
| Town Center | TWC | | |
| Urban Residential | URR | | |
| Parcels with no land use designation | - | | |

Notes:
1. Includes schools, churches, health facilities, libraries, and fire stations.
2. The correctional facility is categorized as PF in the GP. For modeling purposes, it was given a distinct code.
3. Hotels are categorized under various land uses in the GP. They were identified and assigned a distinct code.

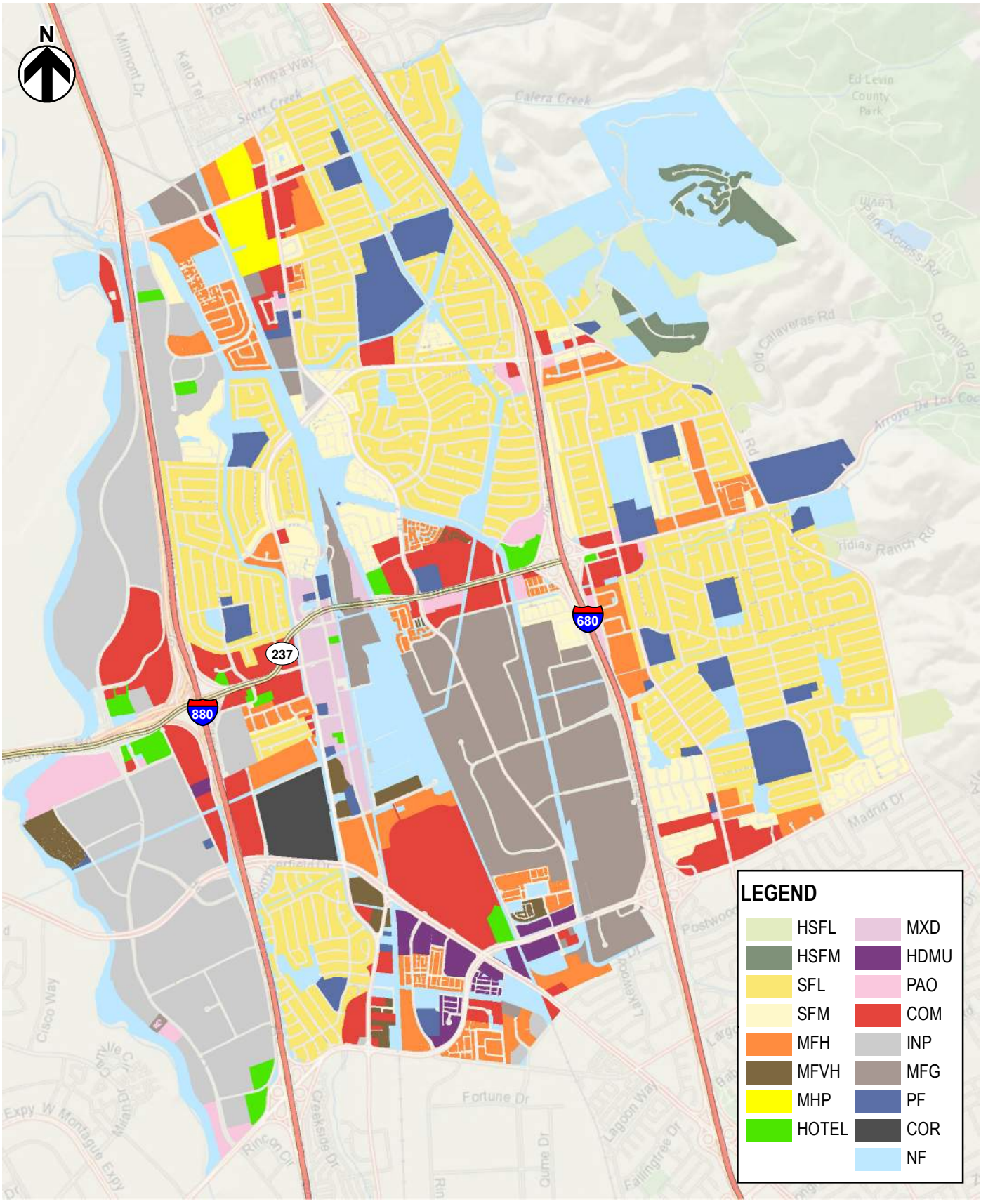


**FIGURE 5-1**
CITY OF MILPITAS
SEWER MASTER PLAN
MODEL-BASED LAND USE DESIGNATIONS - EXISTING

HydroScience

## 5.2 Land Use Designations for Model Analysis – Future Condition

The City has identified "Opportunity Areas" (see **Section 2.1.1**) which refers to parcels identified within the City that may be considered for future redevelopment (see **Figure 2-2**). For modeling and planning purposes, it is important to understand the potential impact redevelopment can have on the wastewater collection system. Not all "Opportunity Areas" had proposed changes in land use.

Similar to the existing condition described in **Section 5.1**, the objective is to assign the model-based land use designation to the parcel according to the type of redeveloped land uses planned/anticipated within the "Opportunity Areas". The future land uses identified in the "Opportunity Areas" were reviewed and assigned the model-based land use designations listed in **Table 5-1** according to the anticipated use, density, and wastewater flow rates.

**Table 5-2** summarizes the changes in land uses from the existing condition within "Opportunity Areas" that are proposed for redevelopment. The table identifies the redeveloped future land use, the assigned model-based land use designation, and the corresponding area. Areas listed represent the acreage within each opportunity area that is changing and does not include areas within "Opportunity Areas" where land use remains the same. **Figure 5-2** displays the identified "Opportunity Areas" where land use has changed, and the corresponding model-based land use designation within those areas.

**Table 5-2: Summary of Future Land Use Updates**

| "Opportunity Areas" | Proposed Future LU | Model-Based LU | Area (acres) |
|---|---|---|---|
| Sunny Hills Neighborhood/Commercial Center | NCMU | HDMU | 19.9 |
| California Circle | NCMU | HDMU | 54.1 |
| | HDR | MFH | 18.3 |
| Landess Neighborhood/Commercial Center | NCMU | HDMU | 38.0 |
| Calaveras & North Park Neighborhood/Commercial Center | NCMU | HDMU | 28.3 |
| Milpitas Town Center | HDR | MFH | 38.1 |
| Southwestern Employment Area | BPR&D | PAO | 488.3 |
| Jacklin & 680 Neighborhood/Commercial Center East | NC | COM | 8.0 |
| Jacklin & 680 Neighborhood/Commercial Center West | NC | COM | 6.4 |
| Jacklin Neighborhood/Commercial Center | NC | COM | 9.8 |
| Midtown Specific Plan | Various | Various | 484.3 |
| Metro Specific Plan (aka TASP) | HDR | MFH | 212.5 |
| | NC | COM | 85.4 |

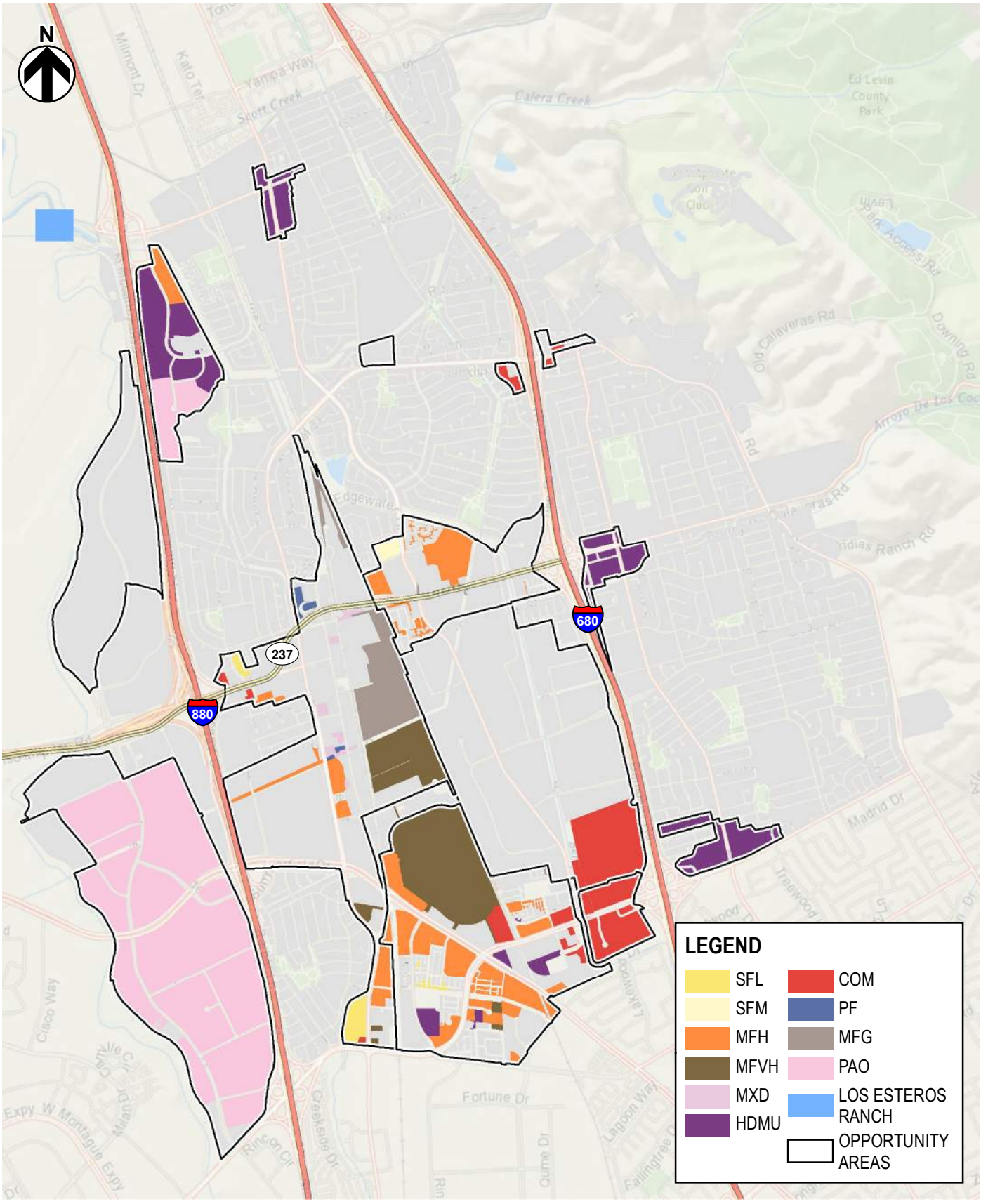


**FIGURE 5-2**
CITY OF MILPITAS
SEWER MASTER PLAN
MODEL-BASED LAND USE DESIGNATIONS - FUTURE

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# SECTION 6 – HYDRAULIC MODEL DEVELOPMENT

This section summarizes the history of the City's hydraulic model and describes the process of developing and building the most up-to-date version of the hydraulic model.

## 6.1 Model System Development

The City's original hydraulic model was built using SANSYS as part of the 1994 master planning effort. As part of the 2002 master planning effort, the hydraulic model was converted to Hydra® software version 6.0 by Pizer, Inc. The Hydra® model was subsequently reviewed, updated, and calibrated as part of the 2004 and 2009 Master Plan Updates.

For this Master Plan, HydroScience recommended InfoWorks ICM by Innovyze® (InfoWorks) to model the City's collection system because it is a fully dynamic software that uses the full set of St. Venant equations to model and evaluate complicated hydraulic systems. This recommendation was based on the knowledge that the City's collection system includes 177 flow splits, which significantly increases the complexity of the system and model.

As part of the model build, a review and update of the City's GIS was conducted using an extensive database of record drawings. A summary of the updates made to the GIS is included in **Appendix C**.

The updated GIS sewer system consists of 160 miles of gravity sewer main comprised of approximately 3,500 pipe segments and 3,000 manholes. For model development, the network was pared down to approximately 2,600 pipe segments and 2,400 manholes. All pipes 8-inches and larger were included, as well as all smaller pipes that included flow splits as they can affect the direction and quantity of flow downstream. The purpose of trimming the system is to reduce complexity of the system while maintaining all critical infrastructure. Smaller diameter pipes are generally less critical to the system operation. Including all pipe segments increases the complexity of the model but does not necessarily increase the value of the model and its analysis.

### 6.1.1 Model Network Development

The first step in developing the model network was to identify all pipelines for inclusion in the model. Using GIS, the pipe database was queried to select all pipes 8-inches and larger. To ensure the accuracy of flow representation, smaller pipelines downstream of flow splits were hand-selected where those flow splits would affect the direction and volume of downstream flow. Where there were unselected pipe segments between selected pipes, presenting potential gaps, those pipes were also hand selected for inclusion in the model to ensure network continuity. Pipes that had a listed diameter of "0" inch or an unknown diameter were the most common reason for unselected pipe segments.

The second step in developing the model network was to identify all manholes for inclusion in the model. Using GIS, all manholes that coincided with the selected pipelines were also selected. There were some instances where there was no manhole at the end of a terminal pipe segment

or at the junction between two pipe segments. These instances were most commonly one of the following two conditions:

1. Where a terminal pipe segment has a cleanout or flushing invert at its upstream end that was not represented in GIS; or
2. Where two pipe segments were built at different times and were directly connected without a manhole at the junction.

To remedy this, manhole placeholders were inserted at these locations for inclusion in the model network to prevent errors during the import into InfoWorks. These placeholders were given unique identification numbers to differentiate them from existing manholes.

The Venus Way LS was also included in the model network and the Main LS was modeled as the outfall. **Figure 6-1** shows the final model network that was imported into InfoWorks.

Approximately 63% of the manholes did not have rim elevations documented in the GIS. To reconcile this data gap, regional digital elevation model (DEM) data was downloaded from the USGS web database to obtain surface elevations at each manhole. Two separate DEM files were needed for coverage of the entire modeled collection system. The DEM resolution for most of the collection system (over 99% of manholes) was 1/9 arc-second (approximately 10 feet). For the remaining (~25) manholes, rim elevations were supplemented by a 1/3 arc-second (approximately 30 feet) resolution DEM. **Figure 6-2** shows the coverage for the 1/9 arc-second DEM data set.

DEM surface elevations were given in reference to the North American Vertical Datum of 1988 (NAVD 88). Most of the data in the City's existing GIS is based on the National Geodetic Vertical Datum of 1929 (NGVD 29) due to the age of the system. For consistency, NGVD 29 was established as the reference datum in the hydraulic model. To adjust from NAVD 88 to NGVD 29, the following conversion, referenced from City record drawing #2-1228, was applied:

$$\text{NGVD 29} = \text{NAVD 88} - 2.743 \text{ ft}$$

This equation is a simplified representation of conversion between the two datums but is generally representative within the bounds of the City. Small differences are not expected to affect the hydraulic model results as the relative elevation differences that affect inverts and slopes would be unchanged.

Generally, rim elevations contained in the GIS were used and supplemented by DEM where no rim elevation was documented. Existing rim elevations were compared to DEM elevations for confirmation. The average discrepancy between those listed in GIS and those calculated using the DEM data was approximately 0.8 ft. The cases that had the largest discrepancies were reviewed against record drawings and adjusted, as necessary.

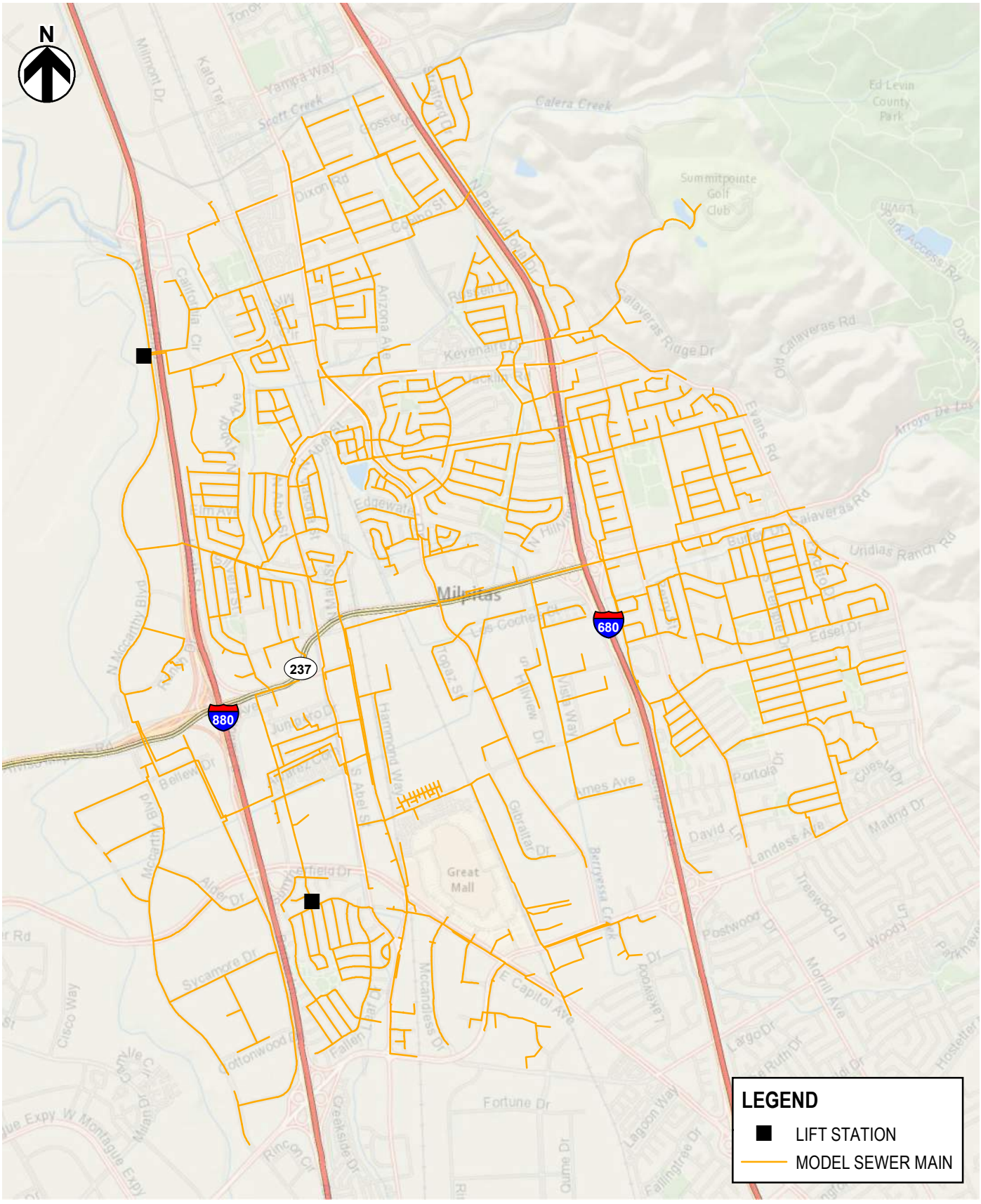


**FIGURE 6-1**
CITY OF MILPITAS
SEWER MASTER PLAN
MODEL NETWORK

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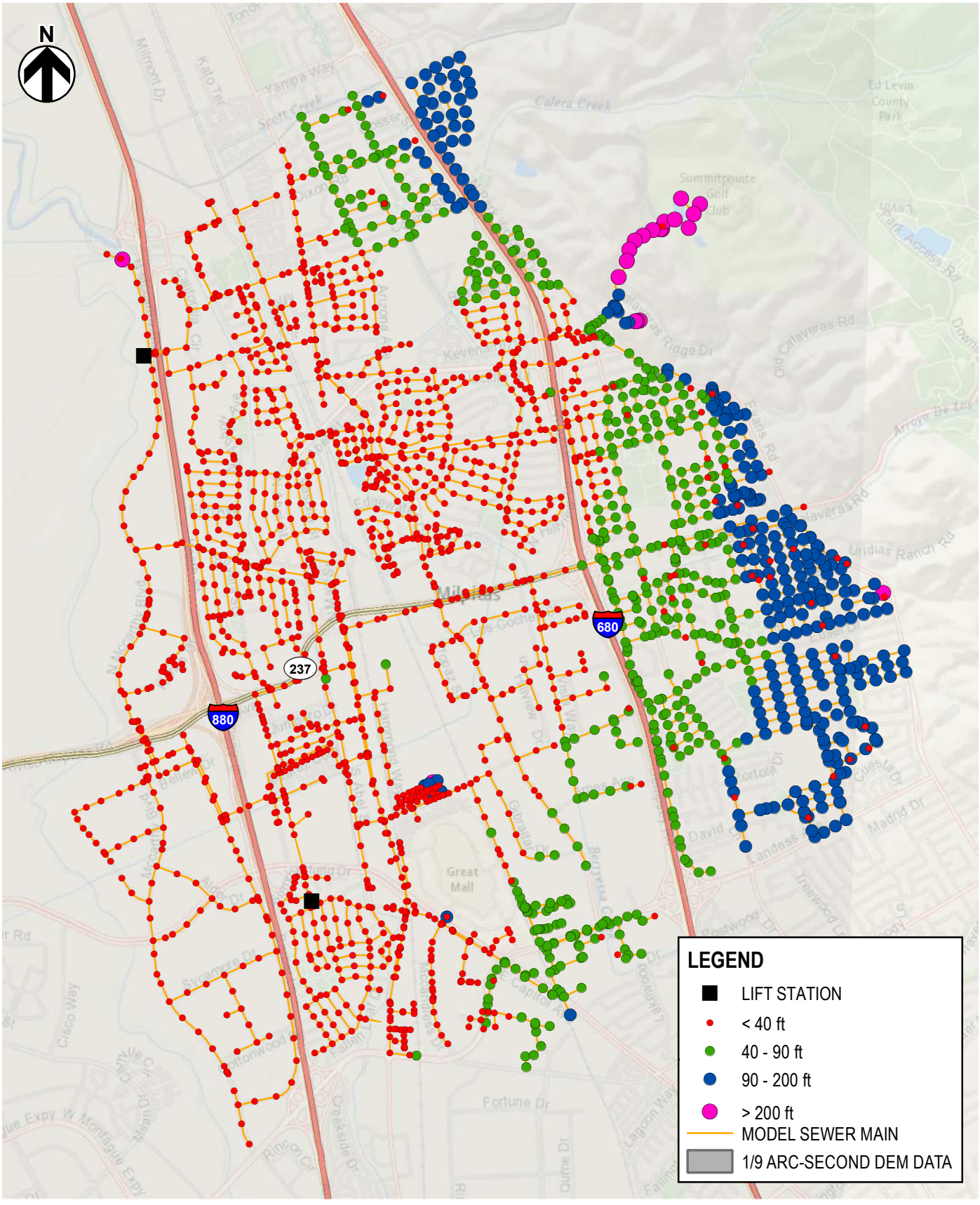


**FIGURE 6-2**
CITY OF MILPITAS
SEWER MASTER PLAN
MANHOLE RIM ELEVATIONS

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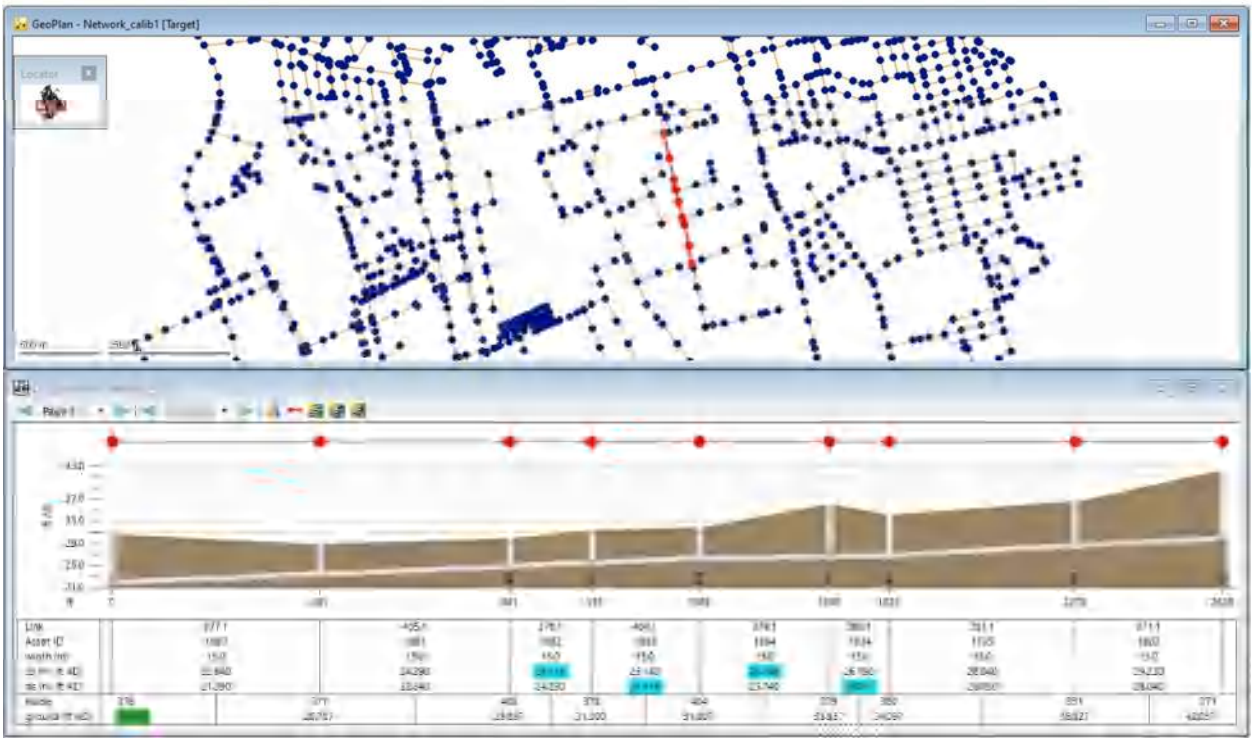
**Figure 6-3: InfoWorks Profile View**




## Network Review

Selected elements were imported into InfoWorks to build the hydraulic model. It is noted that the element selection and import process was iterative as errors in network continuity were identified and resolved. Upon import, InfoWorks will detect any errors when validating the network. Most validation errors encountered were related to network discontinuity and elements with missing data. Where possible, missing data, such as invert elevations or pipe diameters, were interpolated using surrounding data and the *Inference Tool* in InfoWorks.

Once all validation errors were reconciled, the system was analyzed using the pipeline *Profile View* (see **Figure 6-3**). If additional analysis was required, record drawings or CCTV were reviewed, where available. Significant adjustments were made based on differing datums referenced in the record drawings. Each update to the model data was marked with a data flag and different flags were created to represent the varying reasons for the updates. **Figure 6-4** shows the various data flags that were developed and used during the model network review process.

### 6.1.2 Load Allocation

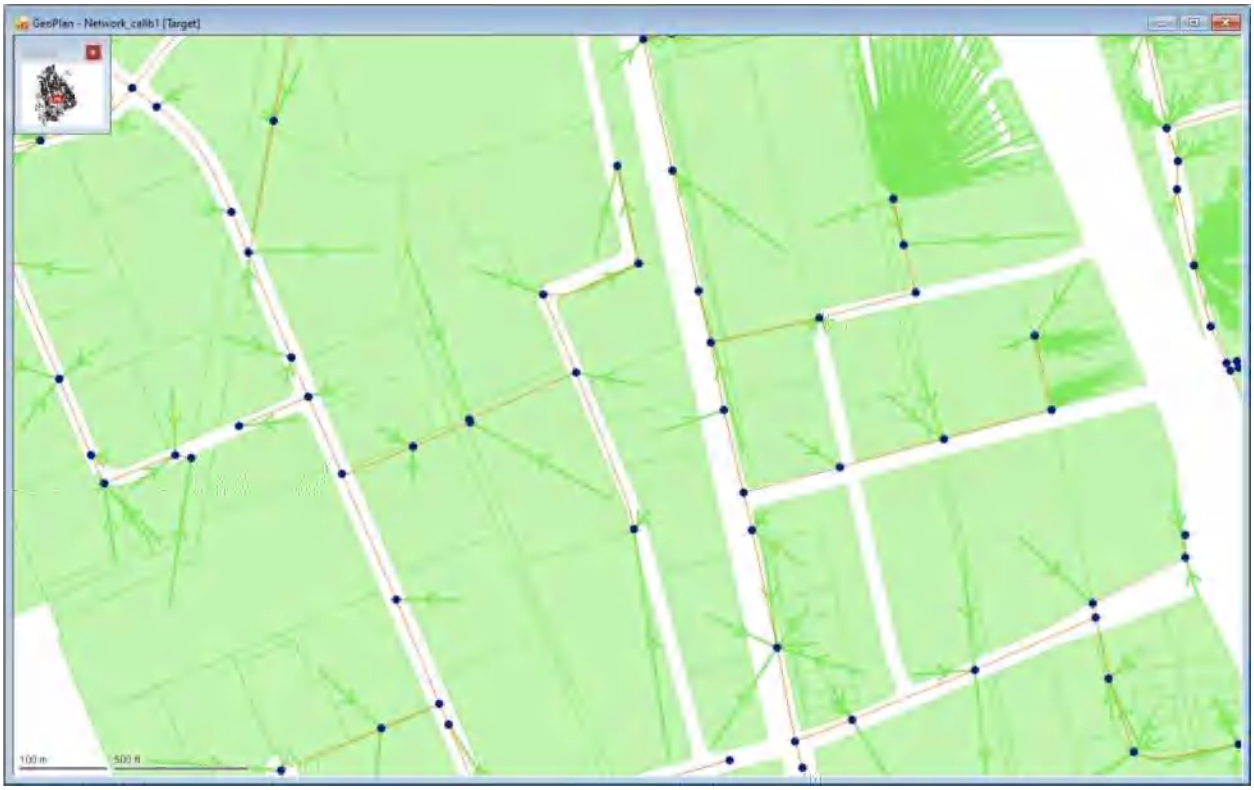
Parcel loads were initially assigned to the nearest manhole. Quality control was performed alongside the map of the sub-basins to verify that the load allocations matched the actual flow path; adjustments were made as necessary. **Figure 6-5** is a sample showing the load allocation from the parcel centroid to the corresponding receiving manhole.

**Figure 6-4: InfoWorks Data Flags**

| Name | Display Colour | Obsolete | Description |
|---|---|---|---|
| #A | | ☐ | Asset Data |
| #D | | ☐ | System Default |
| #G | | ☐ | Data From GeoPlan |
| #I | | ☐ | Model Import |
| #S | | ☐ | System Calculated |
| #V | | ☐ | CSV Import |
| CCTV | | ☐ | Estimated from CCTV footage |
| DEM | | ☐ | DEM elevation source |
| DTM | | ☐ | Datum adjustment |
| DWG | | ☐ | Drawing elevation source |
| INT | | ☐ | Interpolated elevation |
| NRBY | | ☐ | Rim based on near-by rims |
| RLV | | ☐ | Relative adjustment based on drawing |
| SIPH | | ☐ | Siphon |
| SLP | | ☐ | Calculated from slope |
| UPD | | ☐ | Updated during calibration |

Notes:
1. Descriptions that are highlighted gray are system defaults.

**Figure 6-5: Sample Load Allocation**



## 6.2 Scenario Development

InfoWorks can create many different scenarios within the same model. The following scenarios were developed and analyzed:

1. **Existing Dry Weather:** Used to calibrate the hydraulic model to dry weather conditions and to evaluate hydraulic deficiencies under existing dry weather conditions. Two alternatives were evaluated under this scenario:
    - With obstructions: includes adjustments made to account for flow obstructions as described in **Section 7.3.4**. This scenario was used for dry weather calibration.
    - Design conditions: inverts at flow splits with obstructions returned to the elevations they are designed to operate at. This scenario assumes the flow obstructions have been removed/cleaned and the flow splits are operating as intended. This scenario was used to evaluate hydraulic deficiencies under existing dry weather conditions.
2. **Existing Wet Weather:** Used for calibration of wet weather conditions. This scenario accounts for an elevated water table and R-factors to model wet weather conditions and to evaluate hydraulic deficiencies under existing wet weather conditions. Two alternatives were evaluated under this scenario:
    - With obstructions: includes adjustments made to account for flow obstructions as described in **Section 7.3.4**. This scenario was used for wet weather calibration.
    - Design conditions: inverts at flow splits with obstructions returned to the elevations they are designed to operate at. This scenario assumes the flow obstructions have been removed/cleaned and the flow splits are operating as intended. This scenario was used to evaluate hydraulic deficiencies under existing wet weather conditions.
3. **Future Dry Weather:** Land use categories updated based on future planned land use changes in “Opportunity Areas” (see **Sections 2.1.1** and **5.2**) and dry weather GWI included. This scenario was used to evaluate hydraulic deficiencies under future dry weather conditions assuming flow obstructions are addressed and no longer present.
4. **Future Wet Weather:** Land use categories updated based on future planned land use changes in “Opportunity Areas” and GWI adjusted to match wet weather calibration. This scenario was used to evaluate hydraulic deficiencies under future design storm/wet weather conditions assuming flow obstructions are addressed and no longer present.

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# SECTION 7 – WASTEWATER FLOW ANALYSIS

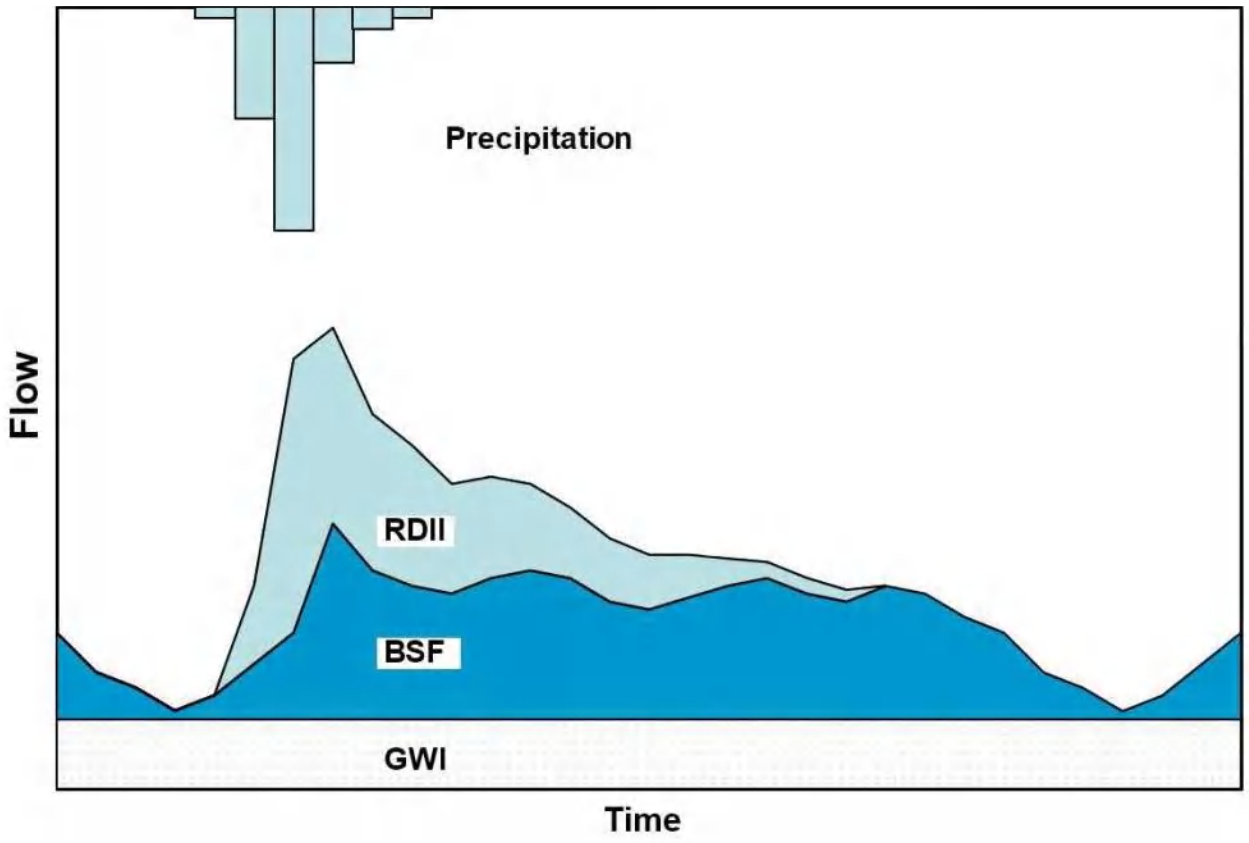
For this study, the flow monitoring data collected by the City was used for model calibration. This section summarizes typical wastewater flow components, summarizes the City's flow monitoring program, describes the basis for developing design wastewater flows used to model the City's collection system, and presents the results of the model calibration.

## 7.1 Typical Wastewater Flow Components

Wastewater flows consist of three primary flow components: groundwater infiltration (GWI), base sanitary flow (BSF), and rainfall dependent inflow and infiltration (RDI/I) as illustrated in **Figure 7-1**.

- **GWI** – For modeling purposes, this document defines GWI as any, and all sources of constant flow. GWI is comprised both of groundwater infiltration and any other constant flow that is generally detected during low flow periods. Constant flows can be associated with leaking faucets, running toilets, and/or manufacturing or industrial processes, etc. This can also capture any meter reading variance at extremely low flows. GWI is seasonal where dry

**Figure 7-1: Typical Wastewater Flow Components**




Source: Rainfall Dependent Inflow and Infiltration from the EPA SWMM 5 Hydrology Manual

weather GWI (summer) is typically less than wet weather GWI (winter) due to the elevated water table that occurs during the rainy season.

- **BSF** – This represents the direct diurnal flow contributions from customers. This is represented by a combination of unit flows and diurnal patterns, which is further detailed in **Section 7.3** below.
- **RDI/I** – This is the volume of rainfall that enters the wastewater collection system through various avenues (holes in manhole covers, elevated water table, etc.).

To understand hydraulic capacity of a wastewater collection system, both dry weather flow (DWF) and wet weather flow (WWF) conditions are evaluated. DWF includes both dry weather GWI and BSF while WWF includes wet weather GWI, BSF, and RDI/I.

The flow monitoring and rainfall data collected by the City was evaluated for each of the components, and this process is described in the following sections.

## 7.2 Flow Monitoring Program

The City contracted with ADS Environmental Services (ADS) to perform dry and wet weather flow monitoring within the City collection system. ADS installed 23 ADS FlowShark Triton flow meters throughout the City and monitored flow between November 16, 2019 and March 9, 2020. This type of meter is a velocity flow meter installed in collection system manholes to measure both depth and velocity at either a 5- or 15-minute intervals for the duration of the flow monitoring period. Depth, velocity, and flow (calculated using the Continuity Equation) were presented in the *Milpitas Sewer Flow Monitoring Report 2019-2020* (ADS Report) in the form of daily averages, and additional data was provided separately in the form of hourly averages. The ADS Report is included as **Appendix B**.

Rain gauges were also installed in two distinct locations for the duration of the monitoring period – one was placed on the valley floor at the Gibraltar Reservoir (RG01) and the other was placed on the hillside near the Summitpointe Golf Club (RG02). Depth of precipitation was presented in the ADS Report in the form of hourly averages to the nearest hundredth of an inch. The raw data was recorded in 5-minute increments to the nearest hundredth of an inch.

The locations of all flow meters and rain gauges are shown in **Figure 7-2**. Flow meters are identified according to the GID of the manhole in which they were installed.

**Table 7-1** summarizes the recorded depths, velocities, and flows for each flow meter.

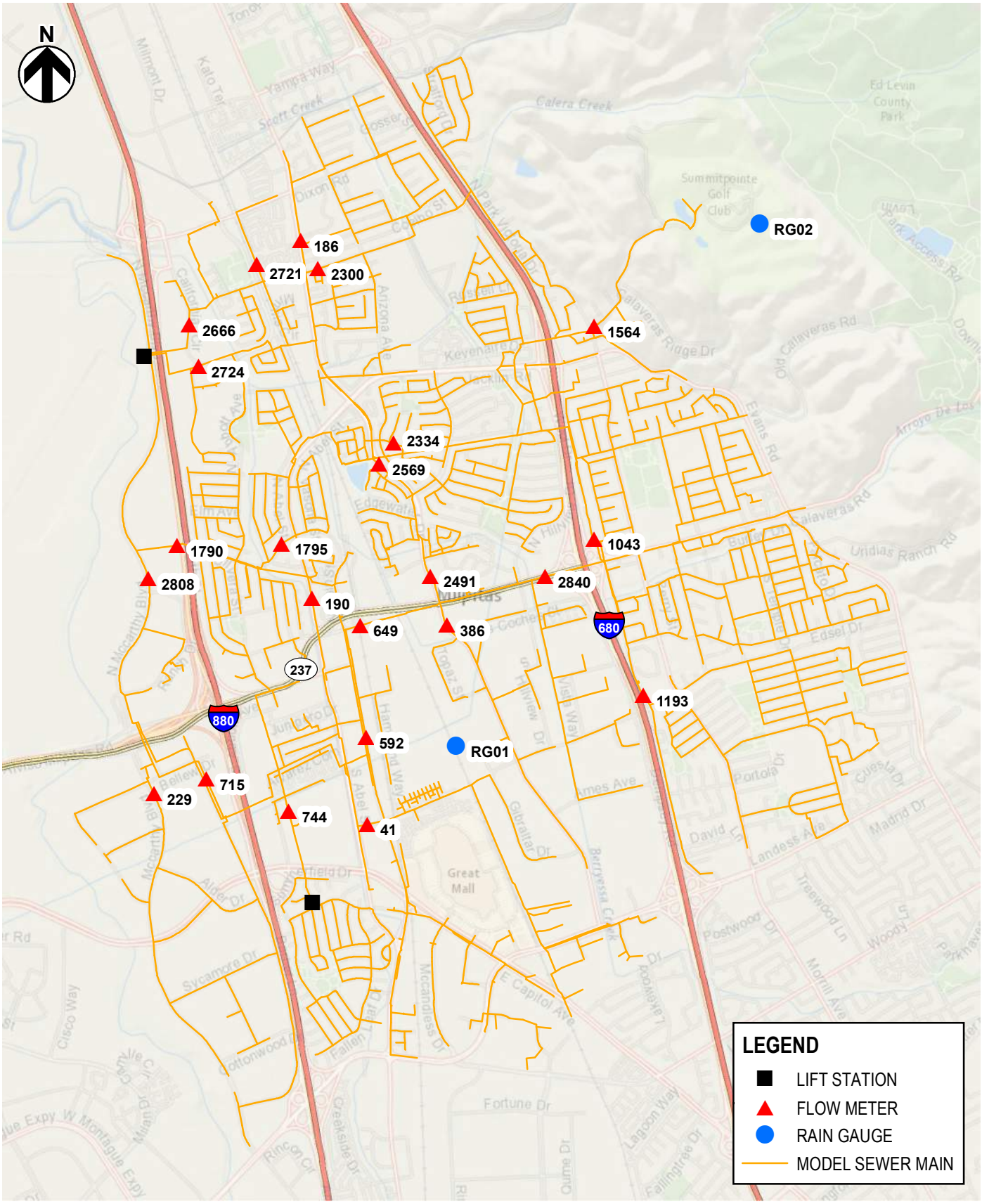



**FIGURE 7-2**
CITY OF MILPITAS
SEWER MASTER PLAN
FLOW MONITORS AND RAIN GAUGES

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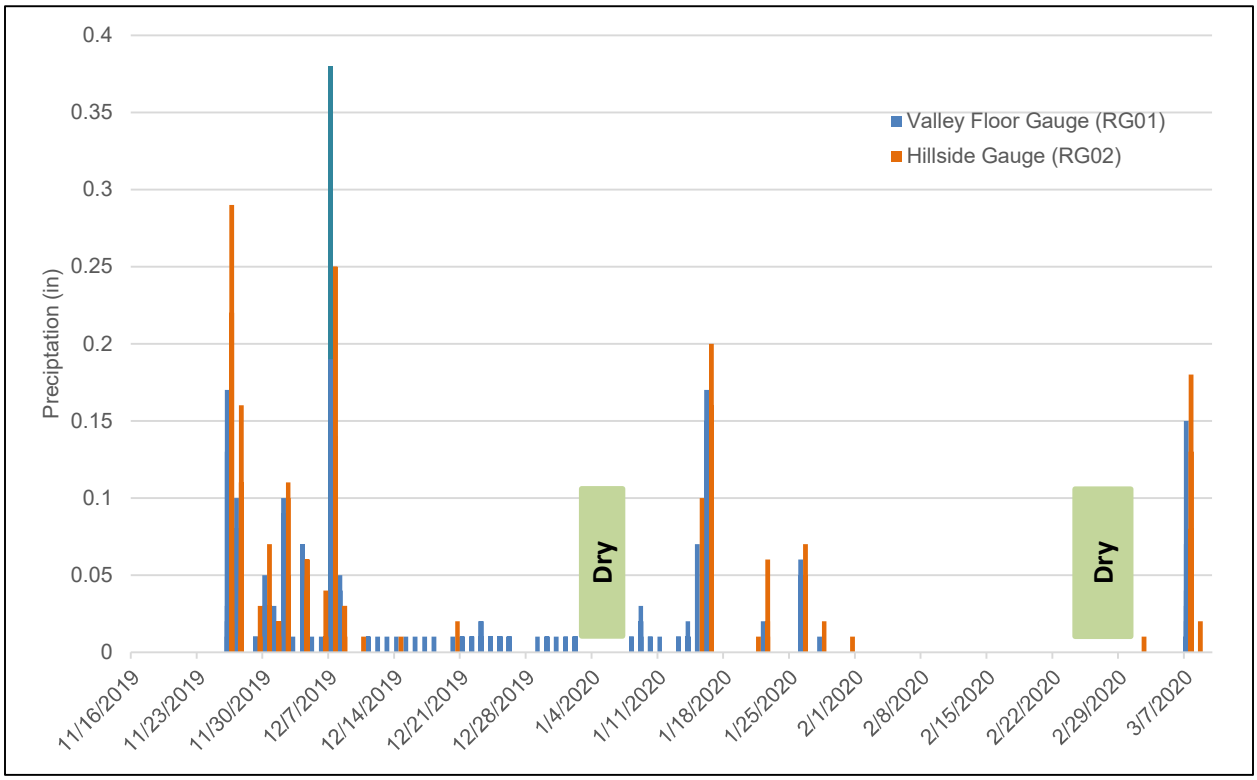
**Table 7-1: Flow Monitoring Data Summary**

| Flow Meter | Nominal Pipe Dia. (in)[1] | Depth (in)[2] | | | Velocity (ft/s)[2] | | | Flow (MGD)[2] | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Average | Minimum | Maximum | Average | Minimum | Maximum | Average | Minimum | Maximum |
| 41 | 24 | 6.515 | 4.000 | 9.340 | 1.543 | 0.780 | 2.060 | 0.708 | 0.189 | 1.310 |
| 186 | 8 | 1.540 | 0.780 | 2.060 | 1.540 | 0.780 | 2.060 | 1.540 | 0.780 | 2.060 |
| 190 | 18 | 2.465 | 1.820 | 3.200 | 0.959 | 0.500 | 1.320 | 0.093 | 0.031 | 0.160 |
| 226 | 21 | 3.466 | 1.810 | 5.100 | 0.591 | 0.240 | 0.840 | 0.103 | 0.021 | 0.232 |
| 386 | 16 | 6.427 | 5.190 | 9.000 | 1.375 | 1.060 | 1.880 | 0.511 | 0.291 | 1.071 |
| 592[3] | 18 | 3.682 | 1.280 | 5.620 | 1.534 | 0.430 | 2.130 | 0.276 | 0.016 | 0.644 |
| 649 | 21 | 8.655 | 6.660 | 11.190 | 1.236 | 0.860 | 1.600 | 0.776 | 0.406 | 1.361 |
| 715 | 30 | 0.959 | 0.500 | 1.320 | 0.959 | 0.500 | 1.320 | 0.959 | 0.500 | 1.320 |
| 744 | 15 | 0.094 | 0.032 | 0.160 | 0.094 | 0.032 | 0.160 | 0.094 | 0.032 | 0.160 |
| 1043 | 21 | 5.252 | 3.420 | 7.270 | 3.999 | 2.220 | 4.800 | 1.263 | 0.378 | 2.277 |
| 1193 | 21 | 0.590 | 0.240 | 0.840 | 0.590 | 0.240 | 0.840 | 0.590 | 0.240 | 0.840 |
| 1564 | 8 | 0.590 | 0.240 | 0.840 | 0.590 | 0.240 | 0.840 | 0.590 | 0.240 | 0.840 |
| 1790 | 30 | 0.590 | 0.240 | 0.840 | 0.590 | 0.240 | 0.840 | 0.590 | 0.240 | 0.840 |
| 1795 | 27 | 9.483 | 6.360 | 12.140 | 0.399 | 0.220 | 0.510 | 0.300 | 0.091 | 0.460 |
| 2300 | 10 | 1.647 | 1.020 | 2.350 | 1.402 | 0.450 | 2.690 | 0.056 | 0.009 | 0.154 |
| 2334 | 12 | 2.123 | 1.620 | 2.580 | 2.770 | 1.460 | 3.460 | 0.175 | 0.063 | 0.263 |
| 2491 | 15 | 2.345 | 1.110 | 3.850 | 2.356 | 0.510 | 3.700 | 0.216 | 0.014 | 0.592 |
| 2569 | 21 | 6.434 | 4.390 | 8.470 | 1.051 | 0.540 | 1.600 | 0.441 | 0.148 | 0.828 |
| 2666 | 18 | 8.746 | 5.850 | 20.960 | 1.741 | 0.880 | 2.160 | 0.949 | 0.385 | 1.371 |
| 2721 | 8 | 6.229 | 3.950 | 7.900 | 1.053 | 0.590 | 1.420 | 0.198 | 0.091 | 0.312 |
| 2724 | 42 | 18.342 | 13.520 | 22.120 | 0.779 | 0.510 | 1.000 | 2.041 | 0.876 | 3.205 |
| 2808 | 36 | 8.737 | 5.860 | 11.120 | 2.257 | 1.320 | 2.920 | 2.007 | 0.643 | 3.438 |
| 2840[4] | 15 | 1.995 | 1.810 | 2.250 | 1.384 | 1.080 | 1.660 | 0.087 | 0.060 | 0.120 |

Notes:
1. Pipe diameter listed in GIS. ADS measured internal pipe diameters in the field which are recorded in the ADS Report. Nominal pipe diameters listed in GIS were used in the hydraulic model.
2. These values are calculated using hourly averages. These may differ slightly from the ADS Report since those values are based on all field data collected.
3. Initially identified as FM 602 in the ADS Report, was placed further downstream in manhole GID 592.
4. FM 2840 was directly downstream of a flow diversion structure which diverts wastewater flows away from the flow meter, resulting in extremely low recorded flows at this site.

**Figure 7-3: Rainfall during Monitoring Period**




Rainfall measured by both rain gauges for the duration of the monitoring period is shown in **Figure 7-3**. The flow monitoring program was designed to capture both WWF and DWF, thus, the flow meters and rain gauges provided the data necessary to estimate both dry weather and wet weather GWI and RDI/I.

The following dry weather and wet weather periods, as shown on **Figure 7-3**, were identified and used for the model calibration and analysis. Dry weather period 1 and Storm event 1 were used primarily, unless there was insufficient data for the flow meter, then Dry weather period 2 or Storm event 2 was used:

- Dry weather period 1: February 24 – March 3, 2020
- Dry weather period 2: January 4 – 8, 2020
- Storm event 1: December 7, 2019
- Storm event 2: November 26, 2019

The maximum rainfall from either of these days are listed in **Table 7-2**, along with the National Oceanic and Atmospheric Administration (NOAA) precipitation frequency estimates for Milpitas, CA. The largest storms were between a 1- and 2-year storm or smaller than a 1-year storm frequency.

**Table 7-2: NOAA Rainfall Frequency vs. Rain Gauge Data**

| NOAA Frequency Estimates[1] | | | | | Rain Gauge Data[2] | |
|---|---|---|---|---|---|---|
| Duration | 1-year | 2-year | 5-year | 10-year | RG01 | RG02 |
| 1-hr: | 0.34 | 0.43 | 0.56 | 0.66 | 0.38 | 0.29 |
| 2-hr: | 0.50 | 0.63 | 0.80 | 0.95 | 0.57 | 0.51 |
| 6-hr: | 0.85 | 1.06 | 1.36 | 1.62 | 0.64 | 0.76 |
| 12-hr: | 1.10 | 1.40 | 1.82 | 2.18 | 0.66 | 0.92 |
| 24-hr: | 1.37 | 1.79 | 2.36 | 2.83 | 0.95 | 1.30 |

Notes:
1. NOAA Atlas 14 Volume 6 Version 2 precipitation frequency estimates for Milpitas, CA
2. Maximum Rain by Rain Gauge (Total Inches by Duration)

### 7.2.1 Flow Meter Sewer Sub-Basins

The flow meters served as the basis for the delineation of tributary sewer sub-basins in the City for calibration purposes. Generally, for sub-basins located at the most upstream ends of the collection system, all flow from the sub-basin is captured by a single flow meter which in turn flows to downstream sub-basins. Where there are flow splits, flow can be directed to more than one downstream sub-basin so it is important to understand the flow behavior at each flow split in order to properly delineate sub-basin boundaries.

The identification of all flow splits (see **Section 3.1.1**) was imperative to track the flow through the system. They were each reviewed and identified as either a “non-critical” or “critical” flow split, as follows:

- **Non-Critical Flow Split:** In these cases, the flow is split then returns to the same sub-basin or flow path before it reaches the downstream flow meter. These flows splits and flow are fully contained within a single subbasin.
- **Critical Flow Split:** These are flow splits that divert flow to two different downstream sub-basins (or flow meters). All critical flow splits were evaluated using the City’s most current GIS geodatabase and the City’s extensive library of as-built record drawings.

There are 177 identified flow splits, of which five are considered critical, as shown in **Figure 7-4**. For critical flow splits, the ratio of flow was estimated based on the slopes and diameters of the outgoing pipes.

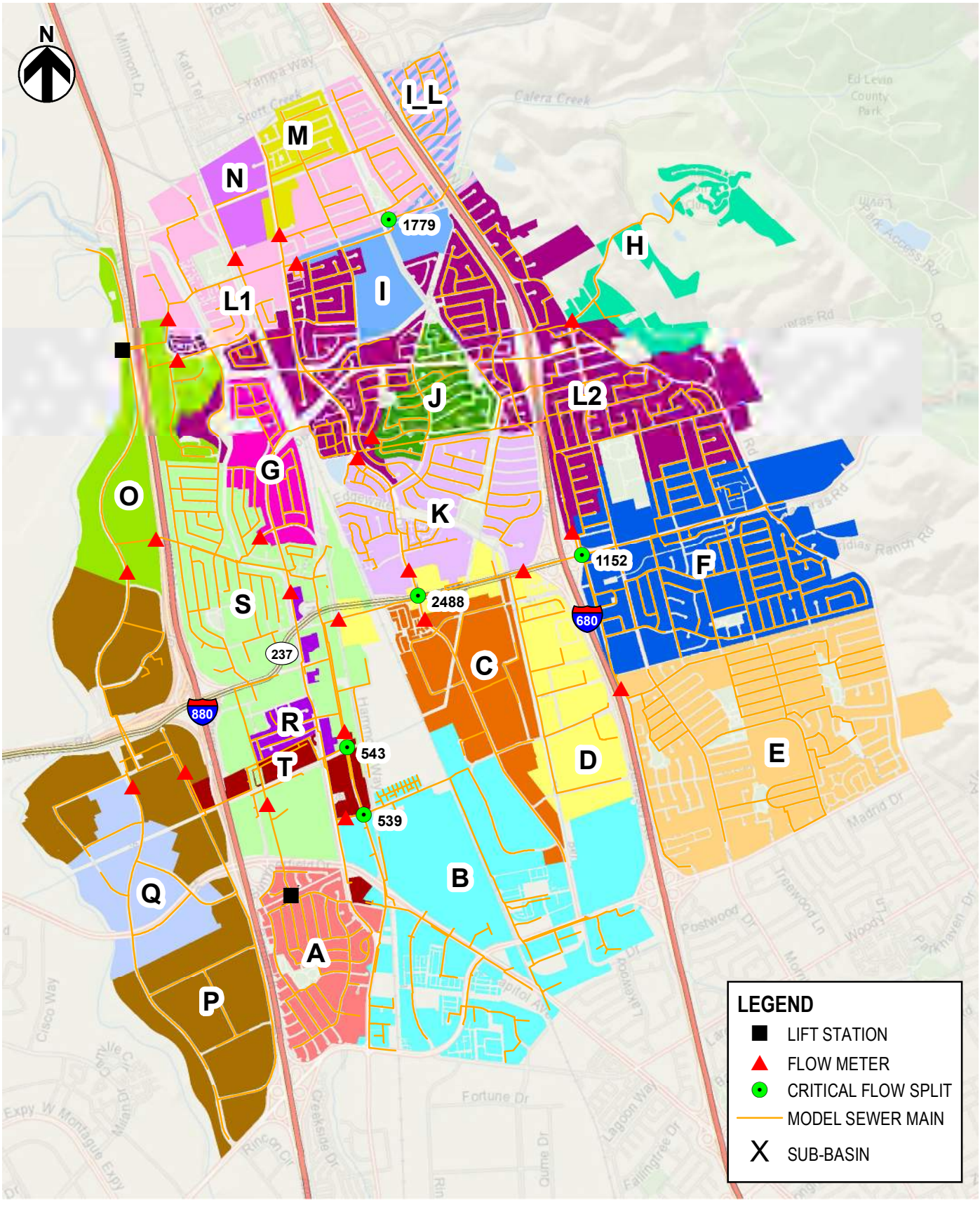



**FIGURE 7-4**
CITY OF MILPITAS
SEWER MASTER PLAN
SUB-BASIN DELINEATION

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The results of the sub-basin delineation are displayed on **Figure 7-4**. The flow meters immediately upstream of each sub-basin and those that are capturing the flow of each sub-basin are listed in **Table 7-3**. **Figure 7-5** is a diagram summarizing flow through the sub-basins and the flow meters in the entire system, including all critical flow splits.

**Table 7-3: Sub-Basins and Corresponding Flow Meters**

| Sub-Basin | Upstream Flow Meters | Capturing Flow Meters |
|---|---|---|
| A | N/A | 744 |
| B[1] | N/A | 41 |
| C | N/A | 386 |
| D | 386 & 2840 | 649 & 2491 |
| E | N/A | 1193 |
| F | 1193 | 1043 & 2840 |
| G | N/A | 1795 |
| H | N/A | 1564 |
| I[2] | N/A | 2300 |
| J | N/A | 2334 |
| K | 2491 | 2569 |
| L1[2] | 186, 2721 | 2666 |
| L2 | 1043, 1564, 2300, 2334, & 2569 | 2724 |
| M | N/A | 186 |
| N | N/A | 2721 |
| O | 1790, 2666, 2724, & 2808 | OUTFALL |
| P | 229 & 715 | 2808 |
| Q | N/A | 229 |
| R | N/A | 190 |
| S | 190, 592, 649, 744, & 1795 | 1790 |
| T | 41 | 592 & 715 |

Notes:
1. Flow from sub-basin B splits at MH 539. FM 41 captures a portion of the flow from sub-basin B and the remainder continues downstream to sub-basin T.
2. Flow from parcels upstream of MH 1776 splits and flows to sub-basins I and L1 downstream.

A summary of the various contributing land uses within each sub-basin is shown in **Table 7-4**. The area of each parcel was calculated using the geometry calculator tool in GIS.

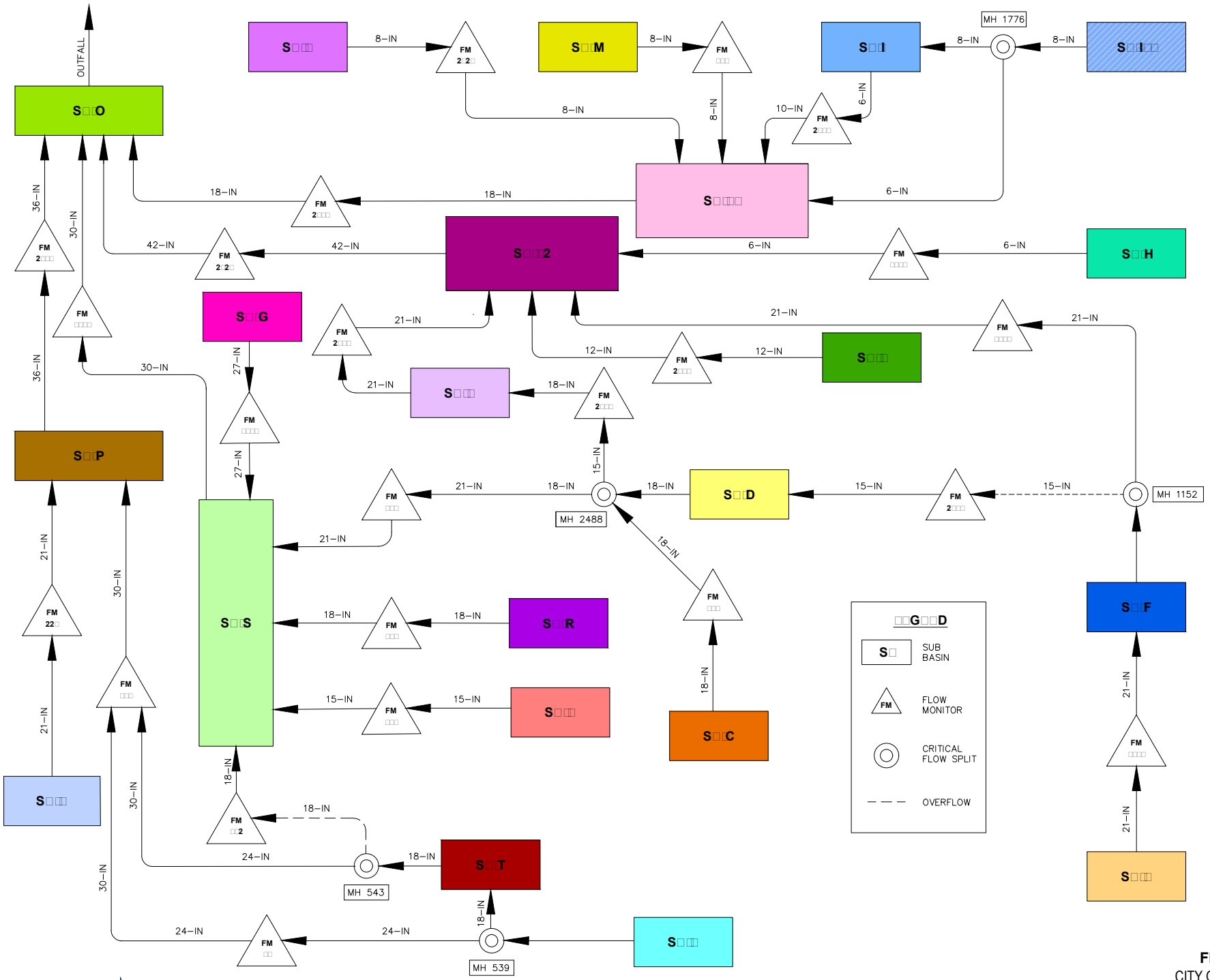


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**FIG R**
CITY OF MILPITAS
SEWER MASTER PLAN
SCHEMATIC FLOW DIAGRAM

**Table 7-4: Total Acreage of Each Land Use by Sub-Basin**

| LU Code | A | B[1] | C | D | E | F | G | H | I[2] | J | K | L1[2] | L2 | M | N | O | P | Q | R | S | T[1] | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HSFL (DU)[3] | - | - | - | - | 22 (17) | 9 (4) | - | 39 (8) | 3 (3) | - | - | 2 (2) | 71 (22) | - | - | - | - | - | - | - | - | 146 (56) |
| HSFM (DU)[3] | - | - | - | - | - | - | - | 67 (107) | - | - | - | - | - | - | - | - | - | - | - | - | - | 67 (107) |
| SFL (DU)[3] | 115 (982) | - | - | - | 227 (1,586) | 228 (1,500) | 50 (331) | 4 (9) | 42 (208) | 72 (490) | 86 (571) | 108 (716) | 320 (2,028) | 32 (229) | - | - | - | - | 12 (101) | 131 (868) | - | 1,427 (9,619) |
| SFM | - | - | - | 17 | 87 | 8 | 13 | - | - | 7 | 32 | 11 | 67 | 6 | - | 7 | - | - | 1 | 10 | - | 266 |
| MFH | - | 93 | 8 | 3 | 25 | 52 | 1 | - | - | - | 6 | 57 | 46 | - | 12 | - | - | - | 7 | 15 | 48 | 373 |
| MFVH | 3 | 20 | 1 | - | - | - | - | - | - | - | 2 | - | - | - | - | - | 19 | 2 | - | - | 27 | 72 |
| MHP | - | - | - | - | - | - | - | - | - | - | - | 13 | - | - | 39 | - | - | - | - | - | - | 52 |
| HOTEL | - | 5 | - | - | - | 1 | - | - | - | - | 14 | 3 | - | - | - | 3 | 28 | - | - | 7 | 2 | 62 |
| MXD | - | - | - | - | - | - | - | - | - | - | - | - | - | <1 | - | - | - | - | 12 | 45 | 10 | 67 |
| HDMU | - | 46 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 18 | 64 |
| PAO | - | - | - | 10 | 1 | 6 | - | - | - | - | 9 | 2 | 6 | - | - | - | 54 | - | - | - | - | 87 |
| COM | 13 | 108 | 12 | 17 | 39 | 21 | 2 | - | - | - | 38 | 15 | 18 | 16 | 4 | 9 | 86 | - | 1 | 59 | 45 | 502 |
| INP | - | 5 | - | - | - | - | - | - | - | - | - | 21 | 5 | - | - | 188 | 347 | 148 | - | 22 | 2 | 738 |
| MFG | - | 150 | 171 | 154 | - | - | - | - | - | - | - | 24 | 12 | - | - | - | 2 | - | - | 25 | 50 | 588 |
| PF | 7 | 6 | - | 7 | 54 | 89 | 12 | - | 36 | - | <1 | 10 | 62 | 3 | - | - | 1 | 1 | 1 | 17 | 5 | 311 |
| COR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 62 | - | 62 |
| **Total** | **138** | **432** | **192** | **210** | **454** | **414** | **78** | **110** | **81** | **79** | **187** | **266** | **606** | **57** | **55** | **207** | **537** | **151** | **34** | **393** | **207** | **4,889** |

Notes:
1. Flow from sub-basin B splits at MH 539. Areas are based on the estimate that 75% of flow from sub-basin B parcels flow to meter 41, and 25% flow from these parcels downstream to sub-basin T.
2. Areas are based on the estimate that 60% of parcels upstream of flow split at MH 1776 flows to sub-basin I, and 40% flows to sub-basin L1.
3. HSFL, HSFM, and SFL are analyzed based on number of dwelling units in UF factor analysis with the assumption that there is one dwelling unit per parcel.
4. The City encompasses 8,680 acres. The area contributing sanitary flows is 4,884 acres. Non-contributing areas include park, streets, railroads, waterways, and other open spaces. Only parcels contributing sanitary flows are included in this table.

## 7.3 Dry Weather Flow (DWF)

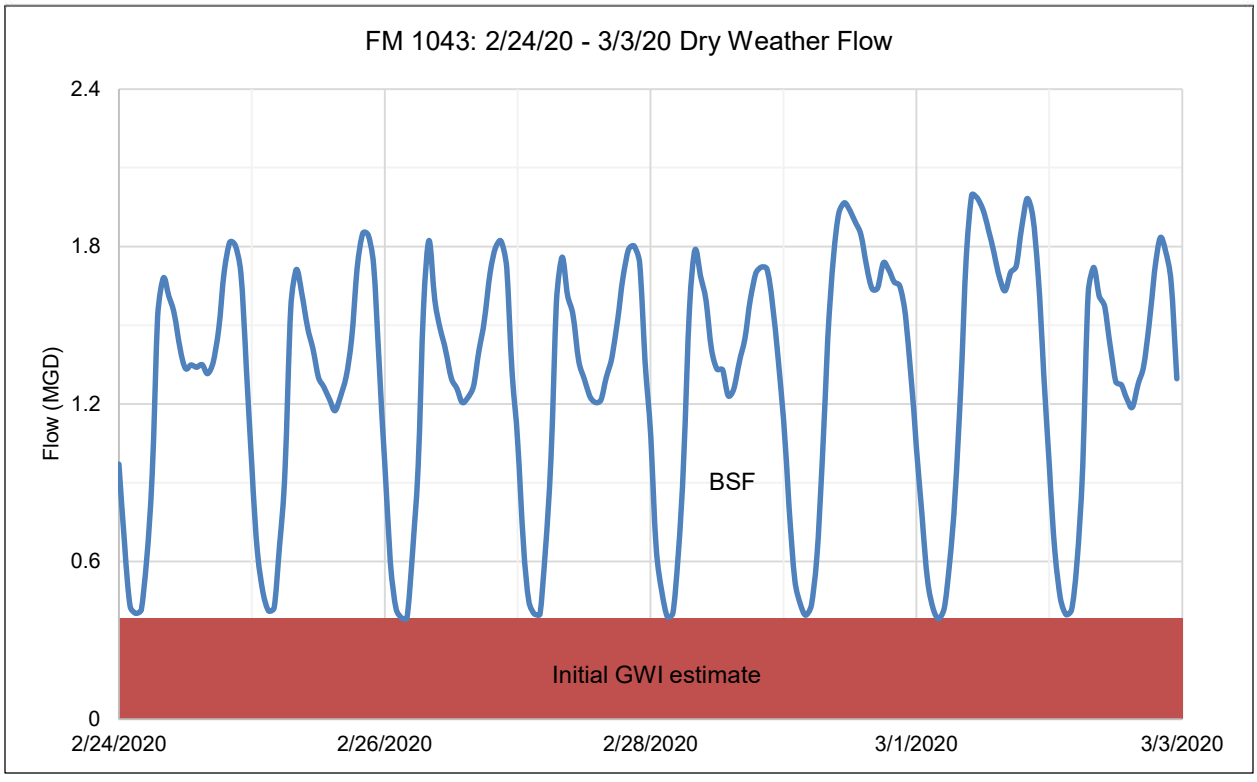
The dry weather periods were analyzed to establish dry weather GWI and BSF inclusive of the diurnal patterns for groups of land uses. The process for developing each of the components and the results are discussed below.

### 7.3.1 Dry Weather GWI

To isolate BSF, an estimate of GWI was developed. The daily minimum flow was calculated to serve as the initial basis for the GWI estimate. **Figure 7-6** presents an example of the DWF and corresponding estimated GWI for FM 1043. Once GWI estimates were developed for each flow meter, upstream contributing flow meters, outlined in **Table 7-3**, were subtracted to develop an estimate of dry weather GWI by sub-basin. Because GWI is not affected by human activity, and therefore should be the same for weekdays and weekend, there is only one value for GWI.

Using these initial values, a unique unit GWI (gpd/acre) was calculated for each sub-basin by dividing the total estimated GWI by the total contributing sub-basin acreage. This unit GWI was then applied to each parcel by multiplying the parcel area by the unit GWI for the respective sub-basin. These initial GWI estimates served as a starting point for model calibration and were further refined during the calibration using an iterative process, as described in **Section 7.3.4** below.

**Figure 7-6: Dry Weather Flow**



### 7.3.2 Base Sanitary Flow (BSF)

The GWI estimates developed for each sub-basin and estimated wastewater flows of identified large dischargers were subtracted from the total weekday DWF for the corresponding sub-basin. The remaining BSF was then used to estimate the UF factors for each land use category. These UF factors represent the average daily contribution to BSF by each parcel according to land use. The analysis was initiated in the most terminal/upstream sub-basins with the fewest land use types, and UF factors were iteratively adjusted until the calculated BSF matched the observed BSF at the corresponding flow meter. UF factors were calibrated to weekday flows; diurnal patterns were then adjusted to account for differences between weekday and weekend discharge patterns.

**Large Dischargers**

For this analysis, large dischargers are defined as those customers that discharge a disproportionately large volume of wastewater for the parcel size and use type. Large dischargers are typically treated as point sources for hydraulic modeling purposes. The City provided wintertime water use data for January thru March 2019 for non-single family residential, commercial, and industrial customers to estimate wastewater flows. It is preferable to use water data from the winter period to estimate wastewater flows as it is a closer representation of indoor water use, since less water is consumed for irrigation.

Wastewater flows were estimated at approximately 85% of winter water use. Estimated flows greater than 10,000 gpd were linked to a respective parcel, and a unit flow (gpd/acre) was calculated by dividing the total estimated wastewater flow by the total area of the contributing parcel(s). The gpd/acre for each flagged large discharger was compared to the respective land use based UF factor. Each flagged discharger was ultimately classified as a large discharger if the gpd/acre was at least twice the UF factor or more for its respective land use.

**Table 7-5** lists the identified large dischargers and **Figure 7-7** shows the location of the associated parcels.

**Table 7-5: Large Dischargers**

| Rank | Location[1] | Estimated Wastewater Flows (gpd) [1] | Model-Based Land Use | Sub-Basin |
|---|---|---|---|---|
| 1 | Abel St. | 157,678 | COR | S |
| 2 | Hillview Dr | 148,562 | MFG | C |
| 3 | Ames Ave | 74,079 | MFG | D |
| 4 | Hillview Dr | 63,137 | MFG | C |
| 5 | Abel St | 49,821 | MFVH | T |
| 6 | Main St | 39,341 | MFH | B |
| 7 | Milmont Dr | 38,377 | MFH | L |
| 8 | Dixon Landing Rd | 35,426 | MFH | L |
| 9[2] | McCandless Dr | 32,594 | MFH | B |
| 10[2] | Poppylane Townhouses | 31,158 | MFH | F |
| 11 | Murphy Ranch Rd | 30,694 | MFVH | P |

| Rank | Location[1] | Estimated Wastewater Flows (gpd) [1] | Model-Based Land Use | Sub-Basin |
|---|---|---|---|---|
| 12 | Dixon Landing Rd | 30,134 | MHP | N |
| 13 | Main St | 28,747 | COM | B |
| 14 | Technology Dr | 27,964 | PAO | P |
| 15 | McCarthy Blvd | 26,312 | INP | P |
| 16 | Landess Ave | 24,423 | COM | E |
| 17 | Wilson Way | 23,433 | MHP | N |
| 18 | Milpitas Blvd | 23,142 | MFG | L |
| 19 | Milpitas Blvd | 20,737 | MFG | C |
| 20 | McCarthy Blvd | 20,566 | INP | P |
| 21 | Park Victoria Dr | 19,454 | MFH | E |
| 22 | Main St | 16,927 | MFVH | A |
| 23 | McCarthy Blvd | 16,610 | INP | P |
| 24 | Technology Dr | 16,467 | PAO | P |
| 25 | N Milpitas Blvd | 16,315 | MFH | N |
| 26 | Calaveras Blvd | 16,229 | COM | F |
| 27 | Barber Ln | 15,806 | COM | T |
| 28 | Amalfi Loop | 15,335 | MFH | B |
| 29[2] | Trento Loop | 15,036 | MFH | B |
| 30 | Turquoise St | 13,357 | MFG | C |
| 31 | Yosemite Rd | 11,858 | MFG | C |
| 32 | Trade Zone Blvd | 11,696 | MFH | B |
| 33 | Ames Ave | 11,181 | MFG | D |
| 34 | Milpitas Blvd | 11,044 | MHP | L |
| 35 | Cypress Dr | 10,928 | HOTEL | P |
| 36 | Park Victoria Dr | 10,795 | COM | F |
| 37 | Calaveras Blvd | 10,616 | COM | D |
| 38 | Milmont Dr | 9,664 | COM | L |
| **Total** | **-** | **1,175,643** | **-** | **-** |

Notes:
1. Source: January-March 2019 water meter customer billing data provided by the City multiplied by 85% - assumed portion of water use that contributes to wastewater flows.
2. One meter (or multiple meters) provides water to multiple parcels.

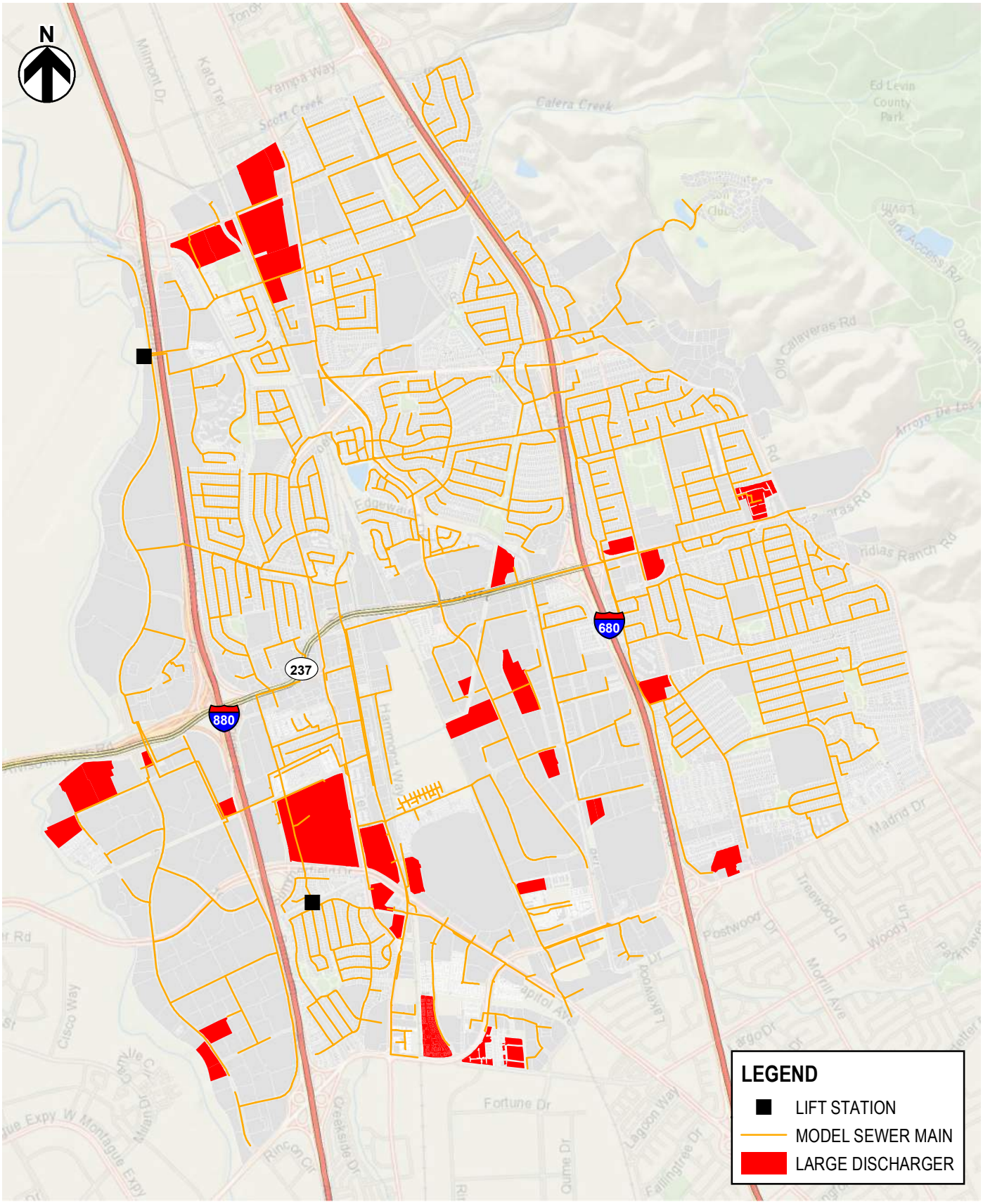



**FIGURE 7-7**
CITY OF MILPITAS
SEWER MASTER PLAN
LARGE DISCHARGERS

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### 7.3.3 Diurnal Patterns

To account for hourly flow fluctuations, a set of diurnal flow patterns were established for different land use categories for both weekday and weekend conditions. To estimate these patterns, sub-basins with predominately residential, industrial, manufacturing, and commercial land uses were identified.

- **Residential:** Sub-basins H (valley floor) and J (hillside) are comprised of only residential land uses, so the average of these two sub-basins was used to develop the weekday residential diurnal pattern. Two separate weekend diurnal patterns were developed for valley floor and hillside residential land uses. No significant variation was observed during the weekday.
- **Industrial:** Flow in sub-basin Q is 95% industrial. This sub-basin was used to develop industrial diurnal patterns.
- **Manufacturing:** Sub-basin C is comprised of 95% manufacturing land use and was used to develop manufacturing diurnal patterns.
- **Commercial:** Sub-basin B has the highest portion of flow from commercial land uses, which is comprised of 32% commercial flow. It is noted that sub-basin B flow is comprised of approximately 1/3 commercial, 1/3 residential, and 1/3 manufacturing. Residential and manufacturing land use diurnal patterns were established using other sub-basins providing the basis for 2/3 of the flow contribution to the sub-basin. The remaining flow and pattern was used to develop the third diurnal pattern (commercial), accordingly.
- **Correctional Facility:** A diurnal pattern was developed for the correctional facility. The pattern is similar to the residential diurnal pattern but is slightly flattened and roughly based on FM 1790, which is downstream of the correctional facility. There is no variation in weekday and weekend patterns for the correctional facility.

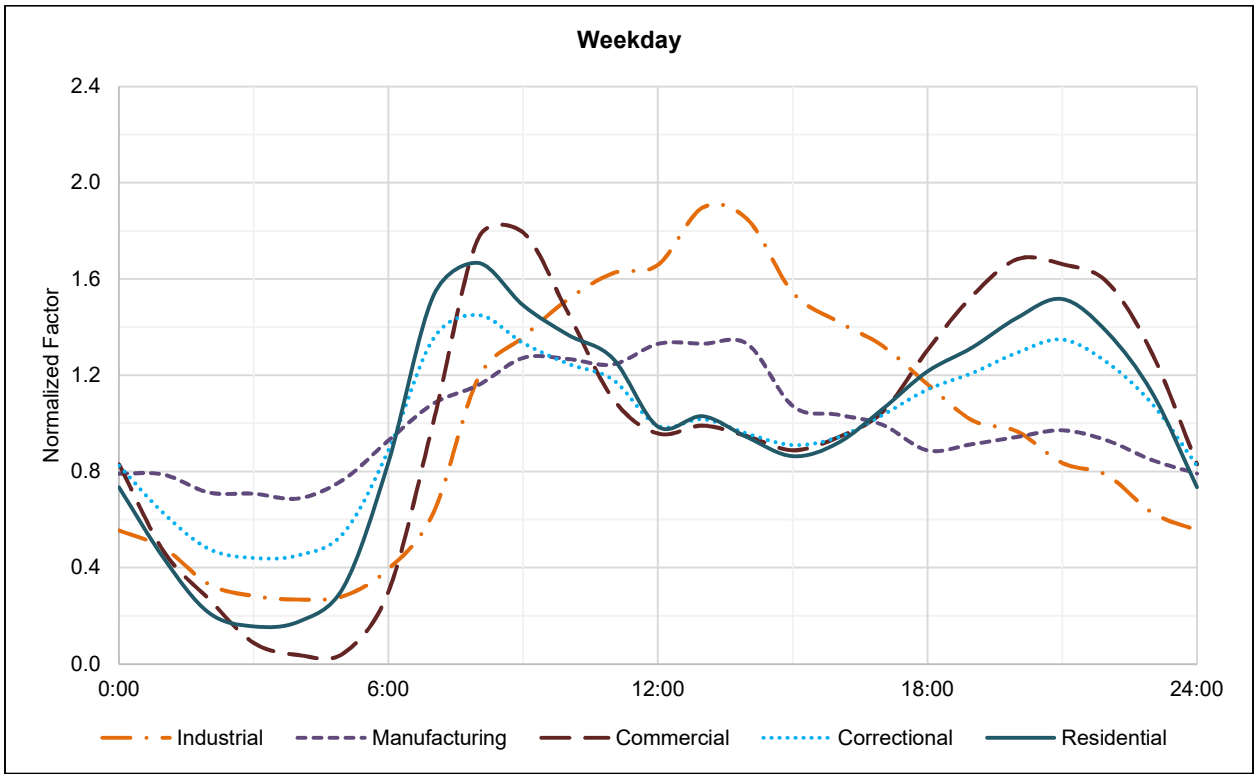
Diurnal patterns were adjusted iteratively for weekday and weekend to match measured flows during the calibration process discussed below.

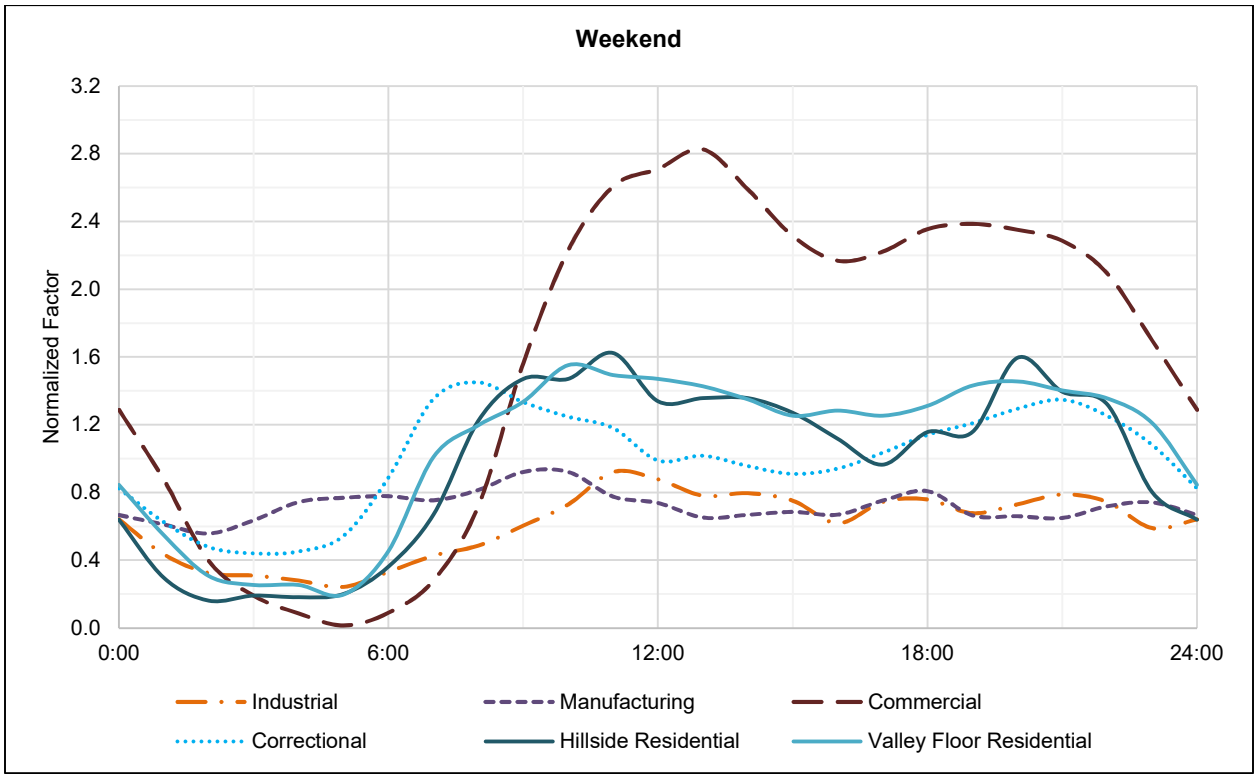
**Figure 7-8** displays the calibrated set of weekday and weekend diurnal patterns developed.

### 7.3.4 Dry Weather Calibration

Initial GWI and base flow estimates, along with diurnal patterns, were added to the model. Large dischargers were assigned the diurnal pattern that corresponds to the original land use listed in **Table 7-5**. After each model run, iterative adjustments were made while comparing the modeled versus the observed flow at each flow meter (see **Figure 7-10**). Adjustments were made to GWI for each sub-basin, UF factors, and diurnal patterns. The process is iteration intensive as one change to a sub-basin affects everything downstream. Thus, the focus was to start with the terminal sub-basins that are in the most upstream areas with the fewest land use types and unknowns, followed by downstream sub-basins.

**Figure 7-8: Diurnal Patterns**



## Flow Obstructions

Where there were consistent discrepancies between modeled and observed flows, CCTV was reviewed to analyze upstream critical flow splits. It was discovered that four of the five critical flow splits were not operating as intended. The key findings and changes that were made in the model to represent these findings are described below and identified on **Figure 7-9**. These adjustments for obstructions were removed for the capacity analysis as detailed in **Section 8.3**.

1. MH 539 is a critical flow split at the intersection of Curtis Avenue and Main Street. There are two pipes flowing into the manhole from the south and the east. During dry weather conditions, all flow should exit the manhole to the west to FM 41 as part of sub-basin B. The outlet to the north is slightly elevated and serves as an overflow flow split flowing to sub-basin T. During CCTV review, a large grease buildup was identified at the manhole. The grease buildup diverts a large portion of the flow entering the manhole from the east to the north to sub-basin T instead of west to FM 41 as part of sub-basin B. To account for this in the model, the upstream pipe invert flowing to the north was adjusted until, as visually estimated using CCTV, approximately two-thirds of the peak flow entering the manhole from the east was flowing north.
2. MH 543 is a critical flow split located where Tom Evatt Park intersects Main Street just downstream of the critical flow split at MH 539. During review of the CCTV for MH 543, it was discovered that there is also a large obstruction here. Based on what was observed in the CCTV, under normal conditions, the flow entering this manhole from the south should flow exclusively to the west during dry weather and the pipe exiting to the north would function as an overflow flow split. Due to a large obstruction at this manhole, some of the flow is being diverted to the north, activating the flow split. To account for this obstruction in the model, the upstream pipe invert of the segment flowing to the north was adjusted to simulate the flow diversion by the obstruction. This invert was adjusted until the modeled flows at FM 592 and FM 715, which are capturing the flow of sub-basin T, approximately matched the observed flows.
3. MH 2488 is a critical flow split located in sub-basin D. After reviewing CCTV, a large obstruction was also observed at this manhole. Under normal conditions, based on the pipe inverts observed in the CCTV, all flow entering this manhole from the south and the east should flow to the north. However, due to the large buildup, a large proportion of the flow is diverted to the west. To account for this obstruction, the upstream pipe invert of the segment exiting this manhole to the north was adjusted until the modeled flows matched the observed flows at FM 649 and FM 2491, which are located just downstream of this flow split to the west and north, respectively.
4. MHs 1053, 1152, and 2578, as discussed in **Section 3.1.1**, are flow diversion structures, and MH 1152 is a critical flow split. As part of the calibration process, the inverts of the overflow segments exiting each of these manholes was adjusted to reflect the operation of the flow diversion structures in the field.

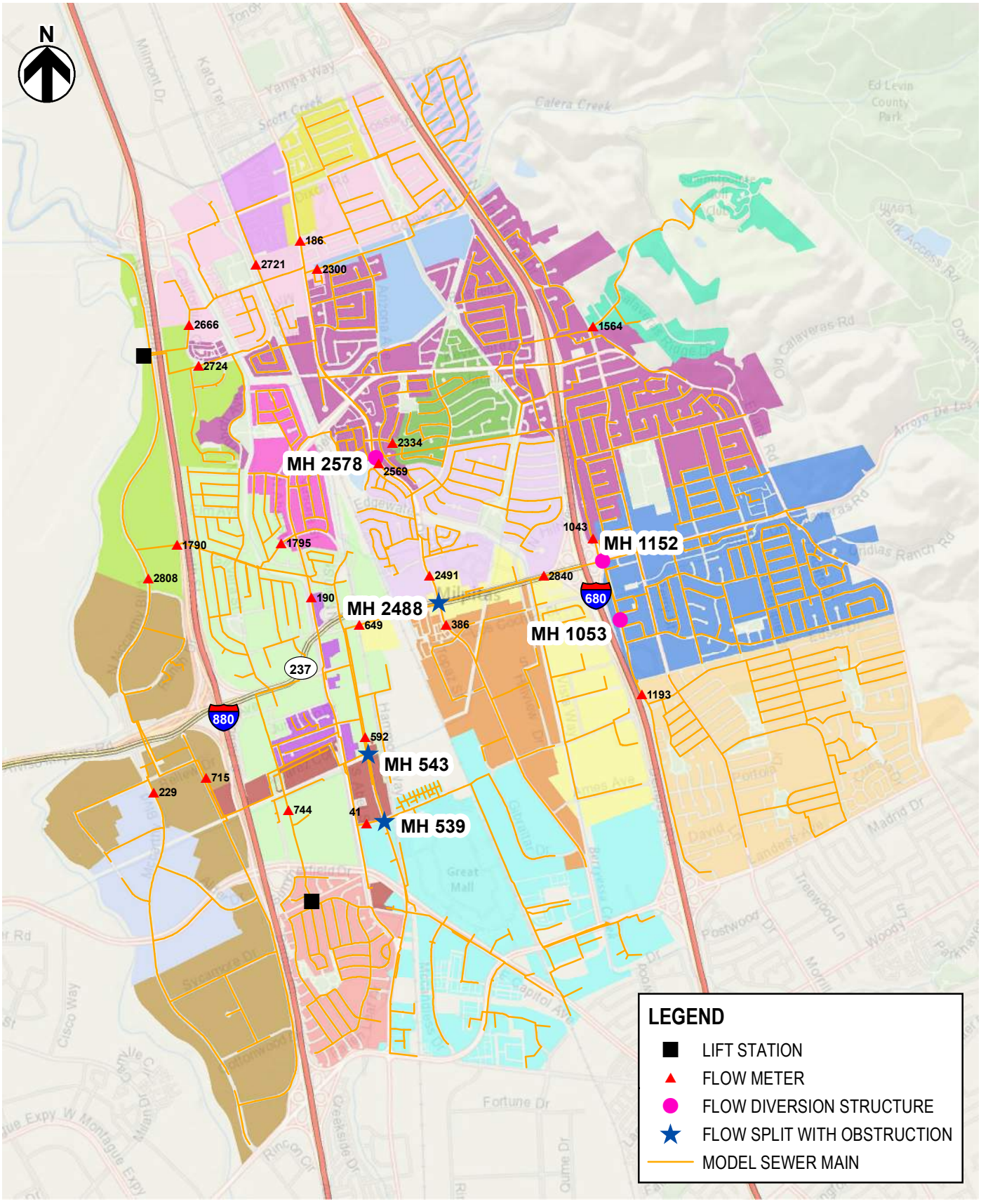



**FIGURE 7-9**
CITY OF MILPITAS
SEWER MASTER PLAN
FLOW DIVERSION AND OBSTRUCTION

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After completing all UF factor and GWI adjustments, and adjusting inverts at flow splits/diversion structures, the modeled flows were determined to align as close to the observed flows as reasonably possible. **Table 7-6** presents the final calibrated UF factors.

The final modeled average DWF at the outfall is 7.55 MGD. The total modeled GWI, which represents both GWI and other continuous flow contributions, is 1.40 MGD. There is no reliable flow data for the outfall at the Main LS; thus, GWI values in sub-basin O were estimated based on the GWI of the nearby sub-basins.

**Figure 7-10** presents a sample of the final modeled versus observed flows for dry weather. This chart includes Sunday and Monday, so both weekend and weekday dry weather calibration are represented. Calibration charts for all flow meters are included as **Appendix D**.

**Table 7-6: Calibrated UF Factors**

| Land Use Designation | UF Factor | Units | Quantity | Flow (MGD) | Diurnal Pattern |
|---|---|---|---|---|---|
| HSFL | 400 | gpd/parcel | 56 | 0.022 | Hillside Residential |
| HSFM | 465 | gpd/parcel | 107 | 0.050 | Hillside Residential |
| SFL | 200 | gpd/parcel | 9619 | 1.924 | Valley Floor Residential |
| SFM | 1200 | gpd/acre | 266 | 0.319 | Valley Floor Residential |
| MFH | 1500 | gpd/acre | 292 | 0.438 | Valley Floor Residential |
| MFVH | 2000 | gpd/acre | 56 | 0.113 | Valley Floor Residential |
| MHP[1] | - | - | - | - | Valley Floor Residential |
| HOTEL | 4000 | gpd/acre | 60 | 0.244 | Valley Floor Residential |
| MXD | 1000 | gpd/acre | 67 | 0.067 | Commercial |
| HDMU | 2200 | gpd/acre | 64 | 0.141 | Commercial |
| PAO | 500 | gpd/acre | 65 | 0.031 | Industrial |
| COM | 900 | gpd/acre | 467 | 0.420 | Commercial |
| INP | 450 | gpd/acre | 727 | 0.327 | Industrial |
| MFG | 1500 | gpd/acre | 550 | 0.825 | Manufacturing |
| PF | 190 | gpd/acre | 310 | 0.059 | Commercial |
| COR[1] | - | - | - | - | Correctional |
| Large Dischargers[2] | Various | - | - | 1.176 | Various |
| **Total** | **-** | **-** | **-** | **6.157** [3] | **-** |

Notes:
1. All three mobile home parks and the correctional facility were identified as large dischargers and assigned flows based on water use data as described in **Section 7.3.2**.
2. Large dischargers were assigned a diurnal pattern based on their original land use codes, which are listed in **Table 7-5**.
3. Represents the total BSF. The total BSF plus the total GWI is the total DWF.

**Figure 7-10: Example of Dry Weather Model Calibration Charts**

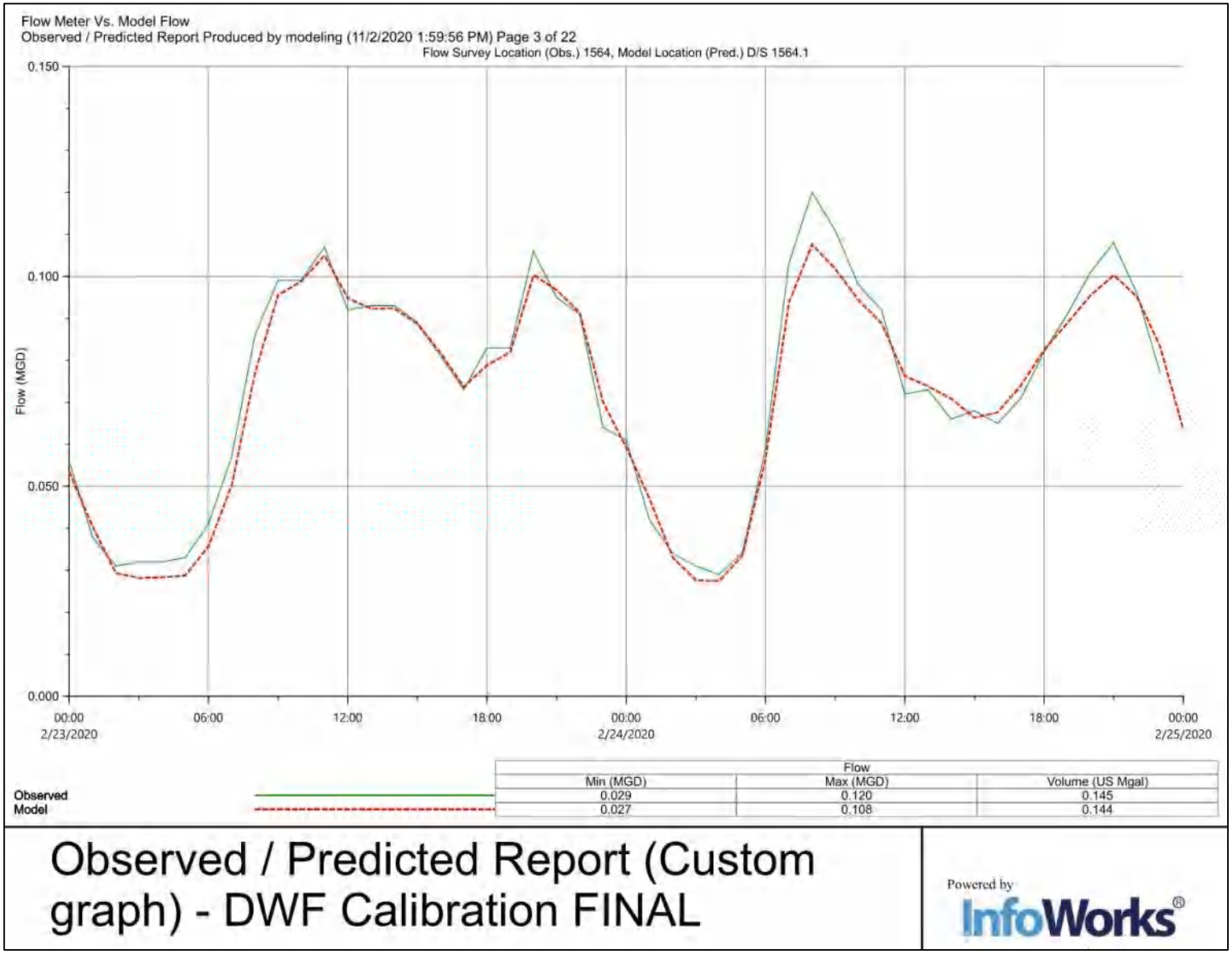


**Figure 7-10** presents a comparison between modeled and observed dry weather weekday flows. For the overall system, modeled flows are 3.4% higher than the observed flows on an average dry weekday and are within 10% (higher) of the measured flows on the average dry weekend. A calibration within 5% is considered a good representation of actual conditions and having modeled flows higher than measured flows assures that the model is conservative in its representation of the collection system.

**Table 7-7: Calibrated Model vs. Observed Weekday Dry Weather Flow Comparison**

| Flow Meter | Sub-Basin | Model Avg Flow (MGD) | Observed Avg Flow (MGD) | % Difference |
|---|---|---|---|---|
| 744 | A | 0.273 | 0.270 | 1.2% |
| 41[1] | B | 0.540 | 0.565 | -4.4% |
| 386 | C | 0.566 | 0.576 | -1.8% |
| *649[2]* | *D* | *0.892* | *0.862* | *3.5%* |
| *2491[2]* | *D* | *0.103* | *0.133* | *-22.9%* |
| | **D Total** | **0.995** | **0.995** | **-0.1%** |
| 1193 | E | 0.588 | 0.580 | 1.3% |
| 1043 | F | 1.219 | 1.248 | -2.4% |
| 1795 | G | 0.258 | 0.271 | -4.6% |
| 1564 | H | 0.073 | 0.074 | -2.3% |
| 2300 | I | 0.059 | 0.056 | 5.3% |
| 2334 | J | 0.163 | 0.167 | -2.2% |
| 2569 | K | 0.383 | 0.357 | 7.5% |
| 2666 | L1 | 0.867 | 0.889 | -2.5% |
| 2724 | L2 | 2.442 | 2.036 | 19.9% |
| 186 | M | 0.113 | 0.123 | -7.5% |
| 2721 | N | 0.198 | 0.199 | -0.7% |
| 2808 | P | 1.755 | 1.837 | -4.5% |
| 229 | Q | 0.091 | 0.086 | 6.2% |
| 190 | R | 0.081 | 0.087 | -7.1% |
| 1790 | S | 2.267 | 1.934 | 17.2% |
| *592[1,3]* | *T* | *0.194* | *0.191* | *1.5%* |
| *715[1,3]* | *T* | *0.990* | *1.027* | *-3.6%* |
| | **T Total** | **1.184** | **1.219** | **-2.8%** |
| OUTFALL[4] | O | 7.492 | - | - |

Notes:
1. Flows are affected by the obstruction in MH 539 - a critical flow split.
2. Flows are affected by the obstruction in MH 2488 - a critical flow split.
3. Flows are affected by the obstruction in MH 543 - a critical flow split.
4. The flows of sub-basin O capture the entire system. There are not any measured flows at this location, so there is nothing to compare the modeled flows to.

## 7.4 Wet Weather Flow (WWF)

The remaining components of wastewater flow are additional wet weather GWI related to an elevated groundwater table and the RDI/I as illustrated in **Figure 7-1**. GWI levels typically fluctuate as the water table rises during the wet season and falls during the dry season; GWI values were adjusted to account for the seasonal variation. RDI/I is the flow that enters the system through manhole covers and through temporarily increased groundwater infiltration driven by rainfall.

### 7.4.1 RDI/I Volume

The volume of RDI/I is calculated by subtracting the volume of DWF in the system from the volume of total wet weather flow, as shown in **Figure 7-11**. For this study, the volume of RDI/I and corresponding R-factor was calculated for the 24-hour period following the start of Storm event 1. Because GWI tends to fluctuate over the course of the wet season as the water table rises and falls, dry weather data from just prior to the storm was used for RDI/I calculations. DWF prior to the storm was subtracted from the storm flow for RDI/I calculations.

**Figure 7-11** is an example of the flows at FM 2724 during the storm period.

**Figure 7-11: Wet Weather Flow**

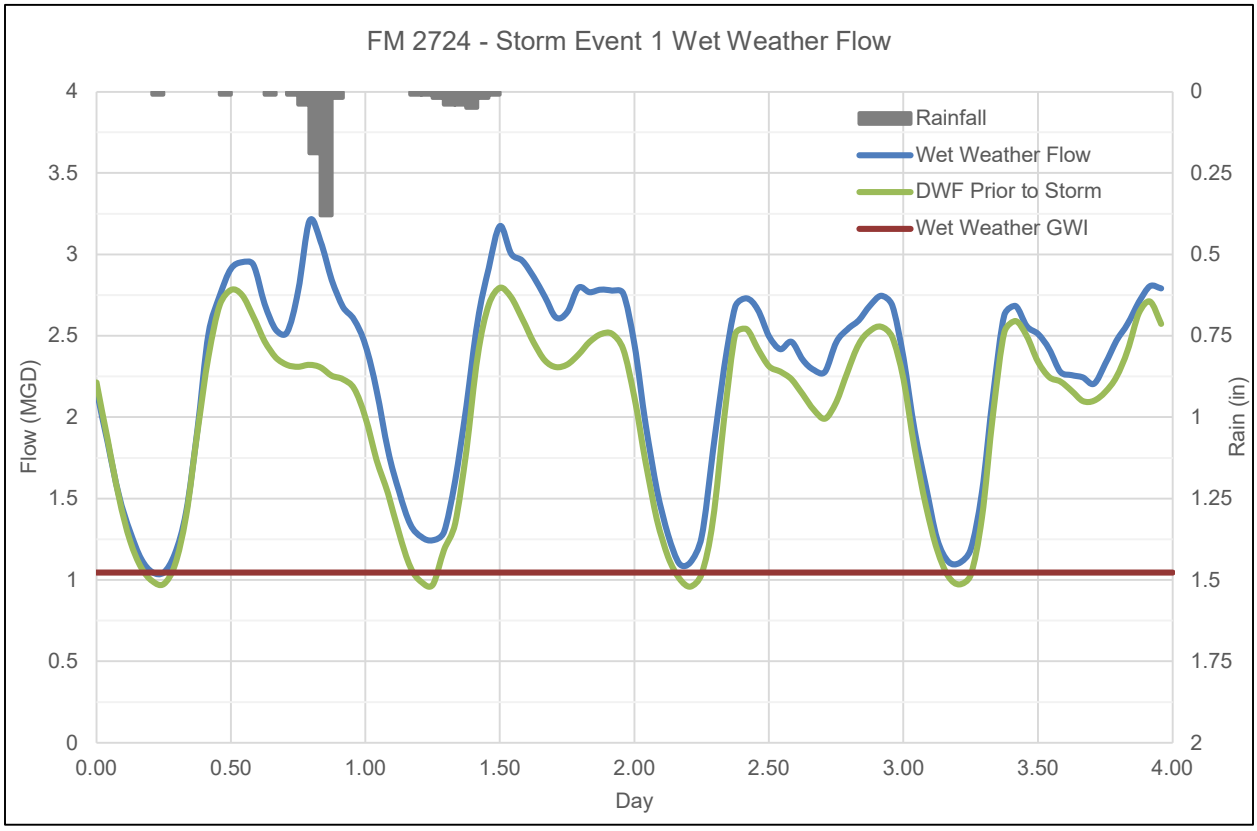
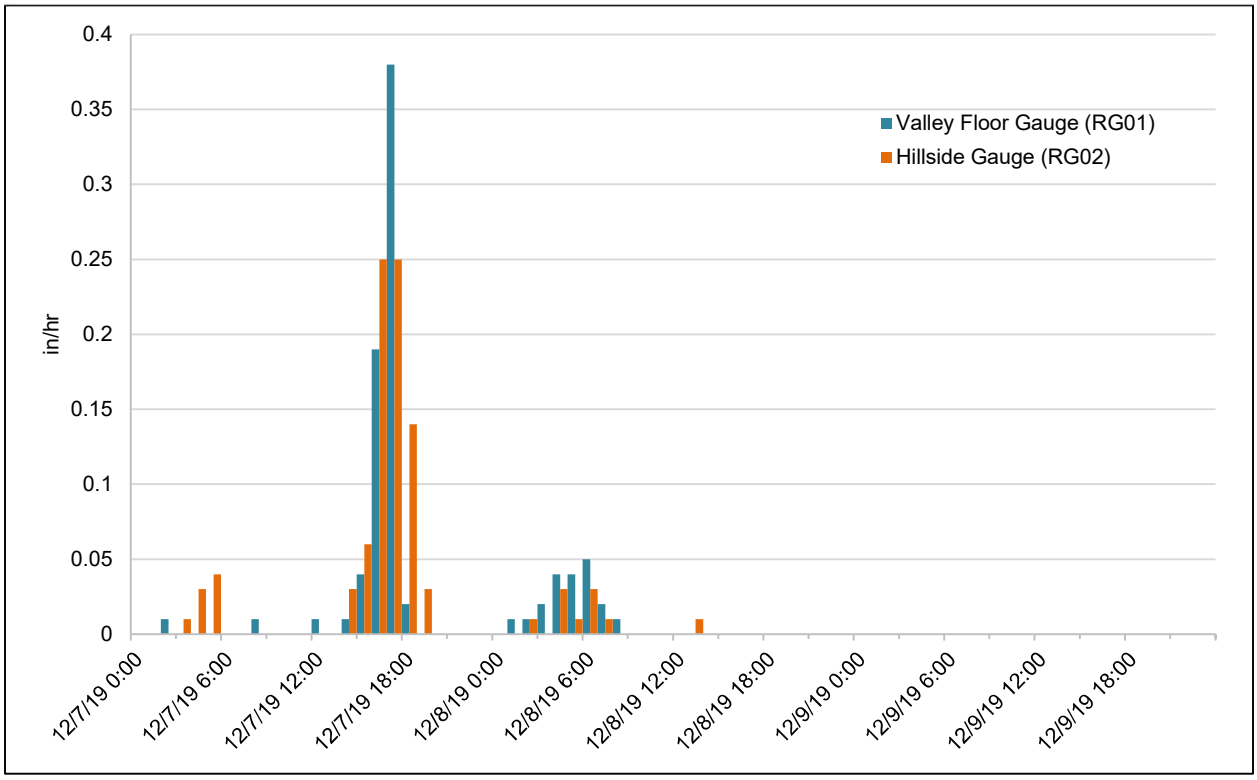


**Figure 7-12: Storm Rainfall**




### 7.4.2 Total Rainfall

The volume of rain that fell on each sub-basin is calculated by multiplying the depth of rain by the total area contributing sanitary flows in each respective sub-basin. The areas of each sub-basin are listed in **Table 7-4**. This acreage excludes parcels with no wastewater flows (NF designation – see **Figure 5-1**) such as streets and areas of open space. To calculate the rainfall volume for this initial analysis, each sub-basin was matched to a corresponding rain gauge (RG01 or RG02) based on proximity and elevation. Sub-basin H is the only sub-basin located on the hillside, so this was matched to RG02. The remainder of the sub-basins were matched with RG01 on the valley floor. **Figure 7-12** presents the rainfall for Storm event 1 for both rain gauges.

### 7.4.3 R-Factor Development

The R-factor represents the percentage of rainfall that enters the City's sewer system by volume: the ratio of RDI/I to total volume of rain. An initial R-factor was calculated for each sub-basin based on the flow data and was iteratively adjusted for the wet weather model calibration process.

There is no separate estimation of antecedent moisture conditions in the soil. It is best to use at least a 2-year storm to estimate R-factors, as it will more likely represent conditions similar to a large representative design storm. For this analysis, the storm selected for the R-factor calculation and calibration was Storm event 1, which was the largest storm available during the flow monitoring period. Storm event 1 was less than a 1-year 24-hour storm, but between a 1- and 2-year 2-hour storm.

Once the RDI/I and total volume of rainfall are calculated, the R-factor is a simple calculation of RDI/I volume divided by rainfall volume, resulting in the estimated portion of rainfall that enters the wastewater collection system. These values were also iteratively adjusted during the model calibration process.

### 7.4.4 Wet Weather Calibration

To initiate the wet weather calibration process, the observed rainfall collected at both rain gauges for Storm event 1 was added to the model (see **Figure 7-12**). During the calibration process, it was noted that the peak flows for all valley floor sub-basin meters occurred approximately three hours prior to the peak rainfall, which was clearly elevated related to rainfall as compared to dry weather flow. It appears that there may have been an error in the timestamps of RG01, so the rainfall was shifted three hours earlier.

**Wet Weather GWI**

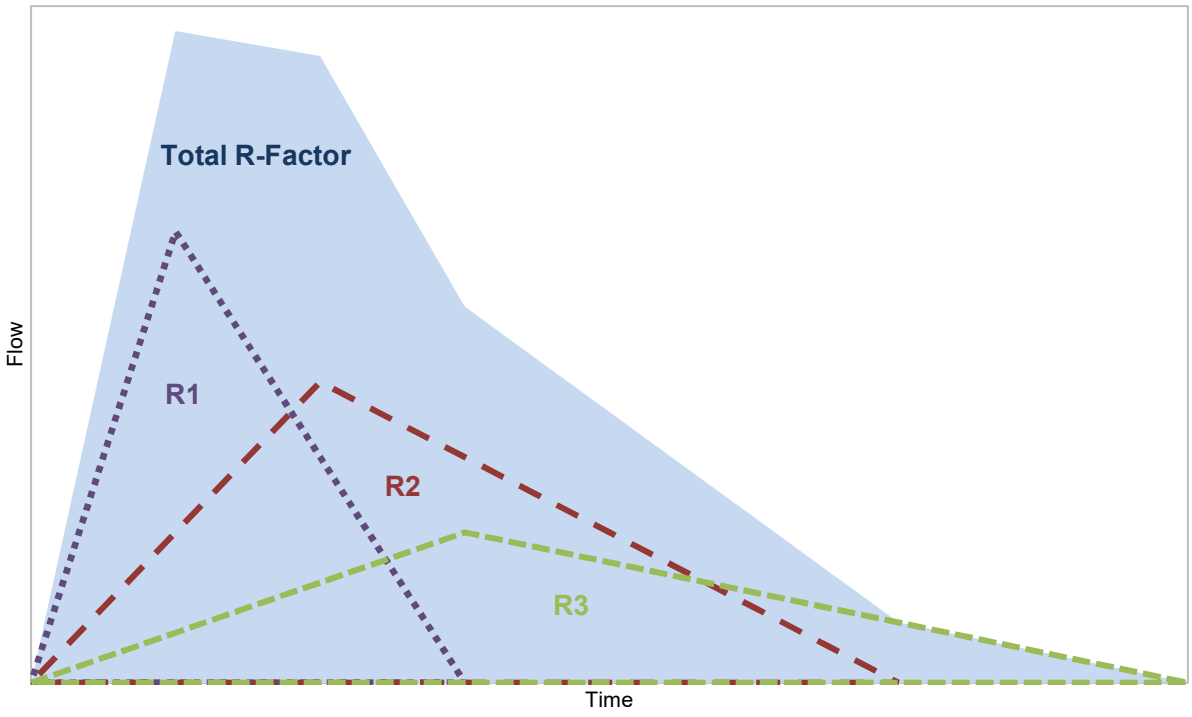
GWI fluctuates over the course of the year, increasing during the wet season as the water table rises. The extent that the water table rises and falls is site specific and can be affected by geology, surface water features, and tides. By extension, wet weather GWI changes are also site specific and can also depend on the condition of the pipelines. In the wet weather calibration scenarios of the model, GWI values established during the dry weather calibration process were iteratively increased to reflect the elevated water table more accurately during the wet season as displayed by an increase in the minimum flows.

**RDI/I R-Factor**

The RDI/I is estimated using the R-factor, or the percentage of rainfall that enters a sewer system as described in **Section 7.4.1**, and the Tri-Triangular Method. The Tri-Triangular Method, which is the industry standard for representing wet weather flows, involves summing three separate hydrographs to derive a single unit hydrograph. The total R-factor is divided into three separate values, represented as triangles (see **Figure 7-13**), based on the speed at which rainfall enters the sewer system, as described below:

- **Rapid (R1)** – Stormwater inflow that enters the sewer system most rapidly, typically through entry points such as holes in manhole covers. The peak of this triangle occurs one to three hours after the start of the rainfall.
- **Intermediate (R2)** – A combination of rapid stormwater inflow and slow rainfall-dependent infiltration.
- **Slow (R3)** – Long term delayed rainfall-dependent infiltration. The peak of this triangle occurs the longest time after the start of the rainfall, and the effects of this infiltration can continue long after the end of the rainfall.

**Figure 7-13: Tri-Triangular R-Factor Method**




The initial estimated R-factors (R1, R2, and R3) for each sub-basin were input into the model, which generated the total R-factors. Total R-factors are simply the sum of the individual R-factors (R1 + R2 + R3). The entered R-factors were iteratively adjusted for each sub-basin by comparing modeled flows to observed flows at each flow meter during the day of, and the two days following, the storm. During this part of the calibration process, it is critical to capture the peak flows as accurately as possible to avoid underestimating capacity deficiencies.

The final calibrated R-factors for each sub-basin are presented in **Table 7-8**.

For wet weather calibration of the system, average modeled flows representing Storm event 1 and one day following the storm are 3.3% higher than measured flows. Modeled peak WWF for Storm event 1 are 2.3% higher than measured peak flows. A calibration within 5% is considered a good representation of actual conditions and having modeled flows higher than measured flows assures that the model is conservative in its representation of the collection system.

A sample wet weather calibration chart is displayed in **Figure 7-14**. Wet weather calibration charts for all flow meters are attached as **Appendix E**.

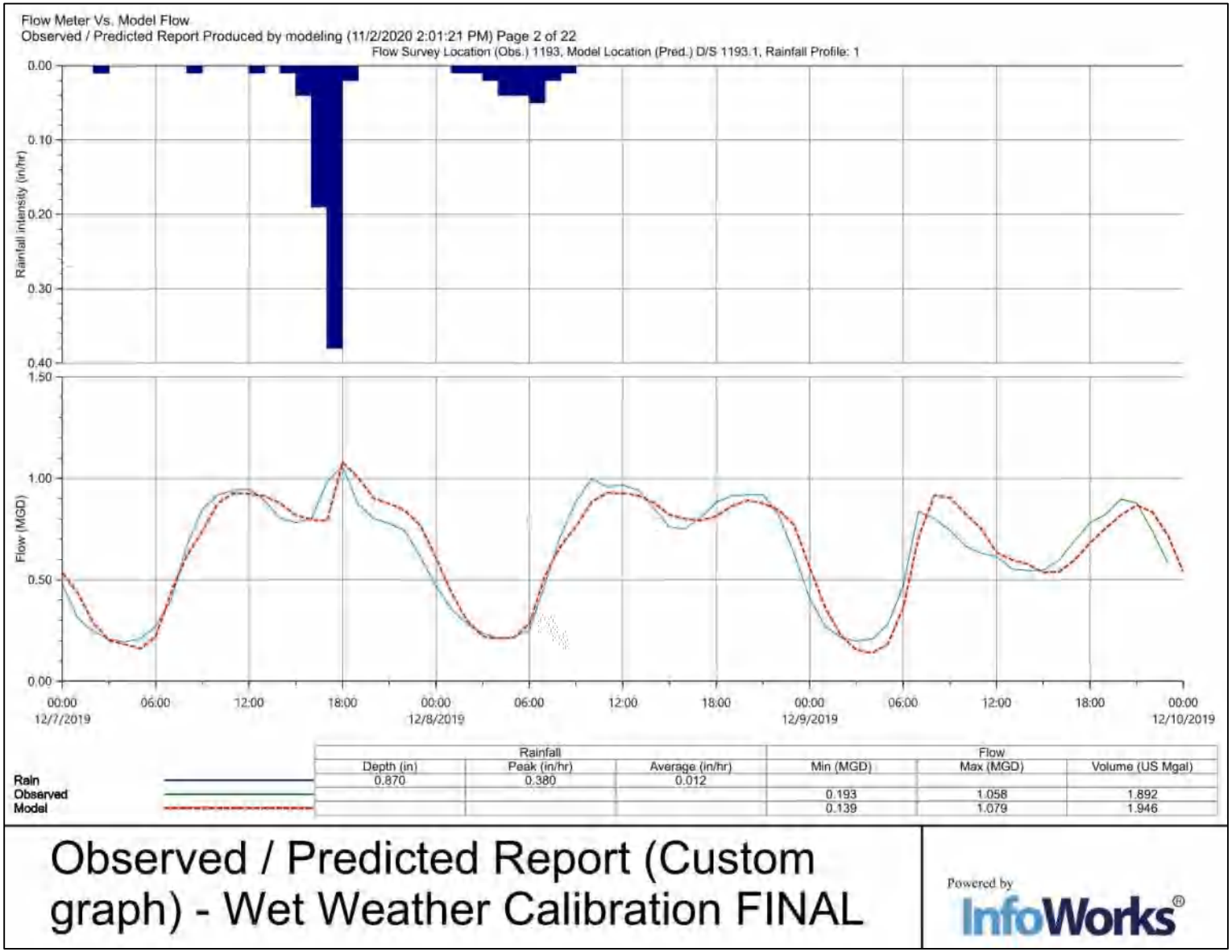
**Table 7-8: Final Calibrated R-Factors**

| Sub-Basin | Acreage | R1 | R2 | R3 | Total R-Factor |
|---|---|---|---|---|---|
| A | 138 | 0.40% | 0.85% | 0.23% | 1.48% |
| B | 433 | 0.80% | 0.66% | 0.13% | 1.59% |
| C | 192 | 0.27% | 0.00% | 0.02% | 0.30% |
| D | 208 | 0.26% | 1.64% | 0.00% | 1.90% |
| E | 455 | 0.53% | 0.00% | 0.07% | 0.60% |
| F | 414 | 0.67% | 0.00% | 0.19% | 0.86% |
| G | 78 | 1.27% | 2.14% | 0.00% | 3.40% |
| H | 110 | 0.24% | 0.00% | 0.00% | 0.24% |
| I | 81 | 0.08% | 0.35% | 0.00% | 0.42% |
| J | 79 | 0.00% | 0.67% | 1.50% | 2.17% |
| K | 187 | 0.10% | 0.56% | 0.15% | 0.81% |
| L1 | 266 | 0.09% | 0.17% | 0.14% | 0.40% |
| L2 | 607 | 0.09% | 0.17% | 0.05% | 0.31% |
| M | 57 | 1.07% | 0.26% | 0.07% | 1.39% |
| N | 55 | 0.55% | 1.17% | 0.34% | 2.06% |
| O[1] | 207 | 0.70% | 0.40% | 0.40% | 1.50% |
| P | 537 | 0.59% | 0.30% | 0.37% | 1.26% |
| Q | 151 | 0.45% | 0.00% | 0.15% | 0.60% |
| R | 34 | 1.30% | 2.41% | 0.00% | 3.71% |
| S | 393 | 0.00% | 1.30% | 0.34% | 1.64% |
| T | 207 | 0.25% | 0.12% | 0.26% | 0.64% |
| **Average[2]** | **4,889** | **0.40%** | **0.45%** | **0.19%** | **1.04%** |

Notes:
1. There is no flow meter at the outfall for sub-basin O. Values were estimated based on surrounding sub-basins.
2. The average represents the weighted average by sub-basin area.

In summary, total R-factors for each subbasin ranges from 0.24% up to 3.71%, which represents the percentage of rainfall entering the collection system. A low R-factor would be less than 3% and 10% is considered high. The weighted average for the entire system is 1.04%; this is considered a relatively watertight system with limited rainfall entering the collection system.

**Figure 7-14: Example of Wet Weather Model Calibration Charts**



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# SECTION 8 – CAPACITY ANALYSIS

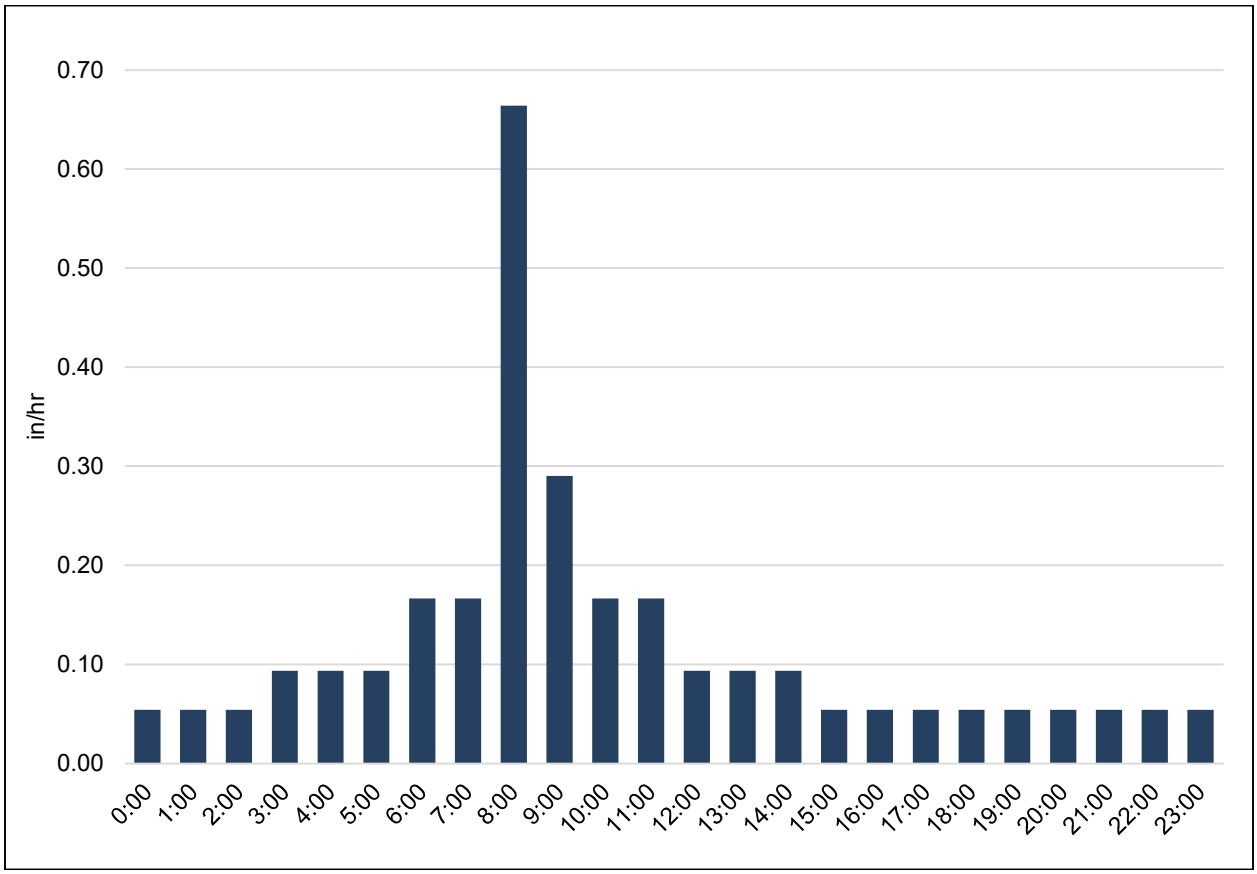
The hydraulic analysis for the collection system was evaluated under design storm for existing and future land use conditions. This section describes the analysis and the resulting deficiencies.

## 8.1 Design Storm

To estimate WWF, a design storm is applied to the model and wet weather flows are represented based on the calibrated R-factors for each sub-basin. A range of storms was considered for the design condition of this study. Both the 2002 and 2009 Master Plans used a 10-year, 4-hour constant distribution storm. Often, a 10-year 24-hour storm is used with a peak hour coinciding with the peak of the typical diurnal curve. A 5-year 24-hour storm was also available in the event that a 10-year 24-hour storm caused exceedingly large flows due to high rates of RDI/I.

For this study, the typical 10-year 24-hour storm with a peak hour coinciding with the peak of the typical diurnal curve was deemed appropriate.

**Figure 8-1: 10-Year 24-Hour Design Storm**




Source: NOAA Atlas 14 Volume 6 Version 2 precipitation frequency estimates in inches for Milpitas, California (https://hdsc.nws.noaa.gov/hdsc/pfds).

## 8.2 Deficiency Criteria

The initial deficiency criteria used to evaluate the capacity of the modeled pipes under design flow conditions was the ratio of wastewater flow depth (d) to pipe diameter (D), or d/D. In InfoWorks, if d/D is greater than one, this means the pipe is flowing full under pressure and the hydraulic grade line (HGL) is higher than the crown of the pipe. InfoWorks also reports a "surcharge state" for each pipe, and **Table 8-1** summarizes the definition of each surcharge state.

In the hydraulic model, the HGL reaching the ground surface indicates a potential SSO. Even for a pipe flowing under capacity or surcharged, if the freeboard – the distance between the ground surface and the HGL – is five feet or greater, the risk of SSO is minimal. Where pipes were shown as surcharged due to inadequate hydraulic capacity (surcharge state of "2"), a pipe was identified as deficient if the freeboard in these locations is also less than five feet.

**Table 8-1: InfoWorks Surcharge States**

| Surcharge State | Definition | Deficiency if: |
|---|---|---|
| < 1 [1] | When depth of flow is less than the diameter of the pipe | Not considered hydraulically deficient |
| = 1 | Pipe is surcharged due to backwater from a downstream deficiency. | Not considered hydraulically deficient |
| = 2 | Pipe is hydraulically under capacity and needs to be upsized. | Freeboard < 5 feet |

Notes:
1. Surcharge State = d/D

## 8.3 Assumed Condition

As detailed in **Section 7.3.4**, there were three critical flow splits identified in the system as having major flow obstructions that drastically changed the flow path of wastewater – likely from grease buildup at MH 539, MH 543, and MH 2488. During the dry weather calibration process, these flow splits were modified in the model to match the wastewater flows observed in the system. For the hydraulic analysis, system performance was evaluated based on the assumption that these obstructions have been cleared and the system is operating as intended.

## 8.4 Future Condition

**Section 5.2** presents the process used to update the land use for potential future redevelopment areas in the City to estimate future wastewater flows. For the hydraulic analysis of the system under future conditions, calibrated GWI, UF factors, and R-factors developed above were applied to the updated land uses for projected future buildout conditions. The same design storm was used for both existing and future conditions.

### 8.4.1 Large Dischargers

If parcels were identified as large dischargers under existing conditions and located within "Opportunity Areas" (see **Figure 2-2** and **Figure 5-2**), the existing land use was compared to the future land use; where the land uses differed, the future land use UF factor was applied. If there

was no change to the land use, then the large discharger wastewater flow (see **Table 7-5**) under existing conditions was maintained for the future scenario.

**Table 8-2** lists the large dischargers that were removed from the future condition and replaced with the future land use UF factors.

**Table 8-2: Summary of Large Discharger Sites Planned for Redevelopment**

| Rank | Location[1] | Existing Land Use | Future Land Use |
|---|---|---|---|
| 13 | Main St | COM | MFH |
| 15 | McCarthy Blvd | INP | PAO |
| 16 | Landess Ave | COM | HDMU |
| 20 | McCarthy Blvd | INP | PAO |
| 23 | McCarthy Blvd | INP | PAO |
| 26 | Calaveras Blvd | COM | HDMU |
| 36 | Park Victoria Dr | COM | HDMU |

Notes:
1. Source: January-March 2019 water meter customer billing data provided by the City multiplied by 85% - assumed portion of water use that contributes to wastewater flows.

Los Esteros Ranch, which is located at the intersection of McCarthy Blvd and Dixon Landing Road, is connected to the City collection system. This land use was added to the modeled system in accordance with the City's agreement with Los Esteros Ranch. The agreement between the City and Los Esteros Ranch, attached as **Appendix F**, states that they have a maximum allowable water usage of 50,000 gpd among the three parcels included in the agreement. Applying the same method identified for other large dischargers (see **Section 7.3.2**), it was assumed that wastewater flows constitute approximately 85% of water usage. Los Esteros Ranch was assigned a wastewater flow of 42,500 gpd and was added as a large discharger for the future condition. The area of the three contributing parcels was measured using the Measure tool in Bluebeam Revu 2016 and calibrated using the scale bar displayed on Exhibit "A" of the Los Esteros Ranch Agreement.

## 8.5 Hydraulic Capacity Deficiencies

Under dry weather conditions, **Table 8-3** shows a 6% increase to 7.9 MGD in average flow for future conditions at the outfall.

**Table 8-3: Model Flow Summary**

| Scenario | Average DWF (MGD) | Peak DWF (MGD) | Peak WWF (MGD) |
|---|---|---|---|
| Existing | 7.5 | 10.4 | 14.9 |
| Future | 7.9 | 11.0 | 18.5 |

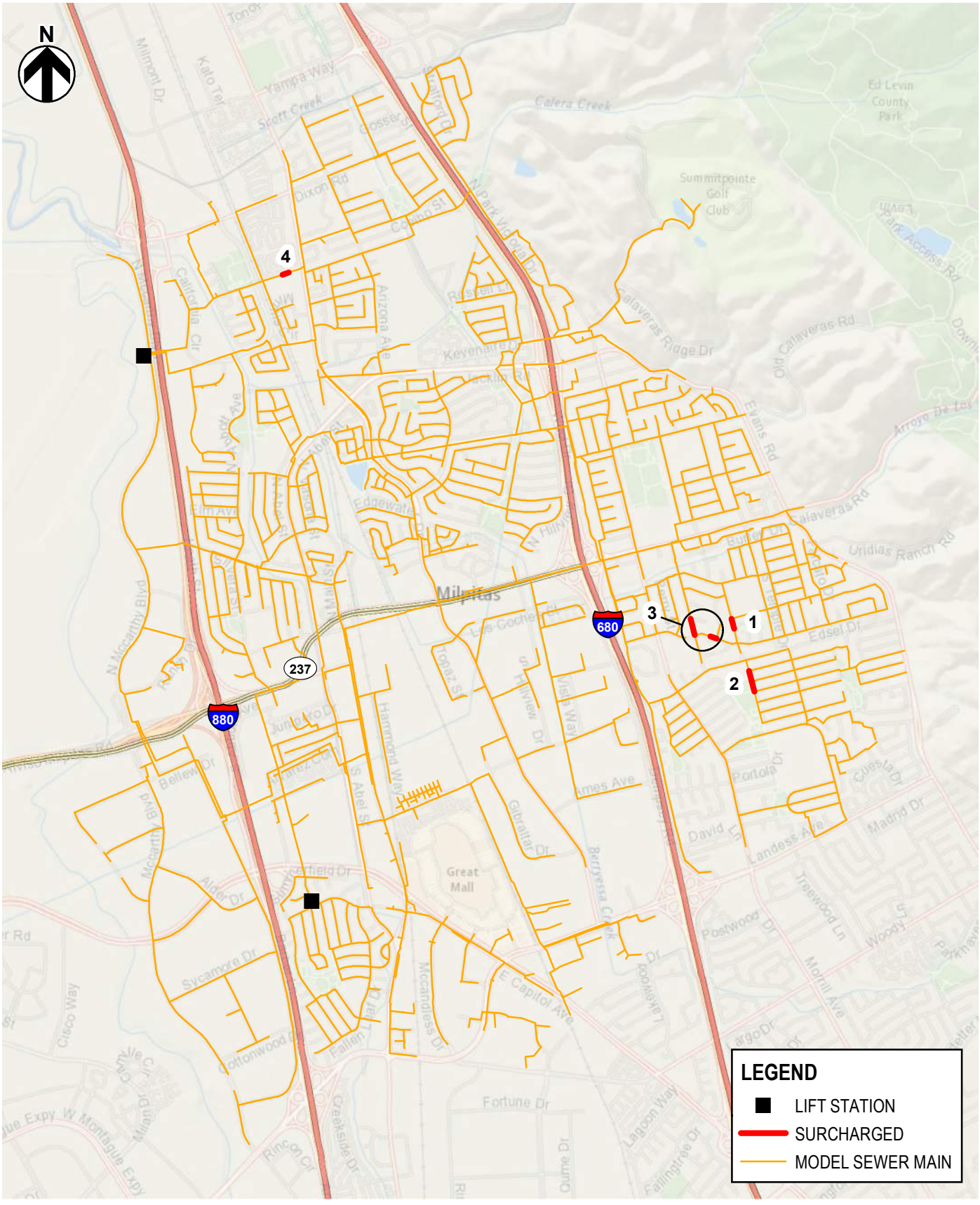



**FIGURE 8-2**
CITY OF MILPITAS
SEWER MASTER PLAN
SURCHARGED PIPELINE SEGMENTS

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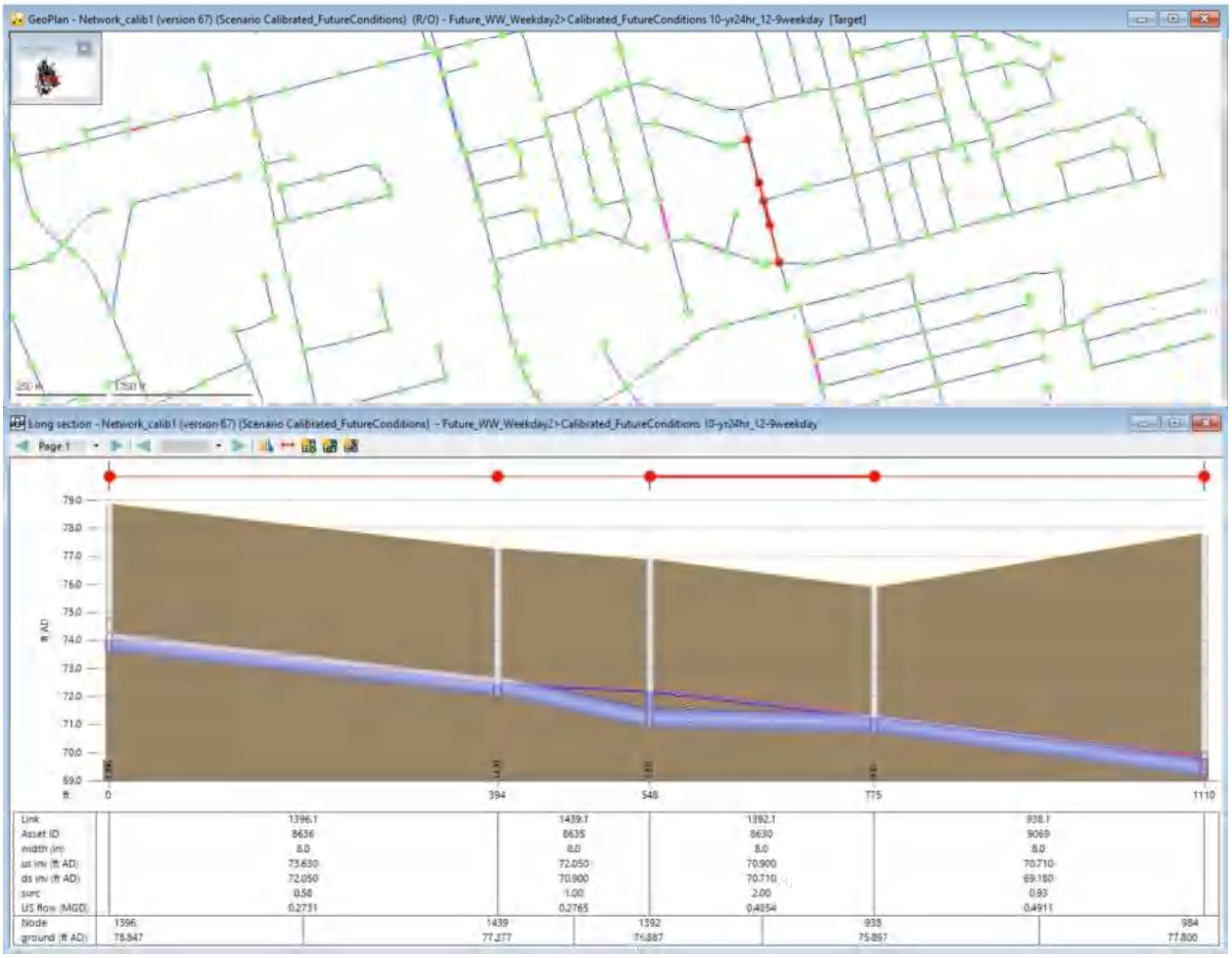
Under all scenarios, there were no additional surcharged segments identified under future conditions that were not seen under existing conditions. It is expected that this is because the City is largely built out and system improvements implemented with development have addressed potential deficiencies.

There were six pipe segments with a recorded surcharge state of "2" (see **Section 8.2**) under both existing and future conditions indicating that they are under capacity. These segments are displayed on **Figure 8-2**. Provided below is a description of each of these pipelines:

- **Surcharged Location 1:** This pipe segment drops below the minimum freeboard deficiency criteria (see **Table 8-1**) with a freeboard of 4.7 ft, shown in **Figure 8-3**. For a single pipe reach, replacement is not recommended without further cause. It is recommended that the City monitor this location for surcharging. This location (MH GID 1392) is a good candidate for installing a SmartCover to monitor the wastewater level and prevent SSOs.
- **Surcharged Location 2:** These two surcharged segments are 6-inch mains. Freeboard at these locations is greater than five feet, so they do not exceed the criteria for a capacity deficiency and therefore are not considered deficient. In general, it is recommended that all future sewer mains in the collection system are constructed with minimum diameters of 8-inches.

**Figure 8-3: Surcharged Location 1 with 4.7 feet of Freeboard**



- **Surcharged Location 3:** These two surcharged segments are 10-inch pipes. Freeboard at these locations is greater than five feet, so they do not exceed the criteria for a capacity deficiency and therefore are not considered deficient.
- **Surcharged Location 4:** This pipe, identified as under capacity (GID 17506), is located to the west of the intersection between N. Milpitas Blvd. and Washington Dr. In GIS, this segment was identified as an 8-inch pipe; however, both upstream and downstream pipes were identified as 12-inch pipes. During the review of record drawings, it was unclear if this pipe has been upsized to match the neighboring pipes. In the model, this segment experiences surcharging during wet weather as an 8-inch pipe, however, when this segment is upsized to 12-inches to match the neighboring pipe diameters, there is no longer surcharging. An improvement project is not recommended at this location as the freeboard is over ten feet and does not meet the threshold for deficiency identified in **Table 8-1**.

# SECTION 9 – PROJECT DEVELOPMENT

Based on the condition assessment described in **SECTION 4**, projects were recommended to address prioritized defects identified in the collection system. This section describes the prioritization process and a summary of the project cost development. Results of this project development and selection translate into a prioritized CIP for the wastewater collection system.

## 9.1 Rehabilitation Selection Methodology

The PACP peak scores from the CCTV inspection and the risk scores calculated from the LoF/CoF desktop condition assessment drive the pipeline rehabilitation selection process. Below is a summary of the methodology implemented for both inspected and non-inspected pipe.

### 9.1.1 CCTV Inspected Segments

For segments with CCTV inspection data, a two-step process was used to determine the final rehabilitation recommendation. Using the defect coding assigned by NPS and the IAP software, the pipe segments with defects were assigned one of the following defect-level rehabilitation methods:

- Replace;
- Cured-in-place pipeline (CIPP);
- Point repair by excavation; or
- Sectional liner.

When the user assigns a rehabilitation method for each defect code, IAP assigns the respective rehabilitation method to each segment based on the associated defect coding.

**Table 9-1** presents a sample of the assigned rehabilitation methods for all structural defects with a score of 5. A full list of all defect codes and associated rehabilitation methods can be found in **Appendix A** (R&R Study App. H).

With the rehabilitation method established for each defect code, a decision tree was established to determine the final overall rehabilitation method for the pipeline. This decision tree was prepared based on the following factors:

- CCTV structural peak score and overall peak score;
- Number of point repairs and lining recommendations by the defect-level rehabilitation methods module;
- Number of defects;
- Length of major (score of 4 or 5) and/or minor (score of 3) defects; and
- Presence of specific defects such as infiltration drippers (ID) or Reinforcement Corroded Chemical (SRCC).

**Figure 9-1** presents a schematic of the established decision tree. Pipeline segments with CCTV inspection data are filtered by their PACP peak scores. Then, they are analyzed based on the number of point repairs and lining recommendations established by the defect-level rehabilitation methods module as well as the number of defects, length of defects, and presence of specified minor, but not negligible, defects. When multiple rehabilitation options were recommended, a cost analysis was performed to determine the best action. For example, if a segment was recommended to receive ten sectional liners, a full liner would be more cost-effective.

**Table 9-1: Sample of Defect Codes with Associated Rehabilitation Methods**

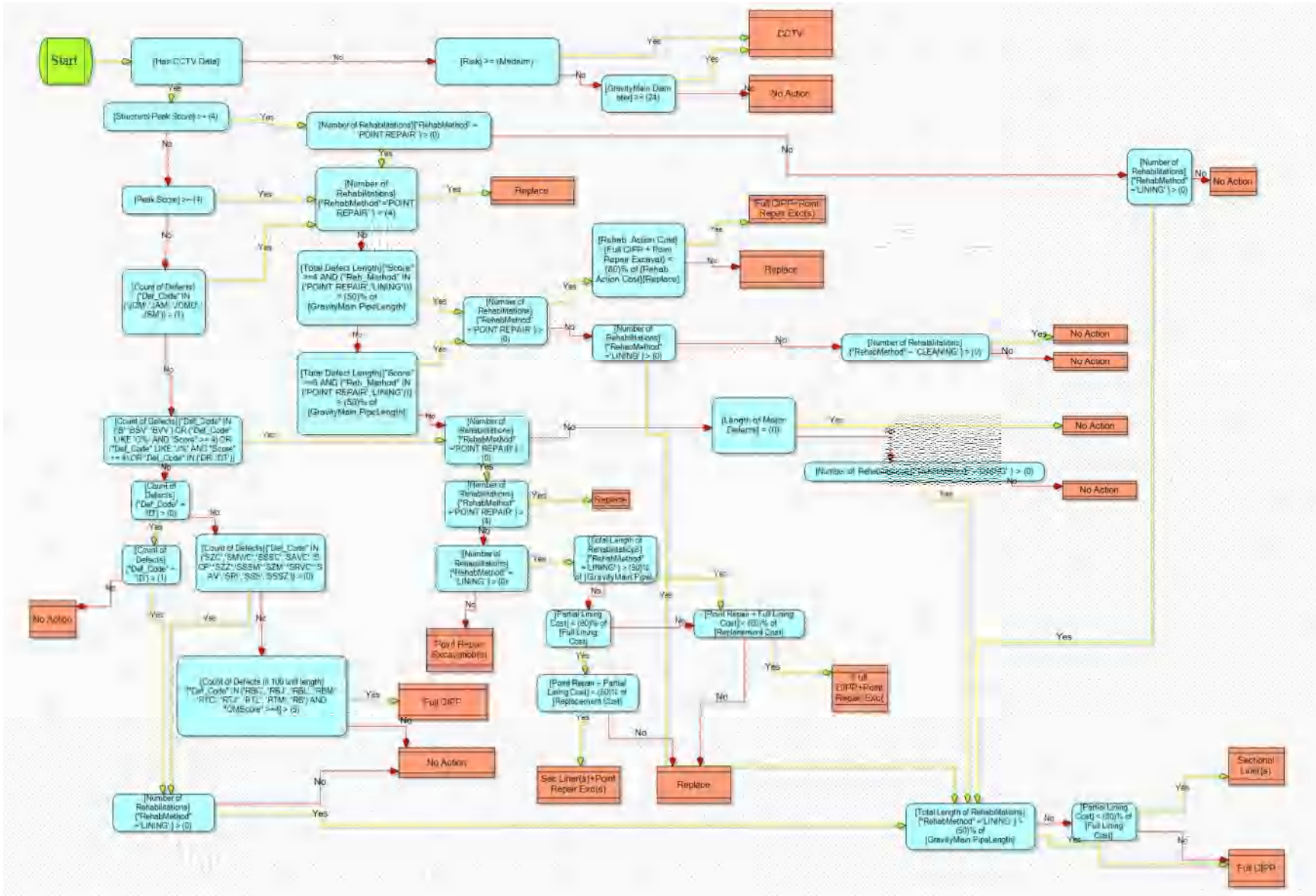
| Defect Code | Score | Defect Type | Description | Rehabilitation Method |
|---|---|---|---|---|
| BSV | 5 | Structural | Broken Soil Visible | Point repair |
| BVV | 5 | Structural | Broken Void Visible | Point repair |
| DI | 5 | Structural | Dropped Invert | Point repair |
| DV | 5 | Structural | Deformed Vertical Brick | Point repair |
| HSV | 5 | Structural | Hole Soil Visible | Point repair |
| HVV | 5 | Structural | Hole Void Visible | Point repair |
| SMW | 5 | Structural | Missing Wall | Point repair |
| SMWC | 5 | Structural | Missing Wall Chemical | Point repair |
| SMWM | 5 | Structural | Missing Wall Chemical | Point repair |
| SMWZ | 5 | Structural | Missing Wall Unknown | Point repair |
| SRC | 5 | Structural | Reinforcement Corroded | Point repair |
| SRCC | 5 | Structural | Reinforcement Corroded Chemical | Point repair |
| SRCM | 5 | Structural | Reinforcement Corroded Mechanical | Point repair |
| SRCZ | 5 | Structural | Reinforcement Corroded Unknown | Point repair |
| SRP | 5 | Structural | Reinforcement Projecting | Lining |
| SRVM | 5 | Structural | Reinforcement Visible Mechanical | Lining |
| SRVZ | 5 | Structural | Reinforcement Visible Unknown | Lining |
| XB | 5 | Structural | Collapse Brick Sewer | Point repair |
| XP | 5 | Structural | Collapse Pipe Sewer | Point repair |

**Figure 9-2** displays the final rehabilitation methods recommended for each segment based on the decision tree. For a table of the recommended rehabilitation method for each segment, see **Appendix A** (R&R Study App. A).

### 9.1.2 Segments without CCTV Inspection

For segments without CCTV inspection data, risk scores and diameter were used to develop a prioritized set of segments that are recommended for CCTV inspection and further analysis. Pipeline segments with a risk score of medium or higher (greater than or equal to three) – see **Section 4.2.3** – were included as part of this CCTV recommendation. Additionally, all pipelines with a diameter of 24-inches or greater are recommended for prioritized CCTV regardless of the associated risk rating. **Figure 9-3** presents the segments recommended to prioritize for CCTV.

**Figure 9-1: Rehabilitation Decision Tree**



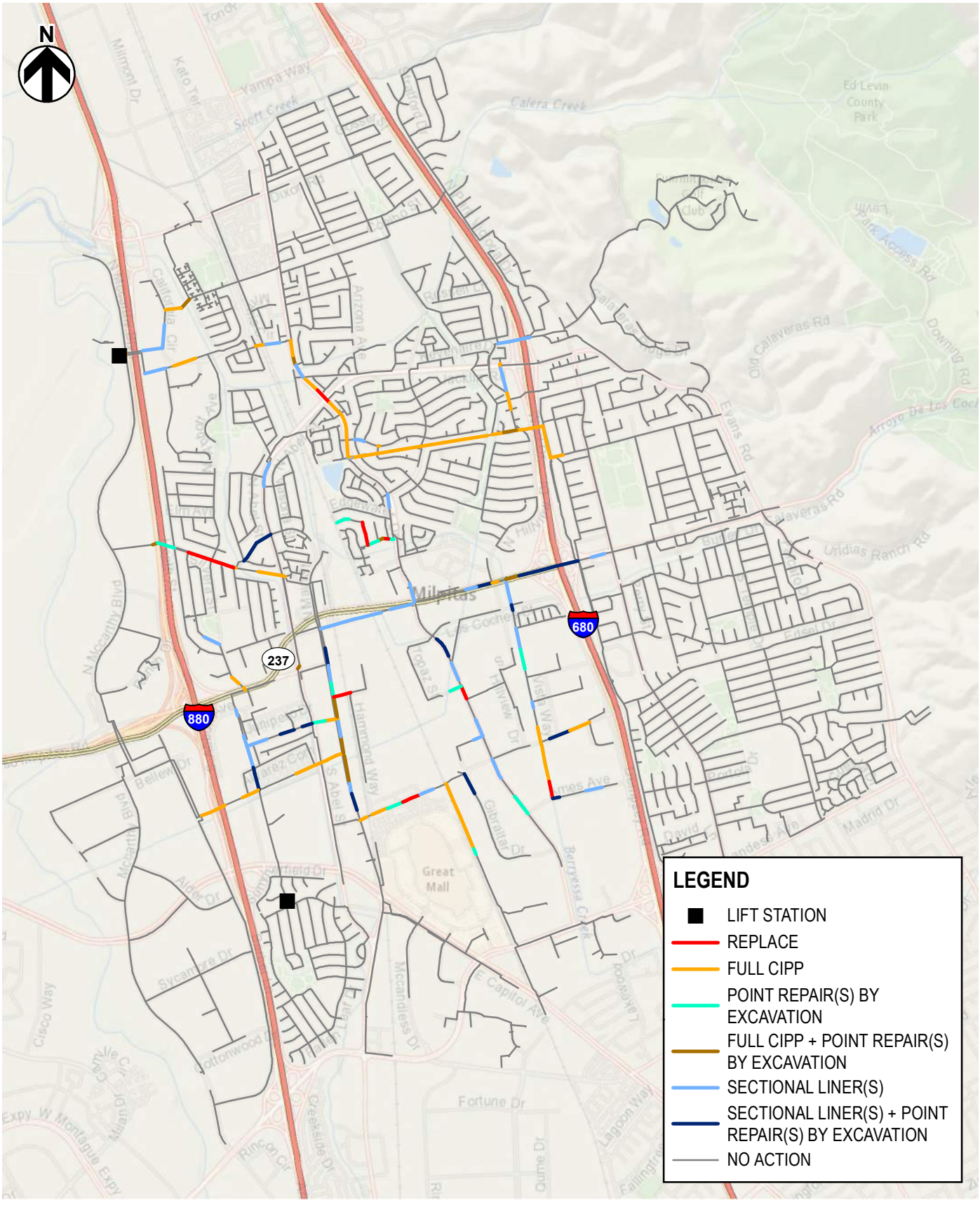



**FIGURE 9-2**
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SEWER MASTER PLAN
RECOMMENDED REHABILITATION METHOD

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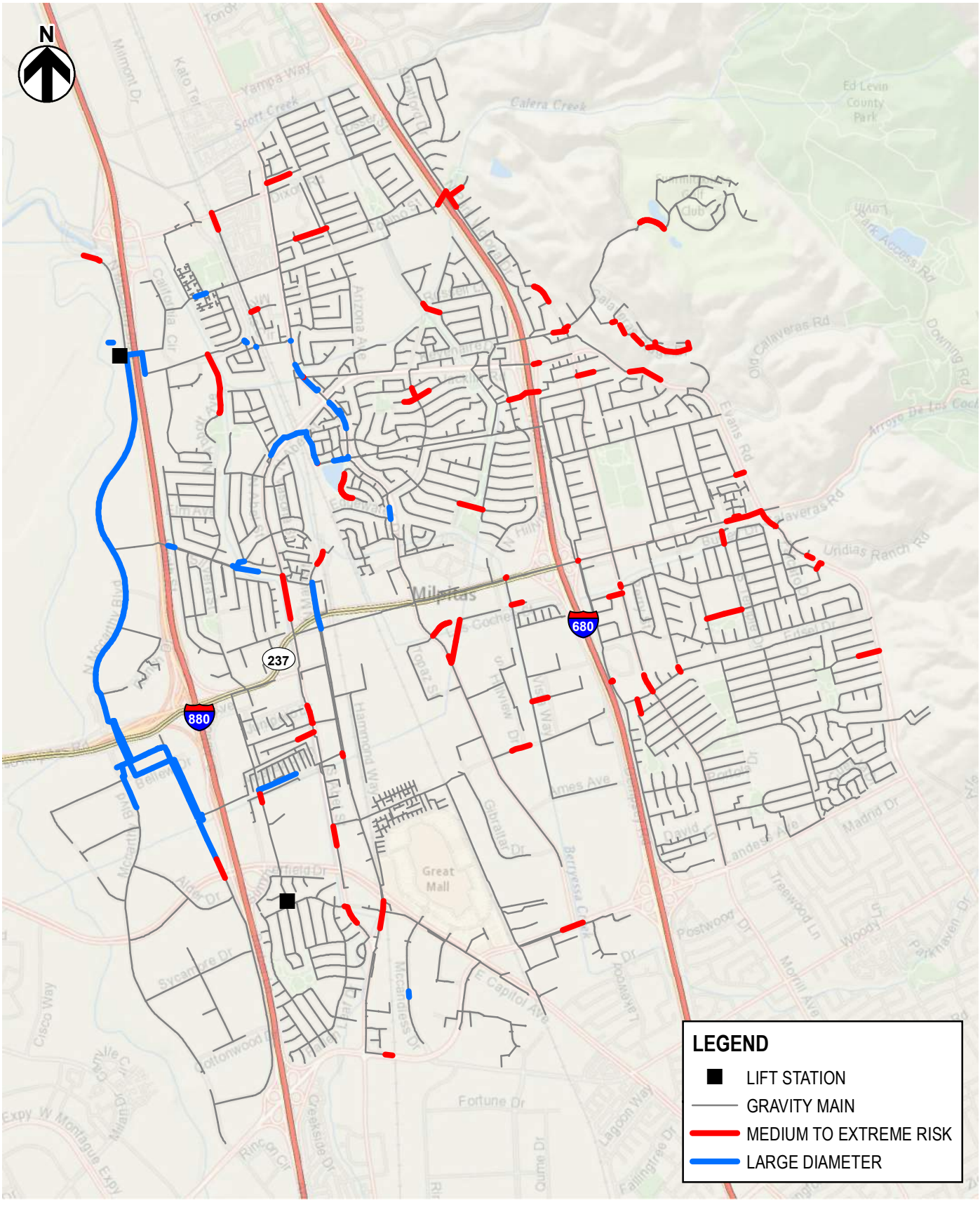


**FIGURE 9-3**
CITY OF MILPITAS
SEWER MASTER PLAN
RECOMMENDED CCTV PRIORITY

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## 9.2 Basis of Cost Assumptions

A cost estimate was developed for each type of rehabilitation method. Provided is a description of the basis for unit cost development and associated project-specific costs for pipelines, resurfacing, manholes, pumping systems, structural rehabilitation, protective coatings, bypass and redundancy, and electrical equipment. The purpose of approximating construction costs is to appropriate a conservative level of funding for each identified rehabilitation project included within the proposed scope of the City's upcoming CIP. **Appendix A** (R&R Study App. J) contains details of the preliminary cost estimates for all projects analyzed as part of this SMP.

### 9.2.1 CCTV Costs

CCTV costs were estimated based on diameter and length. Unit costs are conservative to account for the added cost for specialized techniques, such as laser profiling for large diameter pipe, and general quality control review. Unit costs are provided in **Table 9-2**.

**Table 9-2: CCTV Unit Costs**

| Pipe Diameter (in) | Unit Cost ($/ft) |
|---|---|
| Up to 18 | $4 |
| 19 to 24 | $5 |
| 25 to 36 | $6 |
| 37 to 66 | $8 |

### 9.2.2 Pipeline Unit Costs

Unit costs for pipelines were estimated based on recent project bid tabulation for similar Capital Improvement Projects in the Bay Area as well as experience estimating the cost of similar local rehabilitation projects.

**Pipeline Replacement and Rehabilitation**

For the purposes of this SMP, in general, pipeline replacement projects are estimated using a loaded construction cost estimate of approximately $35/inch-diameter per foot of pipeline replaced. The loaded pipeline unit cost was developed using relevant pipeline replacement project cost of construction bid averages divided by the total foot-inches (the length of pipe multiplied by the diameter in inches) of pipeline included within the scope of each specific project. Budgetary values for sewer bypassing and traffic control are also approximated using assumed construction quantities and according to the unit cost estimation summary provided in **Table 9-3**. The construction contingency provides an allotment of funds designated for unexpected issues that can change the scope of the project. For conceptual planning and cost comparisons of pipeline projects, the following parameters and associated unit costs were globally applied to recommended pipeline projects. Detailed unit costs for each improvement type according to size and depth are detailed in **Appendix A** (R&R Study App. J).

**Table 9-3: Pipeline Improvement Unit Cost Summary**

| Cost Parameter | Unit Cost | Unit Criteria |
|---|---|---|
| Pipeline Replacement[1] | $35 | Per inch-diameter per pipeline foot-length |
| Full Pipe Length CIPP | $16 | Per inch-diameter per pipeline foot-length |
| Point Repair by Excavation | $600 - $10,500 | Per inch-diameter per pipeline foot-length, depending on depth |
| Sectional Liner | $3,000 – $15,000 | Per repair, depends upon pipeline diameter |
| Mobilization/Demobilization | 5% | Cost of construction |
| Sewer Bypassing[2] | 10% | Cost of construction |
| Traffic Control During Construction | $10k - $15k | Per roadway traffic rating |
| Construction Cost and Market Contingency | 30% | Construction Subtotal |

Notes:
1. Loaded cost including costs associated with earthwork, demolition, sheeting, shoring & bracing, paving, and testing and commissioning. Pavement repair assumes minimum four-foot-wide trench per running foot.
2. Sewer bypassing costs typically requires expected flow capacity to determine hydraulic sizing of temporary equipment and materials.

### 9.2.3 Soft Costs

Soft costs are additional project costs that are not considered to be contractor construction costs. These costs include engineering design, permitting, construction administration, and construction management. Typical soft costs include the following:

- Engineering design and consulting is expected to also address California Environmental Quality Act (CEQA) requirements to identify significant environmental impacts, if any.
- Permitting, land acquisition and obtaining right-of-way (ROW) are dependent on the project. For existing City facilities, the cost is expected to be less than if an easement is needed to be obtained through a property. The cost is also expected to be a function of the total cost. A range of percentages were applied to each project.
- Engineering services during construction (ESDC) and construction management costs are those costs associated with the administration of the contract and management of the project, ensuring the project is constructed as designed.
- The annual inflation of cost that would occur over time for a future project.

**Table 9-4** provides a summary of the parameters used for estimating the soft costs. Soft costs were applied to all projects.

**Table 9-4: Soft Cost Estimating Parameters**

| Cost Parameter | Cost | Applied to: |
|---|---|---|
| Engineering Design and Consulting Services | 15% | Construction Subtotal |
| Permitting, land acquisition, and obtaining ROW | 7% | Construction Subtotal |
| ESDC, Construction Management, & Inspection Services | 12% | Construction Subtotal |
| Annual Inflation | 3% | Project Total |

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# SECTION 10 – CAPITAL IMPROVEMENT PLAN

This section presents a summary of the prioritized set of CIP projects developed as a culmination of the condition assessment (CCTV inspection, desktop inspection, and lift station inspection) presented in **SECTION 4** and the project development summarized in **SECTION 9**. Recommendations include budget estimates and targeted timelines for project implementation based on the prioritization laid out in **SECTION 9**.

## 10.1 Existing CIP Projects

Every year, the City prepares a five-year CIP that provides the City Council, staff, and public with a comprehensive planning tool for budgeting and carrying out a range of capital projects. To ensure that the recommendations provided as part of this Master Plan Study align with recent, ongoing, and planned projects, a review of the City's 2020-2025 CIP was conducted. **Table 10-1** presents recent and ongoing wastewater collection system and lift station improvement projects per the 2020-2025 CIP.

**Table 10-1: Recent Sewer Improvement Projects**

| Project ID | Project | Description | Status |
|---|---|---|---|
| 6119 | Sanitary Sewer Condition Assessment Program | Citywide sanitary sewer condition assessment program to determine the condition of the City's sanitary sewer system. | This phase to be completed during FY 2020/21. |
| 6124 | Pump Station Rehabilitation Program | Rehabilitation or replacement of wastewater pumps at Main LS and Venus LS to safely discharge sewage. | Replacement of pump no. 3 and purchase of portable backup generator at the Main LS planned for FY 2020-21. |
| 6126 | Minor Sewer Projects | Ongoing analysis, engineering, and implementation of various minor modifications and improvements to existing sewer systems. | Transfer switch at Venus and pavement restoration at the Main LS are planned for FY 2020-21. |
| 6130 | Main LS Odor Emissions Control | Installation of odor emission controls at the Main LS to address concerns regarding elevated levels of hydrogen sulfide and other odorous compounds at the facility. | Design started in FY2018-19 and construction started during spring 2020. |
| 6131 | Sanitary Sewer Cathodic Protection Improvements | Assessment, design, and installation of cathodic protection system along City's steel sewer force main from the Main LS to the RWF. Includes replacement of two existing magnetic flow meters at the Main LS with proper isolation to prevent reading interference. | Assessment and design started in FY 2019-20. |
| 6134 | On-Call Sewer Maintenance & Repair Services | On-call repair and maintenance services at all City sewer infrastructure, assets, and appurtenances. | Ongoing |
| Plan | Sewer Line Replacement at E. Curtis | Design and construction of sanitary sewer main replacement/upgrade on E. Curtis Avenue from S. Main Street to the E. Curtis cul-de-sac. This project will be financed through TASP Impact Fees. | 2023-2024 |

**Table 10-2** provides a summary of the 2020-2025 allocation for each of the projects and the sources of funding for each per the City's Capital Improvement Program 2020-2025 Final Report.

**Table 10-2: Existing CIP Financing for 2020-2025**

| Projects | Sewer Infrastructure Fund | Sewer Fund | Sewer Treatment Fund | Total |
|---|---|---|---|---|
| 6119 Sanitary Sewer Condition Assessment Prgm[1] | ($50,000) | ($74,000) | $0 | $ 0 |
| 6124 Pump Station Rehabilitation Program[2] | $52,000 | $0 | $0 | $52,000 |
| 6126 Minor Sewer Projects[3] | $163,000 | $0 | $0 | $163,000 |
| 6130 Main Lift Station Odor Emissions Control | $0 | $0 | $200,000 | $200,000 |
| 6131 Sanitary Sewer Cathodic Protection Improvements | $500,000 | $0 | $0 | $500,000 |
| 6134 On-Call Sewer Maintenance & Repair Services | $24,000 | $74,000 | $0 | $98,000 |
| Total Existing Projects | $689,000 | $0 | $200,000 | $889,000 |

Notes:
1. The total $124,000 in prior year funding from Sewer Fund and Sewer Infrastructure Fund to be allocated for other projects in FY2020-21. There is no further allocation for this program according to the Capital Improvement Program 2020-2025 Final Report
2. This is the net allocation. Original allocation is $200,000 with $148,000 in prior year funding from Sewer Infrastructure Fund to be allocated for other projects in FY2020-21.
3. This is the net allocation. Original allocation is $200,000 with $37,000 in prior year funding from Sewer Infrastructure Fund to be allocated for other projects in FY2020-21.

Sewer CIP are largely funded by the Sewer Infrastructure Fund. Other funding sources include the Sewer Fund (user rate structure) and the Sewer Treatment Fund (sewer connection fees). The funds are described in the CIP 2020-2025 Final Report as follows:

- **Sewer Infrastructure Fund:** Monies set aside to replace aging infrastructure for sewer related projects.
- **Sewer Fund:** Enterprise fund which receives revenue from sewer rates for sewer related improvements.
- **Sewer Treatment Fund:** Funded from fees collected from developers connecting to the Sewer System. Funds restricted for sewer related projects.

## 10.2 Proposed CIP Projects

Three alternatives to project phasing were evaluated in developing the proposed CIP phases. The first alternative addresses CIP projects based on BRE grades without consideration of project location, prioritizing the highest risk projects. The second alternative approach groups projects geographically within the sewer basin. The third alternative, which was selected for implementation, was a hybrid approach where pipelines with significant defects were prioritized in the first year and each subsequent year considered risk, type of rehabilitation, and geographic location. The general strategy is to address the highest risk/highest priority projects in the near-term (Years 1-5) with lower risk projects deferred to the medium- (Years 6-10) and long-term (Years 11-20). The objective was to budget for approximately $1.5M-$2M annually. Depending on funding availability, projects can slide up or down CIP phases while maintaining project priority.

The detailed risk assessment, basis for selecting rehabilitation methods, prioritization of improvements, and the related construction costs (construction and contingency) are provided in **Appendix A** (R&R Study).

Soft costs, as described in **Section 9.2.3**, consisting of engineering design and consulting; permitting and ROW; and ESDC, construction management and inspection services are included in the capital project costs provided. The following sections present the recommended projects for implementation and the proposed timeframe.

### 10.2.1 CCTV Inspection

Approximately 105,000 ft (449 segments) of sewer main was inspected as part of the condition assessment. The remaining 685,000 ft was analyzed using the desktop assessment. Medium- to extreme-risk pipes and large diameter pipes are recommended for CCTV inspection. Large diameter pipe is defined as 24-inch diameter or greater. **Figure 9-3** presents the recommended CCTV inspection map of these highest priority areas. These inspections total 55,000 ft, with an estimated cost totaling approximately $400,000 based on the unit costs provided in **Section 9.2.1**.

It is noted that the CCTV inspection work may generate additional improvement projects that may augment the proposed CIP. There is an existing CIP project (6126) that is intended to address minor sewer projects that currently allocates $50,000 annually. It is recommended that the City increase the annual allowance to $250,000 ($1.25M every five years) to budget for improvements needed to address defects as they are discovered during new CCTV inspections.

### 10.2.2 Pipeline Improvements

Of the approximately 105,000 ft (449 segments) of sewer pipeline inspected, approximately 50,000 ft (178 segments, see **Figure 9-2**) requires improvement. Recommended improvements include:

- Pipe Replacement
- Full Cured-In-Place Pipe (CIPP)
- Point Repair(s) by Excavation
- Sectional Liner(s)

It is noted that some pipeline segments include more than one recommended rehabilitation method.

The highest priority improvements are those segments identified to have significant defects during the condition assessment and thus rated as highest risk of failure. These projects are proposed for immediate improvement (Year 1) to reduce the likelihood of a catastrophic failure and are summarized in **Table 10-3**. The proposed method of rehabilitation is provided along with the capital cost for the collective improvements.

**Table 10-3: Highest Priority Pipe with Significant Defects (Year 1: 2022)**

| Average Risk Grade | Street Name | Diameter (in) | Length (ft) | Material | Recommended Rehabilitation Method | Construction Cost |
|---|---|---|---|---|---|---|
| 5.0 | Coming Ave | 8 | 234 | VCP | Sectional Liner(s), Point Repair(s) | $30,000 |
| 5.0 | E Calaveras Blvd | 15 | 1305 | VCP | Sectional Liner(s), Point Repair(s), Full CIPP | $273,000 |
| 5.0 | Just East of S Hillview Dr | 15 | 491 | VCP | Sectional Liner(s), Full CIPP | $50,000 |
| 4.0 | Curtis Ave | 18 | 172 | VCP | Sectional Liner(s) | $39,000 |
| 4.0 | Marylinn Dr | 27 | 292 | VCP, RCP | Pipe Replacement, Full CIPP, Point Repair(s) | $322,000 |
| 4.0 | N Hillview Dr | 12 | 218 | VCP | Sectional Liner(s) | $32,000 |
| 4.0 | S Main St | 18, 21 | 733 | VCP | Sectional Liner(s), Point Repair(s) | $67,000 |
| 4.0 | Sinnot Ln | 12 | 398 | VCP | Full CIPP, Point Repair(s) | $139,000 |
| **Construction Subtotal** | | | | | | **$952,000** |
| Construction Contingency | | | | | 30% | $286,000 |
| Engineering Design and Consulting Services | | | | | 15% | $143,000 |
| Permitting and Right of Way (ROW) | | | | | 7% | $67,000 |
| ESDC, Construction Management, & Inspection Services | | | | | 12% | $114,000 |
| **Total Year 1 Project Costs** | | | | | | **$1,562,000** |

Additional high- and some medium-priority improvements are recommended for implementation in the first five years after addressing the highest risk improvements shown in **Table 10-3**. These improvements are listed in **Table 10-4** and include the next priority projects, which also combine pipes with rehabilitation needs (of any risk grading) along the same street for efficiency.

**Table 10-4: Medium- to High-Priority Improvements (Years 2-5: 2023-2026)**

| Average Risk Grade | Street Name | Diameter (in) | Length (ft) | Material | Recommended Rehabilitation Method | Construction Cost |
|---|---|---|---|---|---|---|
| 5.0 | S Abel St | 18 | 66 | VCP | Point Repair(s), Sectional Liner(s) | $32,000 |
| 3.9 | Just East of S Hillview Dr[1] | 12, 15 | 2,947 | VCP | Full CIPP, Point Repair(s), Sectional Liner(s) | $503,000 |
| 3.7 | N Milpitas Blvd | 33, 39 | 3,062 | RCP | Full CIPP, Sectional Liner(s) | $1,776,000 |
| 3.5 | Nimitz Fwy and California Cir | 18, 42 | 1,974 | VCP, RCP | Full CIPP, Sectional Liner(s) | $474,000 |
| 3.3 | E Calaveras Blvd[1] | 12, 15, 18, 21 | 3,336 | VCP | Full CIPP, Point Repair(s), Sectional Liner(s) | $286,000 |
| 3.2 | Coming Ave[1] | 8 | 1,374 | VCP | Full CIPP | $140,000 |
| **Construction Subtotal** | | | | | | **$3,211,000** |
| Contingency | | | | | 30% | $963,000 |
| Engineering Design and Consulting Services | | | | | 15% | $482,000 |
| Permitting and Right of Way (ROW) | | | | | 7% | $225,000 |
| ESDC, Construction Management, & Inspection Services | | | | | 12% | $385,000 |
| **Total Year 2-5 Project Costs** | | | | | | **$5,266,000** |

Notes:
1. This street had some rehabilitation addressed in Year 1.

After addressing all high-priority, and some medium-priority, improvements in the first five years, the remaining medium-priority improvements are proposed for the next five-year period (Years 6-10). These improvements are listed in **Table 10-5**.

**Table 10-5: Medium-Priority Improvements (Years 6-10: 2027-2031)**

| Average Risk Grade | Street Name | Diameter (in) | Length (ft) | Material | Recommended Rehabilitation Method | Construction Cost |
|---|---|---|---|---|---|---|
| 3.3 | S Main St[1] | 18, 21 | 2,882 | VCP | Point Repair(s) and Sectional Liner(s) | $427,000 |
| 2.9 | Machado Ave | 24, 30 | 2,939 | RCP, VCP | Full CIPP, Sectional Liner(s) | $1,006,000 |
| 2.8 | B/w Tramway Dr & Los Pinos Ave | 24, 30 | 4,473 | VCP, RCP | Full CIPP, Sectional Liner(s) | $2,484,000 |
| **Construction Subtotal** | | | | | | **$3,917,000** |
| Contingency | | | | | 30% | $1,175,000 |
| Engineering Design and Consulting Services | | | | | 15% | $588,000 |
| Permitting and Right of Way (ROW) | | | | | 7% | $274,000 |
| ESDC, Construction Management, & Inspection Services | | | | | 12% | $470,000 |
| **Total Year 6-10 Project Costs** | | | | | | **$6,424,000** |

Notes:
1. This street had some rehabilitation addressed in Year 1.

Low- and very low-priority improvements are proposed in the longer-term CIP (Years 11-20). The next two five-year increments are proposed in **Table 10-6** and **Table 10-7**. While these pipelines pose a small risk of failure, it is expected that they can continue to operate without significant likelihood of immediate failure.

**Table 10-6: Low-Priority Improvements (Years 11-15: 2032-2036)**

| Average Risk Grade | Street Name | Diameter (in) | Length (ft) | Material | Recommended Rehabilitation Method | Construction Cost |
|---|---|---|---|---|---|---|
| 3.1 | Marylinn Dr | 27, 30 | 2,841 | RCP, VCP, SS | Full CIPP, Pipe Replacement, Point Repair(s), Sectional Liner(s) | $1,472,000 |
| 3.0 | Ames Ave | 12 | 533 | VCP | Point Repair(s), Sectional Liner(s) | $50,000 |
| 3.0 | Connection b/w N Milpitas Blvd & Summerwind Way | 42 | 563 | RCP | Full CIPP, Sectional Liner(s) | $176,000 |
| 3.0 | Curtis Ave | 15, 18 | 1,457 | VCP | Full CIPP, Pipe Replacement, Point Repair(s), Sectional Liner(s) | $572,000 |
| 3.0 | Gibraltar Dr | 12 | 502 | VCP | Point Repair(s), Sectional Liner(s) | $46,000 |
| 3.0 | Kennedy Dr | 12 | 276 | VCP | Full CIPP | $82,000 |
| 3.0 | N Abel St | 27 | 543 | VCP | Sectional Liner(s) | $103,000 |
| 3.0 | N McCarthy Blvd | 18 | 44 | VCP | Sectional Liner(s) | $31,000 |
| 3.0 | N Milpitas Blvd | 15 | 423 | VCP | Sectional Liner(s) | $122,000 |
| 3.0 | River Rock Rd | 18 | 561 | VCP, RCP | Full CIPP | $238,000 |
| 3.0 | S Abbott Ave | 15, 16 | 285 | VCP, CIP | Sectional Liner(s), Full CIPP | $103,000 |
| 3.0 | S Milpitas Blvd | 8, 12, 18 | 1,695 | VCP | Point Repair(s), Sectional Liner(s) | $135,000 |
| 3.0 | Fwy Crossing near Fox Hollow Ct | 12 | 748 | VCP | Sectional Liner(s) | $49,000 |
| 3.0 | Smithwood St | 15 | 388 | VCP | Sectional Liner(s) | $19,000 |
| 3.0 | Tramway Dr | 12 | 38 | VCP | Full CIPP | $19,000 |
| 3.0 | Venus Way | 8 | 46 | VCP | Point Repair(s) | $12,000 |
| 3.0 | Wool Dr | 24 | 368 | VCP | Full CIPP | $168,000 |
| 3.0 | Yosemite Dr | 8 | 970 | VCP | Full CIPP, Pt Repair(s), Sectional Liner(s) | $88,000 |
| 2.8 | Great Mall Dr | 15 | 1,724 | VCP | Full CIPP, Pt Repair(s), Sectional Liner(s) | $448,000 |
| 2.7 | Connection to SW Community Starting from W Calaveras Blvd | 15 | 1,419 | VCP | Full CIPP, Pt Repair(s), Sectional Liner(s) | $168,000 |
| 2.3 | N Hillview Dr | 12 | 833 | VCP, DIP | Full CIPP, Sectional Liner(s) | $99,000 |
| **Construction Subtotal** | | | | | | **$4,200,000** |
| Contingency | | | | | 30% | $1,260,000 |
| Engineering Design and Consulting Services | | | | | 15% | $630,000 |
| Permitting and Right of Way (ROW) | | | | | 7% | $294,000 |
| ESDC, Construction Management, & Inspection Services | | | | | 12% | $504,000 |
| **Total Year 11-15 Project Costs** | | | | | | **$6,888,000** |

**Table 10-7: Very Low-Priority Improvements (Years 16-20: 2037-2041)**

| Average Risk Grade | Street Name | Diameter (in) | Length (ft) | Material | Recommended Rehabilitation Method | Construction Cost |
|---|---|---|---|---|---|---|
| 2.0 | S Milpitas Blvd | 8, 12 | 893 | VCP | Sectional Liner(s) | $75,000 |
| 2.0 | Turquoise St | 10 | 275 | VCP | Point Repair(s) | $25,000 |
| 2.0 | Tramway Dr | 12 | 220 | VCP | Sectional Liner(s) | $18,000 |
| 1.0 | Connection b/w S Milpitas Blvd and Gibraltar Ct | 12 | 231 | VCP | Sectional Liner(s) | $29,000 |
| 1.0 | Meadowland Dr | 15 | 816 | Unknown | Pipe Replacement and Point Repair(s) | $354,000 |
| 1.0 | Silverlake Dr | 15 | 621 | Unknown | Full CIPP and Point Repair(s) | $86,000 |
| 1.0 | Wool Dr | 24 | 368 | RCP | Full CIPP | $169,000 |
| **Construction Subtotal** | | | | | | **$756,000** |
| Contingency | | | | | 30% | $227,000 |
| Engineering Design and Consulting Services | | | | | 15% | $113,000 |
| Permitting and Right of Way (ROW) | | | | | 7% | $53,000 |
| ESDC, Construction Management, & Inspection Services | | | | | 12% | $91,000 |
| **Total Year 16-20 Project Costs** | | | | | | **$1,240,000** |

### 10.2.3 Lift Station

The Main LS and Venus Way LS were inspected, and major deficiencies were catalogued in the LS Report, as summarized in **Section 4.3** and detailed in **Appendix A** (R&R Study App. K). There are no immediate needs for the Venus Way LS. For the Main LS, the highest scoring deficiencies are identified **Table 10-8** and presented in order of priority according to both the condition and performance scores for the specific asset. Per City's 2019-24 CIP, project 6124, an allowance of $100,000 annual investment from FY 2019-20 through FY 2022-23 is planned to address these rehabilitation needs.

**Table 10-8: Main LS Deficiencies**

| Asset Name | Field Assessment/Comments | Condition Score | Performance Score |
|---|---|---|---|
| Manifold PV #2 Actuator | Does not work | 5 | 5 |
| Grinder #1 | Excessive vibration and inadequate supports | 5 | 5 |
| Air Vacuum 1 to 15 | Cavitation, coating failure, and inadequate supports | 5 | 5 |
| Mag Meter (Flow Meter A)[1] | Not in operation | 4 | 4 |
| Pump #3 | Has exceeded useful life[2] | 4 | 4 |
| 2" Combination Air/Vacuum Valve | None | 4 | 4 |
| Flow Meter B[1] | Operable, but not accurate | 4 | 4 |
| Variable Frequency Drive P2 | No corrosion identified, arc flash labels missing | 4 | 2 |
| Variable Frequency Drive P3 | No corrosion identified, confirmed by City that IGBT was replaced in 2019, arc flash labels missing | 4 | 2 |
| Variable Frequency Drive P4 | No corrosion identified, arc flash labels missing | 4 | 2 |
| Variable Frequency Drive P5 | No corrosion identified, confirmed by City that cooling fans were replaced in 2019, arc flash labels missing | 4 | 2 |

Notes:
1. The City is replacing these meters as part of CIP Project 6131: Sanitary Sewer Cathodic Protection Improvements.
2. This pump has logged over 50,000 hours.

## 10.3 CIP Budget and Schedule

The sewer CIP is funded by the sewer enterprise fund which includes the user rate structure and sewer connection fees. Provided below in **Table 10-9** is a proposed budget and schedule for the CIP and recommended projects over 20-years in 5-year increments. The most critical projects are scheduled for earlier implementation. It is noted that the timing of projects can be adjusted based on results of CCTV and future operating conditions. **Figure 10-1** presents the proposed improvement projects in 5-year increments.

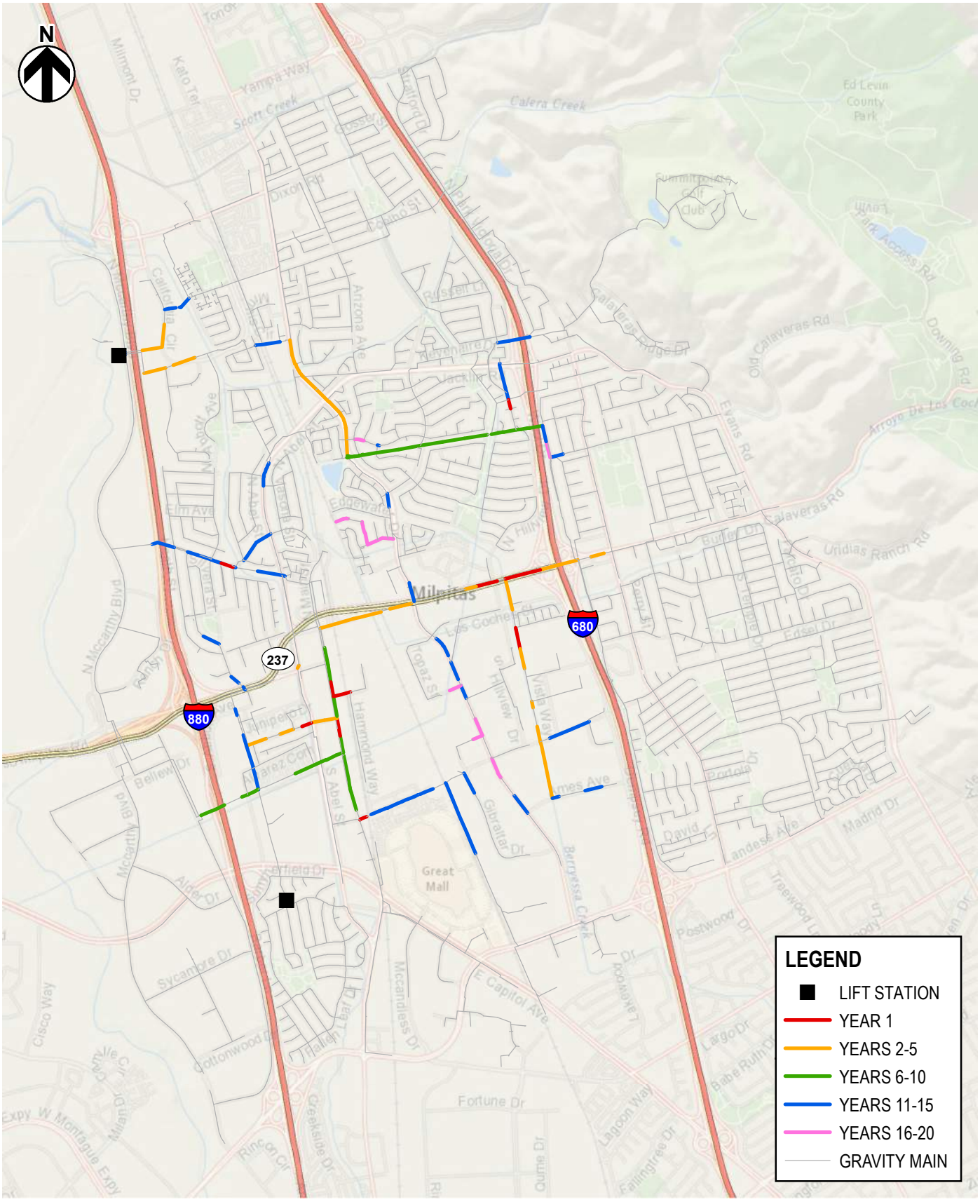


**FIGURE 10-1**
CITY OF MILPITAS
SEWER MASTER PLAN
CAPITAL IMPROVEMENT PROJECTS

HydroScience

**Table 10-9: Proposed CIP Schedule and Budget**

| Projects | 5-Year (2022-2026) | 10-Year (2027-2031) | 15-Year (2032-2036) | 20-Year (2037-2041) |
|---|---|---|---|---|
| **Existing Projects** | | | | |
| 6124 Pump Station Rehabilitation Program | $200,000[1] | -- | -- | -- |
| 6126 Minor Sewer Projects | $200,000[2] | -- | -- | -- |
| 6130 Main Lift Station Odor Emissions Control | $200,000 | -- | -- | -- |
| 6131 Sanitary Sewer Cathodic Protection Improvements | $500,000 | -- | -- | -- |
| 6134 On-Call Sewer Maintenance & Repair Services | $98,000 | -- | -- | -- |
| **Total Existing Projects** | **$1,198,000** | **--** | **--** | **--** |
| **Proposed Projects** | | | | |
| CCTV large diameter and high-risk assets | $400,000 | -- | -- | -- |
| Highest Priority Improvements | $1,562,000 | -- | -- | -- |
| Medium- to High- Priority Improvements | $5,266,000 | $6,424,000 | -- | -- |
| Low Priority Improvements | -- | -- | $6,888,000 | $1,240000 |
| Allocation for improvements identified from ongoing CCTV | $1,250,000 | $1,250,000 | $1,250,000 | $1,250,000 |
| **Total Proposed Projects** | **$8,478,000** | **$7,674,000** | **$8,138,000** | **$2,490,000** |
| **Existing and Proposed Projects** | **$9,676,000** | **$7,674,000** | **$8,138,000** | **$2,490,000** |

Notes:
1. Original allocation is $200,000 through 2023 with $148,000 in prior year funding from Sewer Infrastructure Fund to be allocated for other projects in FY2020-21.
2. Original allocation is $200,000 with $37,000 in prior year funding from Sewer Infrastructure Fund to be allocated for other projects in FY2020-21.

## 10.4 Other Recommendations

During the CCTV inspection performed by NPS, there were instances of large grease buildup in various locations throughout the wastewater collection system. As explained previously, the presence of grease buildup and other blockages, particularly at, or near, critical flow splits, can significantly impact collection system operations, particularly at flow splits, which are generally intended to mitigate high flows and provide redundancy. This redundancy aids the system's ability to handle higher flows during wet weather events and as the water table rises during the wet season. When flow splits are not operating properly, this can drastically impact the system operation, particularly during wet weather events.

It is recommended that the City cleans the locations identified as having grease buildup. Locations should also be vacuumed to remove blockages from moving further downstream. In addition, stricter FOG Control Program guidelines and increased inspections may be necessary to prevent FOG discharges to the wastewater collection system.

It is expected that there will be additional O&M costs related to the following:

- In-house CCTV inspection;
- Additional cleaning related to the act of inspection and as a result of discovering blockages; and
- Implementing a stricter FOG Control Program/increased inspections of grease traps.

In addition to the projects summarized herein, the City is evaluating the need to rehabilitate or replace Force Main A (FM-A), which conveys wastewater from the Main LS to the RWF (see **Figure 3-1**). Built in 1974, FM-A was identified as requiring inspection because the soils surrounding the pipeline are very corrosive. The City contracted with a third party to perform cleaning and CCTV inspection of FM-A to determine the internal condition. The inspection was not fully completed due to unforeseen obstacles.

It is recommended that the City perform a complete condition assessment of FM-A to verify the internal condition of the pipeline and determine the best options for rehabilitation or replacement. The City's report generated by the engineering department is included as **Appendix G**.

Initial City estimates to rehabilitate or replace FM-A are approximately $1M to complete the force main assessment and maintenance of the appurtenances and an additional $25M to replace the force main. Both of these costs were included as capital projects requiring consideration for an upcoming CIP, in addition to the amounts specified in **Section 10.3**.

# APPENDIX A

City of Milpitas
Sewer Master Plan Study
Sewer Utility Asset Renewal and Replacement Study

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Due to the size of the file, this Appendix is provided as a separate document.

# APPENDIX B

City of Milpitas
Sewer Master Plan Study
Milpitas Sewer Flow Monitoring Report 2019-2020

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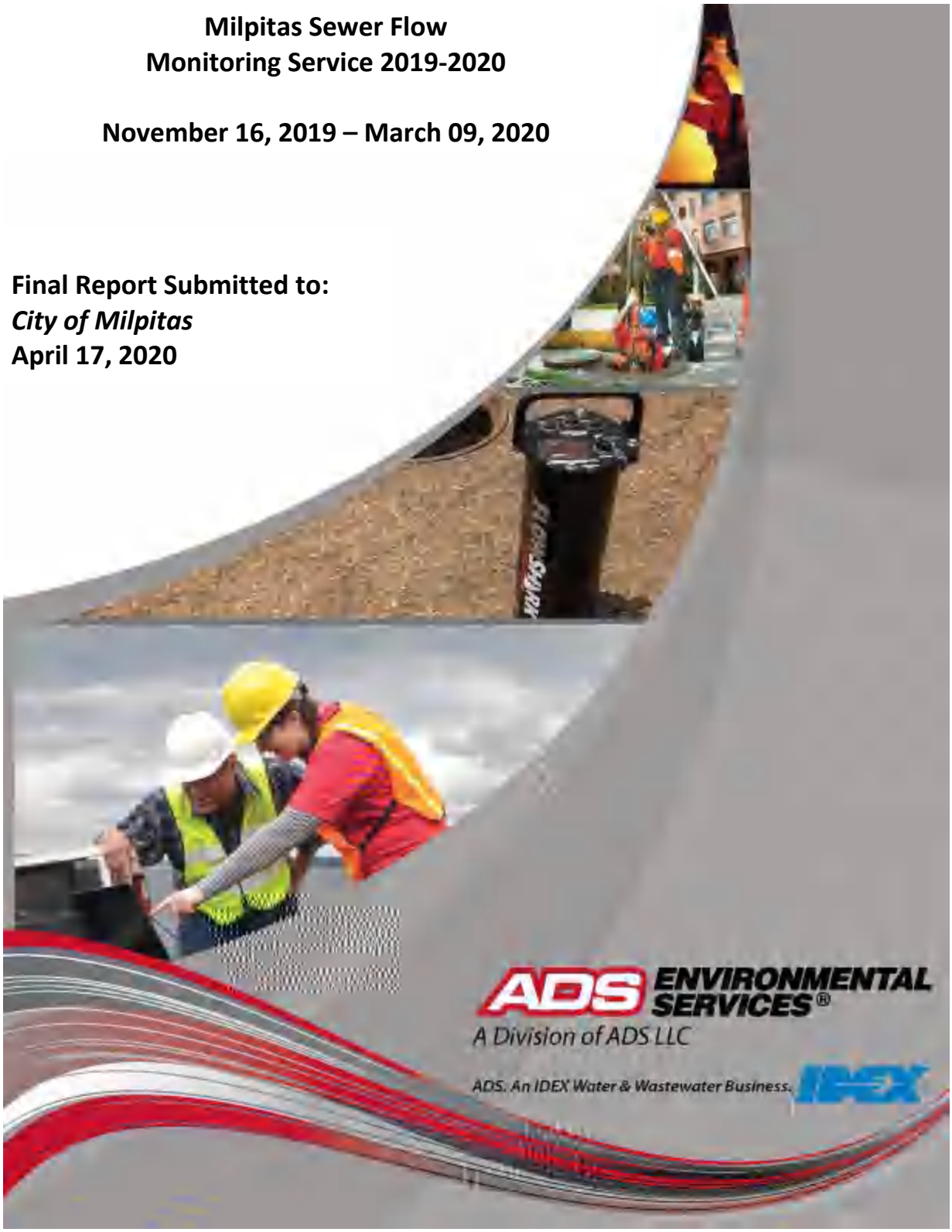
# Milpitas Sewer Flow Monitoring Service 2019-2020

**November 16, 2019 – March 09, 2020**

**Final Report Submitted to:**
***City of Milpitas***
**April 17, 2020**



# Milpitas Sewer Flow Monitoring Service
# 2019 - 2020

Prepared for:

**Theodore Alicante**
**City of Milpitas**
**455 E. Calaveras Boulevard**
**Milpitas, CA 95035**

Prepared by:

**ADS**, LLC
**15201 Springdale Street**
**Huntington Beach, CA 92649**

# Letter of Transmittal

ADS LLC

April 17, 2020

Theodore Alicante
City of Milpitas
455 E. Calaveras Boulevard
Milpitas, CA  95035

SUBJECT:  Milpitas Sewer Flow Monitoring Service 2019 - 2020

Dear Theodore,

ADS is pleased to submit the report for the Milpitas Sewer Flow Monitoring Service 2019 - 2020 conducted on behalf of the City of Milpitas.  The metering was contracted for ninety (90) days at twenty-three (23) flow monitor and two (2) rain rauge locations.  The study period is November 16, 2019 - March 09, 2020.  All available data has been provided.

The report contains hourly averaged depth, velocity, and quantity hydrographs as well as daily long tables for the metering period in pdf format.  Depth, quantity, and velocity entities for each monitoring location have been provided on Prism.

In addition, we would be happy to further explain any details about the report that may seem unclear.  Should you have any questions or comments, you may contact the Project Manager, Paul Mitchell at (714) 379-9778 ext 223.

It has been our pleasure to serve you in the performance of this project.  Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

Mackenzie Michaud
Data Analyst

## Scope and Methodology

### Introduction

*City of Milpitas* entered into an agreement with ADS Environmental Services to conduct flow monitoring at twenty-three (23) metering points in the City of Milpitas Collection System. The study was conducted over a ninety (90) day period. The study period is November 16, 2019 - March 09, 2020. The primary objective of the monitoring was to determine current flows for wet weather planning purposes.

**Project Scope**

The scope of this study involved using flow monitors to quantify wastewater flows at the designated locations. Specifically, the study included the following key components.

- Investigate the proposed flow-monitoring sites for adequate hydraulic conditions.
- Flow monitor installations.
- Flow monitor confirmations and data collections.
- Flow data analysis.

Equipment installation was completed on November 15, 2019. The study period began on November 16, 2019 and was completed on March 09, 2020 .

### Flow Monitoring Equipment

The ***ADS FlowShark Triton*** monitor was selected for this project. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS FlowShark Triton monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals.

The FS Triton monitor features cross-checking using multiple technologies in each sensor for continuous running of comparisons and tolerances. The FS Triton monitor can support two (2) sets of sensors. The sensor option used for this project was:

**The Peak Combo Sensor** installed at the bottom of the pipe includes three types of data acquisition technologies.

The ***up looking ultrasonic depth*** uses sound waves from two independent transceivers to measure the distance from the sensor upward toward the flow surface; applying the speed of sound in the water and the temperature measured by sensor to calculate depth.

The ***pressure depth*** is calculated by using a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a

desiccant filled breather tube.

To obtain ***peak velocity*****,** the sensor sends an ultrasonic signal at an angle upward through the widest cross-section of the oncoming flow. The signal is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity.

**Installation**

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed.

In pipes up to 42 inches in diameter, the sensors were mounted on expandable stainless steel rings, inserted at least a foot upstream into influent pipes and tightened against the inside walls of the pipes. Influent pipe installations reduce the influences of turbulence and backwater often caused by changes in channel geometry in manholes.

### Data Collection, Confirmation, and Quality Assurance

Data collects were done remotely via wireless connect on a weekly basis via ADS Field Representatives. During the monitoring period, field crews visit each monitoring location to verify proper monitor operation and document field conditions. The following quality assurance steps are taken to assure the integrity of the collected data:

***Measure power supplies:*** monitors were powered by dry cell battery packs. Voltages were recorded and battery packs replaced, as necessary. Separate batteries provided back-up power to memory allowing primary batteries to be replaced without loss of data.

***Clock synchronization:*** Field crews synchronized monitor clocks to master clocks.

***Confirm depth and velocity readings:*** Field crews descended into meter manholes to manually measure depths and velocities and compare them meter readings to confirm that they agreed. They also measured silt levels, if any, in the inverts of the pipes. Silt areas were subtracted from flow areas to compute true areas of flow.

***Confirm average velocities through cross-sectional velocity profiles:*** Since ADS velocity sensors measure peak velocity, field crews collected cross-sectional velocity profiles in order to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

***Upload and Review Data***: Data collected from the monitors were uploaded and reviewed by a Data Analyst for completeness, outliers and deviations in the flow patterns, which indicate system anomalies or equipment failure.

## Flow Quantification Methods

There are two main equations used to measure open channel flow: the ***Continuity Equation*** and the ***Manning Equation.*** The Continuity Equation, which is considered the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

***Continuity Equation***

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow.

## Data Analysis and Presentation

### Data Analysis

A flow monitor is typically programmed to collect data at either 15-minute or 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the ultrasonic depth, (2) the peak velocity and (3) the pressure depth. The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to

identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. The data analyst selects which depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Occasionally the velocity sensor's performance may be compromised resulting in invalid readings sporadically during the monitoring period. This is generally caused by excessive debris (silt) blocking the sensor's crystals, shallow flows (~< 1") that may drop below the top of the sensor or very clear flows lacking the particles needed to measure rate. In order to use the Continuity equation to quantify the flow during these periods, a Data Analyst and/or Engineer will use the site's historical pipe curve (depth vs. velocity) data along with valid field confirmations to reconstitute and replace the false velocity recordings with expected velocity readings for a given historical depth along the curve.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

**Data Presentation**

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs. Hydrographs are based on 5-minute averaging. Tables are provided in daily average format. These tables show the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the tables and hydrographs.

**DEPTH** - Final calculated depth measurement (in inches)

**QUANTITY** - Final calculated flow rate (in MGD)

**VELOCITY** - Final calculated flow velocity (in feet per second)

**REPORT TOTAL** - Total volume of flow recorded for the indicated time period (in MG)

## Site Commentary

### Site Information

| MIL_0041 | |
|---|---|
| Pipe Dimensions | 23 |
| Silt Level | 0.00" |

### Overview

Site MIL_0041 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that both free flow and mild backwater flows were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 6.51 | 1.54 | 0.709 |
| Minimum | 3.96 | 0.73 | 0.178 |
| Maximum | 9.42 | 2.30 | 1.647 |
| Time of Minimum | 2/1/2020 5:05 AM | 3/2/2020 3:25 AM | 1/7/2020 5:20 AM |
| Time of Maximum | 2/26/2020 8:40 AM | 2/1/2020 12:40 PM | 2/1/2020 12:40 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_0041

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | S Abel St and Curtis Ave, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.418531° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.904896° | 23.00"x23.50" | Circular |

| Manhole # | System Characteristics |
|---|---|
| #0041 | Residential/Commercial |
| Access | Traffic |
| Drive | Medium |

| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
|---|---|
| ADS Project Number: | 22431.11.325 |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Thursday, November 14, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 5:37:00 AM | 23.00"x23.50" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 5.50" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.40' | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

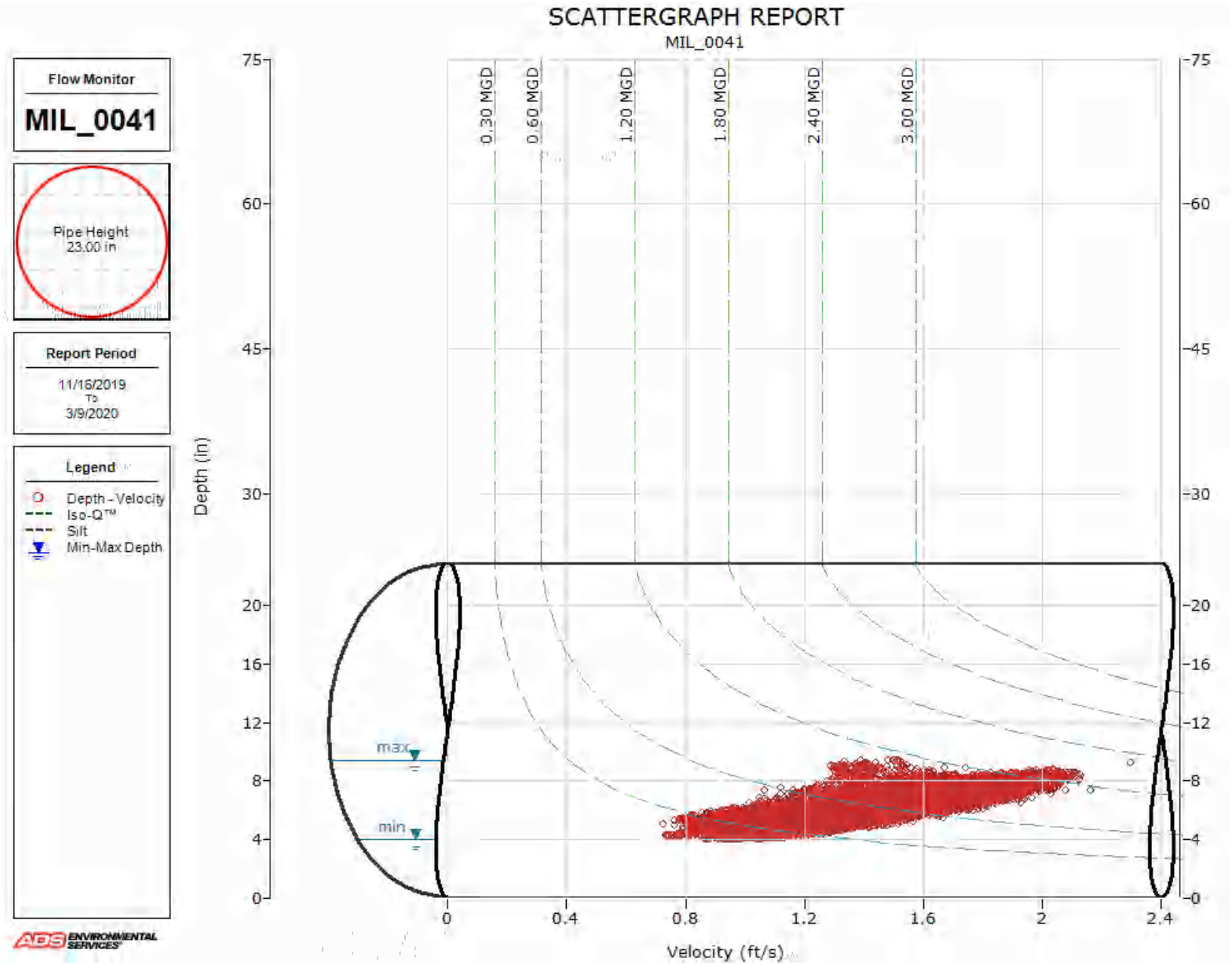
## Manhole / Pipe Information:

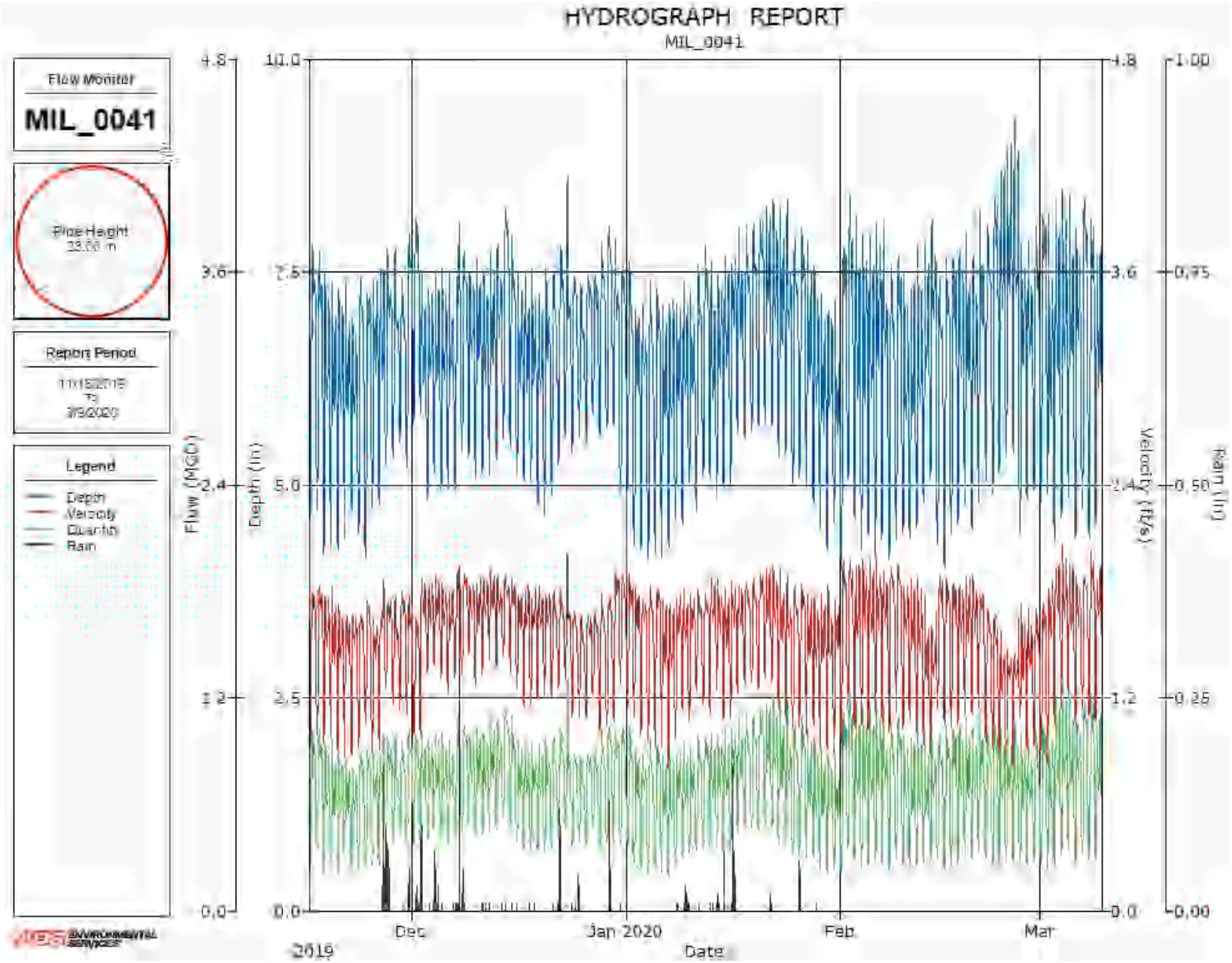
| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 7' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Drilled Pavement / Concrete |

## Additional Site Info. / Comments:


SCATTERGRAPH REPORT
MIL_0041
Flow Monitor
MIL_0041
Pipe Height
23.00 in
Report Period
11/16/2019
To
3/9/2020
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.30 MGD
0.60 MGD
1.20 MGD
1.80 MGD
2.40 MGD
3.00 MGD
max
min
Depth (in)
Velocity (ft/s)
0
4
8
12
16
20
30
45
60
75
0.4
0.8
1.2
1.6
2
2.4
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0041
Flow Monitor
MIL_0041
Pipe Height
Report Period
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
4.8
3.6
2.4
1.2
0.0
10.0
7.5
5.0
2.5
0.0
1.00
0.75
0.50
0.25
0.00
Dec
Jan 2020
Feb
Mar
2019
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0041, Pipe Height: 23.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 05:15 | 4.62 | 12:05 | 7.88 | 6.62 | 05:25 | 0.88 | 11:25 | 1.93 | 1.52 | 05:25 | 0.241 | 11:25 | 1.094 | 0.726 | 0.726 | |
| 11/17/2019 | 05:20 | 4.67 | 11:25 | 8.34 | 6.52 | 05:20 | 0.97 | 11:25 | 1.95 | 1.56 | 05:20 | 0.270 | 11:25 | 1.217 | 0.723 | 0.723 | |
| 11/18/2019 | 04:15 | 4.15 | 08:30 | 7.55 | 6.01 | 03:05 | 0.85 | 08:15 | 1.83 | 1.47 | 04:05 | 0.210 | 08:15 | 0.985 | 0.608 | 0.608 | |
| 11/19/2019 | 04:55 | 4.19 | 08:20 | 7.48 | 5.96 | 04:55 | 0.88 | 08:15 | 1.91 | 1.46 | 04:55 | 0.208 | 08:15 | 1.027 | 0.596 | 0.596 | |
| 11/20/2019 | 04:15 | 4.19 | 08:35 | 7.39 | 5.98 | 05:40 | 0.79 | 08:30 | 1.81 | 1.40 | 04:35 | 0.196 | 08:30 | 0.954 | 0.575 | 0.575 | |
| 11/21/2019 | 04:25 | 4.31 | 08:30 | 7.43 | 6.00 | 05:10 | 0.80 | 11:05 | 1.80 | 1.40 | 05:10 | 0.205 | 08:30 | 0.900 | 0.575 | 0.575 | |
| 11/22/2019 | 05:15 | 4.66 | 08:55 | 7.07 | 5.95 | 03:35 | 0.81 | 08:40 | 1.78 | 1.43 | 03:35 | 0.226 | 08:40 | 0.879 | 0.576 | 0.576 | |
| 11/23/2019 | 05:00 | 4.37 | 11:55 | 7.48 | 6.29 | 04:45 | 0.88 | 10:40 | 1.81 | 1.43 | 04:45 | 0.225 | 12:10 | 0.942 | 0.630 | 0.630 | |
| 11/24/2019 | 04:45 | 4.02 | 12:40 | 7.30 | 6.19 | 06:05 | 1.01 | 17:25 | 1.81 | 1.48 | 04:45 | 0.232 | 12:30 | 0.935 | 0.644 | 0.644 | |
| 11/25/2019 | 05:15 | 4.66 | 09:10 | 7.50 | 6.34 | 05:15 | 0.79 | 20:50 | 1.71 | 1.39 | 05:15 | 0.219 | 09:15 | 0.919 | 0.616 | 0.616 | |
| 11/26/2019 | 04:20 | 4.70 | 12:15 | 8.19 | 6.41 | 04:20 | 0.81 | 20:35 | 1.95 | 1.52 | 04:20 | 0.227 | 12:20 | 1.088 | 0.682 | 0.682 | 0.36 |
| 11/27/2019 | 05:15 | 5.22 | 09:50 | 7.91 | 6.72 | 02:25 | 1.16 | 10:15 | 1.83 | 1.58 | 05:15 | 0.388 | 10:10 | 1.047 | 0.746 | 0.746 | 0.63 |
| 11/28/2019 | 06:40 | 5.31 | 12:10 | 7.83 | 6.58 | 05:05 | 1.05 | 10:45 | 1.87 | 1.52 | 05:05 | 0.353 | 12:05 | 1.052 | 0.699 | 0.699 | |
| 11/29/2019 | 05:00 | 5.46 | 12:00 | 7.46 | 6.63 | 04:45 | 1.08 | 11:35 | 1.88 | 1.57 | 04:45 | 0.375 | 11:35 | 0.998 | 0.729 | 0.729 | 0.02 |
| 11/30/2019 | 05:40 | 5.20 | 13:30 | 7.97 | 6.83 | 05:10 | 0.99 | 12:35 | 1.83 | 1.51 | 05:10 | 0.320 | 12:35 | 1.066 | 0.737 | 0.737 | 0.10 |
| 12/01/2019 | 05:40 | 5.70 | 11:20 | 8.27 | 7.25 | 05:30 | 0.95 | 13:35 | 1.81 | 1.37 | 05:40 | 0.349 | 13:35 | 1.088 | 0.725 | 0.725 | 0.06 |
| 12/02/2019 | 04:40 | 5.80 | 09:10 | 7.62 | 6.59 | 05:10 | 0.94 | 08:45 | 2.00 | 1.57 | 05:10 | 0.357 | 08:45 | 1.080 | 0.719 | 0.719 | 0.30 |
| 12/03/2019 | 04:55 | 4.79 | 08:35 | 7.45 | 6.30 | 04:15 | 1.31 | 22:25 | 1.94 | 1.66 | 04:15 | 0.380 | 08:45 | 1.018 | 0.719 | 0.719 | 0.01 |
| 12/04/2019 | 03:10 | 5.10 | 08:40 | 7.65 | 6.44 | 03:15 | 1.34 | 08:45 | 1.96 | 1.69 | 03:15 | 0.420 | 08:45 | 1.089 | 0.749 | 0.749 | 0.39 |
| 12/05/2019 | 04:55 | 4.93 | 08:35 | 7.69 | 6.41 | 02:40 | 1.25 | 08:15 | 1.91 | 1.63 | 04:50 | 0.384 | 09:10 | 1.046 | 0.723 | 0.723 | 0.01 |
| 12/06/2019 | 04:20 | 4.94 | 09:00 | 7.58 | 6.37 | 05:10 | 1.17 | 20:00 | 1.87 | 1.61 | 05:10 | 0.351 | 08:45 | 1.014 | 0.705 | 0.705 | 0.01 |
| 12/07/2019 | 05:10 | 4.91 | 18:40 | 8.25 | 6.63 | 04:30 | 1.25 | 12:05 | 2.08 | 1.70 | 04:30 | 0.376 | 18:40 | 1.266 | 0.795 | 0.795 | 0.67 |
| 12/08/2019 | 06:00 | 5.35 | 12:25 | 7.84 | 6.84 | 05:25 | 1.28 | 13:35 | 1.97 | 1.70 | 05:25 | 0.433 | 13:35 | 1.083 | 0.822 | 0.822 | 0.20 |
| 12/09/2019 | 04:55 | 5.30 | 08:50 | 7.64 | 6.59 | 02:20 | 1.35 | 23:05 | 1.92 | 1.68 | 04:45 | 0.468 | 23:05 | 1.041 | 0.767 | 0.767 | |
| 12/10/2019 | 04:10 | 5.03 | 09:05 | 7.79 | 6.55 | 04:05 | 1.22 | 23:30 | 2.03 | 1.64 | 04:10 | 0.377 | 08:40 | 1.086 | 0.747 | 0.747 | |
| 12/11/2019 | 04:45 | 5.11 | 08:45 | 7.68 | 6.43 | 04:20 | 1.32 | 12:20 | 1.93 | 1.67 | 04:45 | 0.418 | 08:50 | 1.060 | 0.740 | 0.740 | 0.03 |
| 12/12/2019 | 04:20 | 5.10 | 08:45 | 7.84 | 6.55 | 04:10 | 1.39 | 20:55 | 2.03 | 1.72 | 04:20 | 0.438 | 08:55 | 1.152 | 0.782 | 0.782 | 0.01 |
| 12/13/2019 | 05:05 | 5.27 | 08:45 | 7.93 | 6.72 | 04:45 | 1.32 | 09:40 | 2.01 | 1.68 | 04:45 | 0.437 | 09:40 | 1.150 | 0.791 | 0.791 | 0.01 |
| 12/14/2019 | 05:00 | 5.51 | 13:30 | 8.30 | 7.22 | 05:00 | 1.42 | 10:45 | 2.05 | 1.70 | 05:00 | 0.498 | 10:45 | 1.202 | 0.890 | 0.890 | 0.01 |
| 12/15/2019 | 05:20 | 5.43 | 11:10 | 8.56 | 6.91 | 04:35 | 1.32 | 11:15 | 2.01 | 1.69 | 05:20 | 0.455 | 11:15 | 1.269 | 0.830 | 0.830 | 0.01 |
| 12/16/2019 | 04:40 | 5.08 | 08:35 | 7.61 | 6.38 | 05:10 | 1.19 | 10:10 | 1.85 | 1.61 | 05:10 | 0.372 | 08:30 | 0.990 | 0.705 | 0.705 | 0.01 |
| 12/17/2019 | 04:25 | 5.04 | 08:50 | 7.62 | 6.40 | 03:35 | 1.11 | 21:45 | 1.90 | 1.58 | 03:55 | 0.345 | 09:05 | 0.993 | 0.698 | 0.698 | 0.01 |
| 12/18/2019 | 04:45 | 5.02 | 09:00 | 7.65 | 6.39 | 05:00 | 1.11 | 22:00 | 1.89 | 1.57 | 05:00 | 0.343 | 08:55 | 1.001 | 0.694 | 0.694 | 0.01 |
| 12/19/2019 | 04:30 | 4.75 | 09:05 | 7.28 | 6.19 | 04:20 | 1.11 | 08:55 | 1.93 | 1.60 | 04:20 | 0.318 | 08:55 | 0.997 | 0.677 | 0.677 | |
| 12/20/2019 | 04:55 | 4.61 | 09:35 | 7.61 | 6.29 | 03:30 | 1.15 | 09:30 | 1.83 | 1.59 | 04:50 | 0.323 | 09:30 | 1.004 | 0.690 | 0.690 | |
| 12/21/2019 | 05:25 | 4.85 | 12:10 | 7.56 | 6.46 | 04:20 | 1.17 | 11:15 | 1.91 | 1.57 | 05:20 | 0.346 | 11:15 | 1.012 | 0.708 | 0.708 | 0.01 |
| 12/22/2019 | 04:25 | 5.21 | 13:25 | 7.83 | 6.75 | 04:20 | 1.23 | 13:10 | 1.87 | 1.58 | 04:20 | 0.400 | 13:10 | 1.067 | 0.754 | 0.754 | 0.41 |
| 12/23/2019 | 06:15 | 5.50 | 13:10 | 8.75 | 6.92 | 06:30 | 1.23 | 14:40 | 2.11 | 1.64 | 06:15 | 0.433 | 13:10 | 1.357 | 0.814 | 0.814 | |
| 12/24/2019 | 04:55 | 5.36 | 11:55 | 7.50 | 6.69 | 04:50 | 1.06 | 13:55 | 1.77 | 1.47 | 04:55 | 0.358 | 13:05 | 0.945 | 0.691 | 0.691 | 0.02 |
| 12/25/2019 | 04:45 | 5.54 | 11:35 | 7.38 | 6.52 | 05:10 | 1.06 | 11:35 | 1.74 | 1.42 | 05:10 | 0.375 | 11:35 | 0.916 | 0.642 | 0.642 | 0.08 |
| 12/26/2019 | 04:45 | 5.46 | 12:50 | 7.47 | 6.76 | 04:10 | 1.06 | 12:05 | 1.81 | 1.46 | 05:25 | 0.373 | 12:05 | 0.966 | 0.698 | 0.698 | |
| 12/27/2019 | 04:05 | 5.79 | 12:25 | 7.49 | 6.84 | 04:05 | 1.17 | 12:10 | 1.79 | 1.50 | 04:05 | 0.442 | 12:10 | 0.954 | 0.722 | 0.722 | |
| 12/28/2019 | 05:00 | 5.54 | 12:20 | 7.94 | 6.87 | 04:25 | 0.97 | 12:25 | 1.85 | 1.47 | 04:25 | 0.348 | 12:25 | 1.076 | 0.723 | 0.723 | |
| 12/29/2019 | 06:10 | 5.64 | 12:40 | 8.04 | 7.02 | 05:10 | 1.00 | 12:10 | 1.83 | 1.49 | 05:10 | 0.364 | 12:10 | 1.083 | 0.759 | 0.759 | 0.22 |
| 12/30/2019 | 05:15 | 5.67 | 10:50 | 7.96 | 6.85 | 05:05 | 1.00 | 12:00 | 2.04 | 1.61 | 05:05 | 0.365 | 12:00 | 1.086 | 0.785 | 0.785 | |
| 12/31/2019 | 04:25 | 4.83 | 11:15 | 7.71 | 6.53 | 03:55 | 1.16 | 11:10 | 1.97 | 1.67 | 04:20 | 0.345 | 11:10 | 1.102 | 0.763 | 0.763 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 06:25 | 4.93 13:00 | 7.65 | 6.43 | 06:00 | 1.10 13:00 | 1.96 | 1.60 | 06:20 | 0.332 13:00 | 1.088 | 0.719 | 0.719 | |
| 01/02/2020 | 05:05 | 4.24 09:50 | 7.29 | 5.99 | 05:05 | 1.03 09:35 | 1.93 | 1.56 | 05:05 | 0.250 09:40 | 0.995 | 0.637 | 0.637 | |
| 01/03/2020 | 04:10 | 4.22 09:55 | 7.20 | 5.95 | 05:00 | 0.92 09:50 | 1.86 | 1.52 | 05:00 | 0.220 09:50 | 0.943 | 0.618 | 0.618 | |
| 01/04/2020 | 05:30 | 4.08 13:20 | 7.48 | 5.97 | 05:45 | 0.93 13:35 | 1.90 | 1.49 | 05:30 | 0.213 13:35 | 1.021 | 0.617 | 0.617 | |
| 01/05/2020 | 05:25 | 4.14 11:15 | 7.37 | 6.08 | 05:30 | 0.83 20:35 | 1.94 | 1.51 | 05:30 | 0.196 12:55 | 0.981 | 0.645 | 0.645 | |
| 01/06/2020 | 05:15 | 4.07 08:45 | 7.21 | 5.83 | 04:25 | 0.90 08:50 | 1.85 | 1.43 | 05:15 | 0.204 08:50 | 0.938 | 0.566 | 0.566 | |
| 01/07/2020 | 04:30 | 4.21 08:50 | 7.25 | 5.93 | 05:20 | 0.73 09:20 | 1.82 | 1.38 | 05:20 | 0.178 09:00 | 0.918 | 0.564 | 0.564 | |
| 01/08/2020 | 03:55 | 4.51 08:45 | 7.34 | 6.12 | 03:55 | 0.95 08:30 | 1.91 | 1.51 | 03:55 | 0.249 08:35 | 0.988 | 0.635 | 0.635 | 0.02 |
| 01/09/2020 | 04:50 | 4.53 08:50 | 7.52 | 6.14 | 03:55 | 1.07 08:25 | 1.90 | 1.54 | 03:55 | 0.286 08:50 | 1.022 | 0.647 | 0.647 | 0.18 |
| 01/10/2020 | 05:05 | 4.95 08:40 | 7.35 | 6.21 | 04:05 | 1.01 08:40 | 1.85 | 1.54 | 05:05 | 0.305 08:40 | 0.969 | 0.655 | 0.655 | 0.02 |
| 01/11/2020 | 05:30 | 4.65 12:40 | 7.60 | 6.39 | 05:15 | 1.13 11:45 | 1.92 | 1.58 | 05:15 | 0.314 11:45 | 1.033 | 0.706 | 0.706 | 0.01 |
| 01/12/2020 | 05:10 | 5.10 13:25 | 7.90 | 6.73 | 05:40 | 1.07 12:45 | 1.91 | 1.57 | 05:40 | 0.336 12:45 | 1.082 | 0.753 | 0.753 | |
| 01/13/2020 | 04:10 | 5.05 08:15 | 7.91 | 6.33 | 05:00 | 1.05 09:10 | 1.99 | 1.62 | 05:00 | 0.328 09:10 | 1.077 | 0.703 | 0.703 | 0.02 |
| 01/14/2020 | 05:10 | 4.78 08:55 | 7.56 | 6.29 | 04:50 | 1.17 08:00 | 1.94 | 1.60 | 04:50 | 0.338 08:55 | 1.044 | 0.690 | 0.690 | 0.11 |
| 01/15/2020 | 04:20 | 4.96 08:50 | 7.82 | 6.52 | 04:00 | 1.01 08:10 | 1.90 | 1.52 | 04:00 | 0.308 08:40 | 1.061 | 0.696 | 0.696 | 0.07 |
| 01/16/2020 | 05:15 | 4.98 21:30 | 7.71 | 6.70 | 03:10 | 1.04 08:20 | 2.00 | 1.57 | 04:05 | 0.320 08:20 | 1.102 | 0.747 | 0.747 | 0.66 |
| 01/17/2020 | 05:10 | 5.60 08:45 | 8.05 | 6.90 | 04:25 | 1.19 09:15 | 1.87 | 1.60 | 04:25 | 0.431 09:15 | 1.109 | 0.785 | 0.785 | |
| 01/18/2020 | 05:10 | 5.54 11:35 | 8.13 | 6.95 | 05:00 | 1.19 10:30 | 1.93 | 1.64 | 05:00 | 0.423 11:35 | 1.137 | 0.815 | 0.815 | |
| 01/19/2020 | 05:20 | 5.61 12:45 | 8.09 | 7.03 | 05:00 | 1.20 12:25 | 1.97 | 1.64 | 05:00 | 0.435 12:25 | 1.175 | 0.827 | 0.827 | |
| 01/20/2020 | 05:15 | 5.67 16:15 | 8.32 | 7.24 | 05:10 | 1.21 20:05 | 2.02 | 1.67 | 05:10 | 0.443 20:05 | 1.214 | 0.878 | 0.878 | |
| 01/21/2020 | 04:25 | 5.72 08:50 | 8.43 | 7.21 | 02:55 | 1.24 10:25 | 2.05 | 1.68 | 04:20 | 0.470 09:00 | 1.224 | 0.877 | 0.877 | |
| 01/22/2020 | 05:10 | 5.69 08:55 | 8.40 | 7.11 | 04:00 | 1.19 08:55 | 2.00 | 1.65 | 04:00 | 0.441 08:55 | 1.261 | 0.843 | 0.843 | 0.03 |
| 01/23/2020 | 04:15 | 5.29 08:45 | 8.43 | 6.88 | 03:55 | 1.08 08:40 | 2.00 | 1.57 | 03:55 | 0.358 08:40 | 1.264 | 0.771 | 0.771 | |
| 01/24/2020 | 04:50 | 5.32 09:45 | 8.45 | 6.87 | 03:50 | 1.08 09:35 | 1.98 | 1.54 | 05:00 | 0.364 09:35 | 1.247 | 0.755 | 0.755 | |
| 01/25/2020 | 05:50 | 4.98 11:50 | 7.98 | 6.71 | 05:45 | 0.97 11:45 | 1.98 | 1.53 | 05:45 | 0.297 11:45 | 1.162 | 0.736 | 0.736 | |
| 01/26/2020 | 04:55 | 4.98 12:10 | 8.07 | 6.83 | 04:50 | 1.00 12:40 | 1.91 | 1.55 | 04:50 | 0.303 12:40 | 1.125 | 0.765 | 0.765 | 0.16 |
| 01/27/2020 | 04:20 | 4.95 08:40 | 7.98 | 6.44 | 05:20 | 0.95 09:10 | 1.90 | 1.46 | 05:20 | 0.288 09:10 | 1.098 | 0.659 | 0.659 | |
| 01/28/2020 | 04:00 | 4.76 08:50 | 7.68 | 6.20 | 04:10 | 0.95 08:45 | 1.86 | 1.45 | 04:05 | 0.273 08:45 | 1.037 | 0.618 | 0.618 | 0.01 |
| 01/29/2020 | 04:20 | 4.40 08:40 | 7.37 | 5.94 | 04:25 | 0.81 08:35 | 1.87 | 1.44 | 04:25 | 0.205 08:35 | 0.985 | 0.584 | 0.584 | |
| 01/30/2020 | 05:05 | 4.11 09:00 | 7.30 | 5.92 | 05:05 | 0.87 08:25 | 1.93 | 1.41 | 05:05 | 0.201 09:15 | 0.966 | 0.572 | 0.572 | |
| 01/31/2020 | 05:15 | 4.48 08:30 | 7.35 | 5.81 | 05:10 | 0.86 08:35 | 1.88 | 1.45 | 05:10 | 0.224 08:35 | 0.985 | 0.566 | 0.566 | |
| 02/01/2020 | 05:05 | 3.96 12:40 | 9.25 | 6.29 | 04:40 | 0.87 12:40 | 2.30 | 1.56 | 04:55 | 0.191 12:40 | 1.647 | 0.714 | 0.714 | |
| 02/02/2020 | 06:00 | 5.04 12:40 | 8.45 | 6.90 | 04:50 | 1.11 20:10 | 2.04 | 1.65 | 04:50 | 0.343 12:00 | 1.266 | 0.828 | 0.828 | |
| 02/03/2020 | 04:10 | 4.56 08:40 | 8.31 | 6.47 | 05:00 | 0.96 08:50 | 2.02 | 1.58 | 05:00 | 0.264 08:50 | 1.250 | 0.728 | 0.728 | |
| 02/04/2020 | 04:05 | 4.23 09:00 | 8.06 | 6.25 | 04:50 | 0.97 09:20 | 2.06 | 1.61 | 04:50 | 0.236 08:40 | 1.214 | 0.707 | 0.707 | |
| 02/05/2020 | 03:45 | 4.37 08:55 | 8.14 | 6.26 | 05:00 | 0.96 08:45 | 2.13 | 1.58 | 05:00 | 0.243 08:50 | 1.279 | 0.694 | 0.694 | |
| 02/06/2020 | 03:45 | 4.08 08:40 | 8.23 | 6.35 | 04:35 | 1.08 08:15 | 2.08 | 1.61 | 03:45 | 0.248 08:25 | 1.262 | 0.725 | 0.725 | |
| 02/07/2020 | 03:50 | 4.23 08:55 | 8.30 | 6.39 | 04:00 | 0.98 08:30 | 1.96 | 1.60 | 04:00 | 0.250 08:55 | 1.202 | 0.722 | 0.722 | |
| 02/08/2020 | 05:15 | 4.07 13:00 | 7.64 | 6.20 | 05:35 | 0.97 12:45 | 2.06 | 1.62 | 05:35 | 0.224 12:50 | 1.128 | 0.709 | 0.709 | |
| 02/09/2020 | 04:45 | 4.30 12:15 | 7.75 | 6.34 | 07:10 | 1.02 12:25 | 2.01 | 1.65 | 04:45 | 0.263 12:25 | 1.137 | 0.741 | 0.741 | |
| 02/10/2020 | 04:05 | 4.43 08:35 | 7.57 | 6.02 | 05:00 | 0.98 08:25 | 2.01 | 1.55 | 05:00 | 0.252 08:25 | 1.095 | 0.638 | 0.638 | |
| 02/11/2020 | 04:35 | 4.33 10:30 | 7.60 | 6.03 | 04:10 | 1.02 10:30 | 2.02 | 1.54 | 04:10 | 0.260 10:30 | 1.108 | 0.639 | 0.639 | |
| 02/12/2020 | 04:50 | 4.48 08:35 | 8.01 | 6.15 | 04:15 | 0.96 08:05 | 1.91 | 1.50 | 04:15 | 0.252 08:40 | 1.117 | 0.642 | 0.642 | |
| 02/13/2020 | 04:30 | 4.78 09:00 | 7.96 | 6.47 | 04:10 | 0.84 08:10 | 1.90 | 1.37 | 04:10 | 0.242 08:10 | 1.090 | 0.627 | 0.627 | |
| 02/14/2020 | 05:10 | 5.02 08:45 | 8.19 | 6.87 | 04:15 | 0.83 09:00 | 1.68 | 1.31 | 04:15 | 0.258 09:00 | 1.020 | 0.645 | 0.645 | |
| 02/15/2020 | 04:35 | 4.27 12:35 | 7.50 | 6.23 | 06:00 | 1.02 12:15 | 2.02 | 1.64 | 06:00 | 0.257 12:15 | 1.063 | 0.712 | 0.712 | |
| 02/16/2020 | 05:10 | 3.99 12:10 | 7.74 | 6.22 | 06:05 | 1.02 12:00 | 2.00 | 1.59 | 05:10 | 0.231 12:00 | 1.121 | 0.699 | 0.699 | |
| 02/17/2020 | 05:10 | 4.39 11:35 | 7.68 | 6.46 | 04:40 | 1.00 10:05 | 1.96 | 1.58 | 04:40 | 0.257 10:05 | 1.088 | 0.728 | 0.728 | |
| 02/18/2020 | 05:00 | 4.52 09:15 | 7.87 | 6.33 | 04:55 | 1.02 09:15 | 1.96 | 1.54 | 04:55 | 0.269 09:15 | 1.128 | 0.681 | 0.681 | |
| 02/19/2020 | 04:10 | 4.73 08:55 | 8.11 | 6.40 | 05:10 | 1.04 08:45 | 1.93 | 1.55 | 05:10 | 0.297 08:50 | 1.151 | 0.695 | 0.695 | |
| 02/20/2020 | 05:00 | 4.46 09:05 | 7.88 | 6.20 | 04:00 | 1.05 08:30 | 2.01 | 1.58 | 04:00 | 0.276 09:00 | 1.142 | 0.680 | 0.680 | |
| 02/21/2020 | 04:15 | 4.77 09:25 | 8.37 | 6.69 | 03:45 | 1.05 09:30 | 1.85 | 1.60 | 03:45 | 0.304 09:30 | 1.155 | 0.761 | 0.761 | |
| 02/22/2020 | 05:40 | 5.03 11:25 | 8.11 | 6.88 | 04:40 | 0.88 11:20 | 1.80 | 1.41 | 04:40 | 0.273 11:20 | 1.077 | 0.702 | 0.702 | |
| 02/23/2020 | 05:40 | 4.84 12:55 | 8.41 | 7.11 | 04:25 | 0.86 12:45 | 1.77 | 1.37 | 04:25 | 0.260 12:45 | 1.114 | 0.720 | 0.720 | |
| 02/24/2020 | 03:40 | 5.07 09:00 | 8.91 | 7.24 | 04:15 | 0.80 09:05 | 1.74 | 1.24 | 04:15 | 0.253 09:05 | 1.182 | 0.663 | 0.663 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:15 | 5.23 | 08:45 | 9.10 | 7.45 | 05:00 | 0.76 | 08:45 | 1.54 | 1.25 | 05:00 | 0.250 | 08:45 | 1.083 | 0.695 | 0.695 | |
| 02/26/2020 | 04:25 | 5.32 | 08:40 | 9.42 | 7.39 | 04:30 | 0.78 | 22:50 | 1.78 | 1.28 | 04:30 | 0.261 | 08:15 | 1.106 | 0.696 | 0.696 | |
| 02/27/2020 | 04:40 | 4.39 | 08:40 | 7.99 | 6.36 | 03:10 | 0.93 | 08:10 | 1.87 | 1.41 | 03:10 | 0.249 | 08:35 | 1.082 | 0.624 | 0.624 | |
| 02/28/2020 | 04:35 | 4.79 | 08:50 | 8.04 | 6.54 | 03:40 | 0.86 | 08:20 | 1.78 | 1.37 | 03:40 | 0.252 | 08:45 | 1.045 | 0.633 | 0.633 | |
| 02/29/2020 | 05:15 | 4.88 | 11:55 | 8.11 | 6.79 | 06:10 | 0.86 | 11:55 | 1.77 | 1.39 | 06:10 | 0.255 | 11:55 | 1.061 | 0.682 | 0.682 | |
| 03/01/2020 | 05:35 | 4.76 | 11:05 | 8.19 | 6.93 | 04:55 | 0.79 | 11:00 | 1.80 | 1.40 | 04:55 | 0.232 | 11:00 | 1.089 | 0.715 | 0.715 | |
| 03/02/2020 | 04:50 | 4.86 | 08:40 | 8.48 | 6.34 | 03:25 | 0.73 | 09:00 | 1.95 | 1.47 | 03:25 | 0.222 | 09:00 | 1.101 | 0.650 | 0.650 | |
| 03/03/2020 | 04:30 | 4.29 | 09:00 | 8.65 | 6.46 | 04:50 | 0.96 | 21:30 | 2.03 | 1.64 | 04:50 | 0.243 | 09:05 | 1.319 | 0.759 | 0.759 | |
| 03/04/2020 | 04:45 | 4.59 | 08:20 | 8.56 | 6.65 | 03:50 | 1.10 | 08:10 | 2.13 | 1.68 | 03:50 | 0.302 | 08:25 | 1.362 | 0.802 | 0.802 | |
| 03/05/2020 | 04:30 | 4.80 | 08:45 | 8.55 | 6.71 | 04:25 | 1.14 | 08:45 | 2.07 | 1.66 | 04:25 | 0.328 | 08:45 | 1.333 | 0.791 | 0.791 | |
| 03/06/2020 | 04:55 | 4.29 | 08:50 | 8.10 | 6.52 | 04:45 | 1.01 | 08:45 | 1.96 | 1.59 | 04:50 | 0.248 | 08:45 | 1.174 | 0.740 | 0.740 | |
| 03/07/2020 | 05:10 | 4.64 | 12:15 | 8.39 | 6.91 | 05:10 | 1.10 | 12:50 | 1.95 | 1.64 | 05:10 | 0.304 | 12:50 | 1.214 | 0.829 | 0.829 | |
| 03/08/2020 | 05:15 | 4.36 | 11:20 | 8.18 | 6.66 | 04:40 | 1.00 | 11:20 | 2.12 | 1.67 | 04:40 | 0.252 | 11:20 | 1.286 | 0.812 | 0.812 | |
| 03/09/2020 | 04:00 | 4.54 | 20:30 | 7.88 | 6.40 | 04:05 | 1.00 | 20:40 | 1.98 | 1.61 | 04:05 | 0.266 | 20:30 | 1.140 | 0.728 | 0.727 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 81.489 | 4.90 |
| Avg | 6.51 | 1.54 | 0.709 | |

## Site Commentary

### Site Information

| MIL_0186 | |
|---|---|
| Pipe Dimensions | 8 |
| Silt Level | 1.63" |

### Overview

Site MIL_0186 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019 and December 7, 2019 - December 8, 2019. Surcharge conditions were experienced at this location. Review of the scattergraph shows free flow conditions during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location. Data confidence is less than typical due to sediment. A data gap also occurs beginning February 02, 2020 through February 14, 2020 and another data gap on March 02, 2020 through March 05, 2020 resulting from a meter malfunction.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 4.25 | 1.45 | 0.133 |
| Minimum | 2.64 | 0.71 | 0.030 |
| Maximum | 8.80 | 2.50 | 0.482 |
| Time of Minimum | 2/23/2020 3:35 AM | 11/18/2019 3:25 AM | 11/18/2019 3:25 AM |
| Time of Maximum | 3/6/2020 2:15 PM | 12/4/2019 5:30 AM | 12/4/2019 5:30 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period. 90 days of data provided.

| Percent Uptime | |
|---|---|
| Depth (in) | 88 |
| Velocity (ft/s) | 88 |
| Quantity (MGD) | 88 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

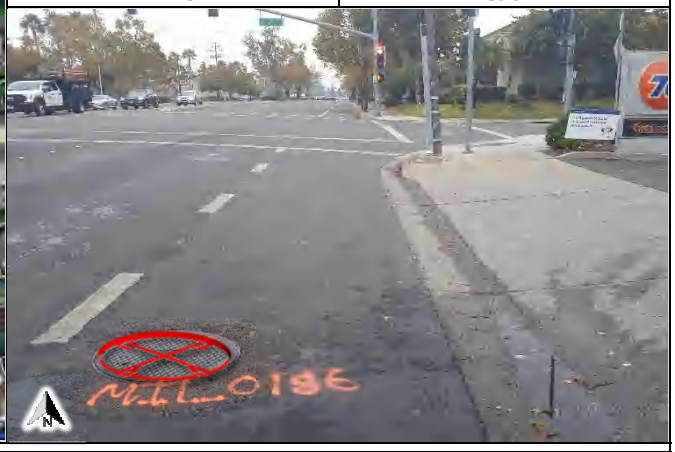
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_0186

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | N Milpitas Blvd and Sunnyhills Ct | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Drive | Latitude: | 37.454452° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.910707° | 8.0" x 8.0" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 186 | Residential |
| Access | Traffic |
| Drive | Medium |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 3:47:18 AM | 8.0" x 8.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 3.75 | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 0.91 | 0'' |
| Silt (in) | Silt Type |
| 1.63 | |

Hydraulic Comments:

Medium depth with moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 7' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431.11.325 |

# SCATTERGRAPH REPORT

MIL_0186

**Flow Monitor**

**MIL_0186**

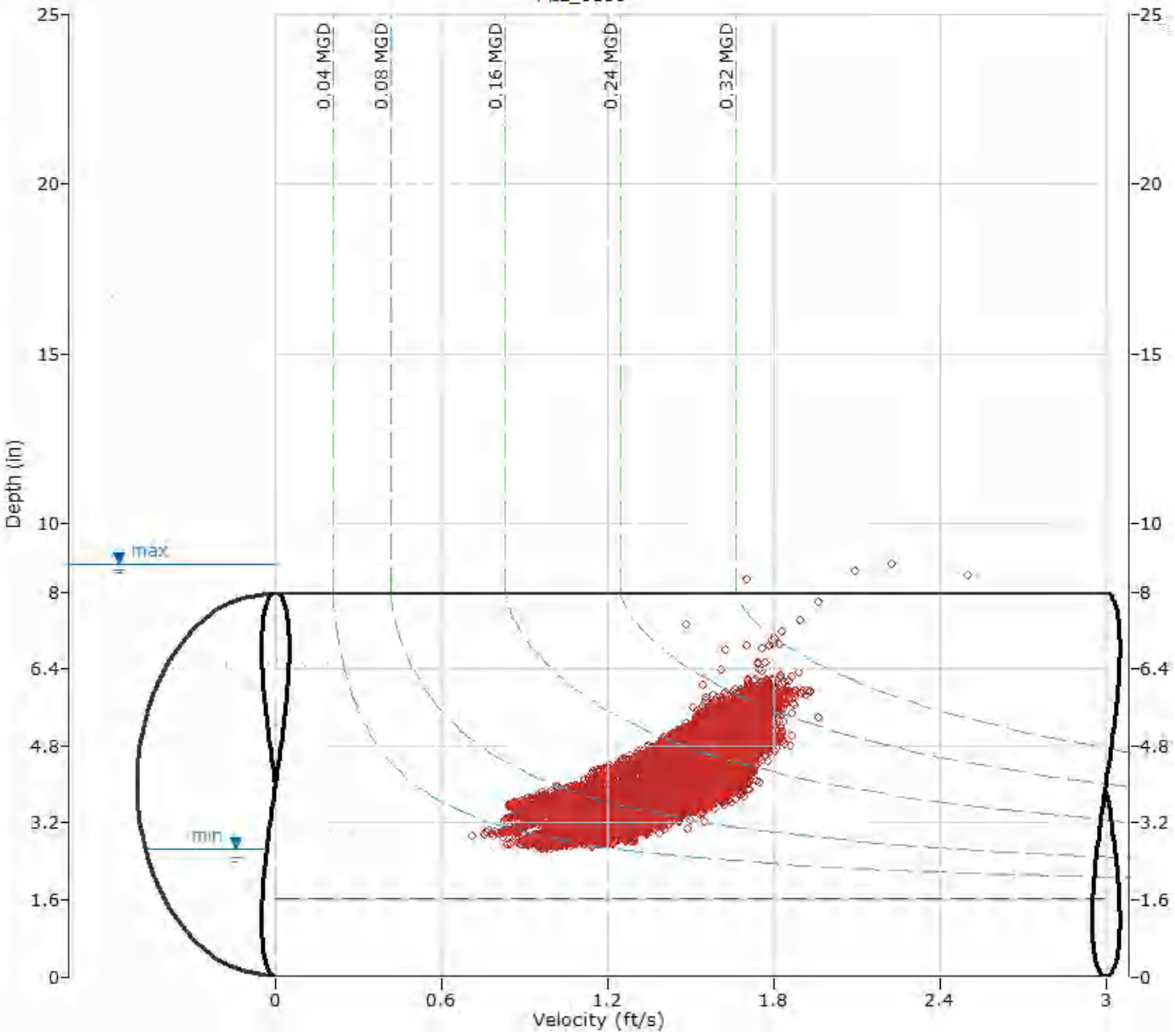
Pipe Height
8.00 in

**Report Period**

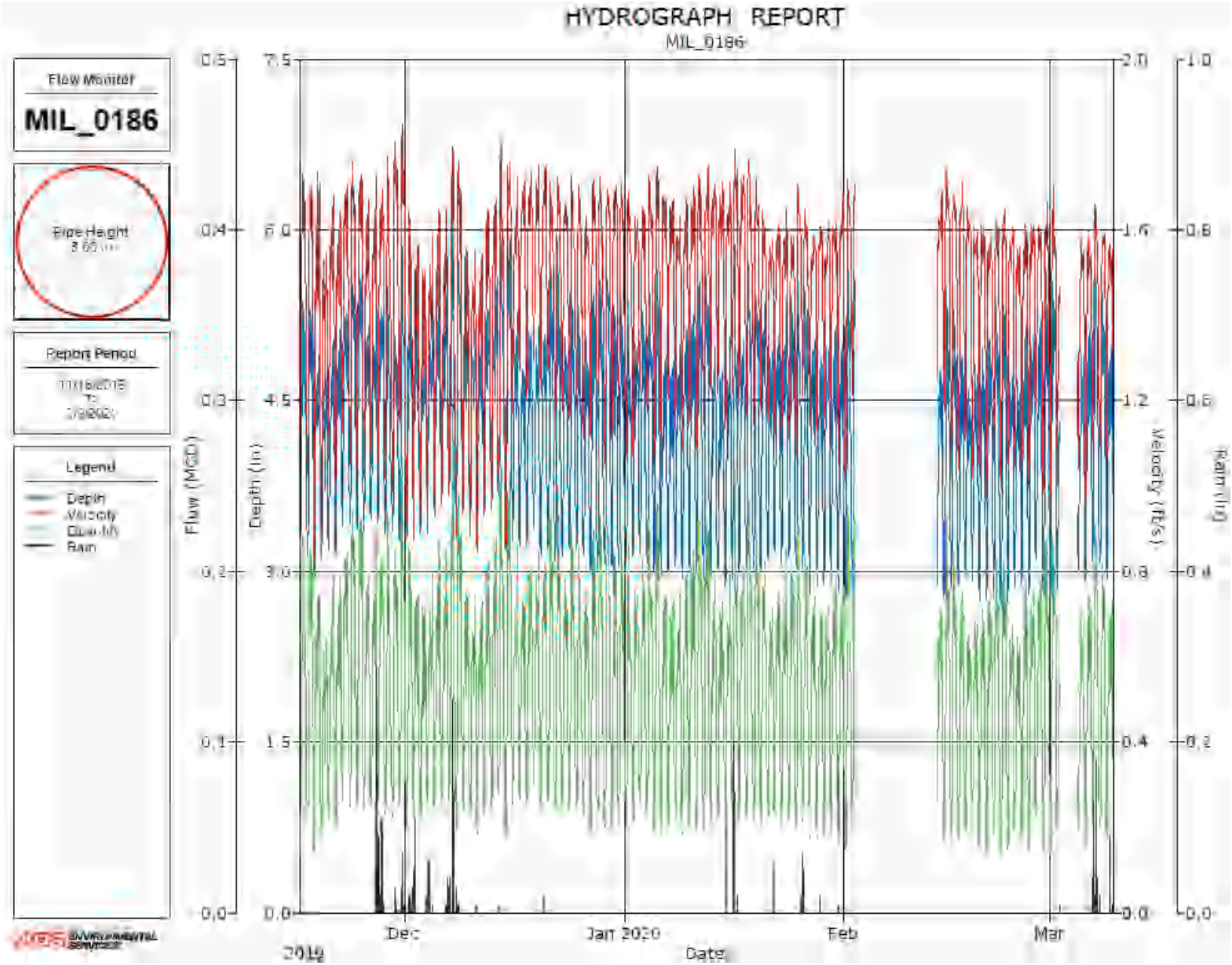
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0186
Flow Monitor
MIL_0186
Pipe Height
Report Period
Legend
Depth
Velocity
Flow
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
Dec
Jan 2020
Feb
Mar
2019
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0186, Pipe Height: 8.00 in, Silt: 1.63 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 05:15 | 3.20 | 12:20 | 5.64 | 4.37 | 05:55 | 1.05 | 10:50 | 1.77 | 1.48 | 05:15 | 0.057 | 12:20 | 0.237 | 0.143 | 0.143 | |
| 11/17/2019 | 03:40 | 3.11 | 11:25 | 5.54 | 4.33 | 04:25 | 0.98 | 10:45 | 1.76 | 1.44 | 04:25 | 0.048 | 11:30 | 0.230 | 0.139 | 0.139 | |
| 11/18/2019 | 03:05 | 2.88 | 18:05 | 5.00 | 4.10 | 03:25 | 0.71 | 18:20 | 1.84 | 1.40 | 03:25 | 0.030 | 17:35 | 0.203 | 0.123 | 0.123 | |
| 11/19/2019 | 04:00 | 3.00 | 19:00 | 4.98 | 3.98 | 04:00 | 0.83 | 17:40 | 1.69 | 1.32 | 04:00 | 0.037 | 19:00 | 0.187 | 0.108 | 0.108 | |
| 11/20/2019 | 03:45 | 3.15 | 20:10 | 5.37 | 4.22 | 03:25 | 1.00 | 19:40 | 1.74 | 1.44 | 03:25 | 0.051 | 20:10 | 0.223 | 0.130 | 0.130 | |
| 11/21/2019 | 03:05 | 3.12 | 18:15 | 5.37 | 4.27 | 03:55 | 0.95 | 19:15 | 1.70 | 1.41 | 03:55 | 0.047 | 19:15 | 0.216 | 0.130 | 0.130 | |
| 11/22/2019 | 01:50 | 3.18 | 14:25 | 6.22 | 4.64 | 01:50 | 0.96 | 14:25 | 1.87 | 1.51 | 01:50 | 0.049 | 14:25 | 0.289 | 0.159 | 0.159 | |
| 11/23/2019 | 04:40 | 3.36 | 17:35 | 5.69 | 4.62 | 04:40 | 1.02 | 14:05 | 1.87 | 1.48 | 04:40 | 0.058 | 14:05 | 0.246 | 0.156 | 0.156 | |
| 11/24/2019 | 04:05 | 3.32 | 14:10 | 6.25 | 4.65 | 04:05 | 0.93 | 14:10 | 1.83 | 1.47 | 04:05 | 0.052 | 14:10 | 0.285 | 0.157 | 0.157 | |
| 11/25/2019 | 03:40 | 3.31 | 18:30 | 5.37 | 4.41 | 04:00 | 1.00 | 18:30 | 1.71 | 1.42 | 03:40 | 0.055 | 18:30 | 0.219 | 0.138 | 0.138 | |
| 11/26/2019 | 02:20 | 3.39 | 20:15 | 5.60 | 4.41 | 02:20 | 0.99 | 19:20 | 1.77 | 1.43 | 02:20 | 0.057 | 20:15 | 0.238 | 0.139 | 0.139 | 0.63 |
| 11/27/2019 | 03:15 | 3.37 | 20:10 | 5.55 | 4.51 | 03:25 | 0.97 | 20:10 | 1.73 | 1.45 | 03:25 | 0.057 | 20:10 | 0.232 | 0.147 | 0.147 | 0.77 |
| 11/28/2019 | 04:25 | 3.27 | 11:00 | 5.69 | 4.34 | 05:15 | 0.99 | 11:00 | 1.85 | 1.43 | 04:25 | 0.054 | 11:00 | 0.256 | 0.137 | 0.137 | |
| 11/29/2019 | 03:55 | 3.29 | 17:40 | 5.39 | 4.24 | 03:50 | 0.91 | 17:40 | 1.97 | 1.48 | 03:50 | 0.050 | 17:40 | 0.253 | 0.136 | 0.136 | 0.05 |
| 11/30/2019 | 04:10 | 3.20 | 11:50 | 6.33 | 4.48 | 03:00 | 1.06 | 13:00 | 1.90 | 1.52 | 03:00 | 0.057 | 11:50 | 0.300 | 0.154 | 0.154 | 0.14 |
| 12/01/2019 | 05:10 | 3.23 | 13:35 | 5.79 | 4.46 | 02:25 | 0.87 | 13:35 | 1.68 | 1.32 | 05:05 | 0.046 | 13:35 | 0.239 | 0.133 | 0.133 | 0.06 |
| 12/02/2019 | 04:35 | 3.51 | 12:00 | 5.39 | 4.47 | 04:10 | 0.85 | 18:40 | 1.66 | 1.30 | 04:10 | 0.053 | 12:00 | 0.210 | 0.130 | 0.130 | 0.36 |
| 12/03/2019 | 03:55 | 3.30 | 11:25 | 5.34 | 4.34 | 03:55 | 0.87 | 11:15 | 1.65 | 1.25 | 03:55 | 0.048 | 11:25 | 0.195 | 0.119 | 0.119 | |
| 12/04/2019 | 02:35 | 3.53 | 05:30 | 8.48 | 4.49 | 02:35 | 0.84 | 05:30 | 2.50 | 1.32 | 02:35 | 0.053 | 05:30 | 0.482 | 0.132 | 0.132 | 0.44 |
| 12/05/2019 | 02:15 | 3.42 | 18:15 | 6.88 | 4.50 | 02:15 | 0.91 | 18:45 | 1.83 | 1.34 | 02:15 | 0.053 | 18:15 | 0.295 | 0.136 | 0.136 | |
| 12/06/2019 | 05:05 | 3.53 | 17:50 | 6.03 | 4.54 | 03:25 | 0.87 | 17:50 | 1.79 | 1.34 | 03:25 | 0.057 | 17:50 | 0.268 | 0.137 | 0.137 | 0.06 |
| 12/07/2019 | 04:25 | 3.57 | 06:55 | 8.34 | 4.79 | 02:55 | 0.87 | 18:40 | 1.91 | 1.42 | 02:55 | 0.057 | 17:25 | 0.330 | 0.160 | 0.160 | 0.84 |
| 12/08/2019 | 03:40 | 3.32 | 10:55 | 5.95 | 4.65 | 03:40 | 0.86 | 11:20 | 1.86 | 1.39 | 03:40 | 0.048 | 10:55 | 0.269 | 0.151 | 0.151 | 0.10 |
| 12/09/2019 | 02:55 | 3.49 | 12:55 | 5.47 | 4.43 | 02:55 | 0.94 | 12:55 | 1.65 | 1.31 | 02:55 | 0.057 | 12:55 | 0.217 | 0.128 | 0.128 | |
| 12/10/2019 | 03:10 | 3.34 | 19:00 | 5.46 | 4.38 | 03:10 | 0.87 | 19:00 | 1.65 | 1.29 | 03:10 | 0.049 | 19:00 | 0.217 | 0.124 | 0.124 | 0.01 |
| 12/11/2019 | 03:40 | 3.25 | 20:05 | 5.32 | 4.32 | 03:40 | 0.83 | 20:05 | 1.61 | 1.26 | 03:40 | 0.044 | 20:05 | 0.204 | 0.120 | 0.120 | 0.00 |
| 12/12/2019 | 03:45 | 3.45 | 12:40 | 5.53 | 4.52 | 03:45 | 0.92 | 19:15 | 1.75 | 1.37 | 03:45 | 0.055 | 19:15 | 0.233 | 0.140 | 0.140 | |
| 12/13/2019 | 04:10 | 3.49 | 18:25 | 7.77 | 4.54 | 04:10 | 0.94 | 18:25 | 1.96 | 1.38 | 04:10 | 0.058 | 18:25 | 0.374 | 0.142 | 0.142 | |
| 12/14/2019 | 03:10 | 3.61 | 11:45 | 6.10 | 4.71 | 03:10 | 0.99 | 10:50 | 1.93 | 1.40 | 03:10 | 0.065 | 10:50 | 0.282 | 0.154 | 0.154 | 0.01 |
| 12/15/2019 | 05:15 | 3.26 | 18:30 | 6.35 | 4.70 | 05:15 | 0.83 | 19:50 | 1.82 | 1.40 | 05:15 | 0.045 | 18:30 | 0.280 | 0.158 | 0.158 | |
| 12/16/2019 | 03:15 | 3.25 | 19:00 | 5.69 | 4.33 | 02:40 | 1.14 | 18:50 | 1.76 | 1.50 | 03:05 | 0.061 | 19:00 | 0.242 | 0.141 | 0.141 | |
| 12/17/2019 | 03:35 | 3.17 | 11:35 | 5.00 | 4.15 | 04:55 | 1.21 | 19:10 | 1.76 | 1.55 | 04:55 | 0.063 | 11:30 | 0.201 | 0.135 | 0.135 | |
| 12/18/2019 | 03:35 | 3.19 | 13:25 | 5.40 | 4.28 | 02:05 | 1.10 | 14:15 | 1.80 | 1.54 | 03:35 | 0.059 | 13:25 | 0.223 | 0.142 | 0.142 | |
| 12/19/2019 | 04:20 | 3.32 | 20:25 | 5.64 | 4.29 | 04:20 | 1.26 | 20:25 | 1.80 | 1.55 | 04:20 | 0.070 | 20:25 | 0.247 | 0.143 | 0.143 | |
| 12/20/2019 | 03:25 | 3.07 | 18:50 | 5.49 | 4.24 | 03:25 | 1.14 | 20:50 | 1.79 | 1.55 | 03:25 | 0.053 | 18:50 | 0.234 | 0.141 | 0.141 | 0.02 |
| 12/21/2019 | 03:40 | 3.16 | 10:30 | 6.15 | 4.39 | 05:15 | 1.14 | 13:25 | 1.77 | 1.51 | 05:15 | 0.061 | 11:10 | 0.267 | 0.146 | 0.146 | |
| 12/22/2019 | 04:00 | 3.03 | 13:10 | 6.16 | 4.35 | 05:20 | 1.03 | 13:10 | 1.80 | 1.48 | 05:20 | 0.047 | 13:10 | 0.276 | 0.143 | 0.143 | |
| 12/23/2019 | 03:55 | 3.10 | 15:05 | 5.78 | 4.20 | 03:55 | 1.16 | 11:40 | 1.79 | 1.50 | 03:55 | 0.055 | 15:05 | 0.244 | 0.135 | 0.135 | |
| 12/24/2019 | 03:20 | 3.16 | 12:15 | 5.83 | 4.29 | 04:35 | 1.07 | 12:25 | 1.80 | 1.48 | 03:20 | 0.054 | 12:30 | 0.247 | 0.138 | 0.138 | |
| 12/25/2019 | 05:30 | 3.14 | 11:35 | 5.87 | 4.13 | 03:25 | 1.12 | 11:35 | 1.81 | 1.49 | 05:35 | 0.057 | 11:35 | 0.261 | 0.129 | 0.129 | |
| 12/26/2019 | 05:35 | 3.10 | 11:45 | 5.49 | 4.14 | 03:30 | 1.07 | 11:45 | 1.69 | 1.44 | 05:25 | 0.053 | 11:45 | 0.223 | 0.126 | 0.126 | |
| 12/27/2019 | 04:30 | 2.92 | 13:50 | 5.86 | 4.20 | 04:30 | 1.07 | 13:20 | 1.75 | 1.49 | 04:30 | 0.044 | 13:50 | 0.250 | 0.135 | 0.135 | |
| 12/28/2019 | 04:10 | 2.96 | 10:50 | 6.81 | 4.29 | 03:15 | 1.09 | 10:45 | 1.79 | 1.48 | 03:10 | 0.049 | 10:50 | 0.302 | 0.139 | 0.139 | |
| 12/29/2019 | 04:05 | 2.99 | 12:00 | 5.94 | 4.37 | 05:10 | 0.99 | 18:35 | 1.78 | 1.47 | 05:05 | 0.046 | 12:00 | 0.250 | 0.144 | 0.144 | |
| 12/30/2019 | 04:00 | 3.00 | 11:20 | 5.74 | 4.19 | 04:05 | 1.00 | 17:30 | 1.74 | 1.50 | 04:05 | 0.044 | 11:20 | 0.229 | 0.135 | 0.135 | |
| 12/31/2019 | 04:20 | 2.98 | 12:55 | 5.49 | 4.20 | 02:00 | 1.08 | 11:10 | 1.74 | 1.50 | 04:20 | 0.048 | 12:55 | 0.230 | 0.135 | 0.135 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:30 | 3.00 | 12:40 | 5.79 | 4.11 | 05:20 | 0.99 | 12:55 | 1.73 | 1.45 | 05:20 | 0.045 | 12:40 | 0.243 | 0.126 | 0.126 | |
| 01/02/2020 | 02:55 | 3.05 | 05:20 | 8.60 | 4.21 | 02:55 | 1.03 | 05:20 | 2.10 | 1.45 | 02:55 | 0.047 | 05:20 | 0.404 | 0.131 | 0.131 | |
| 01/03/2020 | 03:40 | 3.15 | 11:25 | 5.54 | 4.28 | 04:05 | 1.13 | 11:25 | 1.69 | 1.48 | 03:40 | 0.061 | 11:25 | 0.226 | 0.136 | 0.136 | |
| 01/04/2020 | 04:25 | 2.98 | 11:45 | 5.85 | 4.27 | 04:30 | 1.02 | 10:25 | 1.79 | 1.49 | 04:30 | 0.046 | 11:45 | 0.252 | 0.139 | 0.139 | |
| 01/05/2020 | 04:30 | 2.96 | 13:05 | 6.15 | 4.33 | 03:30 | 0.97 | 13:05 | 1.78 | 1.46 | 04:30 | 0.042 | 13:05 | 0.272 | 0.142 | 0.142 | |
| 01/06/2020 | 03:10 | 2.93 | 19:00 | 5.10 | 4.06 | 03:10 | 0.94 | 10:05 | 1.73 | 1.51 | 03:10 | 0.039 | 19:00 | 0.203 | 0.128 | 0.128 | |
| 01/07/2020 | 02:00 | 2.91 | 18:45 | 5.29 | 3.99 | 03:25 | 1.06 | 19:15 | 1.76 | 1.51 | 02:00 | 0.047 | 18:45 | 0.214 | 0.123 | 0.123 | |
| 01/08/2020 | 04:25 | 3.01 | 18:15 | 5.36 | 4.12 | 04:20 | 1.09 | 20:40 | 1.69 | 1.47 | 04:20 | 0.049 | 18:15 | 0.209 | 0.127 | 0.127 | |
| 01/09/2020 | 03:20 | 2.91 | 19:10 | 5.53 | 4.21 | 03:35 | 1.03 | 18:55 | 1.75 | 1.47 | 03:35 | 0.042 | 19:15 | 0.226 | 0.133 | 0.133 | |
| 01/10/2020 | 03:40 | 2.97 | 12:00 | 5.53 | 4.22 | 04:35 | 1.12 | 13:50 | 1.74 | 1.49 | 03:40 | 0.048 | 19:25 | 0.227 | 0.135 | 0.135 | |
| 01/11/2020 | 03:30 | 2.94 | 10:45 | 6.03 | 4.34 | 03:35 | 1.01 | 10:50 | 1.79 | 1.49 | 03:35 | 0.043 | 10:45 | 0.267 | 0.144 | 0.144 | |
| 01/12/2020 | 04:15 | 2.91 | 18:55 | 5.99 | 4.35 | 04:55 | 1.08 | 18:50 | 1.82 | 1.53 | 04:10 | 0.045 | 18:55 | 0.268 | 0.147 | 0.147 | |
| 01/13/2020 | 02:50 | 2.91 | 18:30 | 5.22 | 3.96 | 02:50 | 1.09 | 20:00 | 1.74 | 1.54 | 02:50 | 0.045 | 18:30 | 0.213 | 0.124 | 0.124 | |
| 01/14/2020 | 04:55 | 2.96 | 21:00 | 4.97 | 4.01 | 05:10 | 1.12 | 20:50 | 1.74 | 1.54 | 05:10 | 0.048 | 21:00 | 0.198 | 0.127 | 0.106 | |
| 01/15/2020 | 05:10 | 2.84 | 21:15 | 5.56 | 4.02 | 06:00 | 1.09 | 21:05 | 1.79 | 1.52 | 05:35 | 0.044 | 21:20 | 0.227 | 0.126 | 0.126 | 0.10 |
| 01/16/2020 | 05:40 | 2.91 | 13:55 | 6.07 | 4.18 | 06:00 | 1.15 | 12:45 | 1.83 | 1.57 | 05:30 | 0.048 | 13:45 | 0.269 | 0.140 | 0.140 | 0.66 |
| 01/17/2020 | 04:10 | 2.98 | 21:15 | 5.31 | 4.18 | 04:10 | 1.13 | 12:30 | 1.80 | 1.55 | 04:10 | 0.049 | 19:25 | 0.224 | 0.138 | 0.138 | |
| 01/18/2020 | 05:20 | 2.98 | 14:10 | 6.16 | 4.32 | 05:20 | 1.13 | 14:30 | 1.81 | 1.53 | 05:20 | 0.049 | 14:10 | 0.272 | 0.145 | 0.145 | |
| 01/19/2020 | 06:55 | 3.01 | 13:40 | 5.86 | 4.31 | 08:00 | 1.08 | 13:05 | 1.79 | 1.49 | 06:55 | 0.050 | 13:40 | 0.253 | 0.141 | 0.141 | |
| 01/20/2020 | 05:35 | 2.93 | 18:50 | 5.77 | 4.29 | 04:50 | 1.13 | 17:50 | 1.77 | 1.47 | 05:35 | 0.048 | 18:50 | 0.236 | 0.136 | 0.136 | |
| 01/21/2020 | 06:15 | 3.05 | 13:10 | 5.09 | 4.12 | 07:00 | 1.08 | 20:30 | 1.66 | 1.43 | 06:15 | 0.052 | 20:30 | 0.189 | 0.124 | 0.124 | 0.01 |
| 01/22/2020 | 05:15 | 3.12 | 13:45 | 5.34 | 4.22 | 05:20 | 1.04 | 21:00 | 1.69 | 1.45 | 05:20 | 0.051 | 20:35 | 0.208 | 0.130 | 0.130 | 0.09 |
| 01/23/2020 | 02:55 | 3.04 | 19:40 | 5.66 | 4.29 | 02:40 | 1.04 | 19:20 | 1.70 | 1.44 | 03:30 | 0.048 | 20:25 | 0.231 | 0.134 | 0.123 | |
| 01/24/2020 | 05:30 | 3.10 | 13:25 | 6.38 | 4.33 | 05:00 | 1.08 | 12:15 | 1.71 | 1.42 | 05:30 | 0.052 | 13:25 | 0.258 | 0.135 | 0.135 | |
| 01/25/2020 | 05:40 | 3.02 | 12:20 | 5.91 | 4.20 | 05:30 | 1.03 | 11:00 | 1.84 | 1.47 | 05:40 | 0.047 | 12:20 | 0.257 | 0.133 | 0.133 | |
| 01/26/2020 | 03:30 | 2.97 | 11:15 | 5.69 | 4.25 | 03:05 | 1.14 | 11:05 | 1.68 | 1.49 | 03:25 | 0.050 | 11:15 | 0.227 | 0.136 | 0.136 | 0.16 |
| 01/27/2020 | 04:50 | 2.78 | 11:25 | 5.34 | 4.09 | 05:10 | 1.07 | 08:05 | 1.67 | 1.44 | 03:50 | 0.041 | 20:15 | 0.206 | 0.124 | 0.113 | |
| 01/28/2020 | 04:45 | 2.79 | 22:10 | 5.13 | 4.03 | 04:00 | 1.04 | 19:25 | 1.66 | 1.47 | 04:45 | 0.039 | 20:15 | 0.193 | 0.123 | 0.123 | 0.02 |
| 01/29/2020 | 03:55 | 2.83 | 20:40 | 5.37 | 4.11 | 03:35 | 1.05 | 21:40 | 1.66 | 1.46 | 03:35 | 0.042 | 20:40 | 0.211 | 0.125 | 0.125 | |
| 01/30/2020 | 03:40 | 2.84 | 19:55 | 5.43 | 4.09 | 03:20 | 1.03 | 16:15 | 1.70 | 1.47 | 03:40 | 0.042 | 19:50 | 0.214 | 0.126 | 0.126 | |
| 01/31/2020 | 05:10 | 2.77 | 19:25 | 5.28 | 4.05 | 04:05 | 0.95 | 20:05 | 1.77 | 1.50 | 04:05 | 0.036 | 21:50 | 0.213 | 0.127 | 0.127 | 0.01 |
| 02/01/2020 | 04:45 | 2.73 | 14:55 | 6.17 | 4.26 | 02:50 | 0.94 | 12:20 | 1.76 | 1.46 | 04:55 | 0.035 | 11:35 | 0.266 | 0.138 | 0.138 | |
| 02/02/2020 | 04:45 | 2.75 | 10:30 | 6.14 | 4.00 | 04:20 | 1.15 | 12:20 | 1.75 | 1.49 | 04:45 | 0.041 | 10:30 | 0.261 | 0.125 | 0.076 | |
| 02/03/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/04/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/05/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/06/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/07/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/08/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/09/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/10/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/11/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/12/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/13/2020 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 02/14/2020 | 05:00 | 2.84 | 19:35 | 5.05 | 4.19 | 05:00 | 1.10 | 20:30 | 1.78 | 1.60 | 05:00 | 0.043 | 19:35 | 0.199 | 0.140 | 0.112 | |
| 02/15/2020 | 05:15 | 2.69 | 11:50 | 5.78 | 4.08 | 05:50 | 1.13 | 11:50 | 1.77 | 1.54 | 05:15 | 0.039 | 11:50 | 0.251 | 0.133 | 0.133 | |
| 02/16/2020 | 04:55 | 2.81 | 11:05 | 5.62 | 4.11 | 03:10 | 0.97 | 16:55 | 1.78 | 1.47 | 05:05 | 0.037 | 11:05 | 0.232 | 0.129 | 0.129 | |
| 02/17/2020 | 04:05 | 2.85 | 19:40 | 5.43 | 3.94 | 04:20 | 0.98 | 17:20 | 1.76 | 1.46 | 04:15 | 0.039 | 19:40 | 0.218 | 0.119 | 0.119 | |
| 02/18/2020 | 04:15 | 2.90 | 13:20 | 4.65 | 3.87 | 02:40 | 1.03 | 14:10 | 1.75 | 1.48 | 04:15 | 0.043 | 13:40 | 0.167 | 0.115 | 0.115 | |
| 02/19/2020 | 02:50 | 2.87 | 12:50 | 5.24 | 3.98 | 02:35 | 0.97 | 08:50 | 1.76 | 1.44 | 02:35 | 0.039 | 12:50 | 0.200 | 0.118 | 0.118 | |
| 02/20/2020 | 03:15 | 2.71 | 11:45 | 5.28 | 3.99 | 03:15 | 0.95 | 18:45 | 1.66 | 1.44 | 03:15 | 0.033 | 11:45 | 0.201 | 0.119 | 0.119 | |
| 02/21/2020 | 02:55 | 2.68 | 18:20 | 5.48 | 4.01 | 03:00 | 0.92 | 18:45 | 1.68 | 1.41 | 02:55 | 0.032 | 18:20 | 0.211 | 0.118 | 0.118 | |
| 02/22/2020 | 04:25 | 2.70 | 13:40 | 5.70 | 4.10 | 04:20 | 0.96 | 13:40 | 1.67 | 1.42 | 04:25 | 0.033 | 13:40 | 0.232 | 0.124 | 0.124 | |
| 02/23/2020 | 03:35 | 2.64 | 12:40 | 5.61 | 4.16 | 03:30 | 0.96 | 17:35 | 1.73 | 1.42 | 03:30 | 0.031 | 13:35 | 0.232 | 0.129 | 0.129 | |
| 02/24/2020 | 03:50 | 2.70 | 11:45 | 6.05 | 3.94 | 03:45 | 0.99 | 21:25 | 1.69 | 1.43 | 03:50 | 0.034 | 11:45 | 0.232 | 0.115 | 0.115 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 03:40 | 2.82 | 21:00 | 5.11 | 3.95 | 04:50 | 1.01 | 21:00 | 1.62 | 1.40 | 03:40 | 0.039 | 21:00 | 0.192 | 0.113 | 0.113 | |
| 02/26/2020 | 02:45 | 2.74 | 19:15 | 5.58 | 4.13 | 02:35 | 0.95 | 19:05 | 1.64 | 1.43 | 02:45 | 0.034 | 19:15 | 0.219 | 0.125 | 0.125 | |
| 02/27/2020 | 02:45 | 2.70 | 11:45 | 5.42 | 4.14 | 03:10 | 0.91 | 16:35 | 1.62 | 1.44 | 03:10 | 0.032 | 11:40 | 0.206 | 0.127 | 0.127 | |
| 02/28/2020 | 04:20 | 3.05 | 18:30 | 5.46 | 4.24 | 04:20 | 1.14 | 19:50 | 1.64 | 1.46 | 04:20 | 0.052 | 19:50 | 0.212 | 0.133 | 0.133 | |
| 02/29/2020 | 04:15 | 2.72 | 10:40 | 5.87 | 4.28 | 04:35 | 0.90 | 18:10 | 1.70 | 1.41 | 04:35 | 0.032 | 10:40 | 0.235 | 0.134 | 0.134 | |
| 03/01/2020 | 05:15 | 2.73 | 11:45 | 5.96 | 4.27 | 04:20 | 0.84 | 13:25 | 1.72 | 1.40 | 04:20 | 0.030 | 11:45 | 0.245 | 0.133 | 0.133 | |
| 03/02/2020 | 03:30 | 2.82 | 07:45 | 4.60 | 3.48 | 02:50 | 0.95 | 07:30 | 1.52 | 1.24 | 03:25 | 0.037 | 07:45 | 0.148 | 0.079 | 0.034 | 0.01 |
| 03/03/2020 | | | | | | | | | | | | | | | | | |
| 03/04/2020 | | | | | | | | | | | | | | | | | |
| 03/05/2020 | 03:40 | 2.93 | 12:45 | 5.21 | 4.10 | 02:30 | 0.94 | 12:45 | 1.60 | 1.41 | 02:30 | 0.039 | 12:45 | 0.196 | 0.121 | 0.121 | |
| 03/06/2020 | 04:20 | 2.85 | 14:15 | 8.80 | 4.14 | 04:05 | 0.92 | 14:15 | 2.23 | 1.40 | 04:05 | 0.036 | 14:15 | 0.429 | 0.123 | 0.123 | |
| 03/07/2020 | 05:05 | 3.01 | 14:15 | 5.90 | 4.41 | 05:05 | 1.07 | 15:10 | 1.77 | 1.44 | 05:05 | 0.048 | 15:10 | 0.257 | 0.141 | 0.141 | 0.58 |
| 03/08/2020 | 04:30 | 2.96 | 12:35 | 5.73 | 4.30 | 04:30 | 1.04 | 14:05 | 1.63 | 1.42 | 04:30 | 0.045 | 12:35 | 0.227 | 0.133 | 0.133 | 0.02 |
| 03/09/2020 | 04:05 | 2.91 | 20:05 | 5.34 | 4.08 | 04:05 | 1.01 | 12:40 | 1.60 | 1.39 | 04:05 | 0.041 | 20:00 | 0.202 | 0.119 | 0.119 | 0.11 |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 13.410 | 5.26 |
| Avg | 4.25 | 1.45 | 0.133 | |

## Site Commentary

### Site Information

| MIL_0190 | |
|---|---|
| Pipe Dimensions | 18 |
| Silt Level | 0.00" |

### Overview

Site MIL_0190 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed upstream of site MIL_1790. (See MIL_1790 Site Commentary for More Details)

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 2.47 | 0.96 | 0.093 |
| Minimum | 1.80 | 0.41 | 0.024 |
| Maximum | 3.29 | 1.47 | 0.198 |
| Time of Minimum | 11/22/2019 4:00 AM | 11/22/2019 3:50 AM | 11/22/2019 3:50 AM |
| Time of Maximum | 12/12/2019 1:55 PM | 3/6/2020 9:10 AM | 3/6/2020 9:10 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

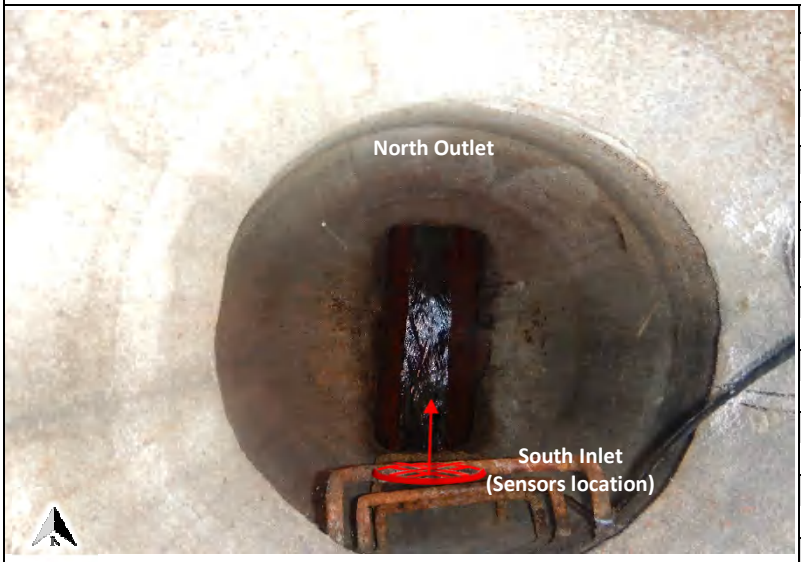
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_0190

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | N Abel St and Weller Ln | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | middle of N bound lanes | Latitude: | 37.432482° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.909452° | 18.0" x 18.0" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 190 | Residential |
| Access | Traffic |
| Drive | Heavy |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Wednesday, November 13, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 10:04:15 AM | 18.0" x 18.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 3.00 | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 0.97 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

Smooth shallow flow with moderate velocity

## Manhole / Pipe Information:

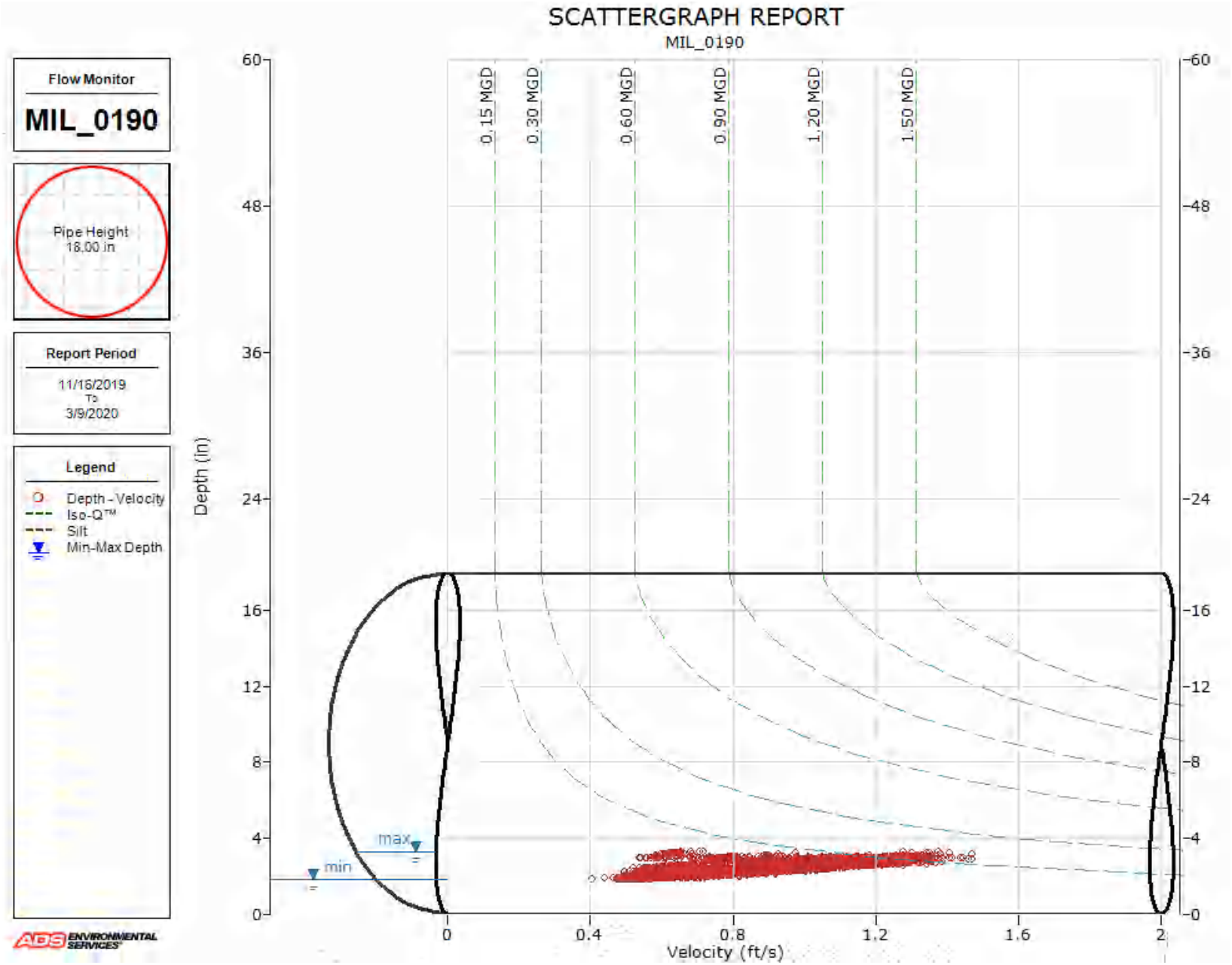
| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 8' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Vitrified Clay Pipe | Good |

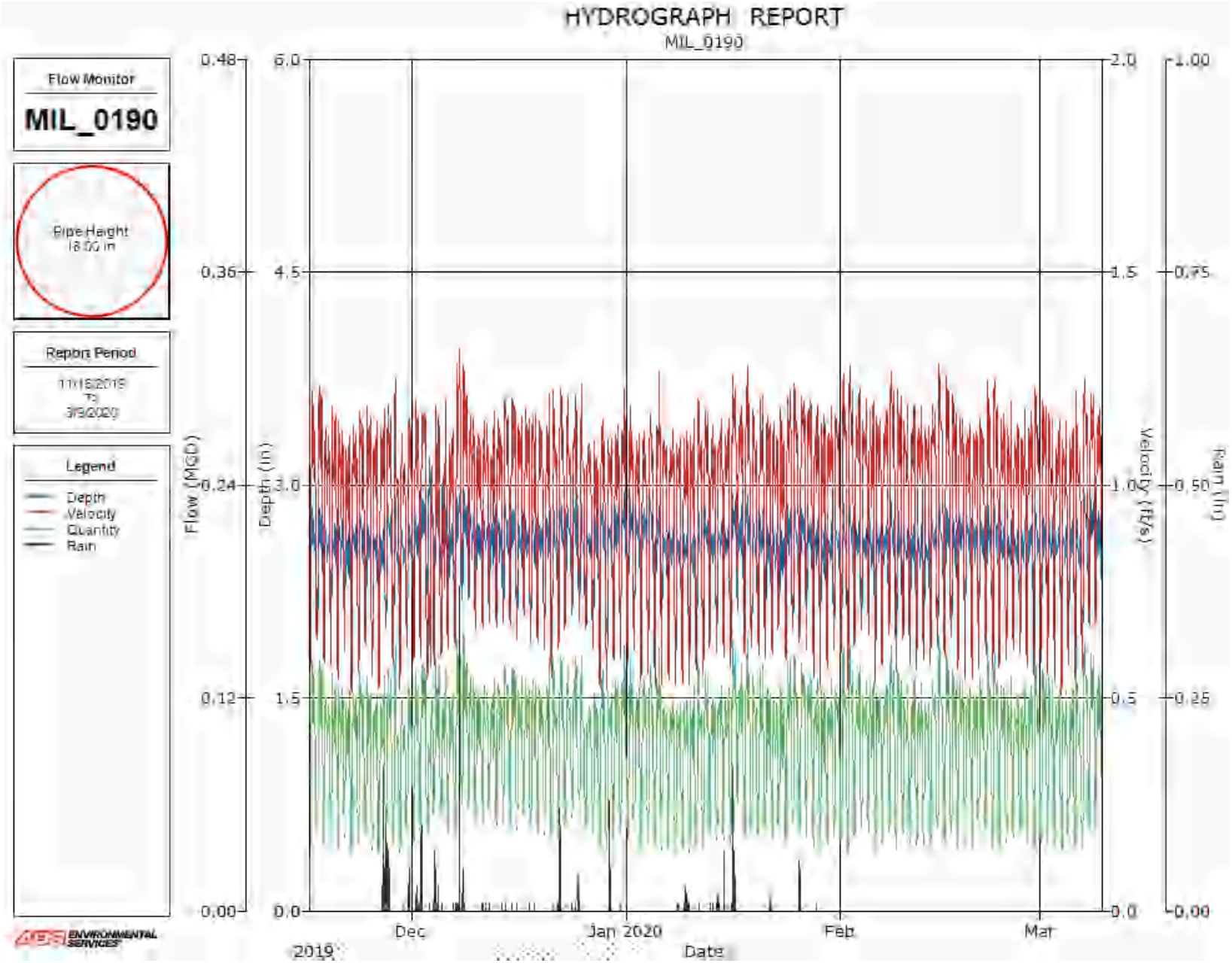
## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |


SCATTERGRAPH REPORT
MIL_0190
Flow Monitor
MIL_0190
Pipe Height
18.00 in
Report Period
11/16/2019
To
3/9/2020
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.15 MGD
0.30 MGD
0.60 MGD
0.90 MGD
1.20 MGD
1.50 MGD
Depth (in)
Velocity (ft/s)
max
min
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0190
Flow Monitor
MIL_0190
Pipe Height
18.00 in
Report Period
11/1/2019
To
3/3/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
0.48
0.36
0.24
0.12
0.00
6.0
4.5
3.0
1.5
0.0
2.0
1.5
1.0
0.5
0.0
1.00
0.75
0.50
0.25
0.00
Dec
Jan 2020
Feb
Mar
2019
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0190, Pipe Height: 18.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 05:40 | 1.91 | 11:20 | 2.88 | 2.45 | 05:30 | 0.55 | 12:55 | 1.35 | 0.96 | 05:30 | 0.036 | 13:00 | 0.155 | 0.093 | 0.093 | |
| 11/17/2019 | 05:05 | 1.95 | 11:00 | 3.02 | 2.48 | 04:10 | 0.58 | 10:55 | 1.36 | 0.98 | 04:10 | 0.040 | 10:55 | 0.172 | 0.097 | 0.097 | |
| 11/18/2019 | 03:55 | 1.91 | 11:05 | 2.74 | 2.42 | 03:45 | 0.53 | 20:00 | 1.23 | 0.94 | 03:45 | 0.034 | 11:10 | 0.130 | 0.089 | 0.089 | |
| 11/19/2019 | 05:35 | 1.89 | 09:05 | 2.81 | 2.44 | 05:35 | 0.54 | 18:45 | 1.38 | 0.95 | 05:35 | 0.034 | 18:45 | 0.150 | 0.091 | 0.091 | |
| 11/20/2019 | 04:35 | 1.91 | 19:10 | 2.80 | 2.46 | 04:25 | 0.49 | 08:35 | 1.25 | 0.94 | 04:25 | 0.032 | 19:05 | 0.137 | 0.091 | 0.091 | |
| 11/21/2019 | 04:40 | 1.95 | 21:10 | 2.88 | 2.41 | 04:40 | 0.55 | 18:35 | 1.19 | 0.92 | 04:40 | 0.037 | 21:15 | 0.138 | 0.086 | 0.086 | |
| 11/22/2019 | 04:00 | 1.80 | 10:45 | 2.76 | 2.41 | 03:50 | 0.41 | 10:25 | 1.23 | 0.93 | 03:50 | 0.024 | 10:35 | 0.134 | 0.088 | 0.088 | |
| 11/23/2019 | 03:20 | 1.96 | 10:15 | 2.91 | 2.46 | 05:00 | 0.54 | 11:15 | 1.30 | 0.94 | 05:00 | 0.037 | 10:15 | 0.150 | 0.092 | 0.092 | |
| 11/24/2019 | 03:40 | 1.98 | 12:35 | 2.81 | 2.44 | 03:35 | 0.57 | 21:55 | 1.25 | 0.96 | 03:35 | 0.039 | 22:00 | 0.141 | 0.092 | 0.092 | |
| 11/25/2019 | 05:35 | 1.83 | 21:30 | 2.69 | 2.38 | 04:20 | 0.53 | 20:30 | 1.20 | 0.93 | 05:35 | 0.032 | 18:50 | 0.126 | 0.087 | 0.087 | |
| 11/26/2019 | 05:40 | 1.84 | 21:15 | 2.87 | 2.39 | 03:50 | 0.44 | 12:50 | 1.28 | 0.93 | 03:50 | 0.027 | 21:15 | 0.147 | 0.088 | 0.088 | 0.36 |
| 11/27/2019 | 05:25 | 2.00 | 12:45 | 2.95 | 2.52 | 05:10 | 0.61 | 12:40 | 1.29 | 0.98 | 05:10 | 0.043 | 12:40 | 0.157 | 0.099 | 0.099 | 0.63 |
| 11/28/2019 | 05:25 | 1.92 | 12:45 | 3.00 | 2.41 | 06:25 | 0.52 | 12:50 | 1.30 | 0.93 | 06:25 | 0.034 | 12:50 | 0.160 | 0.088 | 0.088 | |
| 11/29/2019 | 05:40 | 1.85 | 10:35 | 2.74 | 2.35 | 04:40 | 0.50 | 12:25 | 1.24 | 0.90 | 05:50 | 0.031 | 10:35 | 0.135 | 0.082 | 0.082 | 0.02 |
| 11/30/2019 | 05:35 | 1.99 | 11:05 | 2.78 | 2.42 | 05:15 | 0.58 | 14:20 | 1.22 | 0.94 | 05:15 | 0.040 | 11:05 | 0.135 | 0.089 | 0.089 | 0.10 |
| 12/01/2019 | 06:25 | 1.92 | 11:30 | 2.84 | 2.43 | 06:25 | 0.55 | 11:30 | 1.29 | 0.94 | 06:25 | 0.036 | 11:30 | 0.150 | 0.091 | 0.091 | 0.06 |
| 12/02/2019 | 05:15 | 1.92 | 09:00 | 2.95 | 2.56 | 04:10 | 0.55 | 09:00 | 1.20 | 1.00 | 04:10 | 0.037 | 09:00 | 0.147 | 0.104 | 0.104 | 0.30 |
| 12/03/2019 | 06:05 | 2.19 | 13:25 | 3.24 | 2.75 | 03:50 | 0.50 | 18:45 | 1.12 | 0.74 | 03:50 | 0.041 | 20:10 | 0.130 | 0.082 | 0.082 | 0.01 |
| 12/04/2019 | 02:15 | 2.36 | 11:10 | 2.98 | 2.72 | 05:15 | 0.52 | 09:10 | 1.26 | 0.91 | 04:00 | 0.048 | 09:10 | 0.153 | 0.101 | 0.101 | 0.39 |
| 12/05/2019 | 04:45 | 2.33 | 15:10 | 3.18 | 2.67 | 04:55 | 0.57 | 21:45 | 1.25 | 0.87 | 04:55 | 0.050 | 15:15 | 0.152 | 0.094 | 0.094 | 0.01 |
| 12/06/2019 | 03:50 | 2.01 | 19:25 | 2.89 | 2.49 | 05:20 | 0.58 | 19:25 | 1.28 | 0.95 | 03:20 | 0.041 | 19:25 | 0.152 | 0.094 | 0.094 | 0.01 |
| 12/07/2019 | 05:25 | 2.01 | 21:05 | 2.98 | 2.58 | 05:15 | 0.59 | 12:50 | 1.44 | 1.03 | 05:15 | 0.042 | 12:50 | 0.174 | 0.108 | 0.108 | 0.67 |
| 12/08/2019 | 04:25 | 2.18 | 10:50 | 2.99 | 2.63 | 05:15 | 0.72 | 10:55 | 1.37 | 1.07 | 05:15 | 0.056 | 10:55 | 0.170 | 0.113 | 0.113 | 0.20 |
| 12/09/2019 | 03:50 | 2.16 | 21:25 | 2.84 | 2.55 | 04:05 | 0.65 | 22:00 | 1.28 | 1.00 | 04:05 | 0.050 | 11:30 | 0.144 | 0.101 | 0.101 | |
| 12/10/2019 | 04:35 | 2.05 | 19:00 | 2.77 | 2.50 | 03:40 | 0.61 | 11:00 | 1.23 | 0.96 | 03:40 | 0.044 | 11:00 | 0.134 | 0.094 | 0.094 | |
| 12/11/2019 | 03:45 | 2.07 | 09:10 | 2.79 | 2.50 | 05:00 | 0.64 | 20:55 | 1.25 | 0.97 | 05:00 | 0.047 | 20:00 | 0.137 | 0.095 | 0.095 | 0.03 |
| 12/12/2019 | 03:45 | 2.08 | 13:55 | 3.29 | 2.50 | 03:55 | 0.63 | 13:50 | 1.38 | 0.97 | 03:55 | 0.047 | 13:55 | 0.196 | 0.095 | 0.095 | 0.01 |
| 12/13/2019 | 05:00 | 2.02 | 14:00 | 2.87 | 2.49 | 05:10 | 0.62 | 13:50 | 1.25 | 0.97 | 05:10 | 0.044 | 10:40 | 0.144 | 0.095 | 0.095 | 0.01 |
| 12/14/2019 | 05:35 | 2.05 | 11:05 | 2.90 | 2.53 | 04:55 | 0.66 | 12:05 | 1.30 | 1.01 | 05:35 | 0.048 | 11:00 | 0.150 | 0.102 | 0.102 | 0.01 |
| 12/15/2019 | 04:20 | 2.04 | 20:50 | 2.85 | 2.53 | 05:20 | 0.64 | 13:45 | 1.29 | 1.00 | 05:20 | 0.046 | 13:45 | 0.149 | 0.101 | 0.101 | 0.01 |
| 12/16/2019 | 04:10 | 2.01 | 21:15 | 2.89 | 2.48 | 03:50 | 0.59 | 11:25 | 1.27 | 0.98 | 03:50 | 0.042 | 21:15 | 0.145 | 0.096 | 0.096 | 0.01 |
| 12/17/2019 | 04:45 | 2.05 | 10:10 | 2.80 | 2.49 | 05:20 | 0.62 | 20:55 | 1.33 | 1.00 | 05:20 | 0.045 | 20:55 | 0.142 | 0.098 | 0.098 | 0.01 |
| 12/18/2019 | 04:45 | 1.99 | 14:30 | 2.81 | 2.48 | 05:30 | 0.58 | 22:00 | 1.36 | 0.98 | 05:30 | 0.040 | 22:00 | 0.148 | 0.096 | 0.096 | 0.01 |
| 12/19/2019 | 03:50 | 1.98 | 13:05 | 2.77 | 2.47 | 04:50 | 0.57 | 09:30 | 1.24 | 0.97 | 04:50 | 0.040 | 09:10 | 0.138 | 0.094 | 0.094 | |
| 12/20/2019 | 04:20 | 1.98 | 20:55 | 2.92 | 2.49 | 04:00 | 0.54 | 20:55 | 1.29 | 0.95 | 04:00 | 0.038 | 20:55 | 0.155 | 0.093 | 0.093 | |
| 12/21/2019 | 05:40 | 1.97 | 11:05 | 2.92 | 2.46 | 05:30 | 0.49 | 11:05 | 1.35 | 0.94 | 05:30 | 0.034 | 11:05 | 0.162 | 0.092 | 0.092 | 0.01 |
| 12/22/2019 | 06:25 | 1.94 | 11:10 | 2.91 | 2.50 | 05:15 | 0.52 | 11:00 | 1.38 | 0.99 | 05:15 | 0.035 | 11:00 | 0.163 | 0.099 | 0.099 | 0.41 |
| 12/23/2019 | 05:10 | 2.04 | 13:40 | 2.91 | 2.52 | 03:40 | 0.63 | 10:45 | 1.32 | 0.97 | 03:40 | 0.045 | 13:40 | 0.154 | 0.097 | 0.097 | |
| 12/24/2019 | 05:25 | 2.07 | 18:25 | 2.95 | 2.54 | 04:55 | 0.64 | 20:25 | 1.25 | 0.98 | 04:55 | 0.047 | 18:30 | 0.150 | 0.099 | 0.099 | 0.02 |
| 12/25/2019 | 06:00 | 2.02 | 12:30 | 2.94 | 2.47 | 05:30 | 0.65 | 14:30 | 1.47 | 0.96 | 05:55 | 0.047 | 14:30 | 0.174 | 0.093 | 0.093 | 0.08 |
| 12/26/2019 | 04:55 | 2.00 | 10:40 | 2.70 | 2.42 | 05:10 | 0.63 | 19:45 | 1.20 | 0.94 | 04:55 | 0.044 | 19:45 | 0.128 | 0.088 | 0.088 | |
| 12/27/2019 | 04:50 | 1.94 | 13:05 | 2.82 | 2.44 | 04:45 | 0.53 | 19:35 | 1.17 | 0.91 | 04:45 | 0.035 | 13:05 | 0.134 | 0.087 | 0.087 | |
| 12/28/2019 | 06:30 | 1.95 | 14:20 | 2.93 | 2.48 | 06:20 | 0.49 | 14:30 | 1.22 | 0.91 | 06:20 | 0.033 | 14:30 | 0.145 | 0.090 | 0.090 | |
| 12/29/2019 | 06:05 | 1.94 | 10:30 | 2.84 | 2.45 | 05:40 | 0.50 | 21:30 | 1.19 | 0.89 | 05:50 | 0.033 | 20:05 | 0.133 | 0.087 | 0.087 | 0.22 |
| 12/30/2019 | 04:45 | 1.99 | 12:55 | 2.91 | 2.50 | 05:45 | 0.56 | 12:55 | 1.21 | 0.92 | 05:45 | 0.039 | 12:55 | 0.145 | 0.092 | 0.092 | |
| 12/31/2019 | 05:15 | 2.01 | 19:25 | 3.00 | 2.56 | 04:20 | 0.54 | 19:00 | 1.26 | 0.95 | 05:05 | 0.039 | 19:25 | 0.157 | 0.098 | 0.098 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 06:05 | 2.01 17:10 | 3.07 | 2.51 | 06:15 | 0.56 17:10 | 1.31 | 0.93 | 06:15 | 0.039 17:10 | 0.170 | 0.093 | 0.093 | |
| 01/02/2020 | 05:30 | 2.04 21:25 | 2.85 | 2.50 | 04:45 | 0.59 15:10 | 1.19 | 0.92 | 04:45 | 0.042 21:20 | 0.134 | 0.091 | 0.091 | |
| 01/03/2020 | 05:20 | 1.96 13:10 | 2.87 | 2.48 | 04:25 | 0.50 12:40 | 1.19 | 0.90 | 04:25 | 0.035 13:05 | 0.138 | 0.089 | 0.089 | |
| 01/04/2020 | 05:50 | 2.01 13:20 | 2.91 | 2.50 | 05:15 | 0.54 12:40 | 1.21 | 0.92 | 05:15 | 0.038 12:40 | 0.144 | 0.092 | 0.092 | |
| 01/05/2020 | 05:55 | 1.93 21:00 | 3.01 | 2.47 | 05:40 | 0.50 21:00 | 1.34 | 0.93 | 05:40 | 0.033 21:00 | 0.168 | 0.093 | 0.093 | |
| 01/06/2020 | 05:00 | 1.86 20:55 | 2.72 | 2.40 | 04:45 | 0.46 11:20 | 1.22 | 0.93 | 04:45 | 0.029 12:05 | 0.128 | 0.087 | 0.087 | |
| 01/07/2020 | 04:55 | 1.85 21:00 | 2.80 | 2.38 | 04:55 | 0.50 20:55 | 1.30 | 0.92 | 04:55 | 0.031 20:55 | 0.148 | 0.086 | 0.086 | |
| 01/08/2020 | 05:30 | 1.84 21:25 | 2.77 | 2.39 | 05:20 | 0.50 21:15 | 1.20 | 0.92 | 05:30 | 0.031 21:15 | 0.131 | 0.086 | 0.086 | 0.02 |
| 01/09/2020 | 05:00 | 1.88 08:55 | 2.71 | 2.41 | 04:45 | 0.51 21:15 | 1.19 | 0.92 | 04:55 | 0.033 21:15 | 0.127 | 0.087 | 0.087 | 0.18 |
| 01/10/2020 | 05:10 | 1.82 20:40 | 2.78 | 2.38 | 04:55 | 0.50 09:35 | 1.26 | 0.93 | 05:10 | 0.030 09:35 | 0.135 | 0.086 | 0.086 | 0.02 |
| 01/11/2020 | 05:25 | 1.87 11:10 | 2.93 | 2.43 | 05:05 | 0.52 12:40 | 1.32 | 0.94 | 05:05 | 0.033 12:40 | 0.154 | 0.091 | 0.091 | 0.01 |
| 01/12/2020 | 05:10 | 1.88 11:15 | 2.92 | 2.46 | 05:35 | 0.54 19:05 | 1.29 | 0.96 | 05:35 | 0.034 11:15 | 0.147 | 0.094 | 0.094 | |
| 01/13/2020 | 03:45 | 1.94 20:45 | 2.81 | 2.43 | 04:25 | 0.58 20:45 | 1.18 | 0.95 | 04:25 | 0.040 20:45 | 0.134 | 0.091 | 0.091 | 0.02 |
| 01/14/2020 | 03:35 | 1.90 19:45 | 2.82 | 2.44 | 02:25 | 0.57 19:40 | 1.31 | 0.96 | 03:25 | 0.038 19:40 | 0.149 | 0.092 | 0.092 | 0.11 |
| 01/15/2020 | 04:55 | 1.91 21:10 | 2.77 | 2.44 | 04:45 | 0.56 19:35 | 1.23 | 0.95 | 04:45 | 0.037 21:10 | 0.137 | 0.091 | 0.091 | 0.07 |
| 01/16/2020 | 04:30 | 1.93 12:40 | 3.22 | 2.52 | 03:20 | 0.54 12:50 | 1.38 | 1.00 | 03:50 | 0.036 12:40 | 0.186 | 0.102 | 0.102 | 0.66 |
| 01/17/2020 | 04:40 | 2.08 19:05 | 2.90 | 2.54 | 04:45 | 0.71 10:55 | 1.29 | 1.03 | 04:45 | 0.052 19:00 | 0.149 | 0.103 | 0.103 | |
| 01/18/2020 | 05:40 | 1.98 14:40 | 3.02 | 2.51 | 03:40 | 0.55 14:40 | 1.35 | 0.99 | 03:40 | 0.040 14:40 | 0.170 | 0.099 | 0.099 | |
| 01/19/2020 | 04:35 | 1.95 10:40 | 2.84 | 2.43 | 04:10 | 0.58 14:00 | 1.32 | 0.95 | 04:10 | 0.039 14:00 | 0.146 | 0.090 | 0.090 | |
| 01/20/2020 | 05:20 | 1.95 20:05 | 2.85 | 2.44 | 06:10 | 0.55 11:00 | 1.35 | 0.97 | 06:10 | 0.038 11:00 | 0.149 | 0.093 | 0.093 | |
| 01/21/2020 | 04:55 | 1.94 21:00 | 2.85 | 2.45 | 05:10 | 0.57 21:05 | 1.27 | 0.97 | 05:10 | 0.038 21:05 | 0.147 | 0.094 | 0.094 | |
| 01/22/2020 | 05:25 | 1.92 09:10 | 2.74 | 2.41 | 05:30 | 0.55 08:55 | 1.25 | 0.96 | 05:25 | 0.036 09:00 | 0.135 | 0.090 | 0.090 | 0.03 |
| 01/23/2020 | 05:20 | 2.01 09:20 | 2.76 | 2.42 | 02:45 | 0.59 09:00 | 1.29 | 0.96 | 02:45 | 0.042 11:55 | 0.138 | 0.090 | 0.090 | |
| 01/24/2020 | 05:05 | 1.92 19:45 | 3.01 | 2.49 | 05:10 | 0.54 19:45 | 1.32 | 1.00 | 05:10 | 0.035 19:45 | 0.165 | 0.099 | 0.099 | |
| 01/25/2020 | 06:20 | 2.00 10:45 | 2.93 | 2.49 | 06:05 | 0.55 10:25 | 1.32 | 1.00 | 06:05 | 0.039 10:25 | 0.157 | 0.099 | 0.099 | |
| 01/26/2020 | 04:15 | 1.97 11:55 | 2.87 | 2.49 | 03:45 | 0.58 11:55 | 1.30 | 1.00 | 03:45 | 0.040 11:55 | 0.152 | 0.099 | 0.099 | 0.16 |
| 01/27/2020 | 04:40 | 1.97 19:45 | 2.78 | 2.48 | 04:20 | 0.55 08:35 | 1.30 | 1.00 | 04:20 | 0.037 21:05 | 0.139 | 0.098 | 0.098 | |
| 01/28/2020 | 04:50 | 1.91 20:30 | 2.83 | 2.44 | 04:40 | 0.51 20:25 | 1.27 | 0.97 | 04:50 | 0.033 20:25 | 0.145 | 0.092 | 0.092 | 0.01 |
| 01/29/2020 | 05:25 | 1.83 09:15 | 2.79 | 2.39 | 05:10 | 0.48 19:20 | 1.28 | 0.94 | 05:10 | 0.029 09:10 | 0.136 | 0.088 | 0.088 | |
| 01/30/2020 | 05:15 | 1.90 19:40 | 2.79 | 2.40 | 04:50 | 0.54 19:35 | 1.27 | 0.96 | 04:50 | 0.035 19:40 | 0.143 | 0.090 | 0.090 | |
| 01/31/2020 | 04:00 | 1.95 09:05 | 2.74 | 2.46 | 04:40 | 0.57 13:50 | 1.25 | 1.00 | 04:40 | 0.039 13:50 | 0.135 | 0.096 | 0.096 | |
| 02/01/2020 | 04:10 | 1.90 14:10 | 2.91 | 2.45 | 03:50 | 0.54 20:10 | 1.37 | 0.99 | 03:50 | 0.035 14:10 | 0.157 | 0.097 | 0.097 | |
| 02/02/2020 | 05:35 | 1.83 12:15 | 2.88 | 2.45 | 05:30 | 0.50 12:35 | 1.46 | 0.99 | 05:30 | 0.031 12:35 | 0.171 | 0.097 | 0.097 | |
| 02/03/2020 | 03:55 | 1.95 21:05 | 2.87 | 2.45 | 04:05 | 0.56 21:00 | 1.33 | 0.99 | 04:05 | 0.037 21:00 | 0.157 | 0.096 | 0.096 | |
| 02/04/2020 | 04:00 | 2.02 20:05 | 2.74 | 2.45 | 03:10 | 0.63 22:10 | 1.28 | 1.00 | 04:00 | 0.046 20:20 | 0.139 | 0.096 | 0.096 | |
| 02/05/2020 | 05:30 | 1.98 10:20 | 2.82 | 2.45 | 06:00 | 0.60 20:55 | 1.37 | 0.99 | 06:00 | 0.041 20:55 | 0.145 | 0.094 | 0.094 | |
| 02/06/2020 | 04:20 | 1.84 10:55 | 2.70 | 2.41 | 03:20 | 0.51 21:25 | 1.23 | 0.96 | 03:00 | 0.033 21:25 | 0.130 | 0.091 | 0.091 | |
| 02/07/2020 | 05:15 | 1.88 20:35 | 2.75 | 2.42 | 05:05 | 0.50 20:35 | 1.28 | 0.97 | 05:05 | 0.033 20:35 | 0.141 | 0.092 | 0.092 | |
| 02/08/2020 | 05:20 | 1.98 09:45 | 3.01 | 2.47 | 04:05 | 0.61 09:40 | 1.41 | 1.02 | 05:05 | 0.042 09:40 | 0.173 | 0.099 | 0.099 | |
| 02/09/2020 | 06:10 | 1.83 13:15 | 2.90 | 2.40 | 06:10 | 0.52 10:50 | 1.30 | 0.96 | 06:10 | 0.032 10:50 | 0.149 | 0.091 | 0.091 | |
| 02/10/2020 | 05:20 | 1.91 21:15 | 2.76 | 2.41 | 03:50 | 0.60 07:55 | 1.34 | 0.98 | 03:50 | 0.039 07:55 | 0.136 | 0.092 | 0.092 | |
| 02/11/2020 | 04:35 | 1.91 21:25 | 2.82 | 2.42 | 04:25 | 0.53 21:20 | 1.27 | 0.97 | 04:25 | 0.035 21:20 | 0.144 | 0.092 | 0.092 | |
| 02/12/2020 | 04:05 | 1.87 21:25 | 2.76 | 2.42 | 03:45 | 0.51 20:00 | 1.21 | 0.98 | 03:45 | 0.033 21:25 | 0.133 | 0.093 | 0.093 | |
| 02/13/2020 | 04:50 | 1.88 08:50 | 2.75 | 2.40 | 04:20 | 0.55 22:45 | 1.22 | 0.97 | 05:00 | 0.035 09:00 | 0.129 | 0.090 | 0.090 | |
| 02/14/2020 | 05:05 | 1.88 11:05 | 2.77 | 2.44 | 03:20 | 0.53 20:40 | 1.32 | 0.99 | 03:20 | 0.034 20:40 | 0.141 | 0.095 | 0.095 | |
| 02/15/2020 | 03:25 | 1.99 09:30 | 2.99 | 2.48 | 04:20 | 0.60 09:20 | 1.44 | 1.01 | 04:20 | 0.042 09:20 | 0.176 | 0.100 | 0.100 | |
| 02/16/2020 | 05:15 | 1.90 13:40 | 2.88 | 2.45 | 05:25 | 0.57 14:10 | 1.28 | 0.99 | 05:25 | 0.037 13:45 | 0.151 | 0.097 | 0.097 | |
| 02/17/2020 | 05:05 | 1.94 10:50 | 2.86 | 2.43 | 04:50 | 0.55 12:35 | 1.29 | 0.98 | 04:50 | 0.037 10:45 | 0.148 | 0.094 | 0.094 | |
| 02/18/2020 | 03:35 | 1.87 18:10 | 2.84 | 2.45 | 03:45 | 0.54 18:10 | 1.20 | 0.95 | 03:30 | 0.034 18:10 | 0.139 | 0.092 | 0.092 | |
| 02/19/2020 | 04:10 | 1.95 12:05 | 2.82 | 2.47 | 04:15 | 0.53 20:45 | 1.21 | 0.94 | 04:10 | 0.035 20:45 | 0.137 | 0.092 | 0.092 | |
| 02/20/2020 | 04:55 | 1.91 12:45 | 2.77 | 2.45 | 05:05 | 0.51 18:45 | 1.22 | 0.93 | 05:05 | 0.033 20:30 | 0.131 | 0.090 | 0.090 | |
| 02/21/2020 | 05:15 | 1.97 09:30 | 2.86 | 2.48 | 04:35 | 0.53 18:45 | 1.27 | 0.95 | 04:35 | 0.036 09:30 | 0.140 | 0.093 | 0.093 | |
| 02/22/2020 | 06:10 | 1.97 11:10 | 3.00 | 2.48 | 05:55 | 0.56 11:50 | 1.27 | 0.96 | 05:55 | 0.038 11:10 | 0.158 | 0.095 | 0.095 | |
| 02/23/2020 | 05:15 | 1.87 11:25 | 2.87 | 2.45 | 06:00 | 0.54 10:10 | 1.35 | 0.98 | 06:00 | 0.034 10:10 | 0.152 | 0.096 | 0.096 | |
| 02/24/2020 | 03:55 | 1.89 19:50 | 2.81 | 2.43 | 04:05 | 0.48 19:40 | 1.25 | 0.97 | 04:05 | 0.031 19:40 | 0.142 | 0.093 | 0.093 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:55 | 1.88 | 21:15 | 2.81 | 2.42 | 04:40 | 0.52 | 19:55 | 1.26 | 0.95 | 04:40 | 0.034 | 21:10 | 0.139 | 0.090 | 0.090 | |
| 02/26/2020 | 05:05 | 1.92 | 21:15 | 2.74 | 2.42 | 04:50 | 0.55 | 20:30 | 1.27 | 0.96 | 04:55 | 0.036 | 20:30 | 0.135 | 0.091 | 0.091 | |
| 02/27/2020 | 04:55 | 1.94 | 20:55 | 2.78 | 2.44 | 05:00 | 0.57 | 08:50 | 1.26 | 0.96 | 05:00 | 0.038 | 20:30 | 0.138 | 0.091 | 0.091 | |
| 02/28/2020 | 05:10 | 1.91 | 20:35 | 2.75 | 2.44 | 05:05 | 0.51 | 20:45 | 1.21 | 0.95 | 05:05 | 0.033 | 21:20 | 0.132 | 0.091 | 0.091 | |
| 02/29/2020 | 06:15 | 1.89 | 09:35 | 2.93 | 2.43 | 06:10 | 0.52 | 09:30 | 1.29 | 0.95 | 06:15 | 0.033 | 09:35 | 0.156 | 0.091 | 0.091 | |
| 03/01/2020 | 05:00 | 1.90 | 21:10 | 2.84 | 2.44 | 06:10 | 0.55 | 12:30 | 1.33 | 0.96 | 06:10 | 0.036 | 12:30 | 0.148 | 0.093 | 0.093 | |
| 03/02/2020 | 04:30 | 1.93 | 09:15 | 2.85 | 2.46 | 04:20 | 0.54 | 09:10 | 1.30 | 0.95 | 04:20 | 0.036 | 09:10 | 0.149 | 0.092 | 0.092 | |
| 03/03/2020 | 05:40 | 1.90 | 21:40 | 2.79 | 2.44 | 05:20 | 0.52 | 19:10 | 1.22 | 0.93 | 05:20 | 0.034 | 19:10 | 0.136 | 0.089 | 0.089 | |
| 03/04/2020 | 04:55 | 1.86 | 21:10 | 2.77 | 2.41 | 05:05 | 0.48 | 21:05 | 1.21 | 0.92 | 05:05 | 0.030 | 21:05 | 0.135 | 0.088 | 0.088 | |
| 03/05/2020 | 04:10 | 1.91 | 20:55 | 2.78 | 2.44 | 03:30 | 0.55 | 18:55 | 1.16 | 0.94 | 03:35 | 0.036 | 21:10 | 0.129 | 0.091 | 0.091 | |
| 03/06/2020 | 04:50 | 1.89 | 09:25 | 3.19 | 2.42 | 04:45 | 0.51 | 09:10 | 1.47 | 0.93 | 04:45 | 0.033 | 09:10 | 0.198 | 0.088 | 0.088 | |
| 03/07/2020 | 05:30 | 1.88 | 13:55 | 3.03 | 2.52 | 05:10 | 0.54 | 16:10 | 1.31 | 1.00 | 05:25 | 0.034 | 13:55 | 0.166 | 0.102 | 0.102 | |
| 03/08/2020 | 05:30 | 1.98 | 17:50 | 3.10 | 2.56 | 05:30 | 0.66 | 13:35 | 1.33 | 1.03 | 05:30 | 0.045 | 17:50 | 0.173 | 0.105 | 0.105 | |
| 03/09/2020 | 03:50 | 2.01 | 11:50 | 2.91 | 2.49 | 03:45 | 0.63 | 11:40 | 1.24 | 0.99 | 03:45 | 0.044 | 11:50 | 0.145 | 0.098 | 0.098 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 10.748 | 4.90 |
| Avg | 2.47 | 0.96 | 0.093 | |

## Site Commentary

### Site Information

| MIL_0229 | |
|---|---|
| Pipe Dimensions | 21 |
| Silt Level | 0.00" |

### Overview

Site MIL_0229 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed upstream of site MIL_2808. (See MIL_2808 Site Commentary for More Details)

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 3.46 | 0.59 | 0.103 |
| Minimum | 1.78 | 0.19 | 0.021 |
| Maximum | 5.18 | 0.94 | 0.253 |
| Time of Minimum | 11/29/2019 7:00 AM | 2/26/2020 4:00 AM | 11/29/2019 7:05 AM |
| Time of Maximum | 12/6/2019 3:20 PM | 11/21/2019 9:05 AM | 1/21/2020 1:55 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

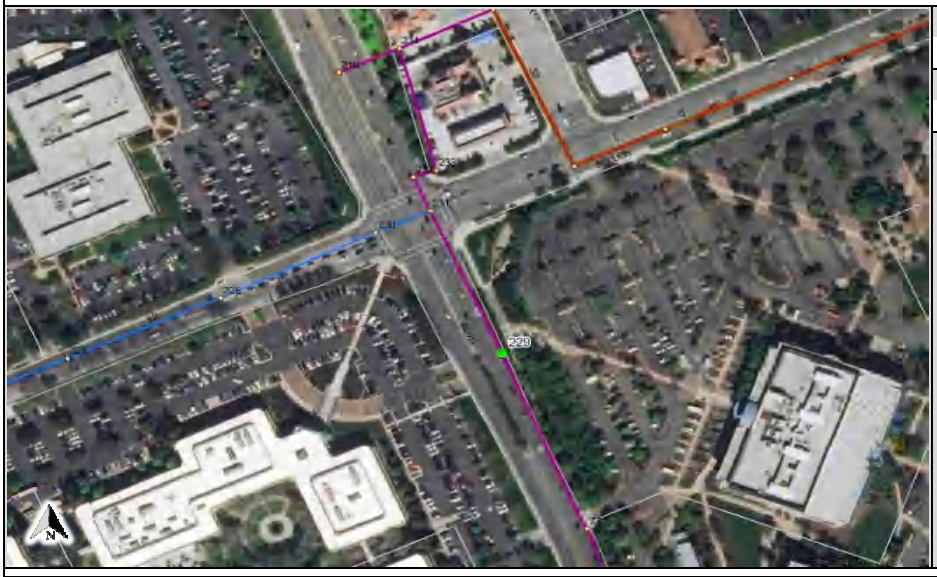
***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_0229

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Bellew Dr and McCarthy Blvd | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | In right lane of road | Latitude: | 37.420574° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.921605° | 21.0" x 21.0" | Circular |




| Manhole # | System Characteristics |
|---|---|
| 229 | Residential/Commercial |
| Access | Traffic |
| Drive | Medium |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 4:21:29 AM | 21.0" x 21.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 2.25 | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 0.25 | 0'' |
| Silt (in) | Silt Type |
| 0.25'' | Soft / Loose |

Hydraulic Comments:

Shallow depth with slow velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 15' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

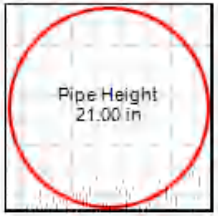
| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |

# SCATTERGRAPH REPORT

MIL_0229

**Flow Monitor**

**MIL_0229**

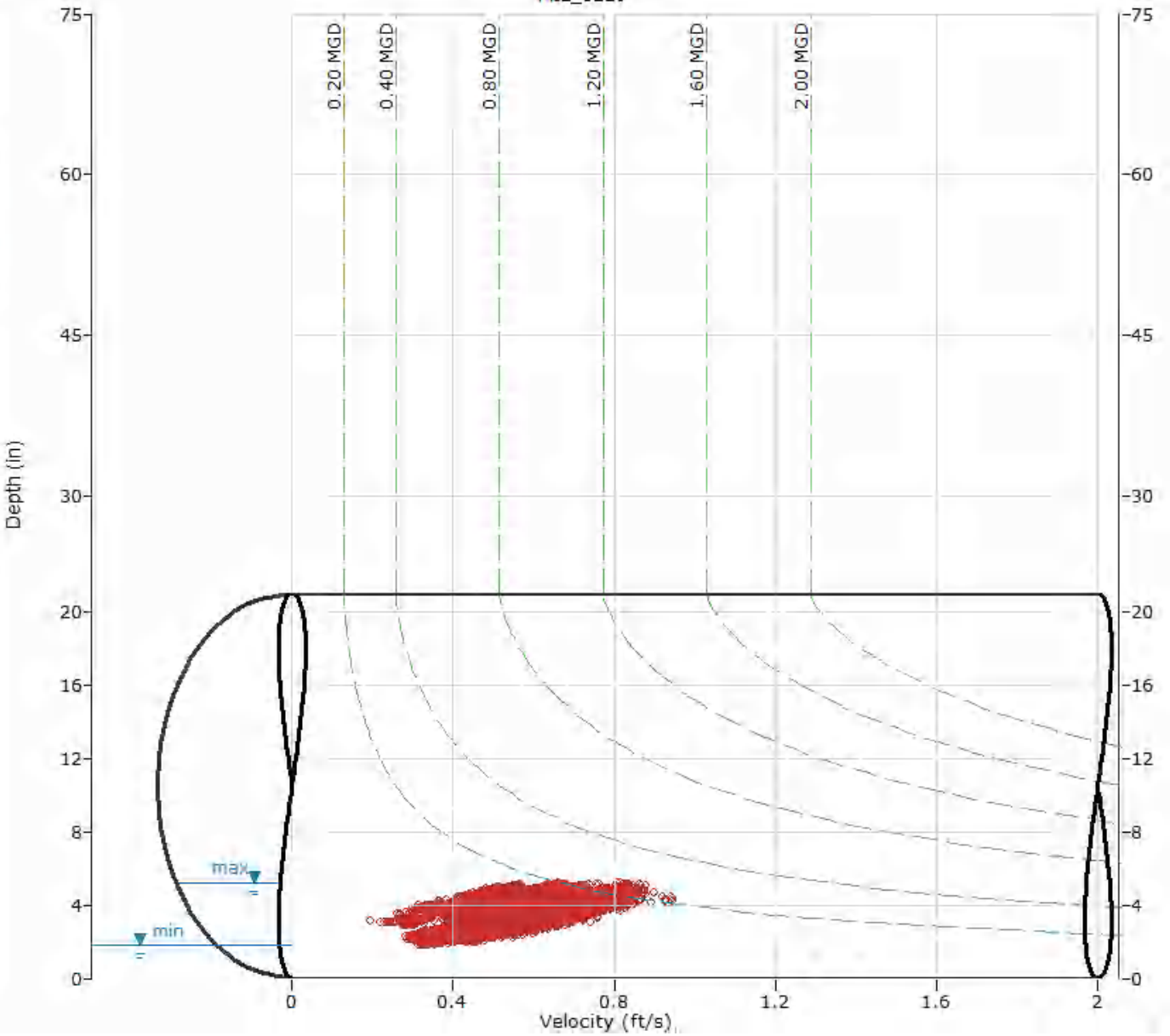



**Report Period**

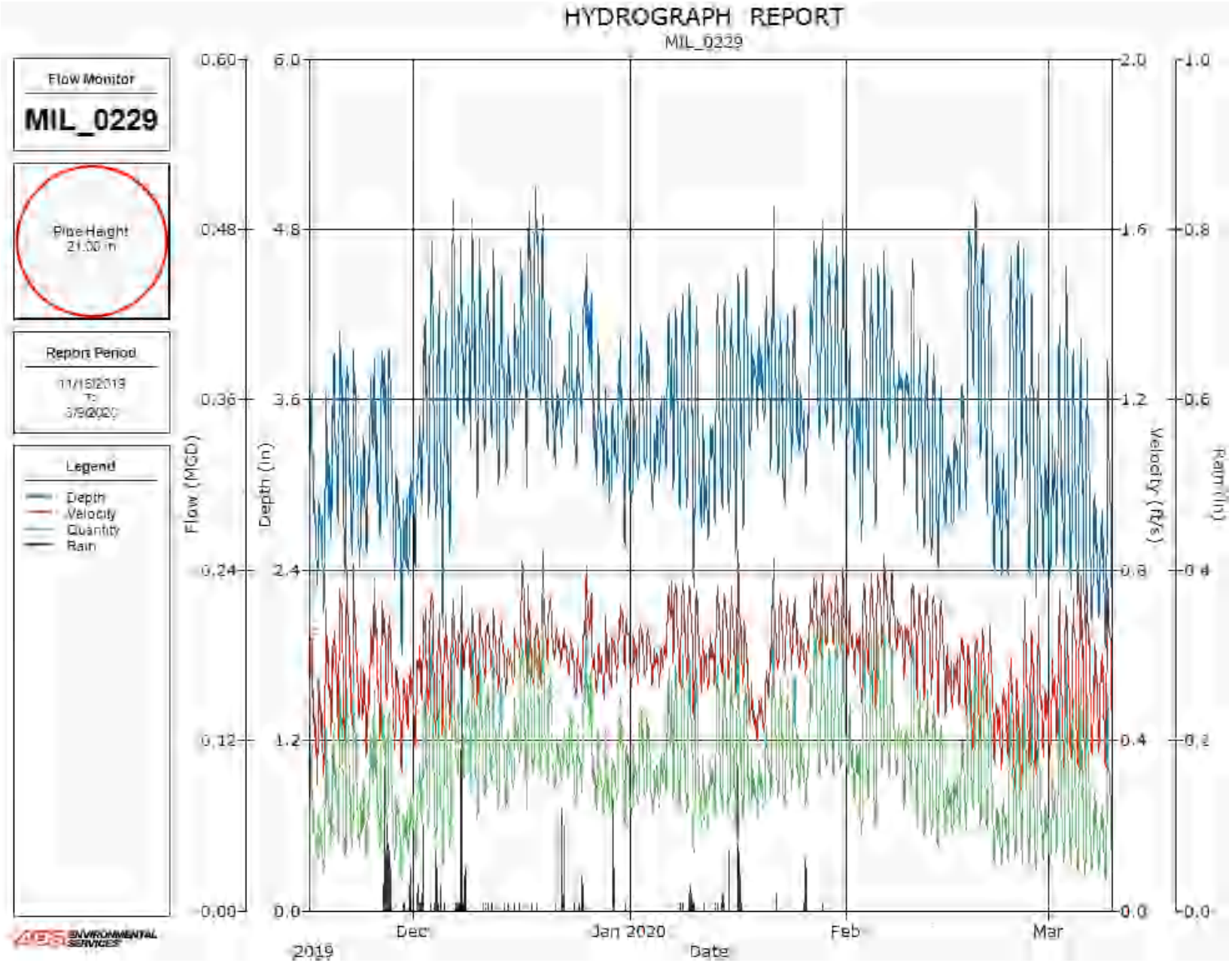
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0229
Flow Monitor
MIL_0229
Pipe Height
21.00 in
Report Period
11/15/2019
To
3/9/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
0.60
0.48
0.36
0.24
0.12
0.00
6.0
4.8
3.6
2.4
1.2
0.0
2.0
1.6
1.2
0.8
0.4
0.0
1.0
0.8
0.6
0.4
0.2
0.0
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0229, Pipe Height: 21.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 21:15 | 2.61 | 10:30 | 4.06 | 3.16 | 23:25 | 0.39 | 10:30 | 0.75 | 0.52 | 20:50 | 0.044 | 10:30 | 0.157 | 0.079 | 0.079 | |
| 11/17/2019 | 07:10 | 2.27 | 10:00 | 3.04 | 2.63 | 05:30 | 0.28 | 09:55 | 0.62 | 0.43 | 05:30 | 0.026 | 09:55 | 0.085 | 0.050 | 0.050 | |
| 11/18/2019 | 03:25 | 2.07 | 10:15 | 3.89 | 2.91 | 02:45 | 0.29 | 10:10 | 0.78 | 0.52 | 03:15 | 0.023 | 10:15 | 0.153 | 0.072 | 0.072 | |
| 11/19/2019 | 05:55 | 2.56 | 15:45 | 4.10 | 3.30 | 05:45 | 0.35 | 15:55 | 0.74 | 0.57 | 05:55 | 0.038 | 15:55 | 0.155 | 0.091 | 0.091 | |
| 11/20/2019 | 03:35 | 2.72 | 09:40 | 4.27 | 3.35 | 03:40 | 0.37 | 09:40 | 0.82 | 0.59 | 03:40 | 0.044 | 09:40 | 0.185 | 0.099 | 0.099 | |
| 11/21/2019 | 03:55 | 2.34 | 09:10 | 4.19 | 3.17 | 03:30 | 0.39 | 09:05 | 0.94 | 0.58 | 03:30 | 0.037 | 09:05 | 0.208 | 0.091 | 0.091 | |
| 11/22/2019 | 04:40 | 2.46 | 09:15 | 4.42 | 3.20 | 04:00 | 0.40 | 09:20 | 0.94 | 0.60 | 04:00 | 0.041 | 09:15 | 0.225 | 0.093 | 0.093 | |
| 11/23/2019 | 07:30 | 2.40 | 21:55 | 3.38 | 2.90 | 15:45 | 0.42 | 08:25 | 0.61 | 0.50 | 07:35 | 0.043 | 22:00 | 0.095 | 0.066 | 0.066 | |
| 11/24/2019 | 07:05 | 2.49 | 21:15 | 3.92 | 3.07 | 06:50 | 0.34 | 20:55 | 0.68 | 0.50 | 07:05 | 0.036 | 21:15 | 0.134 | 0.073 | 0.073 | |
| 11/25/2019 | 20:45 | 2.82 | 08:30 | 3.95 | 3.32 | 23:50 | 0.48 | 08:40 | 0.83 | 0.62 | 23:55 | 0.063 | 08:25 | 0.168 | 0.098 | 0.098 | |
| 11/26/2019 | 06:05 | 2.61 | 21:05 | 4.22 | 3.37 | 04:05 | 0.38 | 21:05 | 0.79 | 0.59 | 04:05 | 0.044 | 21:05 | 0.176 | 0.099 | 0.099 | 0.36 |
| 11/27/2019 | 05:55 | 2.73 | 10:00 | 4.09 | 3.37 | 02:35 | 0.46 | 12:50 | 0.78 | 0.60 | 06:00 | 0.057 | 10:00 | 0.154 | 0.099 | 0.099 | 0.63 |
| 11/28/2019 | 05:35 | 2.21 | 12:00 | 3.37 | 2.75 | 05:40 | 0.34 | 12:00 | 0.63 | 0.49 | 05:40 | 0.030 | 12:00 | 0.101 | 0.060 | 0.060 | |
| 11/29/2019 | 07:00 | 1.78 | 14:15 | 3.10 | 2.51 | 06:00 | 0.31 | 17:20 | 0.64 | 0.46 | 07:05 | 0.021 | 14:15 | 0.084 | 0.050 | 0.050 | 0.02 |
| 11/30/2019 | 06:05 | 2.34 | 22:05 | 3.32 | 2.79 | 04:10 | 0.41 | 12:45 | 0.63 | 0.51 | 04:10 | 0.040 | 12:45 | 0.096 | 0.063 | 0.063 | 0.10 |
| 12/01/2019 | 05:55 | 2.39 | 20:25 | 3.57 | 2.95 | 07:50 | 0.37 | 21:50 | 0.63 | 0.51 | 07:50 | 0.037 | 20:25 | 0.110 | 0.070 | 0.070 | 0.06 |
| 12/02/2019 | 04:25 | 2.82 | 18:10 | 4.36 | 3.59 | 23:55 | 0.47 | 10:05 | 0.76 | 0.61 | 04:25 | 0.060 | 18:10 | 0.169 | 0.110 | 0.110 | 0.30 |
| 12/03/2019 | 04:05 | 2.73 | 14:55 | 4.79 | 3.72 | 04:05 | 0.43 | 14:00 | 0.80 | 0.62 | 04:05 | 0.051 | 14:00 | 0.212 | 0.120 | 0.120 | 0.01 |
| 12/04/2019 | 23:55 | 2.51 | 16:25 | 4.47 | 3.40 | 03:00 | 0.39 | 16:40 | 0.74 | 0.56 | 05:00 | 0.048 | 16:40 | 0.174 | 0.095 | 0.095 | 0.39 |
| 12/05/2019 | 05:30 | 1.98 | 13:15 | 4.45 | 3.16 | 03:55 | 0.39 | 13:15 | 0.76 | 0.57 | 03:55 | 0.030 | 13:15 | 0.182 | 0.088 | 0.088 | 0.01 |
| 12/06/2019 | 03:25 | 2.50 | 15:20 | 5.18 | 3.79 | 04:55 | 0.41 | 15:20 | 0.82 | 0.59 | 04:15 | 0.043 | 15:20 | 0.243 | 0.121 | 0.121 | 0.01 |
| 12/07/2019 | 06:10 | 3.39 | 18:20 | 4.95 | 3.99 | 06:10 | 0.56 | 18:20 | 0.71 | 0.63 | 06:10 | 0.092 | 18:20 | 0.199 | 0.130 | 0.130 | 0.67 |
| 12/08/2019 | 05:50 | 3.37 | 21:05 | 4.61 | 3.89 | 05:50 | 0.56 | 21:05 | 0.69 | 0.62 | 05:50 | 0.091 | 21:05 | 0.173 | 0.124 | 0.124 | 0.20 |
| 12/09/2019 | 03:15 | 3.25 | 09:30 | 5.02 | 4.05 | 03:15 | 0.54 | 09:30 | 0.72 | 0.63 | 03:15 | 0.083 | 09:30 | 0.205 | 0.134 | 0.134 | |
| 12/10/2019 | 03:25 | 2.87 | 13:45 | 5.11 | 3.81 | 02:15 | 0.47 | 13:45 | 0.75 | 0.60 | 02:45 | 0.063 | 13:45 | 0.221 | 0.119 | 0.119 | |
| 12/11/2019 | 04:20 | 3.21 | 14:25 | 4.50 | 3.86 | 04:20 | 0.54 | 17:30 | 0.71 | 0.62 | 04:20 | 0.081 | 14:25 | 0.166 | 0.123 | 0.123 | 0.03 |
| 12/12/2019 | 04:15 | 3.32 | 13:55 | 4.71 | 3.81 | 01:45 | 0.54 | 14:00 | 0.74 | 0.62 | 23:30 | 0.088 | 14:00 | 0.191 | 0.122 | 0.122 | 0.01 |
| 12/13/2019 | 03:50 | 2.97 | 14:50 | 4.64 | 3.73 | 04:25 | 0.48 | 15:10 | 0.72 | 0.61 | 04:25 | 0.065 | 14:50 | 0.177 | 0.116 | 0.116 | 0.01 |
| 12/14/2019 | 06:50 | 3.07 | 14:40 | 4.17 | 3.59 | 05:55 | 0.50 | 12:25 | 0.67 | 0.57 | 06:20 | 0.070 | 12:25 | 0.138 | 0.102 | 0.102 | 0.01 |
| 12/15/2019 | 06:05 | 3.37 | 11:10 | 4.31 | 3.78 | 07:05 | 0.52 | 11:10 | 0.66 | 0.60 | 07:05 | 0.085 | 11:10 | 0.153 | 0.115 | 0.115 | 0.01 |
| 12/16/2019 | 03:35 | 3.55 | 10:00 | 4.86 | 4.00 | 03:35 | 0.52 | 10:05 | 0.86 | 0.70 | 03:35 | 0.090 | 10:05 | 0.216 | 0.146 | 0.146 | 0.01 |
| 12/17/2019 | 04:05 | 2.95 | 13:35 | 5.04 | 4.10 | 05:40 | 0.51 | 09:35 | 0.83 | 0.64 | 04:05 | 0.069 | 13:40 | 0.217 | 0.140 | 0.140 | 0.01 |
| 12/18/2019 | 03:35 | 3.66 | 11:45 | 5.16 | 4.41 | 03:35 | 0.53 | 14:10 | 0.69 | 0.61 | 03:35 | 0.096 | 10:15 | 0.199 | 0.148 | 0.148 | 0.01 |
| 12/19/2019 | 22:35 | 3.46 | 11:05 | 4.99 | 4.03 | 03:45 | 0.52 | 12:15 | 0.87 | 0.66 | 04:20 | 0.092 | 12:15 | 0.235 | 0.141 | 0.141 | |
| 12/20/2019 | 05:40 | 3.22 | 15:45 | 4.28 | 3.76 | 04:25 | 0.55 | 14:55 | 0.79 | 0.66 | 04:25 | 0.085 | 14:55 | 0.177 | 0.126 | 0.126 | |
| 12/21/2019 | 07:00 | 3.12 | 11:35 | 3.79 | 3.44 | 04:35 | 0.58 | 11:30 | 0.71 | 0.62 | 04:35 | 0.086 | 11:30 | 0.135 | 0.104 | 0.104 | 0.01 |
| 12/22/2019 | 06:25 | 3.24 | 14:30 | 3.92 | 3.60 | 02:15 | 0.55 | 14:30 | 0.72 | 0.62 | 02:15 | 0.088 | 14:30 | 0.143 | 0.110 | 0.110 | 0.41 |
| 12/23/2019 | 03:30 | 3.46 | 11:30 | 4.27 | 3.78 | 06:05 | 0.52 | 04:20 | 0.71 | 0.59 | 06:20 | 0.090 | 14:05 | 0.148 | 0.113 | 0.113 | |
| 12/24/2019 | 06:35 | 3.14 | 12:15 | 4.13 | 3.58 | 04:45 | 0.49 | 12:30 | 0.65 | 0.56 | 07:15 | 0.072 | 12:30 | 0.139 | 0.099 | 0.099 | 0.02 |
| 12/25/2019 | 05:00 | 3.34 | 18:30 | 4.66 | 4.10 | 03:10 | 0.50 | 18:25 | 0.84 | 0.66 | 04:45 | 0.080 | 18:25 | 0.215 | 0.145 | 0.145 | 0.08 |
| 12/26/2019 | 19:55 | 3.21 | 01:00 | 4.41 | 3.84 | 23:00 | 0.51 | 12:05 | 0.76 | 0.65 | 18:55 | 0.085 | 12:25 | 0.178 | 0.128 | 0.128 | |
| 12/27/2019 | 05:45 | 2.99 | 11:20 | 4.07 | 3.50 | 04:00 | 0.47 | 12:10 | 0.64 | 0.57 | 04:00 | 0.066 | 11:25 | 0.132 | 0.098 | 0.098 | |
| 12/28/2019 | 05:00 | 2.98 | 12:50 | 4.09 | 3.21 | 06:45 | 0.48 | 13:00 | 0.74 | 0.57 | 06:45 | 0.066 | 12:50 | 0.151 | 0.086 | 0.086 | |
| 12/29/2019 | 02:10 | 2.86 | 12:15 | 3.60 | 3.21 | 07:20 | 0.50 | 17:45 | 0.76 | 0.59 | 07:20 | 0.066 | 12:15 | 0.123 | 0.090 | 0.090 | 0.22 |
| 12/30/2019 | 02:20 | 3.07 | 11:20 | 4.08 | 3.53 | 02:55 | 0.52 | 18:35 | 0.76 | 0.65 | 02:55 | 0.074 | 14:50 | 0.155 | 0.113 | 0.113 | |
| 12/31/2019 | 06:45 | 2.53 | 11:50 | 3.64 | 3.15 | 04:55 | 0.54 | 00:55 | 0.71 | 0.64 | 06:40 | 0.058 | 11:50 | 0.122 | 0.094 | 0.094 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:40 | 2.87 12:50 | 3.74 | 3.21 | 03:45 | 0.49 16:50 | 0.70 | 0.59 | 05:40 | 0.064 12:50 | 0.126 | 0.089 | 0.089 | |
| 01/02/2020 | 03:20 | 2.99 13:10 | 4.21 | 3.60 | 04:30 | 0.51 09:45 | 0.72 | 0.62 | 04:30 | 0.070 13:10 | 0.157 | 0.111 | 0.111 | |
| 01/03/2020 | 07:15 | 3.10 10:40 | 4.07 | 3.56 | 02:45 | 0.52 12:35 | 0.68 | 0.61 | 02:45 | 0.075 10:15 | 0.143 | 0.107 | 0.107 | |
| 01/04/2020 | 07:10 | 2.81 11:55 | 3.54 | 3.16 | 06:05 | 0.52 22:35 | 0.64 | 0.58 | 07:40 | 0.066 19:35 | 0.109 | 0.085 | 0.085 | |
| 01/05/2020 | 04:40 | 3.01 21:40 | 3.76 | 3.35 | 04:40 | 0.51 10:30 | 0.68 | 0.58 | 04:40 | 0.070 21:35 | 0.120 | 0.094 | 0.094 | |
| 01/06/2020 | 04:15 | 3.08 13:40 | 4.30 | 3.70 | 04:15 | 0.59 22:15 | 0.81 | 0.68 | 04:15 | 0.084 13:35 | 0.181 | 0.128 | 0.128 | |
| 01/07/2020 | 05:35 | 2.96 12:10 | 4.45 | 3.63 | 05:35 | 0.54 12:10 | 0.84 | 0.69 | 05:35 | 0.072 12:10 | 0.202 | 0.126 | 0.126 | |
| 01/08/2020 | 03:05 | 2.81 13:30 | 4.50 | 3.56 | 03:10 | 0.51 13:30 | 0.82 | 0.66 | 03:10 | 0.063 13:30 | 0.199 | 0.119 | 0.119 | 0.02 |
| 01/09/2020 | 04:00 | 2.82 13:40 | 4.58 | 3.63 | 04:25 | 0.53 11:40 | 0.79 | 0.66 | 04:25 | 0.066 11:40 | 0.197 | 0.122 | 0.122 | 0.18 |
| 01/10/2020 | 04:45 | 2.27 12:25 | 4.52 | 3.35 | 04:45 | 0.44 14:40 | 0.79 | 0.62 | 04:45 | 0.040 12:25 | 0.193 | 0.105 | 0.105 | 0.02 |
| 01/11/2020 | 06:05 | 2.68 12:20 | 3.62 | 2.96 | 05:55 | 0.49 10:40 | 0.68 | 0.58 | 05:55 | 0.057 12:20 | 0.118 | 0.078 | 0.078 | 0.01 |
| 01/12/2020 | 05:25 | 2.59 11:35 | 3.55 | 3.08 | 02:45 | 0.51 18:50 | 0.67 | 0.59 | 03:15 | 0.057 11:30 | 0.115 | 0.084 | 0.084 | |
| 01/13/2020 | 04:15 | 2.71 13:30 | 4.56 | 3.56 | 03:50 | 0.50 14:10 | 0.79 | 0.65 | 03:50 | 0.060 13:30 | 0.190 | 0.117 | 0.117 | 0.02 |
| 01/14/2020 | 05:50 | 2.81 14:20 | 4.47 | 3.55 | 05:45 | 0.54 13:30 | 0.82 | 0.66 | 05:45 | 0.067 13:30 | 0.191 | 0.117 | 0.117 | 0.11 |
| 01/15/2020 | 04:35 | 2.78 13:35 | 4.31 | 3.52 | 05:30 | 0.52 13:55 | 0.78 | 0.65 | 05:30 | 0.063 13:30 | 0.175 | 0.115 | 0.115 | 0.07 |
| 01/16/2020 | 03:10 | 2.52 12:35 | 4.66 | 3.47 | 04:30 | 0.49 12:35 | 0.90 | 0.65 | 04:30 | 0.053 12:35 | 0.231 | 0.114 | 0.114 | 0.66 |
| 01/17/2020 | 05:45 | 2.65 13:50 | 4.59 | 3.69 | 23:15 | 0.47 10:25 | 0.75 | 0.59 | 05:45 | 0.059 13:35 | 0.173 | 0.111 | 0.111 | |
| 01/18/2020 | 05:55 | 3.23 10:25 | 4.08 | 3.64 | 19:50 | 0.41 00:50 | 0.61 | 0.47 | 05:40 | 0.064 10:00 | 0.120 | 0.085 | 0.085 | |
| 01/19/2020 | 05:45 | 3.37 10:50 | 4.21 | 3.74 | 05:50 | 0.38 04:35 | 0.59 | 0.45 | 05:50 | 0.061 19:50 | 0.112 | 0.085 | 0.085 | |
| 01/20/2020 | 05:40 | 3.43 13:15 | 4.39 | 3.86 | 04:10 | 0.41 18:20 | 0.69 | 0.49 | 04:40 | 0.068 13:20 | 0.139 | 0.098 | 0.098 | |
| 01/21/2020 | 03:25 | 3.10 13:55 | 5.06 | 3.86 | 03:25 | 0.57 13:55 | 0.88 | 0.67 | 03:25 | 0.081 13:55 | 0.253 | 0.135 | 0.135 | |
| 01/22/2020 | 23:55 | 3.01 13:50 | 4.24 | 3.57 | 04:10 | 0.55 13:40 | 0.77 | 0.65 | 04:10 | 0.077 13:40 | 0.172 | 0.116 | 0.116 | 0.03 |
| 01/23/2020 | 04:35 | 2.88 14:10 | 4.30 | 3.56 | 02:45 | 0.54 14:15 | 0.76 | 0.66 | 04:40 | 0.070 14:15 | 0.175 | 0.117 | 0.117 | |
| 01/24/2020 | 03:30 | 3.15 14:25 | 4.33 | 3.69 | 03:20 | 0.54 16:10 | 0.76 | 0.66 | 03:20 | 0.080 14:30 | 0.174 | 0.122 | 0.122 | |
| 01/25/2020 | 06:55 | 3.23 01:30 | 4.08 | 3.46 | 06:45 | 0.56 01:30 | 0.71 | 0.61 | 06:55 | 0.085 01:30 | 0.150 | 0.103 | 0.103 | |
| 01/26/2020 | 04:55 | 2.91 22:05 | 4.36 | 3.51 | 04:10 | 0.54 19:10 | 0.76 | 0.63 | 04:10 | 0.072 20:45 | 0.173 | 0.110 | 0.110 | 0.16 |
| 01/27/2020 | 23:55 | 3.53 09:20 | 4.87 | 4.19 | 23:45 | 0.63 09:15 | 0.82 | 0.71 | 23:55 | 0.108 09:15 | 0.224 | 0.157 | 0.157 | |
| 01/28/2020 | 03:35 | 3.31 13:25 | 4.91 | 3.99 | 04:45 | 0.59 13:30 | 0.81 | 0.69 | 04:45 | 0.094 13:30 | 0.223 | 0.145 | 0.145 | 0.01 |
| 01/29/2020 | 02:50 | 3.38 10:05 | 4.68 | 3.96 | 01:55 | 0.59 17:05 | 0.79 | 0.70 | 23:55 | 0.098 10:05 | 0.197 | 0.143 | 0.143 | |
| 01/30/2020 | 03:25 | 3.22 13:50 | 4.74 | 3.94 | 05:45 | 0.60 13:10 | 0.83 | 0.70 | 05:45 | 0.092 13:10 | 0.215 | 0.143 | 0.143 | |
| 01/31/2020 | 04:05 | 3.39 11:00 | 5.13 | 3.96 | 03:05 | 0.58 10:50 | 0.87 | 0.69 | 03:05 | 0.097 10:55 | 0.252 | 0.142 | 0.142 | |
| 02/01/2020 | 07:20 | 3.33 13:00 | 3.99 | 3.55 | 07:25 | 0.59 11:00 | 0.77 | 0.64 | 07:25 | 0.093 11:00 | 0.151 | 0.113 | 0.113 | |
| 02/02/2020 | 23:30 | 2.95 21:20 | 3.84 | 3.32 | 23:30 | 0.51 21:20 | 0.70 | 0.61 | 23:30 | 0.068 21:20 | 0.135 | 0.096 | 0.096 | |
| 02/03/2020 | 04:15 | 2.57 13:55 | 4.66 | 3.59 | 04:15 | 0.48 13:30 | 0.78 | 0.65 | 04:15 | 0.053 13:45 | 0.197 | 0.120 | 0.120 | |
| 02/04/2020 | 03:25 | 3.07 13:20 | 4.65 | 3.72 | 23:30 | 0.54 13:15 | 0.84 | 0.67 | 23:30 | 0.077 13:15 | 0.215 | 0.129 | 0.129 | |
| 02/05/2020 | 04:05 | 2.71 13:35 | 4.61 | 3.69 | 03:55 | 0.45 16:10 | 0.81 | 0.67 | 04:00 | 0.054 13:35 | 0.200 | 0.129 | 0.129 | |
| 02/06/2020 | 23:50 | 3.35 09:30 | 4.84 | 3.89 | 02:45 | 0.60 09:20 | 0.87 | 0.72 | 02:45 | 0.097 09:20 | 0.234 | 0.145 | 0.145 | |
| 02/07/2020 | 04:05 | 3.17 09:45 | 4.60 | 3.77 | 06:20 | 0.60 12:40 | 0.87 | 0.70 | 05:30 | 0.091 09:40 | 0.207 | 0.135 | 0.135 | |
| 02/08/2020 | 04:15 | 3.30 13:25 | 3.92 | 3.61 | 04:05 | 0.59 08:40 | 0.72 | 0.65 | 04:05 | 0.093 13:25 | 0.139 | 0.117 | 0.117 | |
| 02/09/2020 | 06:10 | 2.89 14:05 | 3.93 | 3.50 | 06:05 | 0.52 11:40 | 0.70 | 0.63 | 06:05 | 0.067 14:05 | 0.138 | 0.107 | 0.107 | |
| 02/10/2020 | 05:00 | 3.09 13:25 | 4.69 | 3.75 | 05:15 | 0.56 14:20 | 0.81 | 0.68 | 05:15 | 0.083 13:25 | 0.207 | 0.130 | 0.130 | |
| 02/11/2020 | 05:30 | 2.66 13:35 | 4.19 | 3.33 | 05:35 | 0.48 07:35 | 0.83 | 0.64 | 05:35 | 0.055 07:35 | 0.176 | 0.104 | 0.104 | |
| 02/12/2020 | 04:55 | 2.56 14:15 | 4.22 | 3.24 | 05:00 | 0.47 14:15 | 0.79 | 0.64 | 05:00 | 0.051 14:15 | 0.177 | 0.101 | 0.101 | |
| 02/13/2020 | 03:10 | 2.49 13:35 | 4.09 | 3.16 | 04:35 | 0.50 15:40 | 0.79 | 0.65 | 04:35 | 0.053 13:35 | 0.167 | 0.098 | 0.098 | |
| 02/14/2020 | 04:10 | 2.41 13:35 | 3.78 | 3.07 | 04:30 | 0.45 12:20 | 0.75 | 0.62 | 04:35 | 0.045 13:35 | 0.139 | 0.090 | 0.090 | |
| 02/15/2020 | 05:55 | 2.73 14:00 | 3.40 | 2.99 | 04:55 | 0.45 00:55 | 0.65 | 0.54 | 04:55 | 0.054 14:00 | 0.100 | 0.074 | 0.074 | |
| 02/16/2020 | 04:50 | 2.69 11:55 | 3.61 | 3.05 | 04:45 | 0.46 19:55 | 0.67 | 0.55 | 04:45 | 0.054 11:55 | 0.117 | 0.077 | 0.077 | |
| 02/17/2020 | 03:15 | 2.81 12:15 | 3.90 | 3.31 | 04:10 | 0.46 13:30 | 0.70 | 0.57 | 03:40 | 0.058 12:00 | 0.132 | 0.092 | 0.092 | |
| 02/18/2020 | 03:45 | 2.79 13:45 | 4.86 | 3.99 | 23:45 | 0.41 13:55 | 0.70 | 0.54 | 03:45 | 0.055 13:55 | 0.188 | 0.113 | 0.113 | |
| 02/19/2020 | 05:35 | 3.69 11:30 | 5.10 | 4.33 | 02:45 | 0.37 11:55 | 0.68 | 0.53 | 05:35 | 0.069 13:55 | 0.185 | 0.125 | 0.125 | |
| 02/20/2020 | 06:00 | 3.18 14:20 | 4.75 | 3.93 | 04:00 | 0.37 10:25 | 0.79 | 0.54 | 04:00 | 0.056 10:25 | 0.203 | 0.113 | 0.113 | |
| 02/21/2020 | 03:55 | 2.76 13:25 | 4.48 | 3.53 | 03:50 | 0.43 14:10 | 0.70 | 0.55 | 03:50 | 0.052 13:30 | 0.169 | 0.099 | 0.099 | |
| 02/22/2020 | 03:05 | 2.35 20:25 | 3.40 | 2.84 | 03:00 | 0.31 09:55 | 0.55 | 0.44 | 03:00 | 0.029 09:55 | 0.087 | 0.056 | 0.056 | |
| 02/23/2020 | 06:35 | 2.34 14:10 | 3.39 | 2.80 | 05:10 | 0.32 20:05 | 0.55 | 0.44 | 06:30 | 0.030 14:10 | 0.088 | 0.055 | 0.055 | |
| 02/24/2020 | 04:10 | 2.34 14:15 | 4.75 | 3.60 | 02:05 | 0.31 13:15 | 0.64 | 0.47 | 02:05 | 0.031 13:25 | 0.164 | 0.088 | 0.088 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:30 | 2.86 | 16:30 | 4.82 | 3.96 | 04:40 | 0.27 | 10:00 | 0.60 | 0.42 | 04:40 | 0.035 | 13:30 | 0.153 | 0.089 | 0.089 | |
| 02/26/2020 | 22:40 | 2.73 | 11:10 | 4.73 | 3.60 | 04:00 | 0.19 | 12:05 | 0.80 | 0.48 | 04:00 | 0.028 | 14:30 | 0.180 | 0.089 | 0.089 | |
| 02/27/2020 | 04:45 | 2.33 | 13:30 | 4.55 | 3.32 | 03:45 | 0.33 | 13:30 | 0.70 | 0.51 | 03:45 | 0.031 | 13:30 | 0.173 | 0.086 | 0.086 | |
| 02/28/2020 | 05:50 | 2.14 | 11:45 | 4.13 | 3.06 | 05:55 | 0.29 | 14:40 | 0.77 | 0.50 | 05:55 | 0.024 | 14:40 | 0.156 | 0.075 | 0.075 | |
| 02/29/2020 | 05:40 | 2.37 | 18:55 | 3.32 | 2.80 | 05:20 | 0.34 | 15:20 | 0.57 | 0.45 | 05:20 | 0.033 | 15:20 | 0.086 | 0.057 | 0.057 | |
| 03/01/2020 | 05:20 | 2.33 | 11:40 | 3.68 | 2.83 | 05:35 | 0.34 | 11:35 | 0.71 | 0.48 | 05:35 | 0.032 | 11:35 | 0.127 | 0.062 | 0.062 | |
| 03/02/2020 | 03:20 | 2.42 | 13:20 | 4.39 | 3.20 | 03:30 | 0.39 | 13:50 | 0.80 | 0.55 | 03:30 | 0.039 | 13:20 | 0.181 | 0.087 | 0.087 | |
| 03/03/2020 | 03:40 | 2.43 | 13:25 | 4.60 | 3.34 | 02:45 | 0.32 | 10:10 | 0.75 | 0.54 | 03:35 | 0.032 | 13:15 | 0.188 | 0.093 | 0.093 | |
| 03/04/2020 | 04:00 | 2.24 | 10:50 | 4.19 | 3.06 | 03:50 | 0.34 | 13:50 | 0.85 | 0.55 | 03:50 | 0.030 | 13:50 | 0.180 | 0.082 | 0.082 | |
| 03/05/2020 | 03:45 | 2.14 | 13:05 | 4.09 | 2.97 | 05:00 | 0.31 | 13:50 | 0.80 | 0.56 | 05:00 | 0.027 | 14:00 | 0.168 | 0.081 | 0.081 | |
| 03/06/2020 | 03:20 | 1.98 | 13:30 | 4.29 | 2.83 | 03:20 | 0.32 | 13:25 | 0.86 | 0.55 | 03:20 | 0.024 | 13:25 | 0.189 | 0.075 | 0.075 | |
| 03/07/2020 | 03:55 | 2.01 | 16:15 | 3.02 | 2.48 | 03:50 | 0.34 | 16:35 | 0.66 | 0.49 | 03:50 | 0.026 | 16:35 | 0.089 | 0.052 | 0.052 | |
| 03/08/2020 | 05:25 | 2.03 | 14:05 | 3.00 | 2.40 | 04:35 | 0.35 | 14:05 | 0.67 | 0.49 | 04:35 | 0.028 | 14:05 | 0.091 | 0.050 | 0.050 | |
| 03/09/2020 | 03:00 | 1.84 | 10:50 | 3.95 | 2.82 | 05:15 | 0.32 | 10:30 | 0.82 | 0.58 | 03:25 | 0.022 | 10:30 | 0.161 | 0.079 | 0.079 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 11.840 | 4.90 |
| Avg | 3.46 | 0.59 | 0.103 | |

## Site Commentary

### Site Information

| MIL_0386 | |
|---|---|
| Pipe Dimensions | 18 |
| Silt Level | 0.00" |

### Overview

Site MIL_0386 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows free flow conditions during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed upstream of sites MIL_0649 and MIL_2491. (See MIL_0649 and MIL_2491 Site Commentary for More Details)

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 6.43 | 1.38 | 0.512 |
| Minimum | 5.11 | 0.93 | 0.262 |
| Maximum | 9.17 | 2.04 | 1.187 |
| Time of Minimum | 2/9/2020 4:10 AM | 12/26/2019 2:40 AM | 12/26/2019 2:40 AM |
| Time of Maximum | 2/6/2020 1:35 PM | 1/16/2020 10:45 AM | 2/6/2020 1:35 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

## *Flow Monitoring Site Report*

ADS ENVIRONMENTAL SERVICES®

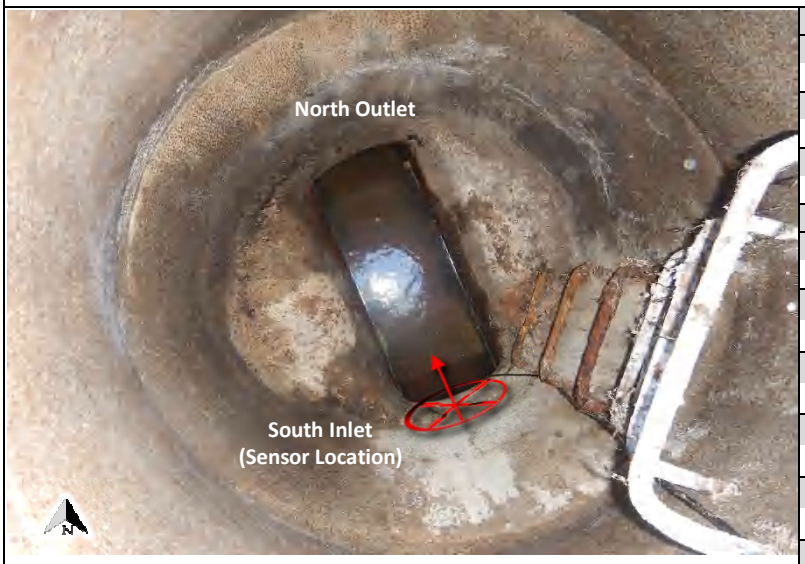
## Site Name

# MIL_0386

| | | | |
|---|---|---|---|
| Site Address /Location: | Milpitas Blvd and Los Coches St, Milpitas, CA | | |
| Site Access Details: | DRIVE. | Latitude: | 37.430913° |
| | | Longitude: | -121.898992° |

| Monitor Series | Location Type |
|---|---|
| TRITON+ | Temporary |
| Pipe Size (H x W) | Pipe Shape |
| 18.00"x18.00" | Circular |

| Manhole # | System Characteristics |
|---|---|
| #0386 | Residential/Commercial |
| Access | Traffic |
| Drive | Medium |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Friday, November 15, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 8:54:00 AM | 18.00"x18.00" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 7.25" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.76' | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 14' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Drilled Pavement / Concrete |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |

# SCATTERGRAPH REPORT

MIL_0386

**Flow Monitor**

**MIL_0386**

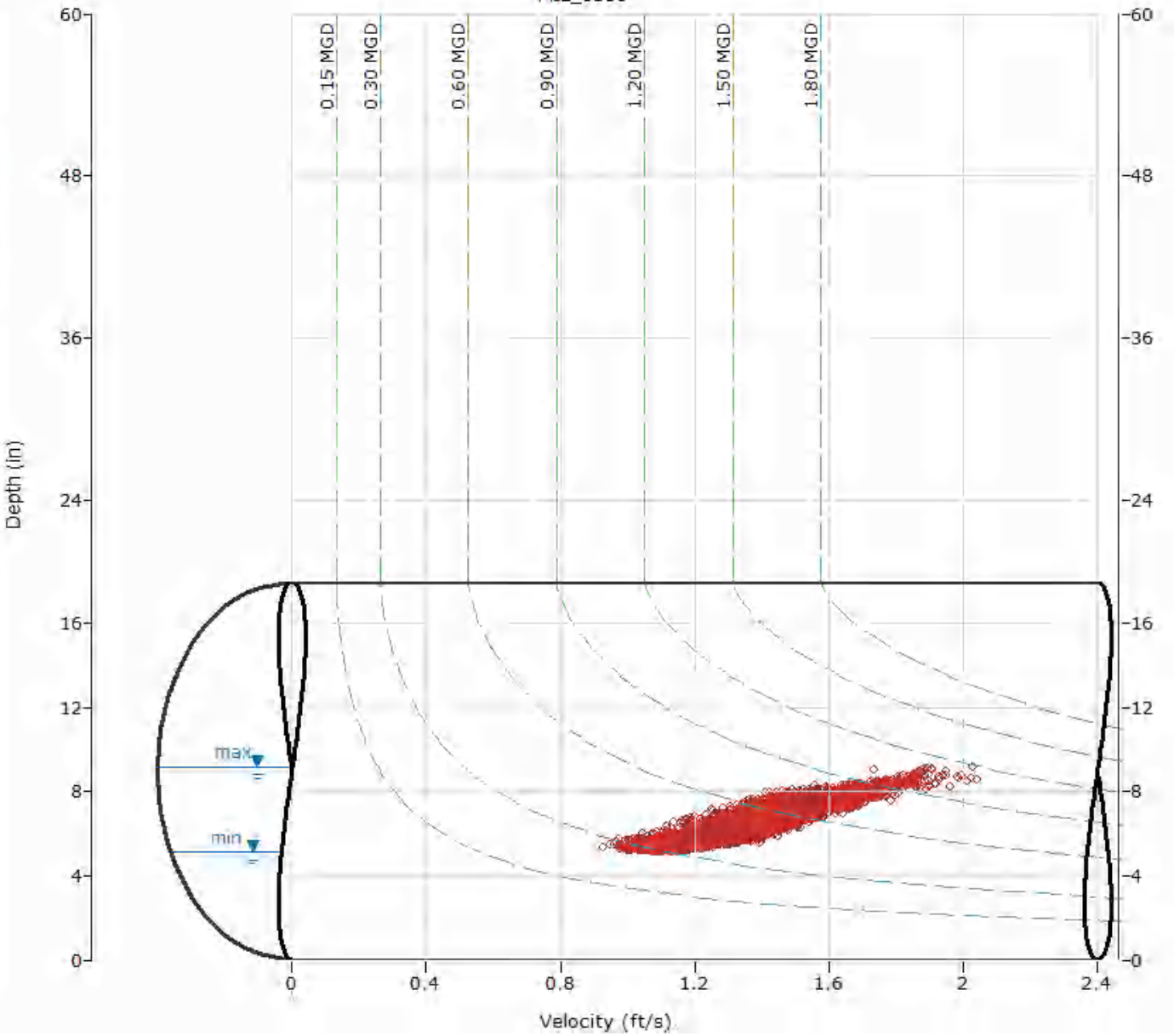
Pipe Height
18.00 in

**Report Period**

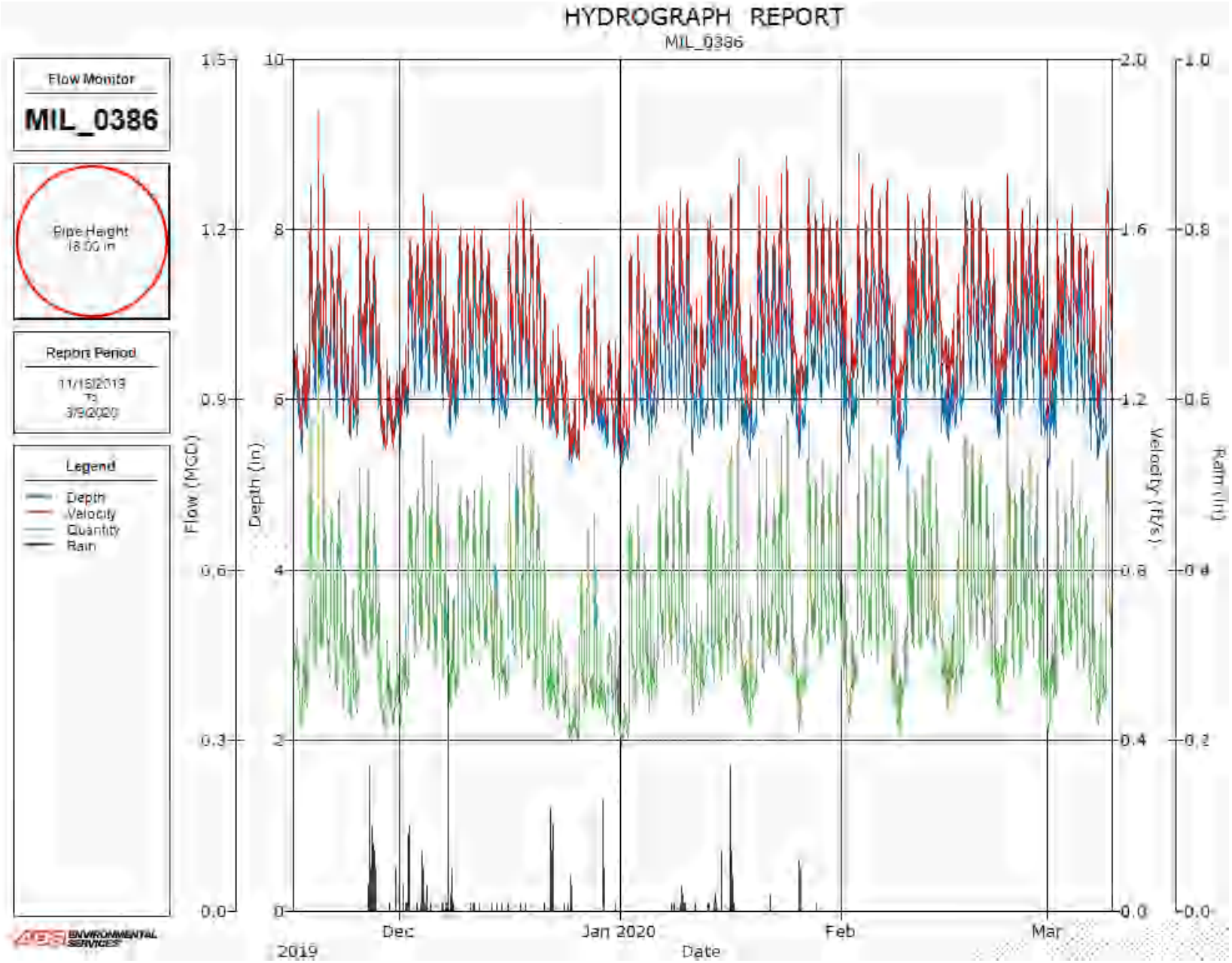
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0386
Flow Monitor
MIL_0386
Pipe Height
18.00 in
Report Period
11/15/2019
To
3/9/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (In)
Velocity (ft/s)
Rain (In)
1.5
1.2
0.9
0.6
0.3
0.0
10
8
6
4
2
0
2.0
1.6
1.2
0.8
0.4
0.0
1.0
0.8
0.6
0.4
0.2
0.0
Dec
2019
Jan 2020
Feb
Mar
Date
ENVIRONMENTAL SERVICES

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0386, Pipe Height: 18.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 22:30 | 5.72 | 14:55 | 6.75 | 6.11 | 16:20 | 1.11 | 14:55 | 1.42 | 1.27 | 16:20 | 0.360 | 14:55 | 0.557 | 0.434 | 0.434 | |
| 11/17/2019 | 06:15 | 5.34 | 19:25 | 6.81 | 5.80 | 16:55 | 0.97 | 19:15 | 1.42 | 1.20 | 16:55 | 0.295 | 19:20 | 0.560 | 0.382 | 0.382 | |
| 11/18/2019 | 00:35 | 5.50 | 13:15 | 8.86 | 6.79 | 02:55 | 1.09 | 13:10 | 1.87 | 1.40 | 00:35 | 0.334 | 13:15 | 1.046 | 0.564 | 0.564 | |
| 11/19/2019 | 04:35 | 5.95 | 15:20 | 9.13 | 6.85 | 02:55 | 1.23 | 15:00 | 1.95 | 1.44 | 04:30 | 0.415 | 15:00 | 1.109 | 0.581 | 0.581 | |
| 11/20/2019 | 23:25 | 5.95 | 09:30 | 8.58 | 6.73 | 15:40 | 1.19 | 10:15 | 1.83 | 1.41 | 03:15 | 0.417 | 10:15 | 0.976 | 0.557 | 0.557 | |
| 11/21/2019 | 04:40 | 5.86 | 09:45 | 7.84 | 6.69 | 04:40 | 1.22 | 09:45 | 1.65 | 1.40 | 04:40 | 0.392 | 09:45 | 0.790 | 0.545 | 0.545 | |
| 11/22/2019 | 04:10 | 5.75 | 14:35 | 7.98 | 6.74 | 11:50 | 1.18 | 10:00 | 1.68 | 1.39 | 04:25 | 0.384 | 08:05 | 0.813 | 0.550 | 0.550 | |
| 11/23/2019 | 04:40 | 5.58 | 06:50 | 7.14 | 6.26 | 04:40 | 1.11 | 08:40 | 1.50 | 1.29 | 04:40 | 0.336 | 08:40 | 0.630 | 0.458 | 0.458 | |
| 11/24/2019 | 03:10 | 5.42 | 11:05 | 7.13 | 5.97 | 00:45 | 1.00 | 11:05 | 1.50 | 1.23 | 00:45 | 0.310 | 11:05 | 0.632 | 0.409 | 0.409 | |
| 11/25/2019 | 00:00 | 5.54 | 08:40 | 8.17 | 6.61 | 01:45 | 1.12 | 08:40 | 1.77 | 1.38 | 00:15 | 0.338 | 08:40 | 0.890 | 0.532 | 0.532 | |
| 11/26/2019 | 04:00 | 6.11 | 16:30 | 8.15 | 6.84 | 03:30 | 1.12 | 16:30 | 1.70 | 1.43 | 03:30 | 0.402 | 16:30 | 0.854 | 0.572 | 0.572 | 0.36 |
| 11/27/2019 | 00:10 | 6.10 | 09:50 | 7.64 | 6.78 | 20:50 | 1.16 | 08:35 | 1.62 | 1.41 | 20:50 | 0.430 | 09:45 | 0.745 | 0.557 | 0.557 | 0.63 |
| 11/28/2019 | 20:00 | 5.34 | 02:55 | 6.98 | 5.85 | 10:45 | 0.98 | 02:50 | 1.41 | 1.20 | 20:00 | 0.299 | 02:50 | 0.578 | 0.388 | 0.388 | |
| 11/29/2019 | 04:00 | 5.43 | 07:10 | 6.91 | 5.81 | 03:10 | 0.96 | 07:05 | 1.47 | 1.17 | 03:10 | 0.282 | 07:05 | 0.593 | 0.375 | 0.375 | 0.02 |
| 11/30/2019 | 06:15 | 5.40 | 17:30 | 6.70 | 5.75 | 01:20 | 0.95 | 10:45 | 1.38 | 1.17 | 01:20 | 0.277 | 17:30 | 0.516 | 0.370 | 0.370 | 0.10 |
| 12/01/2019 | 03:10 | 5.38 | 21:20 | 7.14 | 5.92 | 13:30 | 1.05 | 21:25 | 1.46 | 1.21 | 04:30 | 0.311 | 21:20 | 0.613 | 0.398 | 0.398 | 0.06 |
| 12/02/2019 | 03:55 | 5.70 | 11:10 | 7.83 | 6.72 | 00:30 | 1.12 | 11:05 | 1.67 | 1.42 | 00:30 | 0.348 | 11:10 | 0.792 | 0.559 | 0.559 | 0.30 |
| 12/03/2019 | 03:55 | 5.96 | 09:55 | 7.99 | 6.80 | 04:00 | 1.28 | 13:05 | 1.64 | 1.45 | 04:00 | 0.422 | 10:00 | 0.792 | 0.578 | 0.578 | 0.01 |
| 12/04/2019 | 00:15 | 6.04 | 09:35 | 8.27 | 6.96 | 16:00 | 1.29 | 09:25 | 1.75 | 1.50 | 00:10 | 0.455 | 09:25 | 0.893 | 0.614 | 0.614 | 0.39 |
| 12/05/2019 | 03:40 | 6.08 | 13:35 | 8.08 | 6.90 | 23:55 | 1.26 | 14:50 | 1.67 | 1.45 | 02:15 | 0.446 | 13:40 | 0.828 | 0.590 | 0.590 | 0.01 |
| 12/06/2019 | 00:35 | 6.08 | 09:20 | 8.26 | 6.83 | 01:05 | 1.24 | 09:15 | 1.72 | 1.44 | 00:30 | 0.422 | 09:15 | 0.875 | 0.576 | 0.576 | 0.01 |
| 12/07/2019 | 23:55 | 5.61 | 12:25 | 7.69 | 6.39 | 13:30 | 1.12 | 12:05 | 1.61 | 1.34 | 23:55 | 0.357 | 12:25 | 0.745 | 0.491 | 0.491 | 0.67 |
| 12/08/2019 | 03:35 | 5.56 | 15:40 | 7.18 | 5.97 | 21:05 | 1.09 | 14:10 | 1.52 | 1.26 | 03:35 | 0.338 | 15:40 | 0.605 | 0.418 | 0.418 | 0.20 |
| 12/09/2019 | 04:45 | 5.68 | 13:15 | 7.99 | 6.74 | 01:10 | 1.14 | 13:15 | 1.71 | 1.43 | 01:10 | 0.368 | 13:15 | 0.835 | 0.564 | 0.564 | |
| 12/10/2019 | 04:45 | 5.93 | 15:10 | 7.90 | 6.78 | 04:25 | 1.25 | 16:30 | 1.70 | 1.44 | 04:25 | 0.416 | 15:10 | 0.813 | 0.571 | 0.571 | |
| 12/11/2019 | 04:50 | 5.88 | 11:05 | 7.72 | 6.69 | 05:00 | 1.27 | 12:50 | 1.78 | 1.43 | 04:45 | 0.411 | 12:50 | 0.811 | 0.559 | 0.559 | 0.03 |
| 12/12/2019 | 05:00 | 5.92 | 12:10 | 7.98 | 6.82 | 03:50 | 1.28 | 10:30 | 1.69 | 1.44 | 03:55 | 0.423 | 12:20 | 0.824 | 0.577 | 0.577 | 0.01 |
| 12/13/2019 | 04:40 | 5.97 | 14:10 | 7.87 | 6.79 | 01:25 | 1.29 | 14:00 | 1.61 | 1.44 | 04:35 | 0.432 | 14:00 | 0.765 | 0.570 | 0.570 | 0.01 |
| 12/14/2019 | 06:10 | 5.72 | 12:55 | 7.28 | 6.39 | 06:10 | 1.18 | 12:55 | 1.60 | 1.32 | 06:10 | 0.368 | 12:55 | 0.693 | 0.483 | 0.483 | 0.01 |
| 12/15/2019 | 06:05 | 5.55 | 06:35 | 7.19 | 6.04 | 11:40 | 1.08 | 06:40 | 1.53 | 1.27 | 06:05 | 0.338 | 06:40 | 0.644 | 0.428 | 0.428 | 0.01 |
| 12/16/2019 | 03:25 | 5.72 | 11:10 | 8.53 | 6.73 | 00:50 | 1.17 | 11:10 | 1.75 | 1.41 | 03:25 | 0.372 | 11:10 | 0.931 | 0.557 | 0.557 | 0.01 |
| 12/17/2019 | 05:00 | 6.01 | 10:35 | 8.28 | 6.93 | 00:10 | 1.25 | 10:35 | 1.76 | 1.45 | 05:15 | 0.432 | 10:35 | 0.900 | 0.593 | 0.593 | 0.01 |
| 12/18/2019 | 03:15 | 5.93 | 09:20 | 8.48 | 6.89 | 03:10 | 1.26 | 09:20 | 1.80 | 1.43 | 03:10 | 0.414 | 09:20 | 0.952 | 0.583 | 0.583 | 0.01 |
| 12/19/2019 | 05:55 | 6.04 | 10:30 | 8.31 | 6.93 | 05:55 | 1.25 | 10:25 | 1.71 | 1.42 | 05:55 | 0.419 | 10:30 | 0.880 | 0.584 | 0.584 | |
| 12/20/2019 | 04:05 | 5.76 | 12:50 | 8.05 | 6.74 | 21:10 | 1.13 | 17:00 | 1.68 | 1.39 | 04:05 | 0.381 | 17:05 | 0.822 | 0.550 | 0.550 | |
| 12/21/2019 | 04:15 | 5.60 | 09:25 | 7.29 | 6.25 | 03:00 | 1.02 | 11:10 | 1.52 | 1.27 | 03:00 | 0.319 | 09:30 | 0.657 | 0.452 | 0.452 | 0.01 |
| 12/22/2019 | 03:20 | 5.43 | 14:25 | 7.01 | 5.93 | 23:25 | 1.04 | 14:20 | 1.49 | 1.22 | 03:25 | 0.313 | 14:25 | 0.607 | 0.402 | 0.402 | 0.41 |
| 12/23/2019 | 05:50 | 5.50 | 09:50 | 6.95 | 6.12 | 04:50 | 1.00 | 07:30 | 1.53 | 1.25 | 04:50 | 0.308 | 07:30 | 0.604 | 0.429 | 0.429 | |
| 12/24/2019 | 20:20 | 5.23 | 07:10 | 6.67 | 5.68 | 22:25 | 0.98 | 07:05 | 1.38 | 1.18 | 22:25 | 0.275 | 07:05 | 0.531 | 0.367 | 0.367 | 0.02 |
| 12/25/2019 | 03:55 | 5.20 | 15:55 | 6.31 | 5.42 | 21:25 | 1.01 | 15:55 | 1.31 | 1.11 | 05:40 | 0.279 | 15:55 | 0.469 | 0.323 | 0.323 | 0.08 |
| 12/26/2019 | 04:40 | 5.26 | 13:20 | 7.15 | 6.15 | 02:40 | 0.93 | 11:10 | 1.51 | 1.25 | 02:40 | 0.262 | 11:10 | 0.636 | 0.437 | 0.437 | |
| 12/27/2019 | 00:40 | 5.66 | 11:05 | 8.06 | 6.27 | 03:25 | 1.07 | 11:05 | 1.64 | 1.27 | 03:25 | 0.328 | 11:05 | 0.812 | 0.457 | 0.457 | |
| 12/28/2019 | 05:55 | 5.64 | 10:20 | 8.01 | 6.18 | 23:05 | 1.00 | 10:10 | 1.68 | 1.26 | 23:05 | 0.312 | 10:20 | 0.817 | 0.442 | 0.442 | |
| 12/29/2019 | 23:55 | 5.46 | 05:15 | 6.77 | 5.83 | 09:50 | 1.03 | 06:00 | 1.44 | 1.21 | 09:50 | 0.311 | 05:10 | 0.542 | 0.388 | 0.388 | 0.22 |
| 12/30/2019 | 04:40 | 5.38 | 10:10 | 6.95 | 5.96 | 02:30 | 1.05 | 08:45 | 1.46 | 1.23 | 04:35 | 0.304 | 10:10 | 0.586 | 0.407 | 0.407 | |
| 12/31/2019 | 04:55 | 5.30 | 08:40 | 7.04 | 5.71 | 22:00 | 0.98 | 07:25 | 1.46 | 1.20 | 22:00 | 0.280 | 08:35 | 0.583 | 0.375 | 0.375 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 06:25 | 5.16 13:40 | 5.66 | 5.37 | 05:50 | 0.99 13:40 | 1.26 | 1.14 | 05:50 | 0.274 13:40 | 0.388 | 0.326 | 0.326 | |
| 01/02/2020 | 03:20 | 5.20 07:15 | 8.56 | 6.25 | 03:10 | 1.01 07:20 | 1.85 | 1.31 | 03:10 | 0.278 07:15 | 0.988 | 0.471 | 0.471 | |
| 01/03/2020 | 01:45 | 5.66 12:30 | 7.75 | 6.41 | 00:40 | 1.13 12:20 | 1.71 | 1.35 | 04:55 | 0.354 12:20 | 0.799 | 0.501 | 0.501 | |
| 01/04/2020 | 23:55 | 5.63 10:30 | 7.39 | 6.34 | 03:55 | 1.18 10:25 | 1.57 | 1.35 | 03:55 | 0.370 10:25 | 0.694 | 0.489 | 0.489 | |
| 01/05/2020 | 03:25 | 5.43 07:05 | 7.24 | 5.90 | 22:50 | 1.07 05:45 | 1.59 | 1.28 | 22:50 | 0.335 07:05 | 0.666 | 0.419 | 0.419 | |
| 01/06/2020 | 01:05 | 5.58 13:00 | 7.78 | 6.56 | 01:15 | 1.22 12:50 | 1.77 | 1.45 | 01:15 | 0.370 12:50 | 0.831 | 0.550 | 0.550 | |
| 01/07/2020 | 03:45 | 5.76 14:20 | 7.85 | 6.63 | 00:35 | 1.31 14:20 | 1.80 | 1.47 | 03:40 | 0.413 14:20 | 0.860 | 0.566 | 0.566 | |
| 01/08/2020 | 05:45 | 5.81 15:05 | 7.66 | 6.58 | 05:45 | 1.31 10:30 | 1.70 | 1.46 | 05:45 | 0.419 10:35 | 0.779 | 0.557 | 0.557 | 0.02 |
| 01/09/2020 | 03:30 | 5.78 10:00 | 7.94 | 6.64 | 15:40 | 1.30 10:45 | 1.75 | 1.49 | 03:30 | 0.416 10:45 | 0.848 | 0.574 | 0.574 | 0.18 |
| 01/10/2020 | 05:30 | 5.65 10:35 | 7.90 | 6.48 | 20:30 | 1.30 10:25 | 1.80 | 1.46 | 05:30 | 0.404 10:30 | 0.864 | 0.548 | 0.548 | 0.02 |
| 01/11/2020 | 03:45 | 5.31 18:00 | 7.01 | 5.83 | 23:55 | 1.16 17:45 | 1.55 | 1.31 | 04:45 | 0.331 17:55 | 0.632 | 0.421 | 0.421 | 0.01 |
| 01/12/2020 | 03:35 | 5.53 09:00 | 6.88 | 5.83 | 10:50 | 1.07 08:45 | 1.53 | 1.29 | 01:30 | 0.334 09:00 | 0.612 | 0.416 | 0.416 | |
| 01/13/2020 | 04:30 | 5.74 17:35 | 7.65 | 6.56 | 00:00 | 1.27 13:00 | 1.69 | 1.47 | 00:05 | 0.400 13:00 | 0.778 | 0.557 | 0.557 | 0.02 |
| 01/14/2020 | 04:55 | 5.59 13:05 | 7.67 | 6.46 | 16:25 | 1.16 10:05 | 1.69 | 1.45 | 04:50 | 0.390 13:05 | 0.771 | 0.538 | 0.538 | 0.11 |
| 01/15/2020 | 04:55 | 5.62 12:15 | 7.56 | 6.48 | 04:20 | 1.31 11:45 | 1.68 | 1.45 | 04:55 | 0.400 11:45 | 0.746 | 0.539 | 0.539 | 0.07 |
| 01/16/2020 | 04:00 | 5.69 14:00 | 8.78 | 6.74 | 04:10 | 1.31 10:45 | 2.04 | 1.49 | 04:00 | 0.406 13:50 | 1.097 | 0.588 | 0.588 | 0.66 |
| 01/17/2020 | 04:30 | 5.83 15:00 | 8.83 | 6.72 | 04:30 | 1.29 15:00 | 1.90 | 1.46 | 04:30 | 0.414 15:00 | 1.058 | 0.574 | 0.574 | |
| 01/18/2020 | 22:45 | 5.41 16:05 | 6.86 | 5.76 | 22:45 | 1.15 16:10 | 1.45 | 1.25 | 22:45 | 0.332 16:10 | 0.580 | 0.396 | 0.396 | |
| 01/19/2020 | 04:40 | 5.20 08:45 | 6.94 | 5.66 | 04:35 | 1.12 08:45 | 1.50 | 1.24 | 04:35 | 0.307 08:45 | 0.609 | 0.384 | 0.384 | |
| 01/20/2020 | 00:05 | 5.56 12:25 | 8.11 | 6.65 | 04:35 | 1.21 12:20 | 1.77 | 1.45 | 00:25 | 0.371 12:25 | 0.881 | 0.562 | 0.562 | |
| 01/21/2020 | 05:20 | 5.67 12:40 | 8.18 | 6.61 | 05:20 | 1.26 14:00 | 1.89 | 1.44 | 05:20 | 0.389 14:00 | 0.938 | 0.552 | 0.552 | |
| 01/22/2020 | 00:45 | 5.95 17:00 | 7.99 | 6.74 | 00:45 | 1.30 17:00 | 1.75 | 1.46 | 00:45 | 0.427 17:00 | 0.855 | 0.574 | 0.574 | 0.03 |
| 01/23/2020 | 00:30 | 5.86 14:55 | 8.36 | 6.79 | 05:55 | 1.31 14:50 | 1.96 | 1.49 | 06:00 | 0.424 14:50 | 1.004 | 0.593 | 0.593 | |
| 01/24/2020 | 01:40 | 6.04 11:00 | 8.67 | 6.90 | 03:15 | 1.31 10:50 | 2.01 | 1.52 | 01:40 | 0.450 10:55 | 1.078 | 0.617 | 0.617 | |
| 01/25/2020 | 22:30 | 5.50 07:00 | 6.85 | 6.08 | 22:20 | 1.04 06:20 | 1.50 | 1.31 | 22:20 | 0.313 06:20 | 0.594 | 0.447 | 0.447 | |
| 01/26/2020 | 05:05 | 5.29 00:15 | 6.25 | 5.71 | 02:25 | 1.09 00:10 | 1.40 | 1.25 | 04:50 | 0.310 00:10 | 0.494 | 0.389 | 0.389 | 0.16 |
| 01/27/2020 | 00:40 | 5.84 10:40 | 8.42 | 6.83 | 00:20 | 1.27 10:35 | 1.86 | 1.46 | 00:40 | 0.413 10:35 | 0.974 | 0.588 | 0.588 | |
| 01/28/2020 | 04:50 | 6.06 13:10 | 7.91 | 6.83 | 04:40 | 1.32 13:10 | 1.71 | 1.47 | 04:45 | 0.449 13:10 | 0.828 | 0.590 | 0.590 | 0.01 |
| 01/29/2020 | 04:40 | 5.93 08:15 | 8.02 | 6.76 | 03:20 | 1.24 08:00 | 1.74 | 1.46 | 03:20 | 0.422 08:20 | 0.848 | 0.578 | 0.578 | |
| 01/30/2020 | 04:55 | 6.08 11:05 | 8.09 | 6.81 | 11:45 | 1.33 11:00 | 1.72 | 1.47 | 05:00 | 0.456 11:00 | 0.851 | 0.588 | 0.588 | |
| 01/31/2020 | 05:05 | 6.06 12:30 | 8.18 | 6.84 | 05:00 | 1.33 12:30 | 1.74 | 1.48 | 05:05 | 0.450 12:30 | 0.876 | 0.593 | 0.593 | |
| 02/01/2020 | 23:55 | 5.46 14:15 | 7.17 | 6.12 | 23:50 | 1.20 14:15 | 1.58 | 1.36 | 23:50 | 0.352 14:15 | 0.670 | 0.470 | 0.470 | |
| 02/02/2020 | 02:25 | 5.23 15:15 | 6.83 | 5.73 | 03:20 | 1.11 15:05 | 1.50 | 1.27 | 03:20 | 0.312 15:10 | 0.591 | 0.398 | 0.398 | |
| 02/03/2020 | 02:20 | 5.74 13:10 | 8.54 | 6.79 | 22:45 | 1.20 13:05 | 1.90 | 1.46 | 02:25 | 0.394 13:05 | 1.010 | 0.585 | 0.585 | |
| 02/04/2020 | 03:55 | 5.94 11:05 | 7.86 | 6.77 | 22:10 | 1.27 10:25 | 1.69 | 1.46 | 03:50 | 0.430 10:25 | 0.797 | 0.580 | 0.580 | |
| 02/05/2020 | 06:40 | 6.04 09:45 | 8.07 | 6.90 | 17:45 | 1.30 08:25 | 1.77 | 1.49 | 06:20 | 0.442 09:40 | 0.875 | 0.604 | 0.604 | |
| 02/06/2020 | 04:40 | 5.87 13:35 | 9.17 | 6.75 | 04:40 | 1.29 13:35 | 2.03 | 1.48 | 04:40 | 0.416 13:35 | 1.187 | 0.584 | 0.584 | |
| 02/07/2020 | 02:05 | 5.99 11:25 | 7.98 | 6.73 | 15:35 | 1.31 11:15 | 1.78 | 1.48 | 02:10 | 0.445 11:15 | 0.855 | 0.580 | 0.580 | |
| 02/08/2020 | 23:50 | 5.25 14:35 | 6.79 | 5.85 | 23:50 | 1.13 14:40 | 1.47 | 1.29 | 23:50 | 0.313 14:35 | 0.579 | 0.418 | 0.418 | |
| 02/09/2020 | 04:10 | 5.11 01:40 | 6.27 | 5.62 | 03:30 | 1.00 00:20 | 1.38 | 1.24 | 03:30 | 0.280 01:40 | 0.477 | 0.378 | 0.378 | |
| 02/10/2020 | 04:55 | 5.33 09:00 | 7.84 | 6.66 | 04:55 | 1.20 11:30 | 1.77 | 1.45 | 04:55 | 0.340 11:30 | 0.841 | 0.563 | 0.563 | |
| 02/11/2020 | 06:05 | 6.04 11:35 | 7.73 | 6.80 | 04:50 | 1.31 10:15 | 1.67 | 1.47 | 04:55 | 0.442 11:35 | 0.779 | 0.584 | 0.584 | |
| 02/12/2020 | 04:00 | 5.95 09:35 | 7.82 | 6.82 | 04:15 | 1.31 11:50 | 1.72 | 1.49 | 04:15 | 0.431 11:50 | 0.817 | 0.593 | 0.593 | |
| 02/13/2020 | 05:20 | 6.07 10:20 | 7.93 | 6.83 | 01:50 | 1.34 10:05 | 1.75 | 1.48 | 01:50 | 0.462 10:15 | 0.838 | 0.593 | 0.593 | |
| 02/14/2020 | 06:05 | 5.96 13:15 | 7.72 | 6.75 | 16:25 | 1.25 10:25 | 1.67 | 1.46 | 06:00 | 0.430 10:25 | 0.777 | 0.577 | 0.577 | |
| 02/15/2020 | 23:05 | 5.56 17:10 | 6.63 | 5.93 | 22:35 | 1.15 17:05 | 1.44 | 1.30 | 22:35 | 0.349 17:05 | 0.548 | 0.428 | 0.428 | |
| 02/16/2020 | 01:55 | 5.41 18:55 | 6.93 | 5.89 | 00:40 | 1.10 18:55 | 1.50 | 1.28 | 00:40 | 0.328 18:55 | 0.608 | 0.418 | 0.418 | |
| 02/17/2020 | 01:35 | 5.60 13:45 | 7.68 | 6.25 | 03:35 | 1.09 13:45 | 1.55 | 1.31 | 03:35 | 0.337 13:45 | 0.719 | 0.467 | 0.467 | |
| 02/18/2020 | 00:00 | 5.81 12:10 | 8.37 | 6.96 | 00:00 | 1.21 08:45 | 1.73 | 1.47 | 00:00 | 0.387 12:15 | 0.883 | 0.607 | 0.607 | |
| 02/19/2020 | 05:40 | 6.09 09:40 | 8.43 | 6.98 | 02:25 | 1.33 09:35 | 1.78 | 1.49 | 02:25 | 0.454 09:35 | 0.933 | 0.614 | 0.614 | |
| 02/20/2020 | 02:30 | 5.95 16:25 | 8.21 | 6.95 | 02:35 | 1.31 16:30 | 1.74 | 1.49 | 02:30 | 0.431 16:30 | 0.880 | 0.612 | 0.612 | |
| 02/21/2020 | 07:10 | 6.09 13:20 | 7.89 | 6.86 | 00:35 | 1.33 12:30 | 1.71 | 1.47 | 07:10 | 0.461 12:30 | 0.813 | 0.592 | 0.592 | |
| 02/22/2020 | 23:10 | 5.58 12:30 | 8.05 | 6.34 | 23:45 | 1.01 12:30 | 1.69 | 1.35 | 23:45 | 0.312 12:30 | 0.838 | 0.491 | 0.491 | |
| 02/23/2020 | 03:50 | 5.50 23:25 | 6.61 | 5.93 | 06:35 | 1.11 02:05 | 1.39 | 1.27 | 03:50 | 0.338 02:25 | 0.514 | 0.418 | 0.418 | |
| 02/24/2020 | 04:45 | 5.87 10:55 | 8.81 | 6.87 | 02:20 | 1.24 10:45 | 1.87 | 1.45 | 04:40 | 0.404 10:50 | 1.032 | 0.589 | 0.589 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:35 | 5.79 | 09:30 | 7.84 | 6.74 | 04:30 | 1.27 | 09:20 | 1.71 | 1.45 | 04:30 | 0.405 | 09:25 | 0.814 | 0.569 | 0.569 | |
| 02/26/2020 | 04:35 | 5.77 | 14:20 | 7.91 | 6.76 | 04:00 | 1.25 | 13:15 | 1.66 | 1.47 | 04:00 | 0.395 | 13:30 | 0.789 | 0.580 | 0.580 | |
| 02/27/2020 | 02:05 | 5.82 | 12:25 | 8.09 | 6.76 | 17:40 | 1.25 | 12:25 | 1.79 | 1.48 | 02:05 | 0.424 | 12:25 | 0.893 | 0.583 | 0.583 | |
| 02/28/2020 | 00:35 | 5.92 | 14:45 | 7.85 | 6.79 | 00:40 | 1.32 | 12:40 | 1.68 | 1.48 | 00:35 | 0.432 | 14:45 | 0.792 | 0.589 | 0.589 | |
| 02/29/2020 | 02:50 | 5.53 | 10:10 | 7.26 | 6.08 | 22:55 | 1.12 | 10:00 | 1.56 | 1.33 | 20:50 | 0.358 | 10:10 | 0.673 | 0.454 | 0.454 | |
| 03/01/2020 | 03:20 | 5.20 | 18:05 | 7.05 | 5.66 | 03:00 | 1.00 | 18:05 | 1.53 | 1.25 | 03:00 | 0.273 | 18:05 | 0.636 | 0.387 | 0.387 | |
| 03/02/2020 | 03:25 | 5.55 | 09:20 | 7.66 | 6.56 | 02:50 | 1.22 | 09:05 | 1.68 | 1.43 | 02:55 | 0.366 | 09:15 | 0.770 | 0.545 | 0.545 | |
| 03/03/2020 | 04:45 | 5.92 | 11:35 | 7.83 | 6.68 | 04:35 | 1.32 | 11:35 | 1.73 | 1.46 | 04:35 | 0.432 | 11:35 | 0.827 | 0.566 | 0.566 | |
| 03/04/2020 | 06:10 | 5.93 | 12:10 | 8.10 | 6.75 | 03:20 | 1.32 | 12:10 | 1.77 | 1.48 | 03:20 | 0.434 | 12:10 | 0.882 | 0.582 | 0.582 | |
| 03/05/2020 | 04:20 | 5.83 | 12:00 | 7.83 | 6.69 | 04:40 | 1.27 | 10:50 | 1.65 | 1.47 | 04:40 | 0.409 | 12:05 | 0.769 | 0.572 | 0.572 | |
| 03/06/2020 | 01:55 | 5.48 | 08:45 | 7.65 | 6.65 | 01:55 | 1.28 | 08:25 | 1.66 | 1.47 | 01:55 | 0.376 | 08:25 | 0.744 | 0.566 | 0.566 | |
| 03/07/2020 | 02:00 | 5.39 | 08:00 | 7.36 | 6.06 | 01:45 | 1.17 | 08:00 | 1.62 | 1.35 | 01:45 | 0.341 | 08:00 | 0.709 | 0.459 | 0.459 | |
| 03/08/2020 | 02:00 | 5.24 | 13:35 | 6.52 | 5.65 | 18:20 | 1.10 | 13:35 | 1.46 | 1.26 | 03:50 | 0.316 | 13:35 | 0.544 | 0.390 | 0.390 | |
| 03/09/2020 | 04:00 | 5.52 | 12:25 | 8.08 | 6.66 | 01:15 | 1.20 | 09:05 | 1.77 | 1.46 | 03:50 | 0.361 | 12:20 | 0.875 | 0.570 | 0.569 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 58.839 | 4.90 |
| Avg | 6.43 | 1.38 | 0.512 | |

## Site Commentary

### Site Information

| MIL_0602 | |
|---|---|
| Pipe Dimensions | 18 |
| Silt Level | 0.00" |

### Overview

Site MIL_0602 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows free flow conditions during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 3.67 | 1.53 | 0.274 |
| Minimum | 1.21 | 0.39 | 0.014 |
| Maximum | 6.31 | 2.37 | 0.844 |
| Time of Minimum | 3/7/2020 5:50 AM | 3/9/2020 4:30 AM | 3/9/2020 5:55 AM |
| Time of Maximum | 1/7/2020 8:40 AM | 1/7/2020 8:40 AM | 1/7/2020 8:40 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

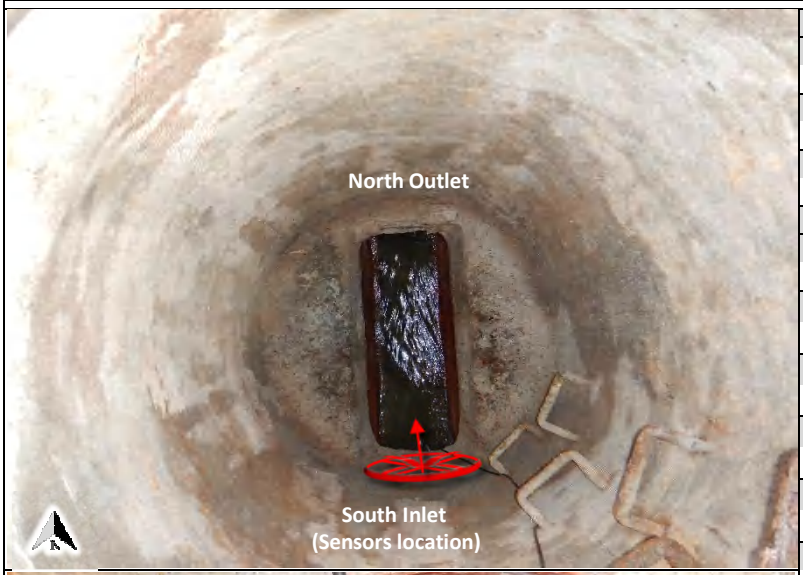
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_0602

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Main St and Curtis Ave | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Parking lane | Latitude: | 37.424137° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.905174° | 18.0" x 18.0" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 602 | Residential/Commercial |
| Access | Traffic |
| Drive | Light |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 9:11:40 AM | 18.0" x 18.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 6.25 | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.52 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 7' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |

# SCATTERGRAPH REPORT

MIL_0602

**Flow Monitor**

**MIL_0602**

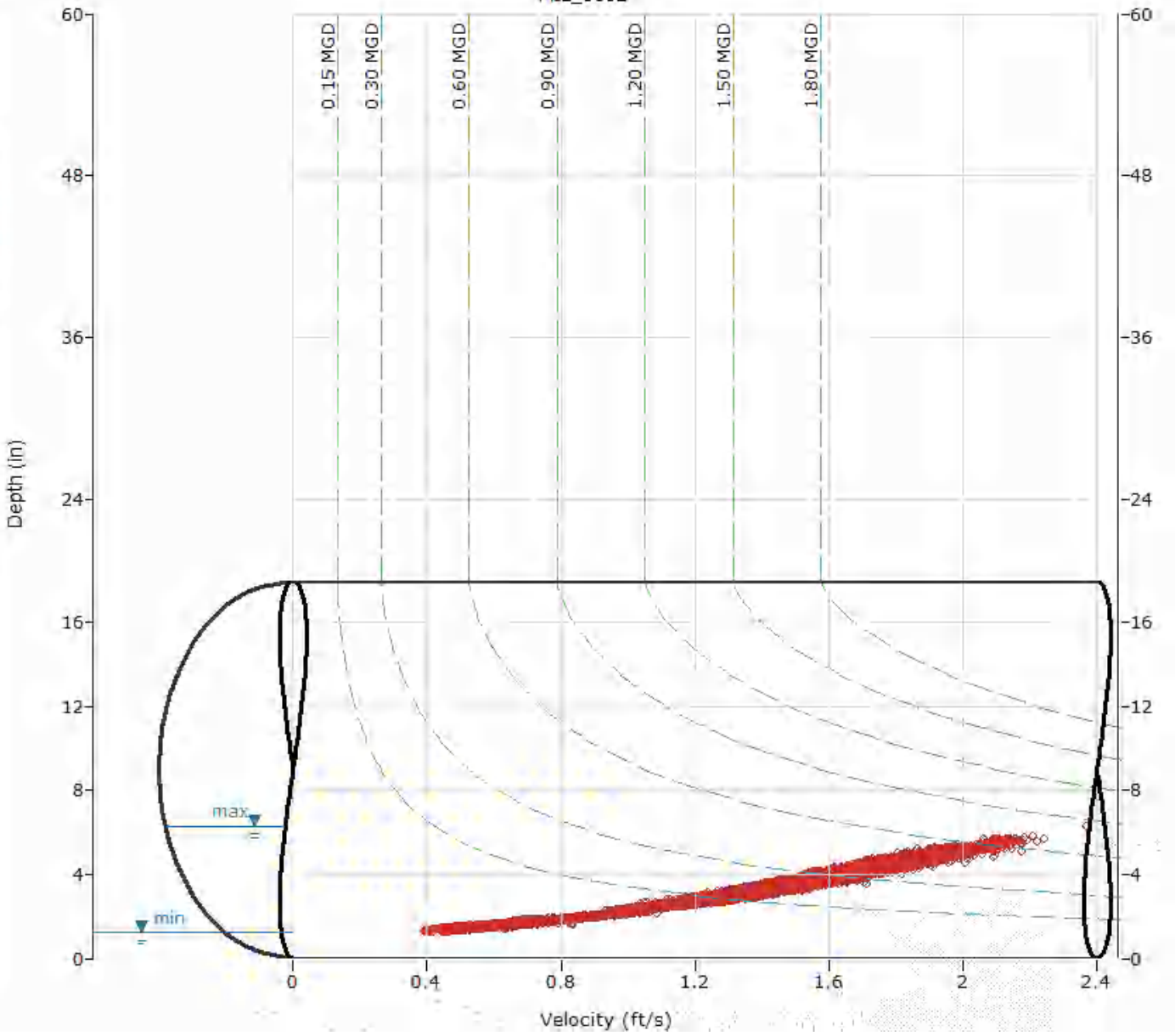
Pipe Height
18.00 in

**Report Period**

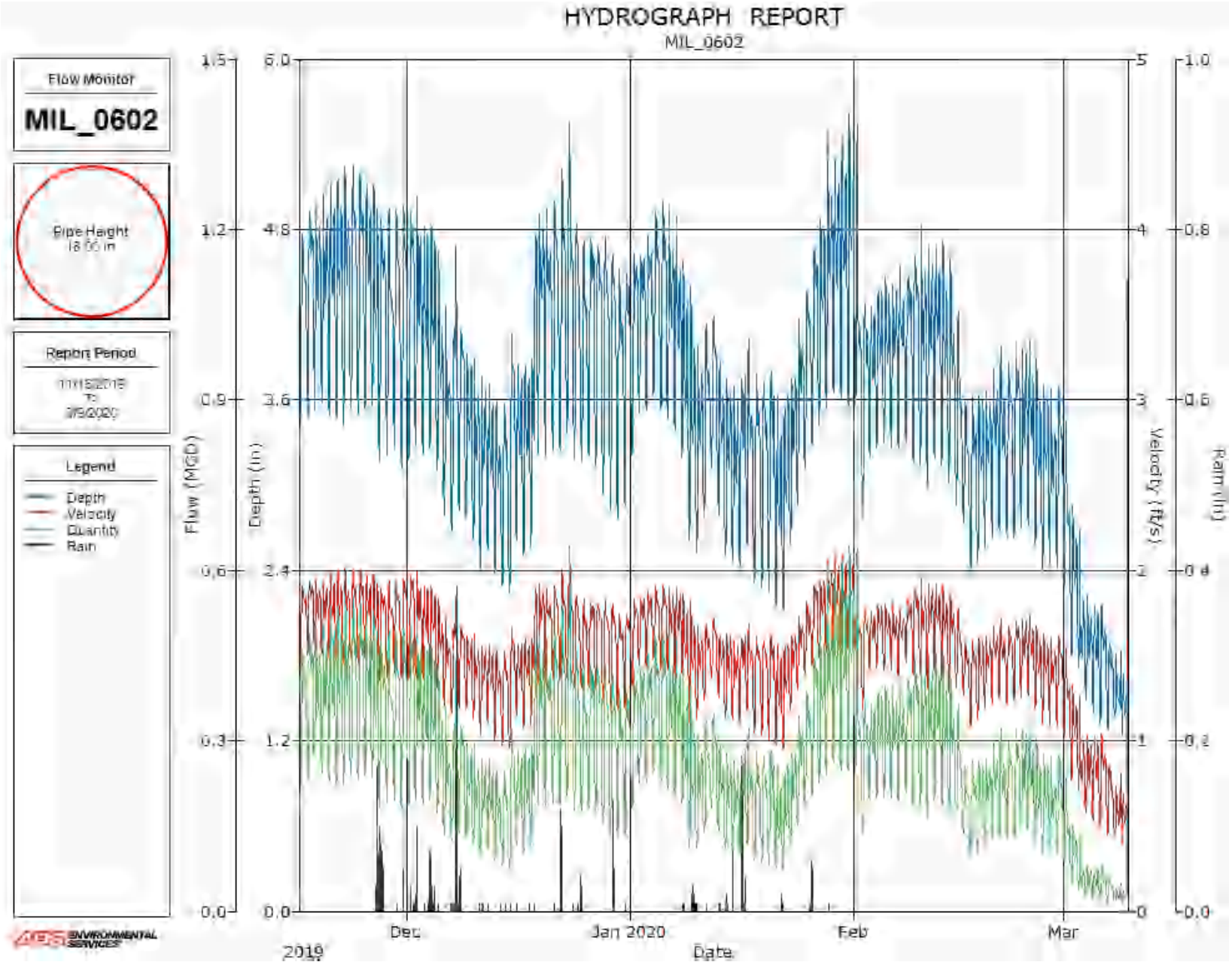
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0602
Flow Monitor
MIL_0602
Pipe Height
18.00 in
Report Period
11/1/2019
to
3/9/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
1.5
1.2
0.9
0.6
0.3
0.0
6.0
4.8
3.6
2.4
1.2
0.0
5
4
3
2
1
0
1.0
0.8
0.6
0.4
0.2
0.0
Dec
2019
Jan 2020
Feb
Mar
Date
AES ENVIRONMENTAL SERVICES

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0602, Pipe Height: 18.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 03:55 | 3.43 | 12:05 | 4.79 | 4.22 | 05:55 | 1.45 | 12:35 | 1.95 | 1.74 | 05:55 | 0.222 | 11:55 | 0.473 | 0.361 | 0.361 | |
| 11/17/2019 | 06:00 | 3.44 | 13:00 | 4.96 | 4.37 | 05:00 | 1.48 | 15:05 | 2.01 | 1.78 | 06:05 | 0.226 | 11:20 | 0.502 | 0.388 | 0.388 | |
| 11/18/2019 | 04:40 | 3.52 | 08:45 | 5.09 | 4.35 | 03:50 | 1.47 | 08:30 | 1.99 | 1.75 | 04:40 | 0.233 | 08:30 | 0.527 | 0.379 | 0.379 | |
| 11/19/2019 | 04:25 | 3.57 | 08:55 | 5.11 | 4.40 | 04:35 | 1.49 | 08:45 | 2.00 | 1.76 | 04:35 | 0.240 | 08:45 | 0.531 | 0.386 | 0.386 | |
| 11/20/2019 | 04:20 | 3.46 | 08:55 | 5.21 | 4.41 | 03:10 | 1.44 | 09:15 | 2.05 | 1.76 | 04:20 | 0.225 | 09:15 | 0.557 | 0.387 | 0.387 | |
| 11/21/2019 | 04:35 | 3.44 | 09:05 | 5.26 | 4.42 | 04:25 | 1.45 | 08:55 | 2.07 | 1.76 | 04:25 | 0.222 | 08:55 | 0.571 | 0.390 | 0.390 | |
| 11/22/2019 | 03:55 | 3.41 | 08:45 | 5.30 | 4.43 | 05:10 | 1.44 | 09:00 | 2.06 | 1.76 | 05:10 | 0.217 | 09:00 | 0.578 | 0.392 | 0.392 | |
| 11/23/2019 | 05:00 | 3.54 | 12:50 | 5.29 | 4.53 | 03:30 | 1.47 | 12:20 | 2.03 | 1.78 | 05:05 | 0.236 | 12:20 | 0.565 | 0.410 | 0.410 | |
| 11/24/2019 | 05:40 | 3.48 | 12:15 | 5.21 | 4.51 | 04:45 | 1.45 | 12:05 | 2.05 | 1.78 | 05:40 | 0.225 | 12:05 | 0.560 | 0.407 | 0.407 | |
| 11/25/2019 | 04:40 | 3.53 | 09:20 | 5.17 | 4.44 | 04:35 | 1.48 | 09:25 | 2.01 | 1.76 | 04:40 | 0.234 | 09:25 | 0.545 | 0.391 | 0.391 | |
| 11/26/2019 | 05:00 | 3.53 | 10:05 | 5.16 | 4.34 | 04:55 | 1.45 | 20:50 | 2.03 | 1.73 | 04:55 | 0.229 | 20:50 | 0.540 | 0.373 | 0.373 | 0.36 |
| 11/27/2019 | 05:25 | 3.13 | 09:50 | 5.00 | 4.24 | 05:30 | 1.33 | 09:25 | 1.93 | 1.71 | 05:30 | 0.176 | 10:00 | 0.495 | 0.358 | 0.358 | 0.63 |
| 11/28/2019 | 06:30 | 3.20 | 12:15 | 4.99 | 4.12 | 05:45 | 1.36 | 12:45 | 1.99 | 1.68 | 05:45 | 0.188 | 12:45 | 0.508 | 0.339 | 0.339 | |
| 11/29/2019 | 05:25 | 3.23 | 12:05 | 4.96 | 4.26 | 05:10 | 1.38 | 11:30 | 1.94 | 1.73 | 05:10 | 0.192 | 12:10 | 0.495 | 0.364 | 0.364 | 0.02 |
| 11/30/2019 | 05:50 | 3.11 | 12:45 | 4.98 | 4.20 | 05:35 | 1.34 | 12:25 | 2.09 | 1.72 | 05:40 | 0.178 | 12:25 | 0.523 | 0.359 | 0.359 | 0.10 |
| 12/01/2019 | 05:50 | 3.16 | 12:50 | 4.97 | 4.26 | 05:35 | 1.35 | 11:35 | 2.09 | 1.74 | 05:35 | 0.184 | 11:35 | 0.512 | 0.371 | 0.371 | 0.06 |
| 12/02/2019 | 04:45 | 3.27 | 09:20 | 5.08 | 4.22 | 03:55 | 1.38 | 09:25 | 2.18 | 1.72 | 04:50 | 0.195 | 09:25 | 0.574 | 0.358 | 0.358 | 0.30 |
| 12/03/2019 | 05:05 | 3.20 | 08:45 | 4.86 | 4.12 | 05:05 | 1.35 | 20:10 | 2.02 | 1.68 | 05:05 | 0.185 | 20:10 | 0.484 | 0.339 | 0.339 | 0.01 |
| 12/04/2019 | 03:20 | 3.25 | 08:55 | 4.96 | 4.11 | 02:30 | 1.35 | 08:40 | 1.93 | 1.67 | 03:15 | 0.192 | 08:45 | 0.491 | 0.335 | 0.335 | 0.39 |
| 12/05/2019 | 05:05 | 3.07 | 08:40 | 4.79 | 3.83 | 04:45 | 1.30 | 08:35 | 1.88 | 1.58 | 05:05 | 0.169 | 08:35 | 0.458 | 0.286 | 0.286 | 0.01 |
| 12/06/2019 | 04:30 | 2.77 | 09:00 | 4.35 | 3.49 | 02:55 | 1.19 | 08:55 | 1.77 | 1.46 | 04:35 | 0.133 | 08:55 | 0.375 | 0.232 | 0.232 | 0.01 |
| 12/07/2019 | 05:55 | 2.67 | 18:50 | 4.84 | 3.62 | 05:40 | 1.14 | 18:45 | 1.96 | 1.50 | 05:40 | 0.121 | 18:45 | 0.483 | 0.256 | 0.256 | 0.67 |
| 12/08/2019 | 06:10 | 2.80 | 12:25 | 4.12 | 3.61 | 05:30 | 1.19 | 13:10 | 1.69 | 1.50 | 06:25 | 0.136 | 13:10 | 0.329 | 0.250 | 0.250 | 0.20 |
| 12/09/2019 | 05:20 | 2.74 | 09:00 | 4.03 | 3.40 | 05:15 | 1.17 | 08:55 | 1.66 | 1.44 | 05:15 | 0.129 | 08:55 | 0.315 | 0.219 | 0.219 | |
| 12/10/2019 | 05:10 | 2.61 | 09:05 | 3.96 | 3.26 | 04:15 | 1.08 | 08:10 | 1.70 | 1.39 | 04:15 | 0.112 | 08:40 | 0.304 | 0.200 | 0.200 | |
| 12/11/2019 | 05:00 | 2.40 | 08:50 | 3.89 | 3.18 | 04:20 | 1.02 | 08:45 | 1.63 | 1.35 | 05:05 | 0.093 | 08:45 | 0.296 | 0.189 | 0.189 | 0.03 |
| 12/12/2019 | 05:35 | 2.53 | 08:40 | 3.78 | 3.16 | 05:30 | 1.10 | 08:40 | 1.60 | 1.36 | 05:30 | 0.107 | 08:40 | 0.279 | 0.187 | 0.187 | 0.01 |
| 12/13/2019 | 04:30 | 2.37 | 09:00 | 3.63 | 3.04 | 04:10 | 1.00 | 09:45 | 1.55 | 1.31 | 04:25 | 0.089 | 08:45 | 0.252 | 0.170 | 0.170 | 0.01 |
| 12/14/2019 | 05:25 | 2.28 | 13:30 | 3.62 | 3.03 | 05:45 | 0.97 | 11:45 | 1.57 | 1.30 | 05:45 | 0.081 | 11:45 | 0.253 | 0.170 | 0.170 | 0.01 |
| 12/15/2019 | 06:05 | 2.23 | 11:20 | 4.43 | 3.25 | 06:40 | 0.93 | 11:20 | 1.80 | 1.37 | 05:55 | 0.077 | 11:20 | 0.393 | 0.205 | 0.205 | 0.01 |
| 12/16/2019 | 05:20 | 2.60 | 09:40 | 3.87 | 3.28 | 05:10 | 1.04 | 08:45 | 1.61 | 1.39 | 05:10 | 0.105 | 09:40 | 0.288 | 0.202 | 0.202 | 0.01 |
| 12/17/2019 | 05:10 | 2.51 | 09:20 | 3.86 | 3.28 | 05:00 | 1.07 | 09:25 | 1.61 | 1.39 | 05:00 | 0.103 | 09:25 | 0.288 | 0.202 | 0.202 | 0.01 |
| 12/18/2019 | 04:50 | 2.55 | 21:45 | 4.78 | 3.68 | 04:15 | 1.08 | 21:40 | 1.92 | 1.52 | 04:55 | 0.107 | 21:45 | 0.467 | 0.270 | 0.270 | 0.01 |
| 12/19/2019 | 04:40 | 3.19 | 09:10 | 4.95 | 4.25 | 04:40 | 1.32 | 08:55 | 1.99 | 1.69 | 04:40 | 0.181 | 09:00 | 0.506 | 0.355 | 0.355 | |
| 12/20/2019 | 05:05 | 3.16 | 09:40 | 4.98 | 4.25 | 03:45 | 1.32 | 09:40 | 1.98 | 1.68 | 05:10 | 0.179 | 09:40 | 0.511 | 0.354 | 0.354 | |
| 12/21/2019 | 05:25 | 3.23 | 12:20 | 5.04 | 4.32 | 05:30 | 1.35 | 11:35 | 1.96 | 1.70 | 05:30 | 0.188 | 11:40 | 0.508 | 0.368 | 0.368 | 0.01 |
| 12/22/2019 | 06:00 | 3.22 | 13:30 | 5.28 | 4.35 | 04:30 | 1.34 | 13:35 | 2.05 | 1.71 | 04:35 | 0.186 | 13:35 | 0.573 | 0.374 | 0.374 | 0.41 |
| 12/23/2019 | 05:35 | 3.32 | 13:15 | 5.71 | 4.47 | 05:30 | 1.35 | 12:15 | 2.19 | 1.73 | 05:30 | 0.195 | 12:15 | 0.666 | 0.396 | 0.396 | |
| 12/24/2019 | 05:05 | 3.16 | 12:05 | 4.87 | 4.19 | 04:55 | 1.27 | 10:40 | 1.88 | 1.64 | 04:55 | 0.173 | 12:05 | 0.467 | 0.339 | 0.339 | 0.02 |
| 12/25/2019 | 04:55 | 3.15 | 12:25 | 4.75 | 4.00 | 05:00 | 1.29 | 19:25 | 1.87 | 1.59 | 04:55 | 0.173 | 12:20 | 0.444 | 0.308 | 0.308 | 0.08 |
| 12/26/2019 | 05:00 | 3.18 | 12:05 | 4.75 | 4.18 | 05:10 | 1.30 | 22:50 | 1.87 | 1.64 | 04:55 | 0.177 | 10:55 | 0.440 | 0.337 | 0.337 | |
| 12/27/2019 | 04:20 | 3.10 | 13:20 | 4.71 | 4.11 | 04:15 | 1.28 | 09:45 | 1.96 | 1.62 | 04:15 | 0.168 | 09:45 | 0.443 | 0.326 | 0.326 | |
| 12/28/2019 | 04:35 | 2.91 | 12:30 | 4.79 | 4.00 | 04:30 | 1.21 | 12:20 | 1.88 | 1.59 | 04:30 | 0.145 | 12:25 | 0.455 | 0.309 | 0.309 | |
| 12/29/2019 | 06:25 | 2.81 | 13:25 | 4.65 | 3.93 | 06:20 | 1.17 | 13:55 | 1.84 | 1.57 | 06:20 | 0.133 | 13:25 | 0.422 | 0.298 | 0.298 | 0.22 |
| 12/30/2019 | 05:55 | 2.75 | 11:10 | 4.54 | 3.81 | 05:30 | 1.15 | 11:20 | 1.81 | 1.53 | 05:30 | 0.128 | 11:20 | 0.408 | 0.278 | 0.278 | |
| 12/31/2019 | 04:45 | 2.84 | 11:20 | 4.53 | 3.89 | 05:15 | 1.17 | 12:40 | 1.91 | 1.55 | 05:15 | 0.136 | 12:40 | 0.419 | 0.290 | 0.290 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:40 | 3.20 12:25 | 4.65 | 4.06 | 06:35 | 1.30 12:05 | 1.88 | 1.62 | 06:35 | 0.181 19:10 | 0.436 | 0.321 | 0.321 | |
| 01/02/2020 | 04:35 | 3.49 10:25 | 4.64 | 4.23 | 04:05 | 1.42 21:00 | 1.86 | 1.69 | 04:05 | 0.223 10:35 | 0.431 | 0.351 | 0.351 | |
| 01/03/2020 | 04:25 | 3.50 10:10 | 4.83 | 4.30 | 04:55 | 1.43 10:05 | 1.89 | 1.71 | 04:20 | 0.223 10:10 | 0.465 | 0.363 | 0.363 | |
| 01/04/2020 | 04:10 | 3.61 11:55 | 4.94 | 4.36 | 04:20 | 1.45 16:40 | 2.01 | 1.72 | 04:20 | 0.238 12:15 | 0.500 | 0.373 | 0.373 | |
| 01/05/2020 | 04:45 | 3.52 12:10 | 5.06 | 4.38 | 05:25 | 1.40 13:50 | 2.06 | 1.72 | 05:25 | 0.221 13:50 | 0.525 | 0.376 | 0.376 | |
| 01/06/2020 | 04:35 | 3.46 08:55 | 5.05 | 4.25 | 05:15 | 1.40 08:50 | 1.94 | 1.69 | 05:05 | 0.216 08:50 | 0.508 | 0.353 | 0.353 | |
| 01/07/2020 | 04:50 | 3.38 08:40 | 6.31 | 4.14 | 04:25 | 1.36 08:40 | 2.37 | 1.68 | 04:25 | 0.204 08:40 | 0.844 | 0.339 | 0.339 | |
| 01/08/2020 | 04:45 | 3.16 08:35 | 4.79 | 3.81 | 04:40 | 1.36 08:35 | 1.94 | 1.59 | 04:40 | 0.183 08:35 | 0.471 | 0.285 | 0.285 | 0.02 |
| 01/09/2020 | 05:05 | 2.58 08:50 | 4.57 | 3.44 | 05:00 | 1.09 08:35 | 1.90 | 1.46 | 05:00 | 0.110 08:35 | 0.425 | 0.230 | 0.230 | 0.18 |
| 01/10/2020 | 04:15 | 2.51 08:40 | 4.12 | 3.33 | 05:20 | 1.11 08:40 | 1.70 | 1.44 | 04:55 | 0.108 08:40 | 0.334 | 0.215 | 0.215 | 0.02 |
| 01/11/2020 | 05:40 | 2.76 12:55 | 4.14 | 3.54 | 05:40 | 1.23 12:55 | 1.70 | 1.50 | 05:40 | 0.137 12:55 | 0.337 | 0.243 | 0.243 | 0.01 |
| 01/12/2020 | 06:00 | 3.09 12:45 | 4.22 | 3.73 | 06:00 | 1.36 12:45 | 1.72 | 1.57 | 06:00 | 0.178 12:45 | 0.350 | 0.271 | 0.271 | |
| 01/13/2020 | 05:20 | 2.74 09:00 | 3.91 | 3.36 | 05:20 | 1.23 09:00 | 1.63 | 1.46 | 05:20 | 0.135 09:00 | 0.298 | 0.218 | 0.218 | 0.02 |
| 01/14/2020 | 05:20 | 2.49 09:05 | 3.78 | 3.17 | 05:20 | 1.12 09:00 | 1.67 | 1.41 | 05:20 | 0.107 09:00 | 0.292 | 0.195 | 0.195 | 0.11 |
| 01/15/2020 | 04:30 | 2.45 09:05 | 3.71 | 3.12 | 05:10 | 1.11 08:55 | 1.60 | 1.39 | 03:55 | 0.104 09:05 | 0.271 | 0.188 | 0.188 | 0.07 |
| 01/16/2020 | 05:30 | 2.42 21:40 | 3.82 | 3.26 | 05:25 | 1.08 21:40 | 1.64 | 1.43 | 05:25 | 0.099 21:40 | 0.289 | 0.208 | 0.208 | 0.66 |
| 01/17/2020 | 05:25 | 2.58 09:20 | 4.05 | 3.27 | 05:15 | 1.15 09:30 | 1.72 | 1.44 | 05:15 | 0.116 09:30 | 0.329 | 0.209 | 0.209 | |
| 01/18/2020 | 05:25 | 2.31 11:10 | 3.83 | 3.14 | 05:25 | 1.02 11:25 | 1.63 | 1.38 | 05:25 | 0.087 11:45 | 0.287 | 0.192 | 0.192 | |
| 01/19/2020 | 05:25 | 2.28 12:55 | 3.75 | 3.11 | 05:15 | 0.98 12:30 | 1.60 | 1.37 | 05:15 | 0.083 12:55 | 0.274 | 0.188 | 0.188 | |
| 01/20/2020 | 05:30 | 2.23 12:00 | 3.81 | 3.16 | 04:30 | 1.00 13:05 | 1.65 | 1.38 | 05:30 | 0.081 13:05 | 0.289 | 0.195 | 0.195 | |
| 01/21/2020 | 04:40 | 2.14 09:00 | 3.72 | 2.87 | 04:40 | 0.95 09:05 | 1.60 | 1.28 | 04:40 | 0.073 08:55 | 0.272 | 0.155 | 0.155 | |
| 01/22/2020 | 04:25 | 2.11 21:30 | 3.63 | 2.93 | 04:55 | 0.95 09:10 | 1.71 | 1.30 | 05:20 | 0.071 09:10 | 0.278 | 0.165 | 0.165 | 0.03 |
| 01/23/2020 | 04:20 | 2.57 09:00 | 3.80 | 3.28 | 04:50 | 1.15 08:55 | 1.71 | 1.44 | 04:50 | 0.116 08:55 | 0.301 | 0.209 | 0.209 | |
| 01/24/2020 | 05:00 | 2.84 09:05 | 4.18 | 3.62 | 05:15 | 1.27 09:05 | 1.76 | 1.55 | 05:15 | 0.148 09:05 | 0.355 | 0.259 | 0.259 | |
| 01/25/2020 | 05:05 | 3.09 11:50 | 4.39 | 3.89 | 05:05 | 1.37 13:55 | 1.85 | 1.63 | 05:05 | 0.179 11:50 | 0.394 | 0.302 | 0.302 | |
| 01/26/2020 | 05:00 | 3.27 12:50 | 4.69 | 4.12 | 05:25 | 1.43 13:00 | 1.93 | 1.73 | 05:25 | 0.202 12:50 | 0.457 | 0.347 | 0.347 | 0.16 |
| 01/27/2020 | 05:10 | 3.40 08:50 | 4.98 | 4.26 | 05:10 | 1.47 09:20 | 2.02 | 1.76 | 05:10 | 0.221 09:20 | 0.509 | 0.368 | 0.368 | |
| 01/28/2020 | 04:25 | 3.53 09:10 | 5.57 | 4.53 | 02:45 | 1.50 09:10 | 2.09 | 1.82 | 04:25 | 0.239 09:10 | 0.630 | 0.418 | 0.418 | 0.01 |
| 01/29/2020 | 04:50 | 3.63 09:05 | 5.41 | 4.54 | 04:10 | 1.54 09:05 | 2.18 | 1.83 | 04:55 | 0.255 09:05 | 0.628 | 0.422 | 0.422 | |
| 01/30/2020 | 04:35 | 3.58 08:55 | 5.55 | 4.62 | 04:10 | 1.52 09:20 | 2.16 | 1.85 | 04:35 | 0.245 09:00 | 0.640 | 0.437 | 0.437 | |
| 01/31/2020 | 05:25 | 3.53 08:55 | 5.72 | 4.67 | 04:20 | 1.50 08:55 | 2.18 | 1.87 | 05:30 | 0.242 08:55 | 0.682 | 0.448 | 0.448 | |
| 02/01/2020 | 12:50 | 2.55 12:05 | 5.81 | 4.22 | 12:50 | 1.17 11:15 | 2.22 | 1.72 | 12:50 | 0.115 12:05 | 0.706 | 0.359 | 0.359 | |
| 02/02/2020 | 05:00 | 2.76 12:55 | 4.30 | 3.71 | 05:50 | 1.15 12:30 | 1.80 | 1.55 | 05:50 | 0.127 12:30 | 0.377 | 0.271 | 0.271 | |
| 02/03/2020 | 04:35 | 3.18 08:55 | 4.30 | 3.82 | 05:15 | 1.40 08:45 | 1.80 | 1.62 | 04:35 | 0.194 08:50 | 0.375 | 0.290 | 0.290 | |
| 02/04/2020 | 04:35 | 3.25 08:50 | 4.45 | 3.93 | 04:35 | 1.42 08:40 | 1.85 | 1.65 | 04:35 | 0.199 08:40 | 0.404 | 0.309 | 0.309 | |
| 02/05/2020 | 04:40 | 3.27 09:05 | 4.53 | 3.96 | 05:20 | 1.40 09:00 | 1.83 | 1.64 | 04:40 | 0.199 09:00 | 0.412 | 0.309 | 0.309 | |
| 02/06/2020 | 04:20 | 3.24 08:45 | 4.50 | 3.96 | 04:20 | 1.39 08:40 | 1.91 | 1.64 | 04:20 | 0.194 08:40 | 0.426 | 0.310 | 0.310 | |
| 02/07/2020 | 03:50 | 3.25 09:00 | 4.58 | 3.97 | 03:55 | 1.35 09:05 | 1.83 | 1.61 | 03:55 | 0.189 09:05 | 0.418 | 0.304 | 0.304 | |
| 02/08/2020 | 06:10 | 3.25 13:30 | 4.48 | 4.03 | 06:10 | 1.44 13:20 | 1.87 | 1.69 | 06:10 | 0.202 13:20 | 0.412 | 0.328 | 0.328 | |
| 02/09/2020 | 06:00 | 3.13 12:30 | 4.65 | 4.07 | 06:25 | 1.36 12:35 | 1.93 | 1.71 | 06:25 | 0.182 12:35 | 0.452 | 0.338 | 0.338 | |
| 02/10/2020 | 05:00 | 3.07 08:15 | 5.65 | 4.03 | 05:00 | 1.37 08:15 | 2.24 | 1.69 | 05:00 | 0.177 08:15 | 0.688 | 0.328 | 0.328 | |
| 02/11/2020 | 04:10 | 2.98 08:40 | 4.80 | 4.01 | 04:40 | 1.27 08:55 | 1.99 | 1.69 | 04:40 | 0.157 08:55 | 0.482 | 0.329 | 0.329 | |
| 02/12/2020 | 04:50 | 3.17 08:40 | 4.84 | 4.07 | 05:20 | 1.39 08:50 | 1.96 | 1.70 | 04:55 | 0.188 08:50 | 0.483 | 0.335 | 0.335 | |
| 02/13/2020 | 04:30 | 3.12 08:40 | 4.81 | 3.95 | 04:25 | 1.32 09:00 | 1.95 | 1.67 | 04:35 | 0.176 09:00 | 0.472 | 0.315 | 0.315 | |
| 02/14/2020 | 04:40 | 3.00 08:55 | 4.67 | 3.80 | 03:55 | 1.27 09:25 | 1.89 | 1.62 | 04:40 | 0.159 08:55 | 0.442 | 0.289 | 0.289 | |
| 02/15/2020 | 05:50 | 2.83 11:30 | 4.28 | 3.54 | 04:50 | 1.29 11:20 | 1.80 | 1.56 | 05:40 | 0.150 11:20 | 0.373 | 0.251 | 0.251 | |
| 02/16/2020 | 04:55 | 2.73 11:35 | 3.61 | 3.19 | 04:55 | 1.24 11:00 | 1.59 | 1.44 | 04:55 | 0.135 12:20 | 0.259 | 0.198 | 0.198 | |
| 02/17/2020 | 04:55 | 2.42 10:05 | 3.66 | 3.10 | 05:00 | 1.05 10:00 | 1.62 | 1.40 | 05:00 | 0.096 10:00 | 0.268 | 0.188 | 0.188 | |
| 02/18/2020 | 04:30 | 2.45 09:00 | 3.64 | 3.11 | 04:25 | 1.10 09:50 | 1.62 | 1.41 | 04:25 | 0.103 08:55 | 0.267 | 0.190 | 0.190 | |
| 02/19/2020 | 04:55 | 2.54 09:10 | 3.69 | 3.18 | 05:40 | 1.17 09:35 | 1.62 | 1.44 | 05:05 | 0.116 09:10 | 0.273 | 0.199 | 0.199 | |
| 02/20/2020 | 05:10 | 2.62 10:10 | 3.89 | 3.31 | 03:50 | 1.19 10:10 | 1.69 | 1.49 | 03:50 | 0.124 10:10 | 0.308 | 0.218 | 0.218 | |
| 02/21/2020 | 04:40 | 2.67 09:40 | 4.02 | 3.32 | 05:05 | 1.22 09:35 | 1.75 | 1.49 | 04:55 | 0.130 09:35 | 0.332 | 0.220 | 0.220 | |
| 02/22/2020 | 05:30 | 2.62 11:30 | 3.89 | 3.37 | 04:45 | 1.18 11:30 | 1.70 | 1.50 | 04:45 | 0.123 11:30 | 0.308 | 0.227 | 0.227 | |
| 02/23/2020 | 05:40 | 2.60 12:40 | 4.05 | 3.45 | 06:05 | 1.20 12:35 | 1.72 | 1.53 | 06:05 | 0.123 12:35 | 0.330 | 0.240 | 0.240 | |
| 02/24/2020 | 05:00 | 2.68 08:45 | 4.05 | 3.40 | 05:05 | 1.24 08:35 | 1.73 | 1.52 | 04:55 | 0.132 08:35 | 0.331 | 0.232 | 0.232 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:55 | 2.69 | 08:50 | 4.14 | 3.41 | 05:20 | 1.20 | 08:50 | 1.79 | 1.52 | 05:20 | 0.129 | 08:50 | 0.356 | 0.233 | 0.233 | |
| 02/26/2020 | 04:50 | 2.56 | 08:30 | 3.94 | 3.22 | 04:30 | 1.18 | 08:40 | 1.69 | 1.45 | 04:50 | 0.118 | 08:40 | 0.312 | 0.205 | 0.205 | |
| 02/27/2020 | 04:55 | 2.38 | 08:30 | 3.75 | 3.15 | 04:55 | 1.10 | 08:40 | 1.66 | 1.42 | 04:55 | 0.098 | 08:40 | 0.287 | 0.195 | 0.195 | |
| 02/28/2020 | 04:55 | 2.43 | 08:55 | 3.71 | 3.09 | 04:25 | 1.09 | 08:55 | 1.63 | 1.38 | 04:55 | 0.101 | 08:55 | 0.277 | 0.184 | 0.184 | |
| 02/29/2020 | 05:35 | 2.41 | 11:10 | 3.72 | 3.17 | 05:35 | 1.06 | 13:15 | 1.64 | 1.41 | 05:35 | 0.097 | 11:10 | 0.278 | 0.196 | 0.196 | |
| 03/01/2020 | 05:45 | 2.27 | 11:15 | 3.47 | 2.79 | 05:40 | 1.00 | 11:10 | 1.55 | 1.27 | 05:40 | 0.084 | 11:15 | 0.238 | 0.145 | 0.145 | |
| 03/02/2020 | 05:05 | 1.78 | 08:40 | 2.97 | 2.36 | 04:45 | 0.77 | 08:40 | 1.39 | 1.07 | 04:50 | 0.045 | 08:40 | 0.171 | 0.098 | 0.098 | |
| 03/03/2020 | 04:30 | 1.69 | 08:55 | 2.80 | 2.00 | 04:50 | 0.70 | 08:55 | 1.32 | 0.88 | 04:30 | 0.039 | 08:55 | 0.149 | 0.063 | 0.063 | |
| 03/04/2020 | 05:30 | 1.46 | 08:50 | 2.30 | 1.87 | 03:35 | 0.56 | 09:10 | 1.07 | 0.81 | 05:30 | 0.025 | 08:55 | 0.091 | 0.053 | 0.053 | |
| 03/05/2020 | 05:30 | 1.38 | 21:00 | 2.29 | 1.83 | 04:35 | 0.52 | 09:10 | 1.06 | 0.81 | 05:15 | 0.022 | 21:00 | 0.087 | 0.051 | 0.051 | |
| 03/06/2020 | 04:45 | 1.31 | 09:00 | 2.19 | 1.82 | 04:00 | 0.49 | 08:10 | 1.09 | 0.81 | 04:45 | 0.019 | 08:20 | 0.084 | 0.051 | 0.051 | |
| 03/07/2020 | 05:50 | 1.21 | 13:40 | 1.92 | 1.67 | 05:00 | 0.45 | 13:45 | 0.88 | 0.69 | 05:50 | 0.015 | 13:45 | 0.058 | 0.038 | 0.038 | |
| 03/08/2020 | 06:00 | 1.37 | 10:30 | 1.89 | 1.51 | 05:20 | 0.42 | 08:50 | 0.83 | 0.58 | 05:20 | 0.017 | 10:30 | 0.050 | 0.027 | 0.027 | |
| 03/09/2020 | 06:35 | 1.23 | 21:50 | 5.37 | 1.75 | 04:30 | 0.39 | 21:50 | 2.13 | 0.70 | 05:55 | 0.014 | 21:50 | 0.608 | 0.060 | 0.060 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 31.478 | 4.90 |
| Avg | 3.67 | 1.53 | 0.274 | |

## Site Commentary

### Site Information

| MIL_0649 | |
|---|---|
| Pipe Dimensions | 21.5 |
| Silt Level | 0.00" |

### Overview

Site MIL_0649 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed upstream of site MIL_1790 and downstream of the combined flows of sites MIL_0386 and MIL_2840. A review of balancing with the combined flows of MIL_0386 and MIL_2840 into MIL_0649 and MIL_2491 shows a net flow between the sites of 0.426 MGD.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 8.66 | 1.24 | 0.777 |
| Minimum | 6.64 | 0.82 | 0.386 |
| Maximum | 11.63 | 1.64 | 1.448 |
| Time of Minimum | 3/1/2020 3:15 AM | 2/1/2020 11:40 PM | 2/17/2020 1:55 AM |
| Time of Maximum | 2/18/2020 11:55 AM | 12/5/2019 2:35 PM | 1/9/2020 10:45 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

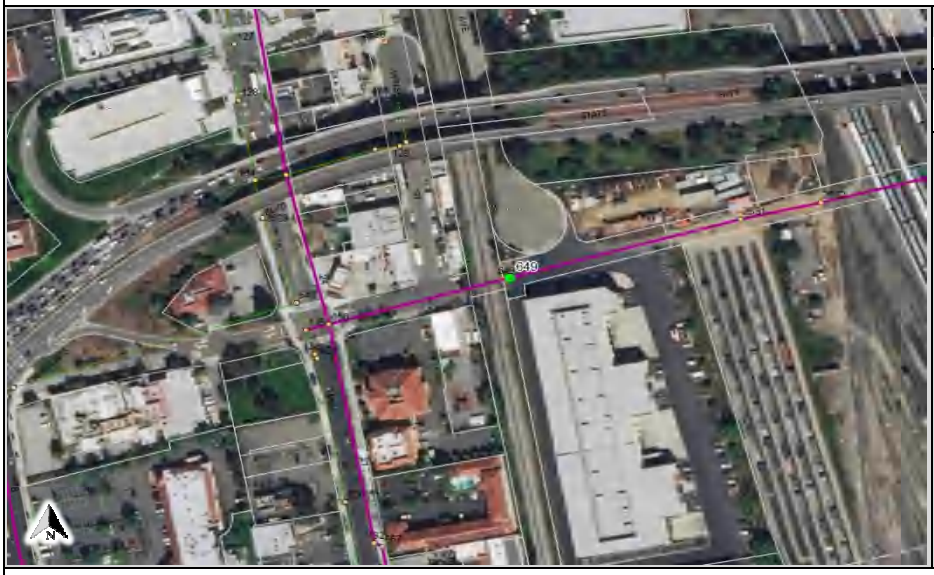
***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_0649

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | 79 Railroad Avenue | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Drive | Latitude: | 37.430840° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.905657 | 21.50" x 21.50" | Circular |




| Manhole # | System Characteristics |
|---|---|
| 649 | Residential/Commercial |
| Access | Traffic |
| Drive | Light |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 10:22:26 AM | 21.50" x 21.50" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 10.50 | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.61 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

Smooth deep flow with moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 10' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |

# SCATTERGRAPH REPORT

MIL_0649

**Flow Monitor**

**MIL_0649**

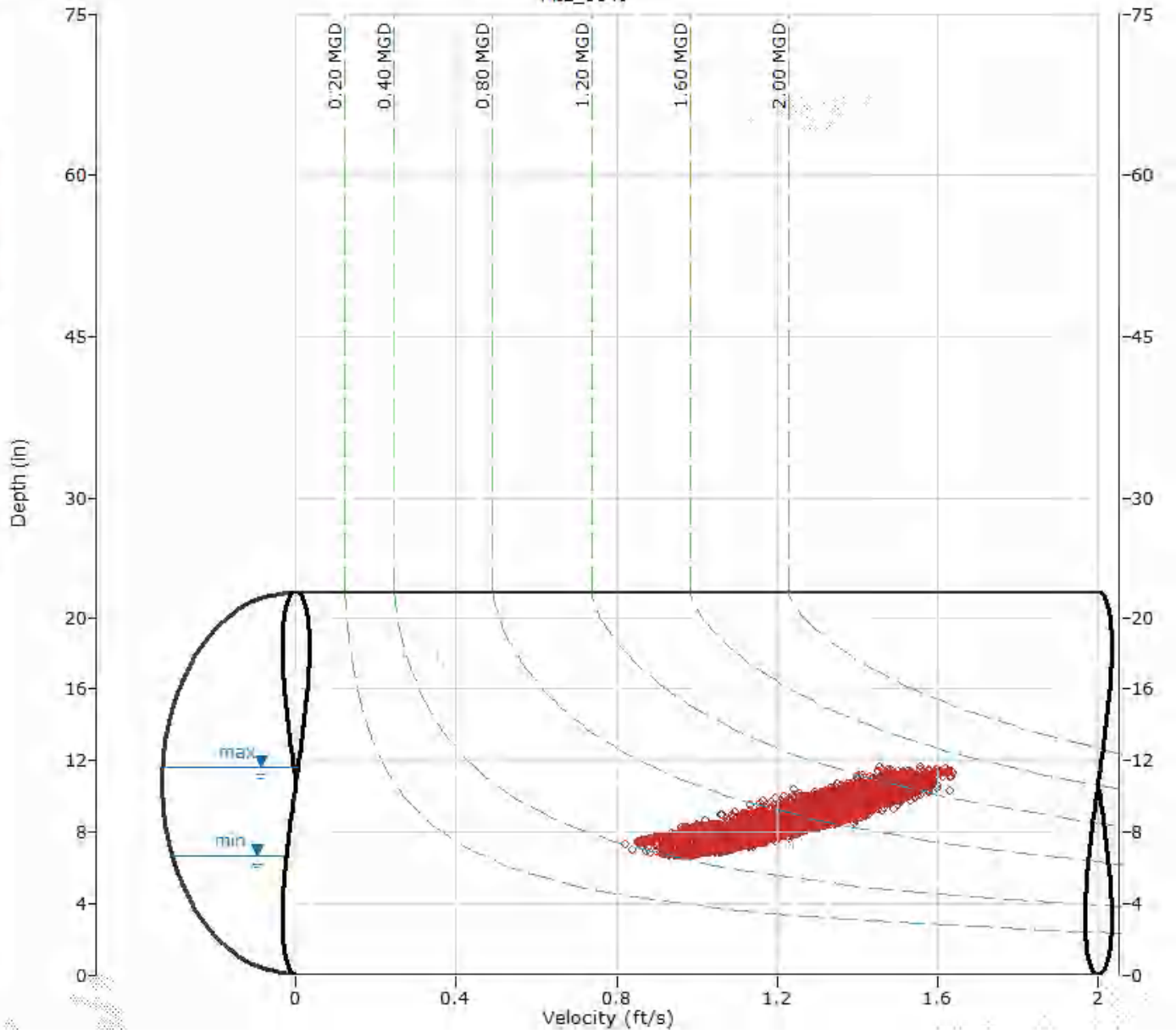
Pipe Height
21.50 in

**Report Period**

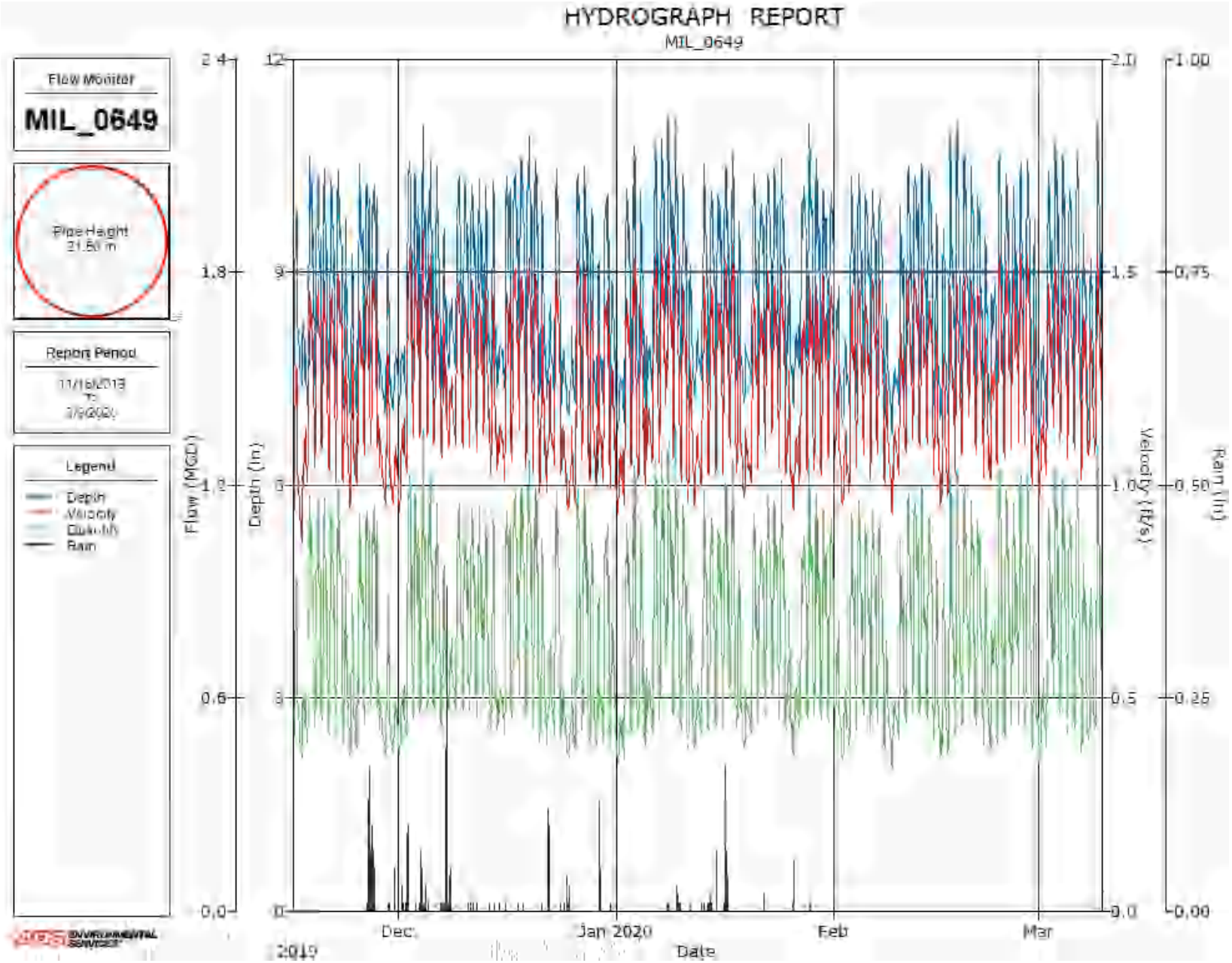
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0649
Flow Monitor
MIL_0649
Pipe Height
21.60 in
Report Period
11/16/2019
To
2/9/2020
Legend
Depth
Velocity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
2.4
1.8
1.2
0.6
0.0
12
9
6
3
0
2.0
1.5
1.0
0.5
0.0
1.00
0.75
0.50
0.25
0.00
Dec.
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0649, Pipe Height: 21.50 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 04:20 | 7.62 | 12:25 | 10.26 | 8.49 | 04:45 | 0.93 | 12:30 | 1.34 | 1.07 | 04:00 | 0.480 | 12:30 | 1.024 | 0.648 | 0.648 | |
| 11/17/2019 | 23:55 | 7.22 | 15:05 | 8.57 | 7.75 | 06:20 | 0.85 | 15:05 | 1.24 | 0.99 | 06:20 | 0.423 | 15:05 | 0.748 | 0.527 | 0.527 | |
| 11/18/2019 | 00:55 | 7.00 | 10:15 | 11.13 | 9.05 | 03:35 | 1.00 | 10:15 | 1.54 | 1.27 | 00:55 | 0.462 | 10:15 | 1.311 | 0.848 | 0.848 | |
| 11/19/2019 | 04:50 | 7.37 | 15:50 | 10.61 | 9.09 | 05:15 | 1.01 | 15:50 | 1.55 | 1.30 | 05:15 | 0.504 | 15:50 | 1.244 | 0.865 | 0.865 | |
| 11/20/2019 | 03:30 | 7.27 | 12:30 | 10.87 | 8.85 | 03:30 | 1.06 | 12:30 | 1.54 | 1.28 | 03:30 | 0.514 | 12:30 | 1.273 | 0.823 | 0.823 | |
| 11/21/2019 | 04:20 | 7.18 | 11:05 | 10.80 | 9.00 | 04:25 | 1.03 | 11:00 | 1.53 | 1.30 | 04:20 | 0.489 | 11:00 | 1.251 | 0.854 | 0.854 | |
| 11/22/2019 | 04:40 | 7.12 | 11:40 | 11.16 | 9.10 | 04:40 | 0.99 | 11:35 | 1.63 | 1.32 | 04:40 | 0.464 | 11:35 | 1.382 | 0.879 | 0.879 | |
| 11/23/2019 | 05:05 | 7.01 | 12:10 | 9.90 | 8.01 | 04:55 | 1.00 | 12:45 | 1.41 | 1.13 | 05:00 | 0.459 | 12:10 | 1.014 | 0.633 | 0.633 | |
| 11/24/2019 | 03:25 | 6.97 | 13:00 | 9.71 | 7.79 | 03:20 | 0.93 | 12:05 | 1.39 | 1.09 | 03:25 | 0.425 | 13:00 | 0.984 | 0.587 | 0.587 | |
| 11/25/2019 | 03:50 | 6.96 | 12:35 | 10.77 | 8.89 | 02:10 | 0.97 | 12:30 | 1.45 | 1.24 | 02:10 | 0.443 | 12:30 | 1.184 | 0.803 | 0.803 | |
| 11/26/2019 | 04:20 | 7.31 | 09:40 | 10.62 | 9.16 | 04:10 | 1.05 | 10:10 | 1.52 | 1.32 | 04:20 | 0.518 | 10:10 | 1.212 | 0.883 | 0.883 | 0.36 |
| 11/27/2019 | 03:20 | 7.70 | 10:05 | 10.48 | 9.23 | 03:15 | 1.09 | 13:05 | 1.54 | 1.34 | 03:15 | 0.569 | 13:10 | 1.198 | 0.906 | 0.906 | 0.63 |
| 11/28/2019 | 20:20 | 7.16 | 00:00 | 8.75 | 7.60 | 23:50 | 0.90 | 00:00 | 1.26 | 1.07 | 23:50 | 0.433 | 00:00 | 0.787 | 0.555 | 0.555 | |
| 11/29/2019 | 04:20 | 7.00 | 14:10 | 9.99 | 7.88 | 22:45 | 0.92 | 13:55 | 1.42 | 1.10 | 04:15 | 0.435 | 09:15 | 1.034 | 0.603 | 0.603 | 0.02 |
| 11/30/2019 | 06:30 | 6.97 | 17:45 | 8.05 | 7.47 | 06:25 | 0.93 | 17:35 | 1.13 | 1.02 | 06:25 | 0.427 | 17:45 | 0.627 | 0.513 | 0.513 | 0.10 |
| 12/01/2019 | 06:05 | 7.08 | 21:35 | 8.27 | 7.55 | 06:05 | 0.91 | 21:40 | 1.20 | 1.05 | 06:05 | 0.427 | 21:40 | 0.695 | 0.537 | 0.537 | 0.06 |
| 12/02/2019 | 04:15 | 7.16 | 13:35 | 10.70 | 9.14 | 04:10 | 1.02 | 10:40 | 1.63 | 1.34 | 04:10 | 0.483 | 10:40 | 1.255 | 0.905 | 0.905 | 0.30 |
| 12/03/2019 | 04:20 | 7.30 | 10:05 | 10.72 | 8.96 | 04:10 | 1.10 | 10:10 | 1.56 | 1.34 | 04:10 | 0.536 | 10:10 | 1.261 | 0.870 | 0.870 | 0.01 |
| 12/04/2019 | 02:45 | 7.45 | 12:15 | 11.41 | 9.35 | 02:20 | 1.11 | 12:10 | 1.64 | 1.39 | 02:45 | 0.557 | 12:10 | 1.436 | 0.957 | 0.957 | 0.39 |
| 12/05/2019 | 03:30 | 7.61 | 14:40 | 11.30 | 9.20 | 03:35 | 1.10 | 14:35 | 1.64 | 1.35 | 03:35 | 0.569 | 14:35 | 1.418 | 0.908 | 0.908 | 0.01 |
| 12/06/2019 | 02:15 | 7.60 | 12:40 | 10.59 | 9.00 | 01:40 | 1.02 | 17:50 | 1.48 | 1.29 | 01:40 | 0.536 | 12:55 | 1.173 | 0.843 | 0.843 | 0.01 |
| 12/07/2019 | 06:00 | 7.33 | 11:50 | 9.77 | 8.30 | 06:05 | 1.05 | 11:45 | 1.49 | 1.21 | 06:05 | 0.516 | 11:50 | 1.068 | 0.710 | 0.710 | 0.67 |
| 12/08/2019 | 04:15 | 7.64 | 07:45 | 9.62 | 8.11 | 05:40 | 1.08 | 07:45 | 1.43 | 1.17 | 04:15 | 0.562 | 07:45 | 1.008 | 0.659 | 0.659 | 0.20 |
| 12/09/2019 | 04:40 | 7.53 | 16:50 | 10.46 | 9.15 | 04:35 | 1.08 | 13:35 | 1.53 | 1.32 | 04:35 | 0.549 | 13:35 | 1.179 | 0.887 | 0.887 | |
| 12/10/2019 | 05:10 | 7.57 | 12:00 | 10.57 | 9.13 | 04:00 | 1.08 | 10:35 | 1.49 | 1.31 | 05:00 | 0.557 | 11:55 | 1.179 | 0.872 | 0.872 | |
| 12/11/2019 | 04:20 | 7.58 | 13:20 | 10.40 | 9.07 | 04:05 | 1.08 | 12:35 | 1.51 | 1.31 | 04:00 | 0.554 | 13:20 | 1.173 | 0.867 | 0.867 | 0.03 |
| 12/12/2019 | 04:30 | 7.49 | 12:45 | 10.46 | 9.06 | 04:20 | 1.07 | 13:25 | 1.50 | 1.31 | 04:20 | 0.539 | 12:40 | 1.173 | 0.865 | 0.865 | 0.01 |
| 12/13/2019 | 01:50 | 7.61 | 12:20 | 10.35 | 8.74 | 01:55 | 1.09 | 12:20 | 1.52 | 1.27 | 01:55 | 0.564 | 12:20 | 1.180 | 0.796 | 0.796 | 0.01 |
| 12/14/2019 | 04:10 | 7.39 | 13:25 | 10.37 | 8.35 | 03:45 | 1.01 | 13:50 | 1.48 | 1.19 | 03:45 | 0.506 | 13:25 | 1.129 | 0.707 | 0.707 | 0.01 |
| 12/15/2019 | 03:10 | 7.25 | 06:55 | 8.09 | 7.78 | 09:10 | 1.00 | 06:50 | 1.17 | 1.10 | 06:20 | 0.487 | 06:50 | 0.655 | 0.584 | 0.584 | 0.01 |
| 12/16/2019 | 03:45 | 7.35 | 08:25 | 10.48 | 9.18 | 03:40 | 1.00 | 12:55 | 1.49 | 1.29 | 03:45 | 0.493 | 12:50 | 1.171 | 0.875 | 0.875 | 0.01 |
| 12/17/2019 | 05:15 | 7.52 | 16:55 | 10.65 | 9.38 | 03:55 | 1.04 | 16:50 | 1.56 | 1.34 | 05:15 | 0.528 | 16:50 | 1.256 | 0.934 | 0.934 | 0.01 |
| 12/18/2019 | 04:20 | 7.59 | 12:50 | 10.77 | 9.53 | 04:20 | 1.07 | 12:45 | 1.51 | 1.36 | 04:20 | 0.549 | 12:45 | 1.232 | 0.953 | 0.953 | 0.01 |
| 12/19/2019 | 04:35 | 7.56 | 13:25 | 11.00 | 9.49 | 04:35 | 1.02 | 13:05 | 1.56 | 1.34 | 04:35 | 0.522 | 13:05 | 1.299 | 0.945 | 0.945 | |
| 12/20/2019 | 05:05 | 7.32 | 14:20 | 10.74 | 9.30 | 05:00 | 1.00 | 14:20 | 1.53 | 1.32 | 05:00 | 0.489 | 14:20 | 1.247 | 0.902 | 0.902 | |
| 12/21/2019 | 04:25 | 7.24 | 11:25 | 10.10 | 8.35 | 05:40 | 0.97 | 11:20 | 1.46 | 1.16 | 04:30 | 0.472 | 11:20 | 1.095 | 0.688 | 0.688 | 0.01 |
| 12/22/2019 | 03:25 | 7.15 | 14:35 | 8.70 | 7.74 | 03:25 | 0.97 | 14:35 | 1.29 | 1.10 | 03:25 | 0.457 | 14:35 | 0.795 | 0.584 | 0.584 | 0.41 |
| 12/23/2019 | 04:40 | 7.12 | 11:35 | 10.73 | 9.01 | 04:05 | 1.04 | 11:35 | 1.53 | 1.31 | 04:45 | 0.491 | 11:35 | 1.244 | 0.867 | 0.867 | |
| 12/24/2019 | 03:10 | 7.11 | 00:10 | 8.79 | 7.55 | 18:30 | 0.96 | 00:10 | 1.31 | 1.07 | 23:40 | 0.478 | 00:10 | 0.821 | 0.548 | 0.548 | 0.02 |
| 12/25/2019 | 06:00 | 6.95 | 16:10 | 8.45 | 7.42 | 01:20 | 0.93 | 16:10 | 1.19 | 1.02 | 05:45 | 0.426 | 16:10 | 0.706 | 0.509 | 0.509 | 0.08 |
| 12/26/2019 | 03:10 | 7.13 | 13:20 | 10.47 | 8.91 | 01:20 | 0.90 | 13:30 | 1.60 | 1.28 | 01:55 | 0.445 | 13:30 | 1.254 | 0.842 | 0.842 | |
| 12/27/2019 | 02:50 | 7.15 | 11:00 | 10.96 | 9.02 | 02:50 | 1.04 | 10:50 | 1.56 | 1.32 | 02:50 | 0.491 | 11:00 | 1.290 | 0.873 | 0.873 | |
| 12/28/2019 | 06:15 | 7.08 | 13:50 | 10.07 | 8.28 | 06:10 | 0.99 | 14:15 | 1.47 | 1.20 | 06:10 | 0.466 | 14:15 | 1.097 | 0.708 | 0.708 | |
| 12/29/2019 | 07:30 | 7.01 | 09:20 | 9.47 | 7.84 | 01:55 | 0.94 | 10:10 | 1.37 | 1.12 | 01:55 | 0.451 | 09:20 | 0.945 | 0.609 | 0.609 | 0.22 |
| 12/30/2019 | 03:35 | 7.11 | 18:55 | 10.29 | 8.95 | 02:50 | 1.00 | 18:40 | 1.58 | 1.28 | 03:00 | 0.473 | 18:40 | 1.199 | 0.839 | 0.839 | |
| 12/31/2019 | 05:10 | 6.91 | 08:50 | 9.14 | 7.96 | 05:10 | 0.97 | 08:50 | 1.34 | 1.14 | 05:10 | 0.441 | 08:50 | 0.885 | 0.631 | 0.631 | 0.01 |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 01/01/2020 | 06:35 | 6.75 | 14:05 | 7.61 | 7.22 | 06:10 | 0.89 | 02:20 | 1.10 | 1.02 | 06:10 | 0.393 | 13:55 | 0.564 | 0.489 | 0.489 | |
| 01/02/2020 | 03:35 | 6.84 | 07:40 | 10.59 | 8.94 | 04:15 | 0.87 | 07:35 | 1.58 | 1.26 | 04:15 | 0.396 | 07:35 | 1.263 | 0.828 | 0.828 | |
| 01/03/2020 | 03:05 | 7.23 | 15:20 | 10.97 | 8.90 | 22:35 | 0.94 | 15:15 | 1.57 | 1.28 | 05:05 | 0.482 | 15:15 | 1.297 | 0.835 | 0.835 | |
| 01/04/2020 | 03:30 | 7.42 | 11:35 | 10.41 | 8.44 | 03:30 | 1.01 | 11:10 | 1.58 | 1.21 | 03:30 | 0.503 | 11:10 | 1.209 | 0.729 | 0.729 | |
| 01/05/2020 | 03:35 | 7.06 | 07:20 | 8.31 | 7.67 | 03:35 | 0.98 | 07:15 | 1.27 | 1.12 | 03:35 | 0.457 | 07:15 | 0.736 | 0.585 | 0.585 | |
| 01/06/2020 | 04:35 | 7.15 | 13:10 | 11.00 | 9.07 | 01:25 | 1.03 | 12:20 | 1.59 | 1.31 | 04:35 | 0.493 | 15:35 | 1.322 | 0.876 | 0.876 | |
| 01/07/2020 | 04:00 | 7.48 | 12:40 | 11.07 | 9.28 | 03:50 | 1.03 | 12:35 | 1.60 | 1.32 | 03:55 | 0.522 | 12:35 | 1.349 | 0.907 | 0.907 | |
| 01/08/2020 | 04:30 | 7.94 | 12:35 | 11.43 | 9.75 | 00:55 | 1.10 | 12:35 | 1.60 | 1.38 | 04:30 | 0.617 | 12:35 | 1.405 | 1.002 | 1.002 | 0.02 |
| 01/09/2020 | 03:50 | 7.55 | 10:45 | 11.57 | 9.35 | 03:45 | 1.04 | 10:50 | 1.62 | 1.33 | 03:45 | 0.531 | 10:45 | 1.448 | 0.919 | 0.919 | 0.18 |
| 01/10/2020 | 05:15 | 7.50 | 12:35 | 10.49 | 9.02 | 05:40 | 1.00 | 12:30 | 1.49 | 1.27 | 05:40 | 0.507 | 12:30 | 1.177 | 0.839 | 0.839 | 0.02 |
| 01/11/2020 | 06:15 | 7.15 | 13:55 | 9.43 | 8.01 | 03:25 | 0.92 | 13:55 | 1.35 | 1.12 | 03:25 | 0.438 | 13:55 | 0.925 | 0.625 | 0.625 | 0.01 |
| 01/12/2020 | 04:00 | 7.19 | 14:20 | 8.26 | 7.67 | 03:00 | 0.86 | 15:30 | 1.16 | 1.04 | 03:00 | 0.416 | 15:30 | 0.668 | 0.546 | 0.546 | |
| 01/13/2020 | 04:40 | 7.37 | 13:15 | 10.57 | 8.93 | 01:20 | 0.98 | 13:15 | 1.52 | 1.25 | 04:35 | 0.487 | 13:15 | 1.212 | 0.816 | 0.816 | 0.02 |
| 01/14/2020 | 04:55 | 7.37 | 13:10 | 10.29 | 8.99 | 04:55 | 1.01 | 15:05 | 1.50 | 1.28 | 04:55 | 0.499 | 15:15 | 1.148 | 0.839 | 0.839 | 0.11 |
| 01/15/2020 | 04:40 | 7.36 | 12:15 | 10.21 | 9.12 | 04:35 | 1.02 | 12:10 | 1.45 | 1.30 | 04:35 | 0.502 | 12:05 | 1.107 | 0.865 | 0.865 | 0.07 |
| 01/16/2020 | 04:30 | 7.39 | 14:05 | 10.85 | 9.26 | 04:10 | 1.01 | 14:05 | 1.57 | 1.33 | 04:10 | 0.505 | 14:05 | 1.293 | 0.904 | 0.904 | 0.66 |
| 01/17/2020 | 04:55 | 7.83 | 15:35 | 10.79 | 9.11 | 04:50 | 1.06 | 15:05 | 1.58 | 1.31 | 04:50 | 0.570 | 15:30 | 1.292 | 0.874 | 0.874 | |
| 01/18/2020 | 06:25 | 7.42 | 12:35 | 9.73 | 8.13 | 04:05 | 0.98 | 11:50 | 1.42 | 1.14 | 04:05 | 0.487 | 11:50 | 0.989 | 0.653 | 0.653 | |
| 01/19/2020 | 05:00 | 7.11 | 09:00 | 8.23 | 7.62 | 00:20 | 0.95 | 09:00 | 1.20 | 1.05 | 05:10 | 0.448 | 09:00 | 0.690 | 0.543 | 0.543 | |
| 01/20/2020 | 05:00 | 7.38 | 14:50 | 10.46 | 8.94 | 05:00 | 0.98 | 15:20 | 1.47 | 1.24 | 05:00 | 0.484 | 15:20 | 1.148 | 0.814 | 0.814 | |
| 01/21/2020 | 04:10 | 7.42 | 12:45 | 10.15 | 9.18 | 04:10 | 1.01 | 09:40 | 1.45 | 1.29 | 04:10 | 0.503 | 12:45 | 1.099 | 0.866 | 0.866 | |
| 01/22/2020 | 04:15 | 7.49 | 12:50 | 10.51 | 9.24 | 04:15 | 1.06 | 12:45 | 1.56 | 1.33 | 04:15 | 0.536 | 12:45 | 1.232 | 0.903 | 0.903 | 0.03 |
| 01/23/2020 | 04:20 | 7.68 | 09:05 | 10.54 | 9.36 | 03:50 | 1.10 | 15:30 | 1.49 | 1.32 | 04:20 | 0.578 | 09:05 | 1.179 | 0.910 | 0.910 | |
| 01/24/2020 | 04:55 | 7.63 | 12:40 | 10.83 | 9.25 | 04:50 | 1.03 | 11:00 | 1.56 | 1.30 | 04:50 | 0.534 | 11:15 | 1.267 | 0.887 | 0.887 | |
| 01/25/2020 | 03:30 | 7.34 | 15:05 | 9.45 | 8.02 | 20:55 | 0.93 | 15:00 | 1.33 | 1.10 | 20:55 | 0.482 | 15:05 | 0.912 | 0.611 | 0.611 | |
| 01/26/2020 | 05:20 | 7.02 | 21:40 | 8.97 | 7.69 | 08:45 | 0.92 | 21:35 | 1.26 | 1.03 | 05:20 | 0.431 | 21:40 | 0.807 | 0.543 | 0.543 | 0.16 |
| 01/27/2020 | 00:55 | 7.55 | 15:45 | 10.43 | 9.27 | 00:25 | 0.95 | 15:35 | 1.43 | 1.25 | 00:25 | 0.492 | 15:40 | 1.120 | 0.852 | 0.852 | |
| 01/28/2020 | 05:05 | 7.64 | 10:00 | 11.35 | 9.43 | 05:05 | 1.00 | 10:35 | 1.52 | 1.28 | 05:05 | 0.520 | 10:05 | 1.324 | 0.897 | 0.897 | 0.01 |
| 01/29/2020 | 04:35 | 7.60 | 09:45 | 10.80 | 9.18 | 04:35 | 1.01 | 09:40 | 1.53 | 1.26 | 04:35 | 0.520 | 09:40 | 1.250 | 0.848 | 0.848 | |
| 01/30/2020 | 02:15 | 7.68 | 11:20 | 10.28 | 9.06 | 02:10 | 1.01 | 11:15 | 1.53 | 1.28 | 02:10 | 0.529 | 11:15 | 1.176 | 0.849 | 0.849 | |
| 01/31/2020 | 05:10 | 7.40 | 12:30 | 10.35 | 9.01 | 03:55 | 1.01 | 14:20 | 1.51 | 1.30 | 03:55 | 0.512 | 12:35 | 1.150 | 0.856 | 0.856 | |
| 02/01/2020 | 03:45 | 7.26 | 14:45 | 9.12 | 7.86 | 23:40 | 0.82 | 08:45 | 1.35 | 1.13 | 23:40 | 0.399 | 14:45 | 0.878 | 0.614 | 0.614 | |
| 02/02/2020 | 02:45 | 6.88 | 15:30 | 8.12 | 7.40 | 21:05 | 0.92 | 12:25 | 1.18 | 1.03 | 06:15 | 0.425 | 12:25 | 0.663 | 0.514 | 0.514 | |
| 02/03/2020 | 02:35 | 7.10 | 10:35 | 10.44 | 8.94 | 00:55 | 0.97 | 10:30 | 1.51 | 1.26 | 02:40 | 0.462 | 10:30 | 1.182 | 0.822 | 0.822 | |
| 02/04/2020 | 04:10 | 7.26 | 13:20 | 10.51 | 8.97 | 03:55 | 1.02 | 13:00 | 1.53 | 1.28 | 04:20 | 0.498 | 13:00 | 1.203 | 0.840 | 0.840 | |
| 02/05/2020 | 04:20 | 7.46 | 10:00 | 10.20 | 9.12 | 04:30 | 1.03 | 09:35 | 1.48 | 1.30 | 04:30 | 0.521 | 09:35 | 1.121 | 0.863 | 0.863 | |
| 02/06/2020 | 04:50 | 7.38 | 13:50 | 10.35 | 9.07 | 04:50 | 0.99 | 13:45 | 1.55 | 1.30 | 04:50 | 0.492 | 13:45 | 1.202 | 0.863 | 0.863 | |
| 02/07/2020 | 02:25 | 7.30 | 11:00 | 10.23 | 8.93 | 02:20 | 1.05 | 10:55 | 1.55 | 1.30 | 02:20 | 0.512 | 10:55 | 1.181 | 0.842 | 0.842 | |
| 02/08/2020 | 04:05 | 6.92 | 11:30 | 8.67 | 7.59 | 22:20 | 0.95 | 11:35 | 1.28 | 1.10 | 04:05 | 0.452 | 11:35 | 0.789 | 0.569 | 0.569 | |
| 02/09/2020 | 04:35 | 6.70 | 13:35 | 7.72 | 7.29 | 05:20 | 0.91 | 11:55 | 1.16 | 1.05 | 05:05 | 0.398 | 11:55 | 0.606 | 0.513 | 0.513 | |
| 02/10/2020 | 04:30 | 7.08 | 08:10 | 10.11 | 8.52 | 00:45 | 0.92 | 08:10 | 1.46 | 1.21 | 00:50 | 0.462 | 08:10 | 1.095 | 0.739 | 0.739 | |
| 02/11/2020 | 04:30 | 7.26 | 13:00 | 10.71 | 9.08 | 04:10 | 1.05 | 13:05 | 1.54 | 1.31 | 04:30 | 0.519 | 13:05 | 1.248 | 0.868 | 0.868 | |
| 02/12/2020 | 04:30 | 7.23 | 12:05 | 10.47 | 9.29 | 04:25 | 1.06 | 09:55 | 1.53 | 1.34 | 04:25 | 0.510 | 12:05 | 1.199 | 0.914 | 0.914 | |
| 02/13/2020 | 02:15 | 7.42 | 10:40 | 10.69 | 9.06 | 02:15 | 1.07 | 10:30 | 1.55 | 1.31 | 02:15 | 0.535 | 10:35 | 1.254 | 0.869 | 0.869 | |
| 02/14/2020 | 04:35 | 7.35 | 13:10 | 10.56 | 9.17 | 05:05 | 1.08 | 10:35 | 1.47 | 1.31 | 05:05 | 0.536 | 13:10 | 1.165 | 0.879 | 0.879 | |
| 02/15/2020 | 03:25 | 6.97 | 11:50 | 10.38 | 8.15 | 02:10 | 0.90 | 11:45 | 1.44 | 1.16 | 02:10 | 0.432 | 11:45 | 1.117 | 0.669 | 0.669 | |
| 02/16/2020 | 02:15 | 6.86 | 12:30 | 10.02 | 7.96 | 04:30 | 0.88 | 12:35 | 1.41 | 1.10 | 02:55 | 0.417 | 12:35 | 1.046 | 0.614 | 0.614 | |
| 02/17/2020 | 04:45 | 6.98 | 12:30 | 11.07 | 8.66 | 01:55 | 0.84 | 12:25 | 1.50 | 1.20 | 01:55 | 0.386 | 12:25 | 1.265 | 0.756 | 0.756 | |
| 02/18/2020 | 04:00 | 7.08 | 11:55 | 11.63 | 9.17 | 03:35 | 0.97 | 11:55 | 1.56 | 1.28 | 03:35 | 0.465 | 11:55 | 1.399 | 0.861 | 0.861 | |
| 02/19/2020 | 04:35 | 7.26 | 11:20 | 10.90 | 9.04 | 02:05 | 1.04 | 13:45 | 1.53 | 1.29 | 02:05 | 0.503 | 11:25 | 1.236 | 0.857 | 0.857 | |
| 02/20/2020 | 04:30 | 7.37 | 12:45 | 10.65 | 9.14 | 03:00 | 1.09 | 16:20 | 1.52 | 1.33 | 04:25 | 0.546 | 12:30 | 1.208 | 0.886 | 0.886 | |
| 02/21/2020 | 03:25 | 7.27 | 10:10 | 10.24 | 8.74 | 03:10 | 1.05 | 14:50 | 1.52 | 1.29 | 03:10 | 0.508 | 10:10 | 1.156 | 0.813 | 0.813 | |
| 02/22/2020 | 04:45 | 6.91 | 13:15 | 9.92 | 8.12 | 06:40 | 0.90 | 10:55 | 1.47 | 1.20 | 06:40 | 0.407 | 13:15 | 1.064 | 0.686 | 0.686 | |
| 02/23/2020 | 06:05 | 6.85 | 20:15 | 9.05 | 7.96 | 05:50 | 0.94 | 19:55 | 1.36 | 1.16 | 05:50 | 0.426 | 19:55 | 0.872 | 0.643 | 0.643 | |
| 02/24/2020 | 04:30 | 6.86 | 10:45 | 11.18 | 8.92 | 04:20 | 0.93 | 11:05 | 1.60 | 1.33 | 04:20 | 0.419 | 11:05 | 1.364 | 0.867 | 0.867 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:55 | 6.92 | 14:00 | 10.51 | 8.85 | 04:35 | 1.04 | 12:30 | 1.56 | 1.32 | 04:55 | 0.472 | 13:55 | 1.234 | 0.849 | 0.849 | |
| 02/26/2020 | 04:35 | 6.97 | 10:25 | 10.67 | 8.86 | 04:30 | 1.03 | 13:30 | 1.56 | 1.34 | 04:30 | 0.472 | 10:20 | 1.228 | 0.856 | 0.856 | |
| 02/27/2020 | 04:45 | 7.05 | 12:40 | 10.71 | 9.02 | 04:40 | 1.07 | 12:45 | 1.57 | 1.36 | 04:40 | 0.498 | 12:45 | 1.274 | 0.896 | 0.896 | |
| 02/28/2020 | 02:20 | 7.09 | 10:35 | 10.78 | 8.92 | 00:30 | 1.07 | 11:40 | 1.58 | 1.33 | 02:20 | 0.509 | 10:30 | 1.286 | 0.868 | 0.868 | |
| 02/29/2020 | 03:05 | 6.92 | 11:00 | 10.62 | 7.97 | 02:50 | 0.98 | 11:00 | 1.51 | 1.15 | 03:00 | 0.444 | 11:00 | 1.208 | 0.642 | 0.642 | |
| 03/01/2020 | 03:15 | 6.64 | 18:20 | 8.11 | 7.30 | 03:05 | 0.93 | 18:25 | 1.24 | 1.07 | 03:05 | 0.400 | 18:25 | 0.696 | 0.524 | 0.524 | |
| 03/02/2020 | 03:20 | 6.85 | 10:35 | 10.66 | 8.91 | 03:10 | 1.01 | 10:40 | 1.55 | 1.28 | 03:15 | 0.453 | 10:40 | 1.249 | 0.836 | 0.836 | |
| 03/03/2020 | 05:20 | 7.40 | 10:05 | 11.11 | 9.27 | 03:20 | 1.07 | 10:10 | 1.61 | 1.33 | 05:15 | 0.539 | 10:10 | 1.364 | 0.909 | 0.909 | |
| 03/04/2020 | 03:30 | 7.22 | 09:10 | 11.00 | 9.17 | 03:10 | 1.05 | 12:20 | 1.54 | 1.33 | 03:10 | 0.506 | 09:05 | 1.285 | 0.899 | 0.899 | |
| 03/05/2020 | 04:40 | 7.10 | 13:30 | 10.54 | 9.04 | 04:30 | 1.04 | 13:25 | 1.57 | 1.32 | 04:35 | 0.490 | 13:30 | 1.242 | 0.868 | 0.868 | |
| 03/06/2020 | 02:10 | 6.88 | 15:40 | 10.99 | 8.95 | 02:10 | 1.03 | 14:15 | 1.55 | 1.32 | 02:10 | 0.462 | 15:35 | 1.273 | 0.863 | 0.863 | |
| 03/07/2020 | 02:25 | 6.80 | 11:35 | 10.26 | 8.12 | 02:45 | 0.91 | 17:45 | 1.49 | 1.23 | 02:45 | 0.404 | 11:35 | 1.111 | 0.706 | 0.706 | |
| 03/08/2020 | 02:15 | 6.84 | 10:40 | 9.79 | 7.88 | 02:20 | 1.06 | 10:40 | 1.42 | 1.20 | 02:15 | 0.472 | 10:40 | 1.029 | 0.655 | 0.655 | |
| 03/09/2020 | 03:25 | 7.04 | 12:00 | 11.45 | 9.16 | 01:50 | 1.06 | 13:30 | 1.59 | 1.32 | 03:25 | 0.495 | 13:30 | 1.388 | 0.895 | 0.895 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 89.337 | 4.90 |
| Avg | 8.66 | 1.24 | 0.777 | |

## Site Commentary

### Site Information

| MIL_0715 | |
|---|---|
| Pipe Dimensions | 30.5 |
| Silt Level | 0.00" |

### Overview

Site MIL_0715 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location. Due to meter malfunction, data confidence is less than typical during January 27, 2020 through February 04, 2020. Also a data gap occured beginning January 05, 2020 through January 09, 2020.

This location was installed upstream of site MIL_2808. (See MIL_2808 Site Commentary for More Details)

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 7.53 | 1.46 | 0.969 |
| Minimum | 4.42 | 0.41 | 0.120 |
| Maximum | 10.33 | 2.18 | 2.069 |
| Time of Minimum | 1/30/2020 5:55 AM | 1/30/2020 5:40 AM | 1/30/2020 5:40 AM |
| Time of Maximum | 3/8/2020 1:30 PM | 3/3/2020 9:20 AM | 3/8/2020 1:45 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 96 |
| Velocity (ft/s) | 96 |
| Quantity (MGD) | 96 |

# Milpitas Temp Study 2019-20

## *Flow Monitoring Site Report*

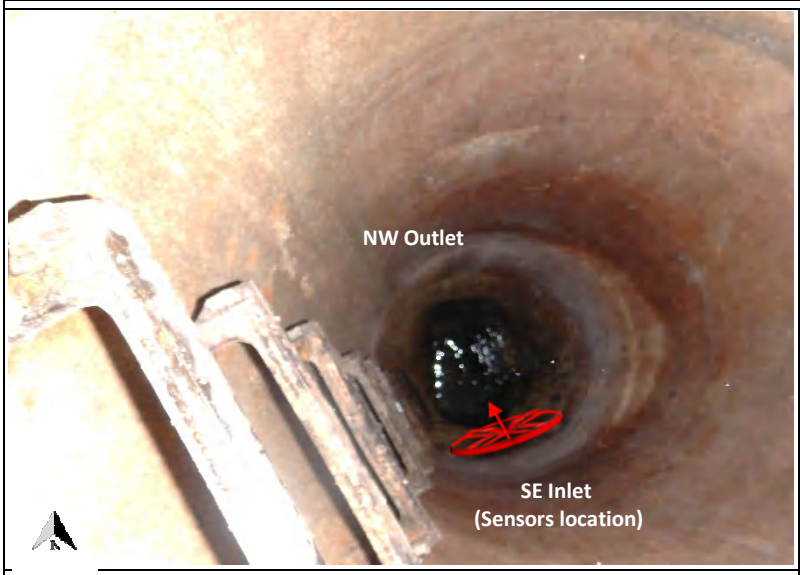
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_0715

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Barber Ln and Bellew Dr | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | In Parking Lot | Latitude: | 37.421203° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.917399 | 30.5" x 30.0" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 715 | Residential/Commercial |
| Access | Traffic |
| Drive | Light |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 5:47:56 AM | 30.5" x 30.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 5.63 | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.03 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 5' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |

# SCATTERGRAPH REPORT

MIL_0715

**Flow Monitor**

**MIL_0715**

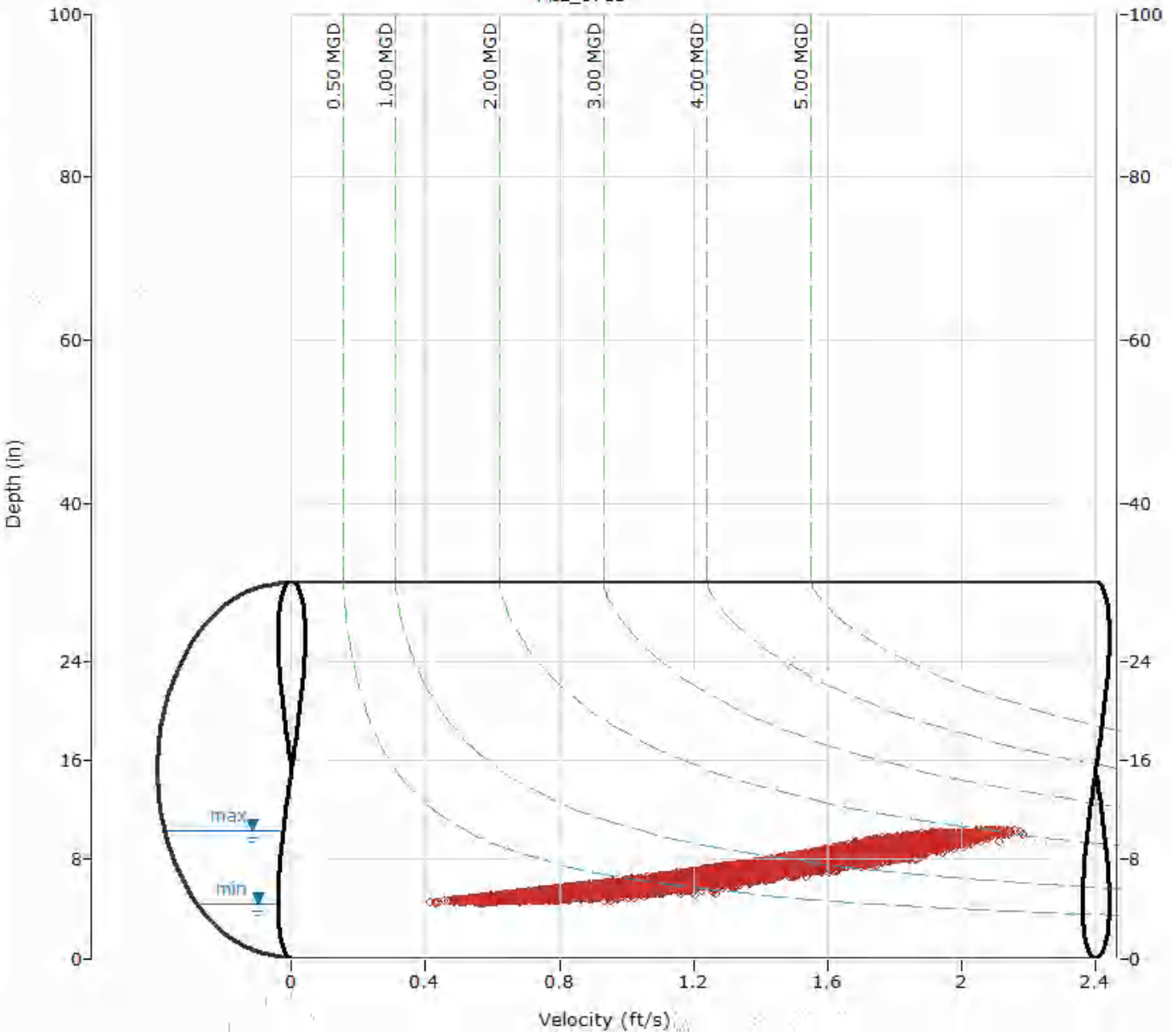
Pipe Height
30.50 in

**Report Period**

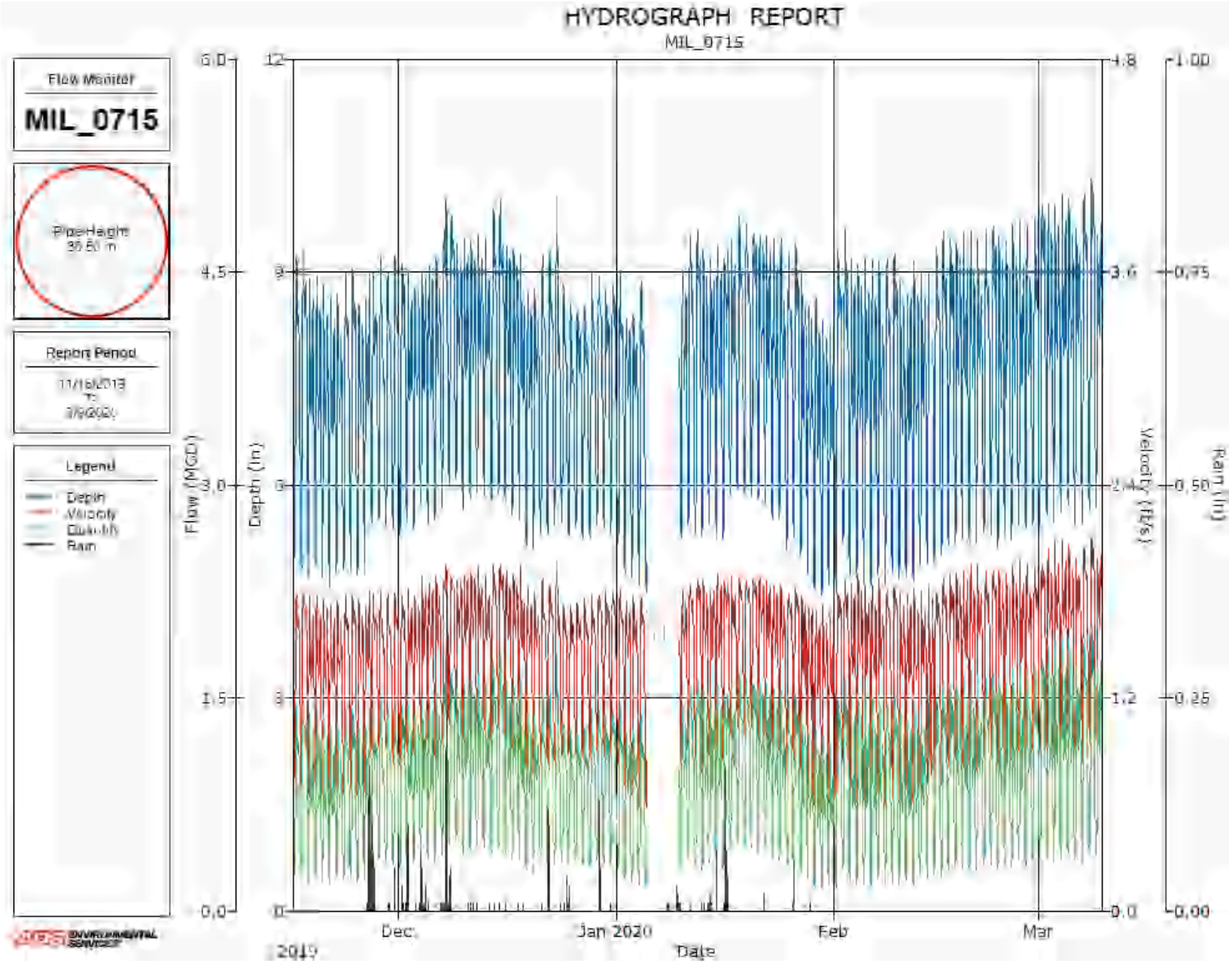
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0715
Flow Monitor
MIL_0715
Pipe Height
36.00 in
Report Period
11/16/2019
to
2/9/2020
Legend
Depth
Velocity
Flow
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
6.0
4.5
3.0
1.5
0.0
12
9
6
3
0
4.8
3.6
2.4
1.2
0.0
1.00
0.75
0.50
0.25
0.00
Dec.
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0715, Pipe Height: 30.50 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 06:25 | 4.95 | 11:55 | 9.20 | 7.43 | 05:00 | 0.66 | 13:45 | 1.88 | 1.39 | 05:00 | 0.225 | 13:45 | 1.517 | 0.912 | 0.912 | |
| 11/17/2019 | 06:10 | 4.81 | 12:15 | 9.36 | 7.49 | 04:55 | 0.58 | 11:45 | 1.87 | 1.40 | 04:55 | 0.196 | 12:40 | 1.544 | 0.939 | 0.939 | |
| 11/18/2019 | 05:25 | 4.68 | 09:20 | 8.94 | 7.09 | 03:45 | 0.61 | 09:05 | 1.84 | 1.31 | 05:25 | 0.204 | 09:10 | 1.436 | 0.802 | 0.802 | |
| 11/19/2019 | 05:55 | 4.84 | 09:30 | 8.99 | 7.09 | 05:10 | 0.56 | 08:40 | 1.87 | 1.32 | 05:10 | 0.185 | 09:35 | 1.465 | 0.803 | 0.803 | |
| 11/20/2019 | 05:15 | 4.68 | 09:20 | 8.90 | 6.97 | 04:00 | 0.65 | 09:00 | 1.92 | 1.31 | 05:15 | 0.204 | 09:00 | 1.464 | 0.777 | 0.777 | |
| 11/21/2019 | 05:25 | 4.52 | 09:15 | 8.71 | 6.93 | 03:50 | 0.56 | 09:15 | 1.80 | 1.29 | 05:25 | 0.178 | 09:15 | 1.368 | 0.764 | 0.764 | |
| 11/22/2019 | 05:20 | 4.76 | 09:35 | 8.75 | 6.99 | 06:40 | 0.61 | 09:05 | 1.81 | 1.32 | 04:25 | 0.206 | 09:05 | 1.353 | 0.781 | 0.781 | |
| 11/23/2019 | 06:05 | 4.77 | 13:05 | 9.03 | 7.27 | 06:10 | 0.51 | 12:00 | 1.84 | 1.37 | 06:10 | 0.165 | 12:05 | 1.445 | 0.871 | 0.871 | |
| 11/24/2019 | 05:50 | 4.75 | 13:20 | 9.10 | 7.35 | 05:25 | 0.57 | 11:00 | 1.93 | 1.39 | 05:25 | 0.188 | 11:55 | 1.492 | 0.907 | 0.907 | |
| 11/25/2019 | 05:15 | 4.71 | 09:55 | 8.66 | 6.99 | 04:40 | 0.54 | 09:40 | 1.87 | 1.31 | 04:40 | 0.174 | 09:40 | 1.400 | 0.782 | 0.782 | |
| 11/26/2019 | 05:25 | 4.71 | 21:35 | 9.03 | 7.16 | 04:35 | 0.58 | 21:35 | 1.94 | 1.36 | 04:35 | 0.189 | 21:35 | 1.553 | 0.845 | 0.845 | 0.36 |
| 11/27/2019 | 05:35 | 5.44 | 10:30 | 9.06 | 7.54 | 06:10 | 0.76 | 09:30 | 1.89 | 1.45 | 06:10 | 0.301 | 10:35 | 1.493 | 0.942 | 0.942 | 0.63 |
| 11/28/2019 | 05:35 | 5.48 | 13:20 | 9.29 | 7.36 | 06:45 | 0.76 | 13:10 | 1.86 | 1.40 | 06:45 | 0.304 | 13:10 | 1.546 | 0.882 | 0.882 | |
| 11/29/2019 | 06:20 | 5.39 | 12:55 | 9.04 | 7.47 | 06:10 | 0.80 | 14:10 | 1.90 | 1.43 | 06:10 | 0.309 | 14:10 | 1.487 | 0.916 | 0.916 | 0.02 |
| 11/30/2019 | 06:40 | 5.38 | 13:25 | 9.28 | 7.49 | 06:10 | 0.72 | 13:45 | 1.86 | 1.41 | 06:10 | 0.278 | 13:45 | 1.535 | 0.918 | 0.918 | 0.10 |
| 12/01/2019 | 06:05 | 5.30 | 13:40 | 9.13 | 7.59 | 06:25 | 0.69 | 14:35 | 1.85 | 1.42 | 06:25 | 0.260 | 14:35 | 1.504 | 0.946 | 0.946 | 0.06 |
| 12/02/2019 | 05:50 | 5.43 | 09:50 | 9.15 | 7.45 | 04:10 | 0.81 | 09:45 | 1.89 | 1.43 | 05:55 | 0.316 | 09:50 | 1.538 | 0.914 | 0.914 | 0.30 |
| 12/03/2019 | 05:40 | 5.38 | 09:35 | 8.83 | 7.41 | 05:55 | 0.72 | 09:50 | 1.84 | 1.44 | 05:55 | 0.276 | 09:50 | 1.422 | 0.909 | 0.909 | 0.01 |
| 12/04/2019 | 04:05 | 5.72 | 09:30 | 9.05 | 7.58 | 04:20 | 0.84 | 09:50 | 1.98 | 1.50 | 04:20 | 0.351 | 09:50 | 1.582 | 0.972 | 0.972 | 0.39 |
| 12/05/2019 | 05:15 | 5.46 | 09:35 | 9.13 | 7.59 | 05:15 | 0.81 | 09:10 | 1.90 | 1.48 | 05:15 | 0.317 | 09:40 | 1.541 | 0.974 | 0.974 | 0.01 |
| 12/06/2019 | 05:20 | 5.48 | 09:35 | 9.24 | 7.69 | 04:50 | 0.76 | 09:40 | 1.94 | 1.50 | 04:50 | 0.305 | 09:40 | 1.596 | 0.997 | 0.997 | 0.01 |
| 12/07/2019 | 06:20 | 5.65 | 19:20 | 10.08 | 8.16 | 06:00 | 0.81 | 18:50 | 2.02 | 1.57 | 06:00 | 0.336 | 19:15 | 1.862 | 1.156 | 1.156 | 0.67 |
| 12/08/2019 | 06:20 | 5.97 | 13:30 | 9.78 | 8.36 | 07:00 | 0.94 | 11:20 | 1.98 | 1.61 | 07:00 | 0.421 | 11:20 | 1.737 | 1.209 | 1.209 | 0.20 |
| 12/09/2019 | 05:40 | 6.05 | 09:35 | 9.47 | 7.99 | 05:20 | 0.95 | 09:40 | 1.93 | 1.58 | 05:20 | 0.436 | 09:40 | 1.642 | 1.093 | 1.093 | |
| 12/10/2019 | 05:05 | 5.65 | 09:40 | 9.52 | 7.86 | 05:05 | 0.81 | 09:15 | 2.02 | 1.57 | 05:05 | 0.333 | 09:15 | 1.711 | 1.079 | 1.079 | |
| 12/11/2019 | 05:30 | 5.79 | 09:30 | 9.50 | 7.89 | 04:45 | 0.88 | 11:20 | 1.98 | 1.59 | 04:45 | 0.383 | 09:20 | 1.675 | 1.091 | 1.091 | 0.03 |
| 12/12/2019 | 05:15 | 5.89 | 09:25 | 9.54 | 7.94 | 04:55 | 0.89 | 09:10 | 2.01 | 1.59 | 04:55 | 0.395 | 10:00 | 1.723 | 1.096 | 1.096 | 0.01 |
| 12/13/2019 | 05:10 | 5.86 | 09:30 | 9.52 | 7.91 | 05:15 | 0.86 | 10:10 | 1.95 | 1.54 | 05:15 | 0.375 | 10:10 | 1.667 | 1.061 | 1.061 | 0.01 |
| 12/14/2019 | 05:55 | 5.74 | 13:40 | 9.92 | 8.18 | 05:15 | 0.85 | 12:35 | 2.02 | 1.59 | 05:15 | 0.367 | 12:35 | 1.810 | 1.164 | 1.164 | 0.01 |
| 12/15/2019 | 06:15 | 5.82 | 12:05 | 10.12 | 8.29 | 05:30 | 0.93 | 12:35 | 2.00 | 1.62 | 06:50 | 0.406 | 12:15 | 1.842 | 1.209 | 1.209 | 0.01 |
| 12/16/2019 | 05:25 | 5.74 | 09:25 | 9.43 | 7.88 | 06:15 | 0.87 | 08:55 | 2.01 | 1.56 | 05:45 | 0.373 | 09:20 | 1.665 | 1.069 | 1.069 | 0.01 |
| 12/17/2019 | 05:10 | 5.54 | 09:30 | 9.36 | 7.81 | 05:10 | 0.78 | 10:10 | 1.94 | 1.54 | 05:10 | 0.313 | 10:10 | 1.616 | 1.049 | 1.049 | 0.01 |
| 12/18/2019 | 05:25 | 5.50 | 09:35 | 9.34 | 7.55 | 05:15 | 0.77 | 09:30 | 2.01 | 1.51 | 05:15 | 0.307 | 09:30 | 1.678 | 0.982 | 0.982 | 0.01 |
| 12/19/2019 | 05:30 | 5.13 | 10:15 | 8.79 | 7.25 | 05:50 | 0.64 | 08:50 | 1.89 | 1.44 | 05:50 | 0.229 | 09:25 | 1.436 | 0.889 | 0.889 | |
| 12/20/2019 | 05:55 | 5.08 | 10:25 | 8.81 | 7.33 | 05:50 | 0.66 | 10:40 | 1.98 | 1.44 | 05:50 | 0.233 | 10:40 | 1.522 | 0.899 | 0.899 | |
| 12/21/2019 | 06:00 | 5.31 | 12:50 | 9.30 | 7.52 | 06:20 | 0.71 | 13:35 | 1.94 | 1.46 | 06:20 | 0.268 | 13:35 | 1.597 | 0.958 | 0.958 | 0.01 |
| 12/22/2019 | 05:40 | 5.29 | 14:10 | 9.35 | 7.61 | 06:40 | 0.71 | 12:35 | 1.91 | 1.47 | 06:40 | 0.270 | 14:05 | 1.590 | 0.984 | 0.984 | 0.41 |
| 12/23/2019 | 05:20 | 5.43 | 13:45 | 10.14 | 7.69 | 05:50 | 0.75 | 12:40 | 2.04 | 1.50 | 05:50 | 0.292 | 12:40 | 1.875 | 1.018 | 1.018 | |
| 12/24/2019 | 05:50 | 5.47 | 12:45 | 8.86 | 7.36 | 06:20 | 0.76 | 12:45 | 1.79 | 1.42 | 06:20 | 0.300 | 12:45 | 1.394 | 0.891 | 0.891 | 0.02 |
| 12/25/2019 | 05:55 | 5.28 | 13:15 | 8.66 | 7.00 | 05:55 | 0.76 | 14:20 | 1.80 | 1.38 | 05:55 | 0.286 | 13:20 | 1.330 | 0.806 | 0.806 | 0.08 |
| 12/26/2019 | 05:45 | 5.37 | 12:50 | 8.46 | 7.23 | 06:20 | 0.75 | 11:25 | 1.83 | 1.43 | 06:20 | 0.290 | 11:25 | 1.327 | 0.877 | 0.877 | |
| 12/27/2019 | 04:50 | 5.23 | 11:35 | 8.59 | 7.23 | 06:50 | 0.73 | 11:45 | 1.80 | 1.42 | 06:50 | 0.280 | 11:45 | 1.339 | 0.873 | 0.873 | |
| 12/28/2019 | 06:00 | 5.24 | 13:05 | 9.09 | 7.34 | 07:00 | 0.71 | 13:05 | 1.84 | 1.42 | 07:00 | 0.265 | 13:05 | 1.481 | 0.900 | 0.900 | |
| 12/29/2019 | 06:05 | 5.41 | 13:05 | 8.96 | 7.45 | 05:05 | 0.74 | 19:05 | 1.85 | 1.44 | 05:05 | 0.288 | 13:55 | 1.445 | 0.933 | 0.933 | 0.22 |
| 12/30/2019 | 05:55 | 5.39 | 12:15 | 8.77 | 7.44 | 06:05 | 0.74 | 11:50 | 1.88 | 1.48 | 06:05 | 0.285 | 11:55 | 1.436 | 0.947 | 0.947 | |
| 12/31/2019 | 05:45 | 5.30 | 13:50 | 8.87 | 7.44 | 06:30 | 0.73 | 13:10 | 1.85 | 1.47 | 06:30 | 0.276 | 13:10 | 1.431 | 0.941 | 0.941 | 0.01 |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 01/01/2020 | 07:15 | 5.16 | 13:40 | 9.05 | 7.28 | 05:45 | 0.70 | 12:50 | 1.87 | 1.43 | 07:35 | 0.256 | 12:50 | 1.471 | 0.897 | 0.897 | |
| 01/02/2020 | 06:05 | 4.74 | 11:00 | 8.50 | 7.00 | 04:45 | 0.55 | 10:05 | 1.84 | 1.37 | 06:20 | 0.180 | 10:35 | 1.303 | 0.816 | 0.816 | |
| 01/03/2020 | 05:25 | 4.67 | 11:00 | 8.44 | 6.97 | 05:35 | 0.49 | 10:05 | 1.86 | 1.36 | 05:35 | 0.152 | 10:05 | 1.315 | 0.805 | 0.805 | |
| 01/04/2020 | 05:25 | 4.58 | 13:10 | 8.88 | 7.03 | 05:50 | 0.46 | 11:30 | 1.86 | 1.36 | 05:50 | 0.140 | 13:15 | 1.431 | 0.838 | 0.838 | |
| 01/05/2020 | 06:30 | 4.46 | 00:00 | 7.34 | 5.48 | 05:25 | 0.49 | 00:00 | 1.48 | 0.92 | 05:25 | 0.151 | 00:00 | 0.882 | 0.395 | 0.136 | |
| 01/06/2020 | | | | | | | | | | | | | | | | | |
| 01/07/2020 | | | | | | | | | | | | | | | | | |
| 01/08/2020 | 00:00 | | 00:00 | | | | | | | | | | | | | | 0.02 |
| 01/09/2020 | 00:00 | | 00:00 | | | | | | | | | | | | | | 0.18 |
| 01/10/2020 | 05:00 | 5.24 | 09:25 | 9.13 | 7.53 | 04:35 | 0.69 | 09:25 | 1.92 | 1.46 | 04:35 | 0.259 | 09:25 | 1.555 | 0.954 | 0.950 | 0.02 |
| 01/11/2020 | 06:25 | 5.41 | 12:05 | 9.62 | 7.81 | 06:25 | 0.79 | 13:55 | 1.95 | 1.52 | 06:25 | 0.306 | 13:55 | 1.677 | 1.044 | 1.044 | 0.01 |
| 01/12/2020 | 05:55 | 5.29 | 13:55 | 9.60 | 7.87 | 06:55 | 0.71 | 13:35 | 1.95 | 1.54 | 06:55 | 0.271 | 13:35 | 1.696 | 1.079 | 1.079 | |
| 01/13/2020 | 05:15 | 5.24 | 09:30 | 9.35 | 7.51 | 05:15 | 0.67 | 08:55 | 1.91 | 1.49 | 05:15 | 0.249 | 09:25 | 1.598 | 0.966 | 0.966 | 0.02 |
| 01/14/2020 | 05:30 | 5.42 | 09:30 | 9.25 | 7.54 | 05:45 | 0.76 | 21:20 | 1.90 | 1.47 | 05:45 | 0.293 | 09:30 | 1.517 | 0.957 | 0.957 | 0.11 |
| 01/15/2020 | 05:20 | 5.23 | 09:25 | 9.38 | 7.55 | 05:35 | 0.68 | 09:15 | 1.95 | 1.49 | 05:35 | 0.253 | 09:40 | 1.645 | 0.981 | 0.981 | 0.07 |
| 01/16/2020 | 05:10 | 5.23 | 21:20 | 9.32 | 7.82 | 05:50 | 0.69 | 09:40 | 1.91 | 1.55 | 05:50 | 0.260 | 22:05 | 1.571 | 1.069 | 1.069 | 0.66 |
| 01/17/2020 | 04:40 | 5.84 | 09:20 | 9.49 | 7.97 | 05:10 | 0.89 | 09:45 | 2.01 | 1.57 | 05:10 | 0.385 | 09:45 | 1.716 | 1.095 | 1.095 | |
| 01/18/2020 | 05:40 | 5.93 | 12:00 | 9.83 | 8.11 | 05:25 | 0.89 | 12:10 | 1.93 | 1.59 | 05:25 | 0.395 | 12:10 | 1.726 | 1.141 | 1.141 | |
| 01/19/2020 | 05:25 | 5.87 | 13:15 | 9.72 | 8.09 | 05:40 | 0.88 | 11:05 | 1.96 | 1.58 | 05:40 | 0.385 | 11:05 | 1.684 | 1.133 | 1.133 | |
| 01/20/2020 | 05:45 | 5.79 | 13:15 | 9.57 | 8.16 | 04:55 | 0.86 | 12:00 | 1.96 | 1.61 | 04:55 | 0.373 | 12:00 | 1.687 | 1.172 | 1.172 | |
| 01/21/2020 | 04:50 | 5.78 | 09:05 | 9.62 | 7.96 | 04:55 | 0.86 | 08:55 | 2.04 | 1.59 | 04:55 | 0.367 | 08:55 | 1.767 | 1.103 | 1.103 | |
| 01/22/2020 | 04:45 | 5.74 | 09:10 | 9.55 | 7.85 | 05:40 | 0.85 | 21:10 | 2.00 | 1.55 | 05:40 | 0.364 | 21:10 | 1.668 | 1.056 | 1.056 | 0.03 |
| 01/23/2020 | 04:35 | 5.47 | 08:55 | 9.59 | 7.70 | 05:05 | 0.81 | 08:55 | 1.93 | 1.50 | 05:05 | 0.321 | 08:55 | 1.673 | 1.002 | 1.002 | |
| 01/24/2020 | 05:35 | 5.49 | 10:20 | 9.49 | 7.61 | 05:15 | 0.78 | 09:40 | 1.89 | 1.47 | 05:15 | 0.312 | 10:35 | 1.616 | 0.967 | 0.967 | |
| 01/25/2020 | 05:35 | 5.07 | 12:40 | 9.33 | 7.53 | 05:45 | 0.62 | 12:05 | 1.85 | 1.46 | 05:45 | 0.220 | 12:05 | 1.520 | 0.968 | 0.968 | |
| 01/26/2020 | 05:15 | 5.13 | 12:55 | 9.46 | 7.67 | 04:35 | 0.72 | 11:50 | 1.92 | 1.49 | 05:00 | 0.260 | 11:50 | 1.591 | 1.006 | 1.006 | 0.16 |
| 01/27/2020 | 05:30 | 4.99 | 09:20 | 9.06 | 7.08 | 06:35 | 0.62 | 20:30 | 1.85 | 1.35 | 05:25 | 0.217 | 09:25 | 1.467 | 0.831 | 0.658 | |
| 01/28/2020 | 05:50 | 4.73 | 09:00 | 8.68 | 6.92 | 20:00 | 0.44 | 08:55 | 1.82 | 1.31 | 06:10 | 0.167 | 08:55 | 1.371 | 0.779 | 0.649 | 0.01 |
| 01/29/2020 | 04:55 | 4.47 | 08:25 | 8.63 | 6.70 | 05:00 | 0.44 | 08:15 | 1.79 | 1.31 | 05:00 | 0.129 | 08:20 | 1.341 | 0.713 | 0.609 | |
| 01/30/2020 | 05:55 | 4.42 | 09:45 | 8.51 | 6.66 | 05:40 | 0.41 | 10:10 | 1.80 | 1.26 | 05:40 | 0.120 | 09:45 | 1.298 | 0.705 | 0.705 | |
| 01/31/2020 | 05:10 | 4.58 | 09:35 | 8.37 | 6.64 | 05:45 | 0.50 | 09:40 | 1.76 | 1.25 | 05:45 | 0.155 | 09:40 | 1.268 | 0.688 | 0.688 | |
| 02/01/2020 | 05:55 | 4.44 | 13:35 | 9.49 | 7.23 | 06:15 | 0.43 | 13:20 | 1.85 | 1.36 | 06:15 | 0.126 | 13:20 | 1.566 | 0.886 | 0.886 | |
| 02/02/2020 | 05:45 | 5.17 | 13:00 | 9.69 | 7.67 | 06:15 | 0.67 | 12:45 | 1.93 | 1.48 | 06:15 | 0.242 | 12:45 | 1.687 | 1.009 | 1.009 | |
| 02/03/2020 | 05:35 | 4.71 | 09:20 | 9.25 | 7.18 | 04:55 | 0.55 | 09:35 | 1.97 | 1.39 | 05:25 | 0.174 | 09:35 | 1.621 | 0.865 | 0.865 | |
| 02/04/2020 | 05:15 | 4.68 | 09:20 | 9.14 | 7.17 | 05:50 | 0.50 | 09:50 | 1.98 | 1.40 | 05:50 | 0.160 | 09:50 | 1.592 | 0.873 | 0.873 | |
| 02/05/2020 | 05:10 | 4.59 | 09:30 | 9.27 | 7.09 | 05:35 | 0.51 | 09:40 | 1.88 | 1.37 | 05:35 | 0.157 | 09:40 | 1.554 | 0.838 | 0.838 | |
| 02/06/2020 | 05:00 | 4.57 | 09:20 | 9.22 | 7.04 | 04:45 | 0.47 | 09:25 | 1.94 | 1.36 | 04:45 | 0.143 | 09:25 | 1.592 | 0.825 | 0.825 | |
| 02/07/2020 | 04:55 | 4.73 | 09:30 | 9.22 | 7.12 | 04:55 | 0.52 | 09:20 | 2.01 | 1.37 | 04:55 | 0.166 | 09:20 | 1.643 | 0.840 | 0.840 | |
| 02/08/2020 | 06:25 | 4.56 | 12:30 | 9.21 | 7.29 | 06:30 | 0.50 | 11:00 | 1.85 | 1.41 | 06:30 | 0.149 | 13:05 | 1.487 | 0.910 | 0.910 | |
| 02/09/2020 | 06:00 | 4.75 | 13:05 | 9.32 | 7.46 | 06:00 | 0.52 | 12:40 | 1.88 | 1.43 | 06:00 | 0.167 | 12:40 | 1.545 | 0.955 | 0.955 | |
| 02/10/2020 | 05:40 | 4.65 | 09:20 | 8.93 | 6.98 | 04:20 | 0.50 | 09:35 | 1.84 | 1.35 | 05:20 | 0.158 | 09:35 | 1.440 | 0.806 | 0.806 | |
| 02/11/2020 | 05:25 | 4.67 | 09:15 | 8.80 | 6.99 | 04:40 | 0.53 | 08:45 | 1.89 | 1.35 | 04:40 | 0.171 | 09:05 | 1.425 | 0.806 | 0.806 | |
| 02/12/2020 | 05:35 | 4.61 | 09:20 | 9.22 | 7.04 | 04:30 | 0.51 | 09:05 | 1.97 | 1.34 | 05:35 | 0.163 | 09:05 | 1.602 | 0.810 | 0.810 | |
| 02/13/2020 | 05:55 | 4.87 | 09:20 | 9.05 | 7.15 | 05:30 | 0.59 | 09:35 | 1.96 | 1.37 | 05:30 | 0.198 | 09:35 | 1.570 | 0.840 | 0.840 | |
| 02/14/2020 | 05:20 | 4.87 | 09:20 | 9.02 | 6.65 | 05:55 | 0.58 | 08:50 | 1.89 | 1.26 | 05:55 | 0.193 | 09:15 | 1.489 | 0.717 | 0.359 | |
| 02/15/2020 | 05:35 | 4.89 | 13:15 | 9.39 | 7.63 | 05:40 | 0.64 | 13:25 | 1.86 | 1.49 | 05:40 | 0.214 | 13:25 | 1.572 | 0.999 | 0.999 | |
| 02/16/2020 | 05:55 | 4.99 | 12:30 | 9.59 | 7.70 | 06:35 | 0.59 | 12:05 | 1.91 | 1.50 | 06:35 | 0.206 | 12:05 | 1.643 | 1.032 | 1.032 | |
| 02/17/2020 | 05:50 | 5.13 | 11:00 | 9.50 | 7.80 | 05:25 | 0.67 | 10:40 | 1.96 | 1.52 | 06:05 | 0.238 | 11:10 | 1.674 | 1.057 | 1.057 | |
| 02/18/2020 | 05:20 | 5.16 | 09:45 | 9.45 | 7.58 | 05:40 | 0.72 | 10:10 | 1.95 | 1.49 | 05:40 | 0.260 | 09:45 | 1.654 | 0.987 | 0.987 | |
| 02/19/2020 | 05:15 | 5.24 | 09:25 | 9.63 | 7.60 | 05:55 | 0.70 | 09:55 | 1.96 | 1.49 | 05:55 | 0.263 | 09:30 | 1.698 | 0.989 | 0.989 | |
| 02/20/2020 | 05:30 | 5.18 | 09:30 | 9.66 | 7.59 | 04:30 | 0.68 | 09:15 | 2.01 | 1.50 | 04:30 | 0.251 | 09:30 | 1.737 | 0.995 | 0.995 | |
| 02/21/2020 | 05:00 | 5.15 | 09:45 | 9.55 | 7.57 | 04:45 | 0.65 | 09:40 | 2.02 | 1.49 | 04:45 | 0.235 | 09:40 | 1.746 | 0.988 | 0.988 | |
| 02/22/2020 | 07:05 | 5.33 | 13:20 | 9.64 | 7.80 | 07:25 | 0.73 | 14:05 | 1.99 | 1.54 | 07:25 | 0.276 | 14:05 | 1.713 | 1.061 | 1.061 | |
| 02/23/2020 | 07:45 | 5.27 | 14:20 | 9.65 | 7.91 | 08:00 | 0.74 | 12:45 | 1.99 | 1.55 | 08:00 | 0.275 | 14:20 | 1.711 | 1.103 | 1.103 | |
| 02/24/2020 | 06:00 | 5.11 | 10:35 | 9.58 | 7.50 | 05:15 | 0.68 | 10:25 | 1.99 | 1.50 | 05:15 | 0.251 | 10:25 | 1.713 | 0.980 | 0.980 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 06:00 | 5.21 | 10:20 | 9.50 | 7.40 | 06:25 | 0.70 | 09:30 | 2.00 | 1.45 | 06:25 | 0.258 | 10:30 | 1.690 | 0.942 | 0.674 | |
| 02/26/2020 | 05:10 | 5.21 | 09:15 | 9.76 | 7.63 | 05:05 | 0.69 | 08:50 | 2.07 | 1.51 | 05:05 | 0.255 | 08:50 | 1.790 | 1.009 | 1.009 | |
| 02/27/2020 | 05:20 | 5.43 | 09:15 | 9.84 | 7.73 | 05:30 | 0.76 | 09:00 | 2.05 | 1.53 | 05:30 | 0.297 | 09:00 | 1.821 | 1.034 | 1.034 | |
| 02/28/2020 | 05:30 | 5.39 | 09:25 | 9.70 | 7.73 | 05:25 | 0.74 | 09:35 | 2.03 | 1.54 | 05:25 | 0.285 | 09:35 | 1.784 | 1.040 | 1.040 | |
| 02/29/2020 | 05:50 | 5.41 | 13:45 | 9.92 | 7.93 | 05:45 | 0.83 | 13:35 | 2.04 | 1.57 | 05:45 | 0.321 | 13:35 | 1.836 | 1.110 | 1.110 | |
| 03/01/2020 | 06:05 | 5.44 | 13:15 | 9.97 | 8.20 | 06:10 | 0.75 | 11:50 | 2.09 | 1.60 | 06:10 | 0.292 | 11:50 | 1.882 | 1.197 | 1.197 | |
| 03/02/2020 | 05:10 | 5.56 | 09:20 | 10.01 | 7.97 | 05:35 | 0.79 | 09:45 | 2.08 | 1.59 | 05:35 | 0.318 | 09:15 | 1.905 | 1.119 | 1.119 | |
| 03/03/2020 | 05:25 | 5.45 | 09:45 | 10.15 | 8.02 | 05:20 | 0.75 | 09:20 | 2.18 | 1.60 | 05:20 | 0.294 | 09:45 | 2.004 | 1.148 | 1.148 | |
| 03/04/2020 | 05:35 | 5.59 | 09:25 | 10.16 | 8.10 | 05:35 | 0.79 | 09:20 | 2.18 | 1.62 | 05:35 | 0.319 | 09:20 | 2.041 | 1.174 | 1.174 | |
| 03/05/2020 | 05:25 | 5.71 | 09:35 | 10.10 | 8.11 | 05:30 | 0.82 | 09:05 | 2.14 | 1.65 | 05:30 | 0.341 | 09:35 | 1.971 | 1.183 | 1.183 | |
| 03/06/2020 | 05:40 | 5.43 | 09:55 | 9.69 | 7.97 | 05:40 | 0.73 | 09:45 | 2.04 | 1.60 | 05:40 | 0.285 | 09:45 | 1.789 | 1.132 | 1.132 | |
| 03/07/2020 | 06:10 | 5.39 | 13:25 | 10.11 | 8.26 | 06:05 | 0.73 | 17:05 | 2.11 | 1.65 | 06:05 | 0.281 | 13:05 | 1.947 | 1.243 | 1.243 | |
| 03/08/2020 | 07:05 | 5.62 | 13:30 | 10.33 | 8.44 | 06:30 | 0.83 | 13:45 | 2.16 | 1.68 | 06:30 | 0.345 | 13:45 | 2.069 | 1.309 | 1.309 | |
| 03/09/2020 | 05:55 | 5.69 | 22:20 | 9.71 | 8.15 | 04:50 | 0.83 | 21:40 | 2.07 | 1.65 | 04:50 | 0.350 | 21:40 | 1.825 | 1.199 | 1.198 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 105.605 | 4.90 |
| Avg | 7.53 | 1.46 | 0.969 | |

## Site Commentary

### Site Information

| MIL_0744 | |
|---|---|
| Pipe Dimensions | 15 |
| Silt Level | 0.00" |

### Overview

Site MIL_0744 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Surcharged conditions were experienced at this location. Review of the scattergraph shows that both free flow and backwater conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 6.17 | 0.94 | 0.283 |
| Minimum | 2.74 | 0.16 | 0.080 |
| Maximum | 34.98 | 1.78 | 1.416 |
| Time of Minimum | 3/1/2020 5:45 AM | 2/27/2020 5:30 PM | 2/6/2020 3:40 AM |
| Time of Maximum | 3/8/2020 2:15 PM | 3/8/2020 2:15 PM | 3/8/2020 2:15 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period. Site installed later than other sites on November 22, 2019. Uptime reflects time in service.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

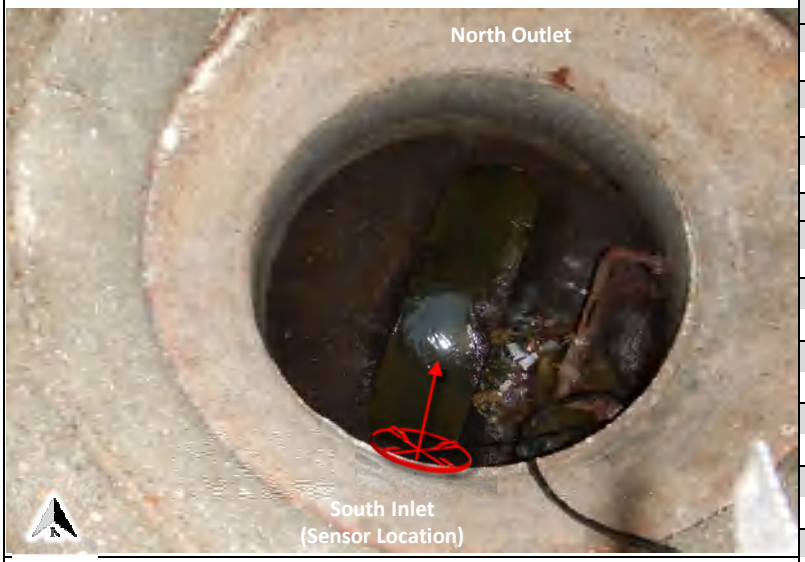
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_0744

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Thompson Court and Machado Avenue | | | Monitor Series: TRITON+ | Location Type: Temporary |
| Site Access Details: | Drive | Latitude: | 37.419309° | Pipe Size (H x W): 15.0" x 15.0" | Pipe Shape: Circular |
| | | Longitude: | -121.911002° | | |

| Manhole # | System Characteristics |
|---|---|
| 744 | Residential |
| Access | Traffic |
| Drive | Light |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 6:52:52 AM | 15.0" x 15.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 5.50 | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.05 | 0'' |
| Silt | Silt Type |
| 0'' | |

Hydraulic Comments:

Smooth flow with medium depth and velocity

## Manhole / Pipe Information:

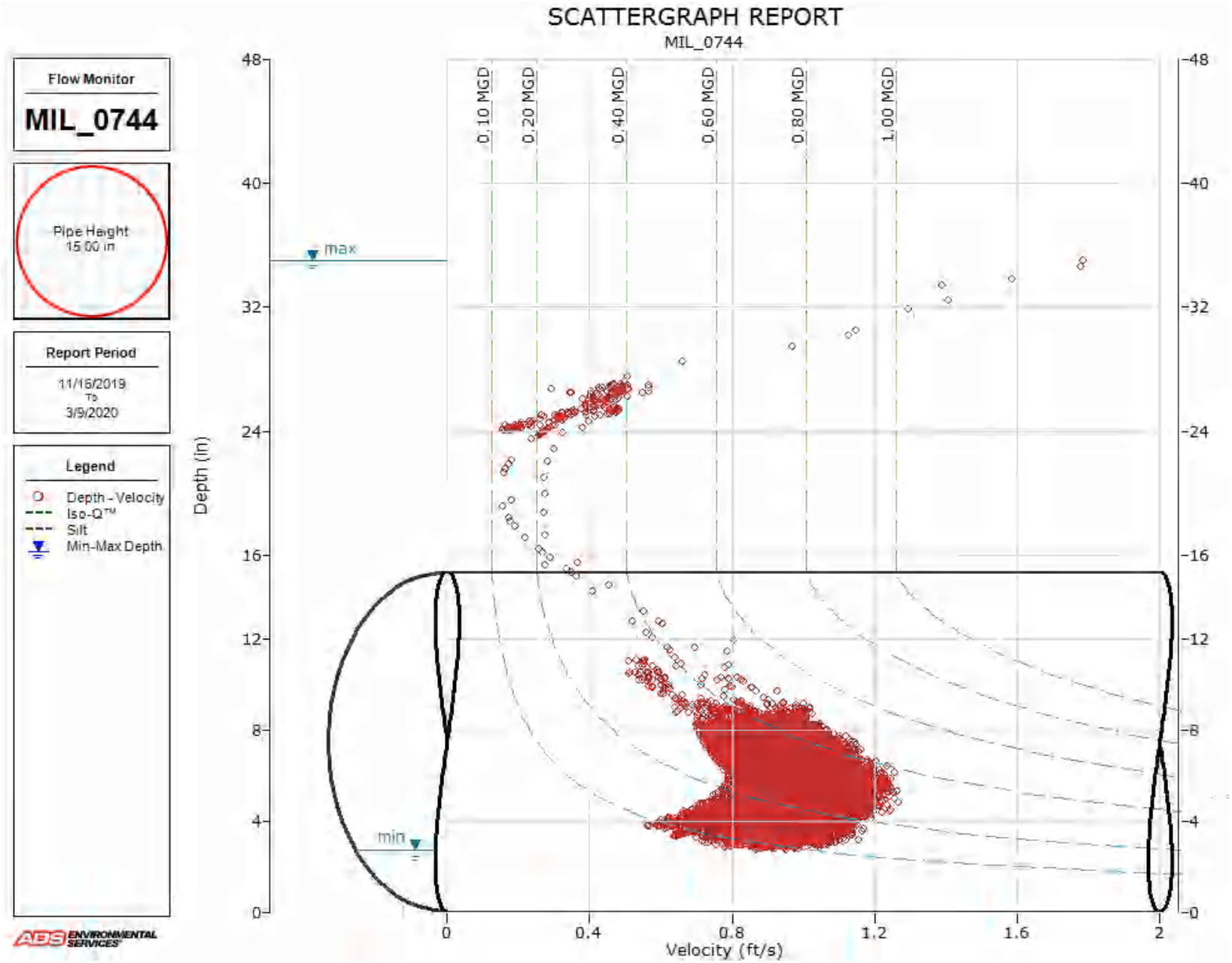
| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 5' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |

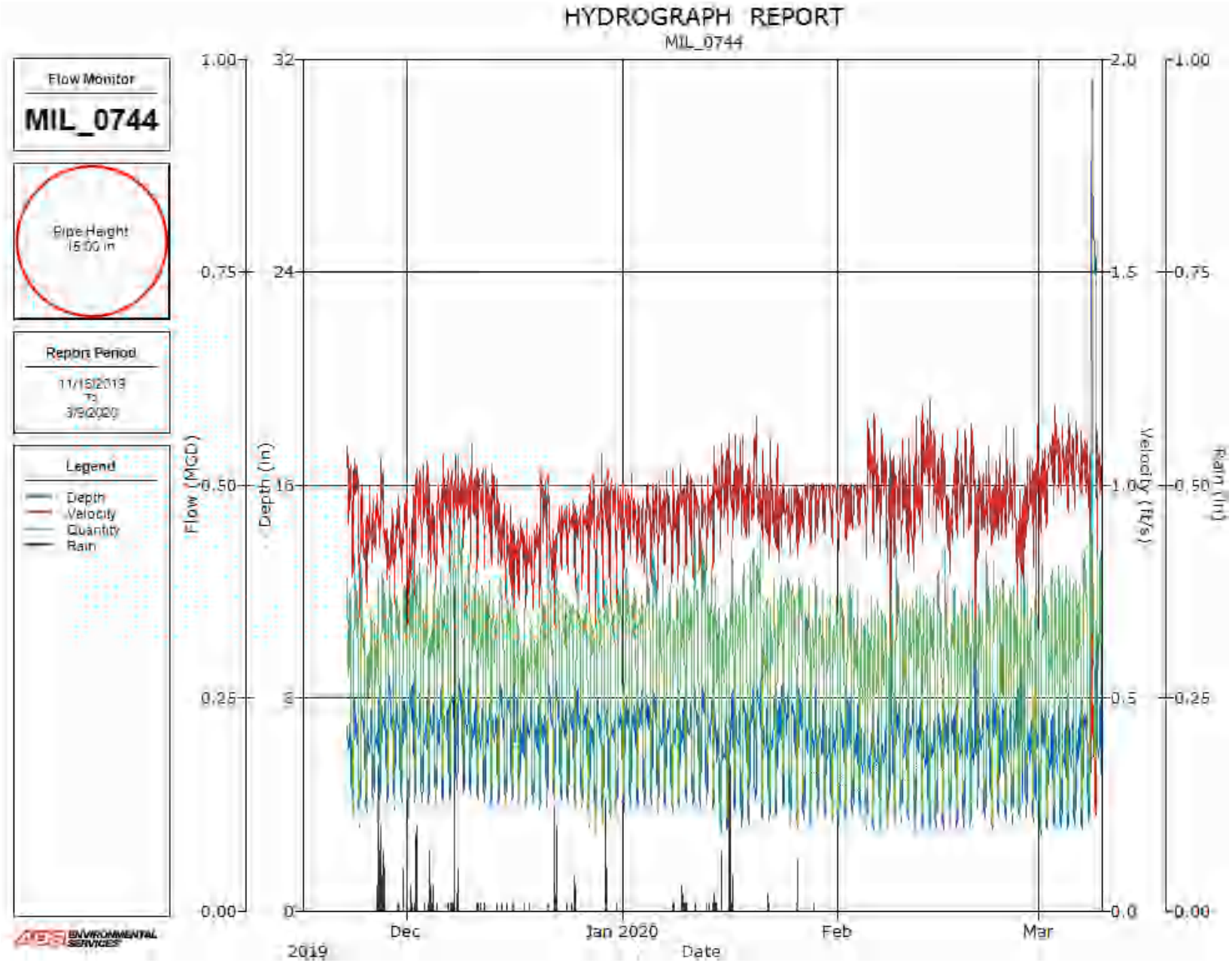
## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |


SCATTERGRAPH REPORT
MIL_0744
Flow Monitor
MIL_0744
Pipe Height
15.00 in
Report Period
11/15/2019
To
3/9/2020
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.10 MGD
0.20 MGD
0.40 MGD
0.60 MGD
0.80 MGD
1.00 MGD
max
min
Depth (in)
Velocity (ft/s)
0
4
8
12
16
24
32
40
48
0.4
0.8
1.2
1.6
2
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_0744
Flow Monitor
MIL_0744
Pipe Height
1500 in
Report Period
11/15/2019
To
3/9/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
1.00
0.75
0.50
0.25
0.00
32
24
16
8
0
2.0
1.5
1.0
0.5
0.0
1.00
0.75
0.50
0.25
0.00
Dec
Jan 2020
Feb
Mar
2019
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_0744, Pipe Height: 15.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 11/17/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 11/18/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 11/19/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 11/20/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 11/21/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 11/22/2019 | 23:50 | 5.35 | 22:20 | 7.49 | 6.47 | 14:55 | 0.82 | 09:25 | 1.13 | 1.01 | 15:05 | 0.250 | 22:25 | 0.403 | 0.333 | 0.214 | |
| 11/23/2019 | 05:40 | 3.43 | 10:55 | 8.49 | 5.95 | 03:20 | 0.67 | 19:05 | 1.12 | 0.96 | 05:25 | 0.099 | 10:35 | 0.451 | 0.289 | 0.289 | |
| 11/24/2019 | 05:30 | 3.43 | 10:25 | 8.27 | 6.10 | 05:25 | 0.64 | 14:15 | 1.09 | 0.87 | 05:25 | 0.088 | 10:25 | 0.454 | 0.270 | 0.270 | |
| 11/25/2019 | 05:05 | 3.63 | 19:40 | 7.82 | 5.81 | 05:10 | 0.61 | 13:25 | 1.06 | 0.87 | 05:10 | 0.091 | 21:50 | 0.428 | 0.250 | 0.250 | |
| 11/26/2019 | 03:10 | 3.81 | 21:40 | 8.27 | 6.02 | 03:20 | 0.64 | 16:55 | 1.06 | 0.91 | 03:20 | 0.103 | 21:45 | 0.435 | 0.272 | 0.272 | 0.36 |
| 11/27/2019 | 03:05 | 4.05 | 19:20 | 8.19 | 6.46 | 02:20 | 0.73 | 06:40 | 1.10 | 0.93 | 03:10 | 0.130 | 09:55 | 0.412 | 0.305 | 0.305 | 0.63 |
| 11/28/2019 | 05:25 | 4.07 | 12:05 | 9.02 | 6.58 | 05:45 | 0.72 | 21:55 | 1.09 | 0.85 | 05:40 | 0.126 | 14:30 | 0.469 | 0.285 | 0.285 | |
| 11/29/2019 | 05:35 | 3.84 | 11:10 | 8.30 | 6.25 | 05:35 | 0.69 | 19:50 | 1.11 | 0.88 | 05:35 | 0.110 | 10:00 | 0.437 | 0.281 | 0.281 | 0.02 |
| 11/30/2019 | 06:05 | 3.92 | 10:55 | 8.34 | 6.32 | 05:45 | 0.67 | 21:35 | 1.09 | 0.89 | 05:45 | 0.111 | 14:00 | 0.456 | 0.287 | 0.287 | 0.10 |
| 12/01/2019 | 06:10 | 3.73 | 20:30 | 8.83 | 6.59 | 05:45 | 0.56 | 00:00 | 1.12 | 0.84 | 05:55 | 0.088 | 20:30 | 0.451 | 0.285 | 0.285 | 0.06 |
| 12/02/2019 | 03:30 | 3.89 | 21:20 | 8.59 | 6.30 | 03:00 | 0.61 | 17:55 | 1.12 | 0.94 | 03:00 | 0.105 | 21:15 | 0.458 | 0.303 | 0.303 | 0.30 |
| 12/03/2019 | 04:20 | 3.93 | 21:40 | 8.37 | 6.16 | 03:30 | 0.71 | 23:40 | 1.12 | 0.95 | 03:30 | 0.131 | 20:00 | 0.416 | 0.295 | 0.295 | 0.01 |
| 12/04/2019 | 03:45 | 3.94 | 19:55 | 8.06 | 6.37 | 04:05 | 0.69 | 07:10 | 1.14 | 0.89 | 04:05 | 0.129 | 21:20 | 0.425 | 0.287 | 0.287 | 0.39 |
| 12/05/2019 | 03:35 | 3.90 | 21:45 | 8.49 | 6.25 | 03:15 | 0.64 | 09:45 | 1.07 | 0.91 | 03:40 | 0.107 | 09:45 | 0.433 | 0.290 | 0.290 | 0.01 |
| 12/06/2019 | 05:10 | 4.03 | 20:55 | 7.82 | 6.20 | 04:10 | 0.71 | 07:30 | 1.12 | 0.95 | 04:10 | 0.126 | 19:30 | 0.422 | 0.296 | 0.296 | 0.01 |
| 12/07/2019 | 05:15 | 4.06 | 19:10 | 9.08 | 6.79 | 03:10 | 0.74 | 00:00 | 1.07 | 0.96 | 03:30 | 0.131 | 19:45 | 0.501 | 0.340 | 0.340 | 0.67 |
| 12/08/2019 | 05:05 | 4.47 | 10:05 | 9.22 | 7.10 | 03:50 | 0.77 | 08:05 | 1.12 | 0.98 | 03:50 | 0.179 | 09:45 | 0.508 | 0.363 | 0.363 | 0.20 |
| 12/09/2019 | 05:15 | 4.35 | 21:05 | 8.75 | 6.50 | 02:55 | 0.80 | 07:05 | 1.12 | 0.97 | 02:55 | 0.160 | 21:10 | 0.458 | 0.321 | 0.321 | |
| 12/10/2019 | 02:40 | 4.22 | 21:55 | 8.12 | 6.28 | 03:25 | 0.68 | 07:05 | 1.13 | 0.96 | 03:25 | 0.126 | 21:05 | 0.417 | 0.305 | 0.305 | |
| 12/11/2019 | 03:15 | 4.08 | 21:05 | 7.89 | 6.10 | 03:30 | 0.71 | 07:10 | 1.14 | 0.96 | 04:05 | 0.135 | 08:45 | 0.408 | 0.294 | 0.294 | 0.03 |
| 12/12/2019 | 03:25 | 3.80 | 22:20 | 8.06 | 6.16 | 04:00 | 0.69 | 07:55 | 1.11 | 0.94 | 04:00 | 0.123 | 21:55 | 0.434 | 0.293 | 0.293 | 0.01 |
| 12/13/2019 | 05:05 | 3.88 | 20:45 | 7.81 | 6.09 | 04:00 | 0.71 | 07:25 | 1.12 | 0.94 | 04:00 | 0.131 | 09:15 | 0.386 | 0.286 | 0.286 | 0.01 |
| 12/14/2019 | 05:35 | 3.92 | 13:45 | 8.88 | 6.45 | 03:55 | 0.70 | 00:20 | 1.07 | 0.89 | 03:10 | 0.128 | 11:55 | 0.433 | 0.290 | 0.290 | 0.01 |
| 12/15/2019 | 05:20 | 3.90 | 10:55 | 8.49 | 6.59 | 04:50 | 0.68 | 23:55 | 1.09 | 0.85 | 05:40 | 0.115 | 10:15 | 0.444 | 0.286 | 0.286 | 0.01 |
| 12/16/2019 | 03:35 | 3.88 | 09:10 | 10.28 | 6.53 | 09:35 | 0.54 | 00:00 | 1.06 | 0.82 | 03:35 | 0.113 | 08:35 | 0.440 | 0.272 | 0.272 | 0.01 |
| 12/17/2019 | 05:00 | 3.92 | 21:20 | 7.91 | 5.99 | 02:50 | 0.62 | 12:35 | 1.05 | 0.84 | 03:25 | 0.105 | 21:20 | 0.376 | 0.252 | 0.252 | 0.01 |
| 12/18/2019 | 03:15 | 3.76 | 21:55 | 8.23 | 6.22 | 04:05 | 0.59 | 23:40 | 1.00 | 0.82 | 03:15 | 0.094 | 21:50 | 0.372 | 0.259 | 0.259 | 0.01 |
| 12/19/2019 | 03:25 | 3.79 | 22:55 | 7.85 | 6.15 | 03:30 | 0.58 | 07:05 | 0.97 | 0.83 | 03:25 | 0.093 | 21:40 | 0.369 | 0.259 | 0.259 | |
| 12/20/2019 | 03:25 | 3.78 | 21:20 | 7.56 | 6.10 | 03:35 | 0.61 | 07:30 | 1.12 | 0.91 | 03:35 | 0.097 | 08:40 | 0.399 | 0.282 | 0.282 | |
| 12/21/2019 | 03:40 | 3.74 | 11:40 | 8.58 | 6.50 | 04:10 | 0.67 | 07:30 | 1.06 | 0.89 | 03:45 | 0.109 | 11:15 | 0.458 | 0.294 | 0.294 | 0.01 |
| 12/22/2019 | 05:35 | 3.73 | 13:45 | 9.05 | 6.67 | 06:00 | 0.62 | 00:10 | 0.97 | 0.85 | 05:45 | 0.098 | 13:45 | 0.417 | 0.295 | 0.295 | 0.41 |
| 12/23/2019 | 05:10 | 4.00 | 10:20 | 8.07 | 6.28 | 05:10 | 0.77 | 23:55 | 0.97 | 0.90 | 05:10 | 0.132 | 10:20 | 0.383 | 0.287 | 0.287 | |
| 12/24/2019 | 05:00 | 3.90 | 19:30 | 7.77 | 6.23 | 05:00 | 0.76 | 23:25 | 0.97 | 0.90 | 05:00 | 0.124 | 19:30 | 0.369 | 0.283 | 0.283 | 0.02 |
| 12/25/2019 | 05:35 | 3.79 | 14:00 | 8.71 | 6.43 | 05:35 | 0.74 | 00:05 | 0.96 | 0.89 | 05:35 | 0.116 | 14:00 | 0.409 | 0.291 | 0.291 | 0.08 |
| 12/26/2019 | 05:05 | 3.79 | 19:15 | 8.07 | 6.15 | 05:05 | 0.74 | 23:50 | 0.97 | 0.89 | 05:05 | 0.116 | 19:15 | 0.383 | 0.278 | 0.278 | |
| 12/27/2019 | 05:25 | 3.33 | 13:20 | 7.24 | 5.73 | 05:25 | 0.64 | 11:35 | 1.10 | 0.91 | 05:25 | 0.084 | 11:40 | 0.385 | 0.259 | 0.259 | |
| 12/28/2019 | 05:10 | 3.31 | 12:10 | 8.23 | 5.96 | 04:00 | 0.61 | 00:00 | 1.10 | 0.90 | 05:10 | 0.083 | 12:05 | 0.417 | 0.272 | 0.272 | |
| 12/29/2019 | 05:45 | 3.36 | 21:50 | 8.00 | 5.98 | 03:55 | 0.63 | 00:30 | 1.10 | 0.94 | 05:45 | 0.086 | 17:05 | 0.416 | 0.283 | 0.283 | 0.22 |
| 12/30/2019 | 03:50 | 3.56 | 13:15 | 7.37 | 5.84 | 03:50 | 0.69 | 11:45 | 1.09 | 0.95 | 03:50 | 0.099 | 13:10 | 0.395 | 0.276 | 0.276 | |
| 12/31/2019 | 05:25 | 3.44 | 10:25 | 7.90 | 6.03 | 04:00 | 0.59 | 10:05 | 1.07 | 0.91 | 05:25 | 0.091 | 17:35 | 0.404 | 0.279 | 0.279 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:15 | 3.66 14:05 | 8.32 | 6.32 | 04:50 | 0.71 01:00 | 1.11 | 0.92 | 04:50 | 0.113 13:25 | 0.443 | 0.295 | 0.295 | |
| 01/02/2020 | 04:10 | 3.69 19:50 | 7.90 | 6.20 | 03:20 | 0.71 07:50 | 1.13 | 0.93 | 04:05 | 0.111 22:40 | 0.405 | 0.291 | 0.291 | |
| 01/03/2020 | 05:30 | 3.78 20:10 | 8.44 | 6.42 | 03:35 | 0.73 23:55 | 1.04 | 0.88 | 03:35 | 0.131 20:30 | 0.405 | 0.288 | 0.288 | |
| 01/04/2020 | 05:15 | 3.92 13:50 | 8.35 | 6.36 | 03:45 | 0.72 17:55 | 1.06 | 0.92 | 03:45 | 0.122 14:00 | 0.434 | 0.301 | 0.301 | |
| 01/05/2020 | 06:10 | 3.85 13:40 | 8.29 | 6.53 | 03:45 | 0.72 10:15 | 1.08 | 0.91 | 06:00 | 0.119 10:30 | 0.457 | 0.309 | 0.309 | |
| 01/06/2020 | 03:50 | 3.65 21:45 | 8.05 | 6.02 | 04:05 | 0.67 07:25 | 1.10 | 0.91 | 03:25 | 0.103 19:30 | 0.433 | 0.277 | 0.277 | |
| 01/07/2020 | 04:05 | 3.75 22:35 | 8.03 | 6.21 | 02:45 | 0.70 10:20 | 1.08 | 0.93 | 03:55 | 0.116 10:20 | 0.394 | 0.291 | 0.291 | |
| 01/08/2020 | 05:20 | 3.62 22:25 | 8.27 | 6.07 | 03:20 | 0.71 07:20 | 1.08 | 0.91 | 03:25 | 0.112 19:00 | 0.409 | 0.277 | 0.277 | 0.02 |
| 01/09/2020 | 05:20 | 3.74 22:30 | 8.30 | 6.15 | 02:05 | 0.70 15:35 | 1.15 | 0.94 | 05:15 | 0.113 22:05 | 0.448 | 0.292 | 0.292 | 0.18 |
| 01/10/2020 | 05:35 | 3.96 19:15 | 8.00 | 6.23 | 04:55 | 0.76 06:50 | 1.15 | 0.94 | 03:15 | 0.136 09:00 | 0.422 | 0.296 | 0.296 | 0.02 |
| 01/11/2020 | 04:55 | 3.86 11:05 | 8.41 | 6.35 | 04:55 | 0.70 19:05 | 1.06 | 0.92 | 04:55 | 0.114 11:30 | 0.458 | 0.302 | 0.302 | 0.01 |
| 01/12/2020 | 05:20 | 3.86 14:25 | 8.71 | 6.51 | 04:05 | 0.69 11:40 | 1.10 | 0.91 | 04:05 | 0.113 11:50 | 0.457 | 0.309 | 0.309 | |
| 01/13/2020 | 03:20 | 3.85 21:05 | 8.08 | 6.17 | 04:00 | 0.73 18:15 | 1.13 | 0.93 | 04:00 | 0.125 20:20 | 0.425 | 0.290 | 0.290 | 0.02 |
| 01/14/2020 | 03:00 | 3.81 08:40 | 7.99 | 5.78 | 03:10 | 0.70 07:30 | 1.12 | 0.95 | 03:10 | 0.112 08:35 | 0.410 | 0.273 | 0.273 | 0.11 |
| 01/15/2020 | 05:10 | 2.74 21:10 | 7.23 | 5.28 | 04:15 | 0.70 07:40 | 1.25 | 0.99 | 03:30 | 0.085 20:35 | 0.374 | 0.251 | 0.251 | 0.07 |
| 01/16/2020 | 03:30 | 2.82 19:35 | 8.52 | 5.88 | 04:05 | 0.73 07:05 | 1.20 | 0.99 | 03:20 | 0.095 19:25 | 0.458 | 0.287 | 0.287 | 0.66 |
| 01/17/2020 | 03:25 | 3.55 08:55 | 8.25 | 5.93 | 03:30 | 0.73 07:00 | 1.21 | 1.00 | 03:30 | 0.126 20:40 | 0.395 | 0.292 | 0.292 | |
| 01/18/2020 | 05:20 | 3.05 11:40 | 8.04 | 6.00 | 21:10 | 0.77 00:10 | 1.19 | 0.97 | 05:25 | 0.118 11:15 | 0.441 | 0.287 | 0.287 | |
| 01/19/2020 | 05:35 | 3.12 21:50 | 8.80 | 6.19 | 04:05 | 0.75 05:45 | 1.15 | 0.98 | 05:15 | 0.117 21:50 | 0.451 | 0.304 | 0.304 | |
| 01/20/2020 | 05:30 | 4.11 13:40 | 9.28 | 6.70 | 16:00 | 0.76 06:35 | 1.21 | 1.00 | 05:30 | 0.157 13:30 | 0.459 | 0.339 | 0.339 | |
| 01/21/2020 | 05:10 | 3.31 21:35 | 7.91 | 5.69 | 03:50 | 0.75 07:45 | 1.15 | 0.95 | 03:45 | 0.110 21:50 | 0.399 | 0.265 | 0.265 | |
| 01/22/2020 | 03:25 | 3.21 22:40 | 8.31 | 5.88 | 03:15 | 0.71 07:40 | 1.13 | 0.95 | 03:25 | 0.095 22:15 | 0.419 | 0.276 | 0.276 | 0.03 |
| 01/23/2020 | 03:35 | 3.43 21:55 | 8.83 | 6.29 | 11:55 | 0.73 07:15 | 1.14 | 0.93 | 03:40 | 0.116 13:25 | 0.400 | 0.294 | 0.294 | |
| 01/24/2020 | 05:10 | 3.85 22:20 | 8.39 | 6.52 | 22:20 | 0.86 07:45 | 1.00 | 0.95 | 05:10 | 0.148 22:20 | 0.393 | 0.312 | 0.312 | |
| 01/25/2020 | 05:35 | 3.13 19:25 | 8.13 | 6.06 | 05:35 | 0.83 00:25 | 1.00 | 0.94 | 05:35 | 0.100 19:25 | 0.388 | 0.287 | 0.287 | |
| 01/26/2020 | 05:30 | 2.96 11:10 | 8.51 | 6.24 | 05:30 | 0.81 00:30 | 1.00 | 0.92 | 05:30 | 0.089 11:10 | 0.394 | 0.291 | 0.291 | 0.16 |
| 01/27/2020 | 03:35 | 3.19 21:25 | 8.09 | 5.82 | 03:35 | 0.84 00:00 | 1.00 | 0.96 | 03:35 | 0.104 21:25 | 0.387 | 0.276 | 0.276 | |
| 01/28/2020 | 05:10 | 3.08 20:00 | 8.74 | 5.85 | 20:00 | 0.83 15:25 | 1.00 | 0.95 | 05:10 | 0.097 20:00 | 0.396 | 0.276 | 0.276 | 0.01 |
| 01/29/2020 | 03:25 | 3.18 21:30 | 8.17 | 5.84 | 03:25 | 0.84 18:05 | 1.00 | 0.96 | 03:25 | 0.103 21:30 | 0.389 | 0.278 | 0.278 | |
| 01/30/2020 | 03:20 | 3.43 22:25 | 7.77 | 5.66 | 03:20 | 0.87 23:50 | 1.00 | 0.97 | 03:20 | 0.119 22:25 | 0.379 | 0.269 | 0.269 | |
| 01/31/2020 | 05:05 | 3.20 19:30 | 7.81 | 5.71 | 05:05 | 0.84 23:35 | 1.00 | 0.96 | 05:05 | 0.105 19:30 | 0.380 | 0.271 | 0.271 | |
| 02/01/2020 | 03:25 | 3.10 10:00 | 7.71 | 5.75 | 03:25 | 0.83 23:40 | 1.00 | 0.95 | 03:25 | 0.098 10:00 | 0.377 | 0.272 | 0.272 | |
| 02/02/2020 | 03:40 | 3.31 12:30 | 8.50 | 6.00 | 12:30 | 0.85 08:30 | 1.00 | 0.94 | 03:40 | 0.112 12:30 | 0.394 | 0.282 | 0.282 | |
| 02/03/2020 | 03:30 | 3.48 21:30 | 7.92 | 5.75 | 03:30 | 0.88 07:30 | 1.00 | 0.96 | 03:30 | 0.123 21:30 | 0.383 | 0.273 | 0.273 | |
| 02/04/2020 | 03:15 | 3.53 08:50 | 7.21 | 5.32 | 03:15 | 0.89 17:00 | 1.00 | 0.98 | 03:15 | 0.126 08:50 | 0.360 | 0.249 | 0.249 | |
| 02/05/2020 | 02:55 | 2.93 21:45 | 6.87 | 5.14 | 06:25 | 0.80 07:40 | 1.25 | 1.02 | 02:55 | 0.087 11:25 | 0.400 | 0.253 | 0.253 | |
| 02/06/2020 | 03:40 | 2.80 19:10 | 7.96 | 5.29 | 03:15 | 0.74 07:40 | 1.23 | 1.00 | 03:40 | 0.080 19:15 | 0.385 | 0.254 | 0.254 | |
| 02/07/2020 | 03:55 | 2.91 21:20 | 7.10 | 5.29 | 03:00 | 0.72 11:55 | 1.19 | 1.02 | 03:00 | 0.083 08:55 | 0.379 | 0.260 | 0.260 | |
| 02/08/2020 | 05:30 | 3.06 15:15 | 25.11 | 5.77 | 15:25 | 0.16 23:40 | 1.11 | 0.92 | 03:30 | 0.094 16:20 | 0.407 | 0.241 | 0.241 | |
| 02/09/2020 | 05:30 | 3.30 11:15 | 8.27 | 6.03 | 11:20 | 0.73 00:00 | 1.17 | 0.96 | 05:55 | 0.101 11:15 | 0.470 | 0.291 | 0.291 | |
| 02/10/2020 | 03:35 | 3.12 21:00 | 7.73 | 5.70 | 05:15 | 0.74 07:30 | 1.23 | 0.97 | 03:40 | 0.091 19:50 | 0.418 | 0.273 | 0.273 | |
| 02/11/2020 | 04:50 | 3.17 22:25 | 8.30 | 6.09 | 22:05 | 0.71 07:25 | 1.15 | 0.90 | 03:05 | 0.091 09:05 | 0.394 | 0.275 | 0.275 | |
| 02/12/2020 | 03:10 | 2.94 19:25 | 7.95 | 5.79 | 19:55 | 0.74 07:20 | 1.26 | 0.98 | 02:50 | 0.093 19:10 | 0.408 | 0.279 | 0.279 | |
| 02/13/2020 | 03:25 | 2.94 19:55 | 7.12 | 5.34 | 04:00 | 0.77 07:35 | 1.24 | 1.05 | 03:35 | 0.089 21:50 | 0.415 | 0.270 | 0.270 | |
| 02/14/2020 | 03:30 | 3.03 08:45 | 7.87 | 5.43 | 03:35 | 0.77 07:25 | 1.27 | 1.05 | 03:35 | 0.088 20:05 | 0.424 | 0.274 | 0.274 | |
| 02/15/2020 | 05:15 | 3.12 10:45 | 8.15 | 5.71 | 04:35 | 0.73 00:05 | 1.18 | 1.00 | 04:35 | 0.093 10:40 | 0.436 | 0.282 | 0.282 | |
| 02/16/2020 | 05:35 | 2.89 12:30 | 7.85 | 5.72 | 04:00 | 0.78 00:50 | 1.18 | 0.97 | 06:00 | 0.091 11:25 | 0.460 | 0.270 | 0.270 | |
| 02/17/2020 | 05:00 | 3.07 20:15 | 7.73 | 5.73 | 04:35 | 0.72 23:40 | 1.13 | 0.93 | 04:40 | 0.091 20:05 | 0.425 | 0.265 | 0.265 | |
| 02/18/2020 | 03:20 | 2.98 19:45 | 7.61 | 5.52 | 02:35 | 0.75 00:00 | 1.18 | 1.00 | 04:50 | 0.095 18:50 | 0.389 | 0.268 | 0.268 | |
| 02/19/2020 | 03:35 | 3.04 21:40 | 8.09 | 5.55 | 22:00 | 0.74 10:30 | 1.26 | 1.00 | 03:25 | 0.094 19:45 | 0.404 | 0.271 | 0.271 | |
| 02/20/2020 | 03:40 | 3.06 21:05 | 11.07 | 6.09 | 22:30 | 0.51 07:25 | 1.20 | 0.95 | 03:05 | 0.104 23:05 | 0.444 | 0.272 | 0.272 | |
| 02/21/2020 | 03:10 | 3.58 08:15 | 9.33 | 6.13 | 08:15 | 0.65 23:30 | 1.11 | 0.95 | 02:45 | 0.110 18:55 | 0.393 | 0.290 | 0.290 | |
| 02/22/2020 | 06:00 | 3.24 10:30 | 8.20 | 6.00 | 10:50 | 0.72 08:10 | 1.19 | 0.96 | 06:05 | 0.111 10:35 | 0.443 | 0.287 | 0.287 | |
| 02/23/2020 | 05:35 | 2.93 10:50 | 8.46 | 6.10 | 05:25 | 0.76 18:10 | 1.14 | 0.94 | 05:25 | 0.084 12:40 | 0.437 | 0.288 | 0.288 | |
| 02/24/2020 | 04:55 | 3.37 20:45 | 7.93 | 5.75 | 04:50 | 0.75 07:30 | 1.15 | 0.95 | 04:10 | 0.103 19:25 | 0.414 | 0.270 | 0.270 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 03:35 | 3.02 | 22:25 | 7.81 | 5.65 | 04:15 | 0.75 | 07:20 | 1.24 | 0.97 | 03:15 | 0.102 | 21:25 | 0.403 | 0.270 | 0.270 | |
| 02/26/2020 | 03:15 | 3.11 | 19:35 | 9.23 | 6.17 | 19:25 | 0.67 | 07:30 | 1.18 | 0.93 | 03:30 | 0.092 | 20:30 | 0.419 | 0.282 | 0.282 | |
| 02/27/2020 | 04:20 | 3.28 | 17:30 | 19.17 | 6.12 | 17:30 | 0.16 | 09:35 | 1.13 | 0.89 | 04:30 | 0.100 | 09:00 | 0.545 | 0.262 | 0.262 | |
| 02/28/2020 | 05:05 | 3.30 | 08:55 | 7.51 | 5.69 | 03:55 | 0.77 | 06:55 | 1.14 | 0.97 | 02:55 | 0.107 | 08:35 | 0.414 | 0.269 | 0.269 | |
| 02/29/2020 | 05:50 | 3.23 | 13:15 | 23.46 | 5.72 | 13:20 | 0.16 | 18:15 | 1.22 | 0.96 | 04:30 | 0.094 | 14:20 | 0.502 | 0.257 | 0.257 | |
| 03/01/2020 | 05:45 | 2.74 | 21:25 | 7.88 | 5.70 | 04:25 | 0.78 | 18:25 | 1.22 | 1.00 | 04:25 | 0.084 | 11:45 | 0.433 | 0.283 | 0.283 | |
| 03/02/2020 | 05:05 | 2.90 | 20:10 | 7.69 | 5.28 | 02:40 | 0.80 | 18:20 | 1.20 | 1.03 | 03:30 | 0.091 | 19:20 | 0.422 | 0.264 | 0.264 | |
| 03/03/2020 | 05:00 | 2.90 | 21:50 | 7.93 | 5.37 | 03:25 | 0.83 | 07:25 | 1.24 | 1.07 | 03:25 | 0.099 | 21:25 | 0.429 | 0.277 | 0.277 | |
| 03/04/2020 | 05:00 | 2.99 | 20:25 | 7.84 | 5.43 | 02:35 | 0.89 | 07:45 | 1.23 | 1.05 | 02:35 | 0.102 | 21:15 | 0.418 | 0.276 | 0.276 | |
| 03/05/2020 | 03:15 | 2.84 | 20:00 | 7.32 | 5.44 | 04:15 | 0.80 | 06:55 | 1.23 | 1.05 | 03:25 | 0.089 | 19:50 | 0.415 | 0.278 | 0.278 | |
| 03/06/2020 | 03:05 | 2.95 | 21:00 | 7.50 | 5.53 | 03:15 | 0.86 | 07:25 | 1.22 | 1.05 | 03:15 | 0.096 | 21:10 | 0.399 | 0.283 | 0.283 | |
| 03/07/2020 | 03:35 | 2.92 | 20:05 | 7.83 | 5.79 | 13:45 | 0.89 | 19:00 | 1.20 | 1.05 | 03:45 | 0.107 | 12:35 | 0.454 | 0.300 | 0.300 | |
| 03/08/2020 | 04:00 | 3.28 | 14:15 | 34.98 | 16.56 | 11:00 | 0.26 | 14:15 | 1.78 | 0.71 | 05:10 | 0.110 | 14:15 | 1.416 | 0.316 | 0.316 | |
| 03/09/2020 | 23:55 | 4.57 | 06:40 | 25.25 | 11.60 | 03:20 | 0.16 | 11:30 | 1.20 | 0.81 | 03:20 | 0.125 | 07:05 | 0.472 | 0.300 | 0.300 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 30.779 | 4.90 |
| Avg | 6.17 | 0.94 | 0.283 | |

## Site Commentary

### Site Information

| MIL_1043 | |
|---|---|
| Pipe Dimensions | 20.75 |
| Silt Level | 0.00" |

### Overview

Site MIL_1043 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited a small response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed downstream of MIL_1193. A review of balancing of combined flows MIL_1043 and MIL_2840 shows a net flow of 0.663 MGD.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 5.25 | 4.00 | 1.263 |
| Minimum | 3.29 | 1.93 | 0.306 |
| Maximum | 7.55 | 4.98 | 2.432 |
| Time of Minimum | 2/26/2020 3:35 AM | 3/2/2020 4:00 AM | 3/2/2020 4:00 AM |
| Time of Maximum | 12/7/2019 6:15 PM | 11/28/2019 12:30 PM | 12/7/2019 6:15 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

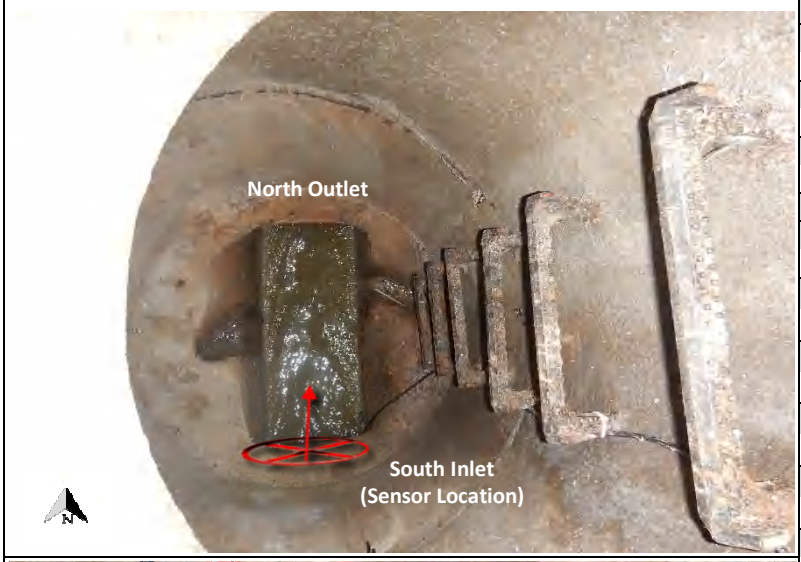
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_1043

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Ayer St and Park Hill Dr, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.436384° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.887700° | 20.75"x20.75" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 1043 | Residential/Commercial |
| Access | Traffic |
| Drive | Medium |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Thursday, November 14, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 6:52:00 AM | 20.75"x20.75" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 6.38" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 4.50' | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

Medium depth with fast velocity and small waves

## Manhole / Pipe Information:

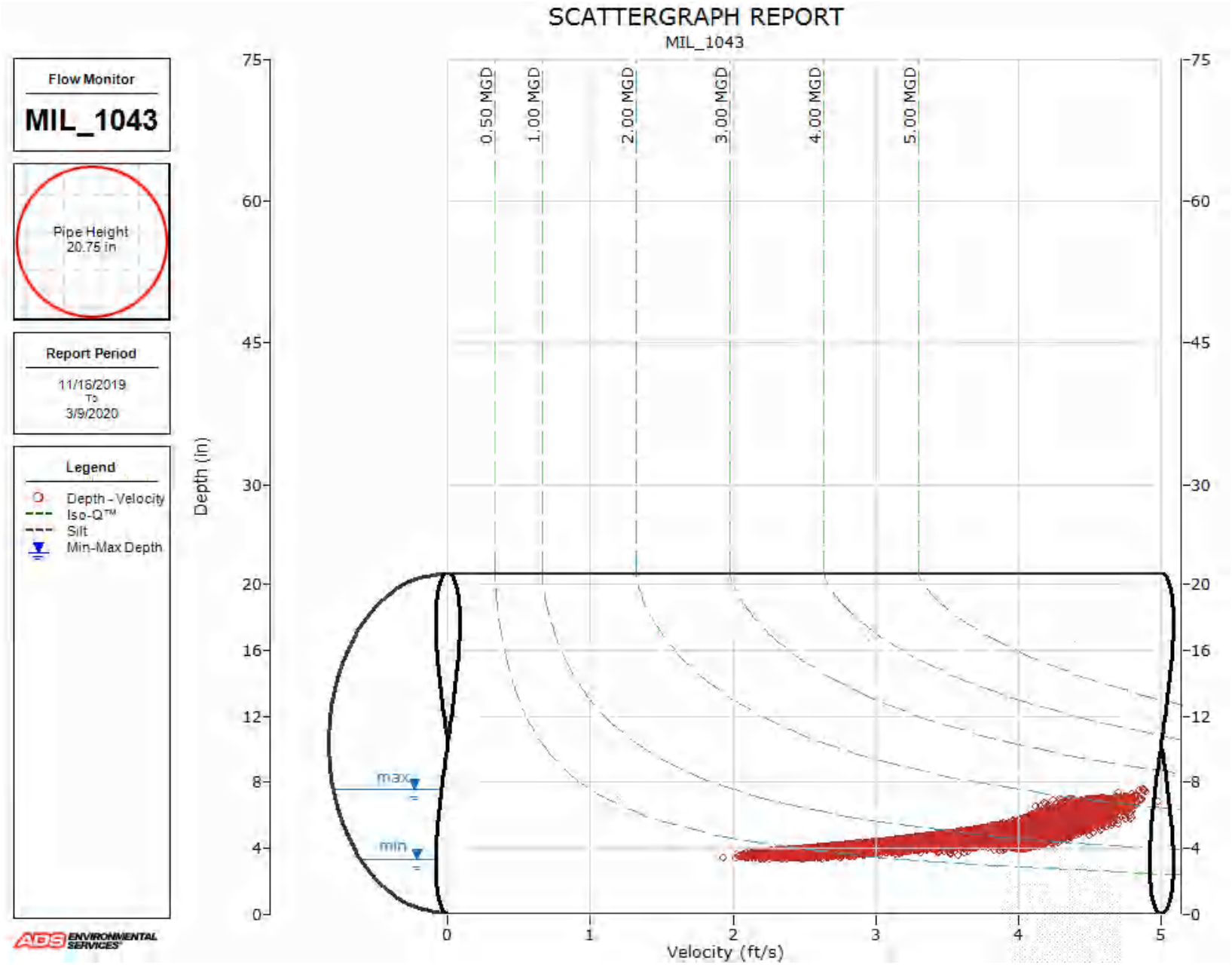
| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 10' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

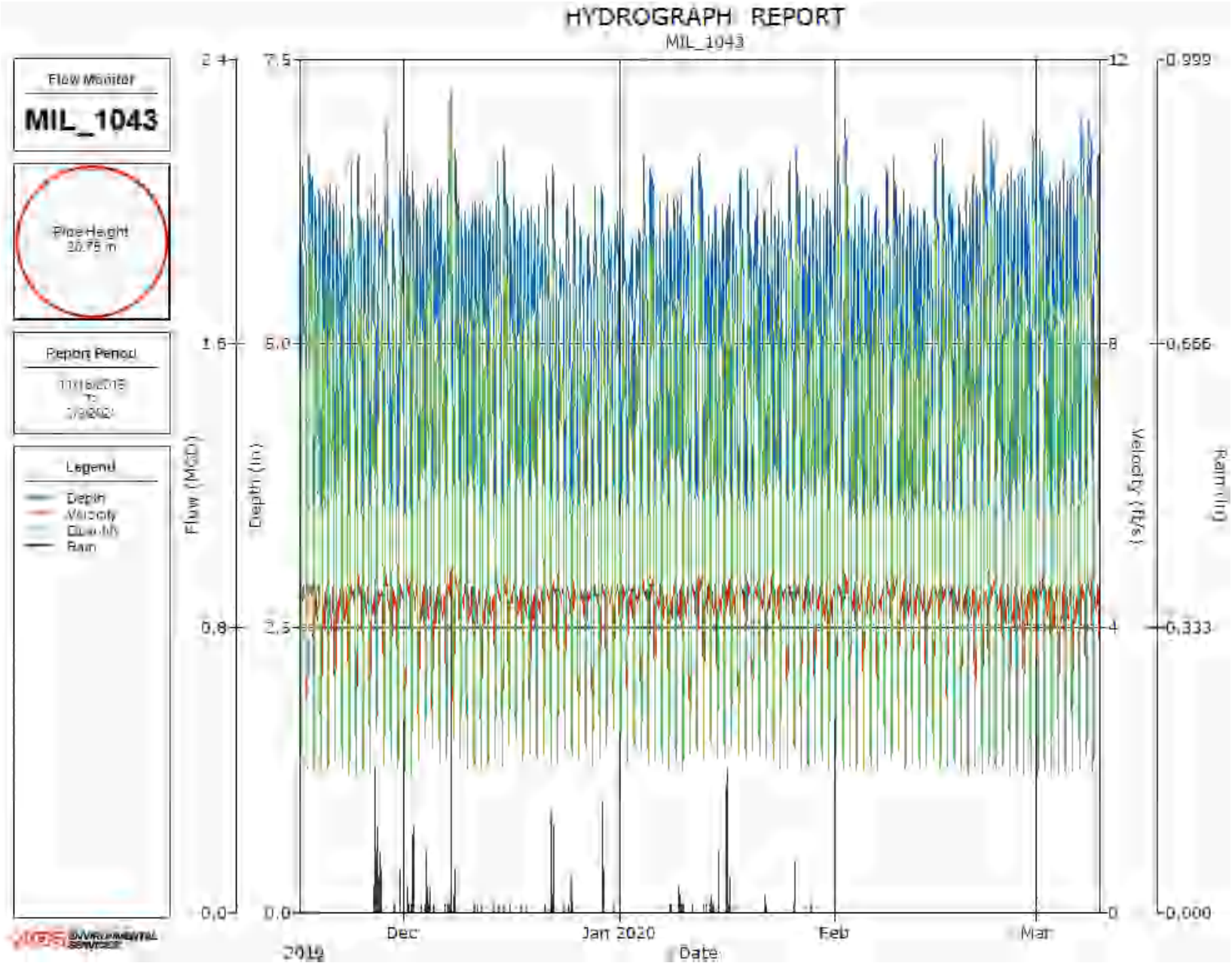
## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Drilled Pavement / Concrete |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |


SCATTERGRAPH REPORT
MIL_1043
Flow Monitor
MIL_1043
Pipe Height
20.75 in
Report Period
11/16/2019
To
3/9/2020
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.50 MGD
1.00 MGD
2.00 MGD
3.00 MGD
4.00 MGD
5.00 MGD
Depth (in)
Velocity (ft/s)
max
min
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_1043
Flow Monitor
MIL_1043
Pipe Height
20.75 in
Report Period
Legend
Depth
Velocity
Flow
Rain
2.4
1.6
0.8
0.0
7.5
5.0
2.5
0.0
12
8
4
0
0.999
0.666
0.333
0.000
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
Dec
Jan 2020
Feb
Mar
2019
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_1043, Pipe Height: 20.75 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 03:25 | 3.55 | 10:30 | 6.60 | 5.43 | 04:55 | 2.20 | 13:25 | 4.68 | 3.94 | 04:55 | 0.387 | 10:25 | 1.915 | 1.316 | 1.316 | |
| 11/17/2019 | 04:45 | 3.48 | 10:40 | 6.86 | 5.50 | 04:30 | 2.20 | 21:10 | 4.74 | 3.99 | 04:30 | 0.373 | 10:50 | 2.066 | 1.366 | 1.366 | |
| 11/18/2019 | 03:25 | 3.47 | 07:55 | 6.71 | 5.27 | 02:20 | 2.15 | 20:15 | 4.73 | 3.94 | 04:20 | 0.372 | 07:55 | 2.002 | 1.251 | 1.251 | |
| 11/19/2019 | 04:35 | 3.51 | 08:05 | 6.55 | 5.27 | 02:55 | 2.17 | 07:35 | 4.63 | 3.90 | 04:20 | 0.381 | 08:05 | 1.888 | 1.238 | 1.238 | |
| 11/20/2019 | 04:25 | 3.59 | 08:10 | 6.63 | 5.26 | 03:30 | 2.11 | 07:55 | 4.70 | 3.91 | 03:30 | 0.377 | 08:00 | 1.938 | 1.235 | 1.235 | |
| 11/21/2019 | 04:25 | 3.59 | 07:55 | 6.68 | 5.27 | 03:35 | 2.20 | 18:15 | 4.70 | 3.93 | 03:35 | 0.400 | 07:55 | 1.961 | 1.242 | 1.242 | |
| 11/22/2019 | 03:35 | 3.58 | 08:05 | 6.49 | 5.26 | 04:25 | 2.14 | 08:05 | 4.62 | 3.94 | 04:25 | 0.382 | 08:05 | 1.873 | 1.240 | 1.240 | |
| 11/23/2019 | 04:30 | 3.47 | 11:00 | 6.70 | 5.31 | 04:00 | 2.13 | 11:20 | 4.71 | 3.94 | 04:30 | 0.361 | 11:25 | 1.978 | 1.276 | 1.276 | |
| 11/24/2019 | 04:40 | 3.49 | 11:10 | 6.75 | 5.35 | 04:45 | 2.07 | 11:35 | 4.82 | 4.00 | 04:45 | 0.350 | 11:10 | 2.035 | 1.314 | 1.314 | |
| 11/25/2019 | 04:10 | 3.45 | 08:05 | 6.32 | 5.12 | 03:20 | 2.21 | 21:55 | 4.65 | 3.95 | 04:10 | 0.371 | 08:10 | 1.811 | 1.203 | 1.203 | |
| 11/26/2019 | 04:10 | 3.51 | 08:00 | 6.68 | 5.18 | 03:45 | 2.13 | 07:55 | 4.82 | 3.94 | 03:45 | 0.373 | 08:00 | 2.033 | 1.223 | 1.223 | 0.36 |
| 11/27/2019 | 03:10 | 3.66 | 10:10 | 6.24 | 5.40 | 02:35 | 2.38 | 21:15 | 4.64 | 4.07 | 03:10 | 0.439 | 10:25 | 1.771 | 1.324 | 1.324 | 0.63 |
| 11/28/2019 | 05:00 | 3.43 | 12:10 | 7.05 | 5.30 | 05:00 | 2.28 | 12:30 | 4.98 | 3.98 | 05:00 | 0.375 | 12:30 | 2.164 | 1.288 | 1.288 | |
| 11/29/2019 | 04:05 | 3.40 | 11:15 | 6.18 | 5.05 | 04:20 | 2.25 | 11:50 | 4.70 | 3.95 | 04:05 | 0.390 | 11:15 | 1.731 | 1.177 | 1.177 | 0.02 |
| 11/30/2019 | 03:45 | 3.41 | 13:15 | 6.57 | 5.17 | 04:10 | 2.13 | 11:50 | 4.69 | 3.97 | 05:00 | 0.357 | 11:50 | 1.931 | 1.237 | 1.237 | 0.10 |
| 12/01/2019 | 04:55 | 3.42 | 12:45 | 6.70 | 5.38 | 04:15 | 2.23 | 18:20 | 4.74 | 4.03 | 04:55 | 0.366 | 12:40 | 2.007 | 1.334 | 1.334 | 0.06 |
| 12/02/2019 | 04:05 | 3.40 | 08:15 | 6.81 | 5.23 | 03:05 | 2.10 | 08:10 | 4.75 | 4.03 | 03:05 | 0.348 | 08:05 | 2.038 | 1.267 | 1.267 | 0.30 |
| 12/03/2019 | 03:25 | 3.41 | 07:55 | 6.43 | 5.21 | 04:25 | 2.14 | 20:25 | 4.64 | 3.96 | 04:25 | 0.375 | 08:00 | 1.848 | 1.232 | 1.232 | 0.01 |
| 12/04/2019 | 03:25 | 3.52 | 08:05 | 6.61 | 5.39 | 03:25 | 2.25 | 08:05 | 4.77 | 4.02 | 03:25 | 0.383 | 08:05 | 1.984 | 1.303 | 1.303 | 0.39 |
| 12/05/2019 | 04:35 | 3.53 | 21:35 | 6.46 | 5.29 | 04:10 | 2.17 | 07:55 | 4.66 | 3.94 | 04:35 | 0.392 | 07:55 | 1.859 | 1.251 | 1.251 | 0.01 |
| 12/06/2019 | 03:30 | 3.58 | 08:15 | 6.57 | 5.31 | 04:45 | 2.24 | 17:25 | 4.62 | 3.94 | 03:35 | 0.402 | 08:15 | 1.812 | 1.253 | 1.253 | 0.01 |
| 12/07/2019 | 03:25 | 3.55 | 18:15 | 7.55 | 5.61 | 04:25 | 2.22 | 18:05 | 4.90 | 4.04 | 04:35 | 0.392 | 18:15 | 2.432 | 1.417 | 1.417 | 0.67 |
| 12/08/2019 | 05:05 | 3.60 | 10:55 | 6.83 | 5.53 | 03:35 | 2.44 | 20:20 | 4.75 | 4.14 | 05:05 | 0.436 | 10:50 | 2.054 | 1.404 | 1.404 | 0.20 |
| 12/09/2019 | 04:25 | 3.52 | 08:05 | 6.43 | 5.18 | 02:40 | 2.03 | 20:30 | 4.71 | 4.01 | 02:40 | 0.364 | 08:10 | 1.859 | 1.233 | 1.233 | |
| 12/10/2019 | 03:50 | 3.45 | 20:50 | 6.38 | 5.17 | 03:45 | 2.11 | 20:55 | 4.68 | 3.95 | 03:45 | 0.356 | 20:55 | 1.845 | 1.212 | 1.212 | |
| 12/11/2019 | 04:40 | 3.56 | 08:10 | 6.39 | 5.27 | 03:30 | 2.17 | 20:40 | 4.62 | 3.92 | 04:30 | 0.387 | 08:15 | 1.813 | 1.240 | 1.240 | 0.03 |
| 12/12/2019 | 04:00 | 3.48 | 08:00 | 6.35 | 5.23 | 04:05 | 2.10 | 08:00 | 4.60 | 3.89 | 04:05 | 0.356 | 08:00 | 1.811 | 1.220 | 1.220 | 0.01 |
| 12/13/2019 | 04:15 | 3.58 | 07:55 | 6.35 | 5.28 | 03:15 | 2.15 | 07:40 | 4.63 | 3.91 | 03:15 | 0.386 | 07:55 | 1.776 | 1.237 | 1.237 | 0.01 |
| 12/14/2019 | 04:35 | 3.57 | 11:05 | 6.65 | 5.42 | 03:25 | 2.20 | 14:05 | 4.68 | 3.99 | 03:35 | 0.397 | 11:05 | 1.941 | 1.322 | 1.322 | 0.01 |
| 12/15/2019 | 04:35 | 3.40 | 10:50 | 6.87 | 5.42 | 04:15 | 2.20 | 10:30 | 4.71 | 4.03 | 04:30 | 0.380 | 11:05 | 2.051 | 1.347 | 1.347 | 0.01 |
| 12/16/2019 | 04:30 | 3.60 | 21:20 | 6.36 | 5.20 | 02:40 | 2.30 | 21:50 | 4.66 | 4.06 | 03:20 | 0.422 | 21:15 | 1.834 | 1.256 | 1.256 | 0.01 |
| 12/17/2019 | 04:40 | 3.67 | 21:55 | 6.25 | 5.17 | 04:25 | 2.49 | 21:00 | 4.67 | 4.04 | 04:25 | 0.460 | 21:55 | 1.774 | 1.229 | 1.229 | 0.01 |
| 12/18/2019 | 02:50 | 3.51 | 07:50 | 6.31 | 5.19 | 02:55 | 2.23 | 22:05 | 4.68 | 3.99 | 02:55 | 0.390 | 22:10 | 1.802 | 1.232 | 1.232 | 0.01 |
| 12/19/2019 | 03:05 | 3.54 | 08:25 | 6.38 | 5.25 | 03:20 | 2.23 | 07:45 | 4.71 | 3.98 | 03:20 | 0.399 | 07:45 | 1.813 | 1.246 | 1.246 | |
| 12/20/2019 | 04:25 | 3.57 | 08:05 | 6.32 | 5.30 | 04:40 | 2.18 | 18:50 | 4.68 | 3.97 | 04:40 | 0.399 | 08:05 | 1.764 | 1.259 | 1.259 | |
| 12/21/2019 | 03:40 | 3.66 | 11:55 | 6.52 | 5.36 | 03:30 | 2.26 | 14:00 | 4.67 | 4.00 | 04:50 | 0.418 | 12:00 | 1.888 | 1.302 | 1.302 | 0.01 |
| 12/22/2019 | 04:25 | 3.43 | 11:00 | 6.61 | 5.31 | 04:15 | 2.19 | 19:35 | 4.75 | 4.05 | 04:15 | 0.379 | 11:30 | 1.930 | 1.304 | 1.304 | 0.41 |
| 12/23/2019 | 04:30 | 3.45 | 11:00 | 5.94 | 5.12 | 04:25 | 2.20 | 12:40 | 4.62 | 4.06 | 04:25 | 0.373 | 11:00 | 1.640 | 1.224 | 1.224 | |
| 12/24/2019 | 03:55 | 3.63 | 11:50 | 6.41 | 5.19 | 03:30 | 2.26 | 12:55 | 4.78 | 4.06 | 03:30 | 0.414 | 11:50 | 1.833 | 1.252 | 1.252 | 0.02 |
| 12/25/2019 | 05:15 | 3.42 | 11:15 | 6.51 | 5.03 | 05:25 | 2.23 | 11:15 | 4.72 | 4.04 | 05:25 | 0.387 | 11:15 | 1.924 | 1.190 | 1.190 | 0.08 |
| 12/26/2019 | 04:25 | 3.47 | 10:10 | 6.37 | 5.05 | 05:00 | 2.35 | 10:05 | 4.67 | 3.99 | 04:25 | 0.406 | 10:10 | 1.830 | 1.188 | 1.188 | |
| 12/27/2019 | 03:50 | 3.48 | 11:45 | 6.05 | 5.10 | 04:30 | 2.30 | 22:05 | 4.61 | 4.02 | 04:25 | 0.393 | 12:15 | 1.655 | 1.207 | 1.207 | |
| 12/28/2019 | 04:25 | 3.43 | 12:05 | 6.46 | 5.14 | 04:45 | 2.13 | 12:10 | 4.64 | 3.97 | 04:45 | 0.373 | 12:05 | 1.865 | 1.220 | 1.220 | |
| 12/29/2019 | 03:55 | 3.47 | 11:55 | 6.51 | 5.16 | 04:35 | 2.16 | 10:45 | 4.73 | 4.01 | 04:35 | 0.381 | 11:50 | 1.894 | 1.242 | 1.242 | 0.22 |
| 12/30/2019 | 04:30 | 3.55 | 11:30 | 6.10 | 5.11 | 03:30 | 2.27 | 12:45 | 4.79 | 4.06 | 03:30 | 0.396 | 12:45 | 1.717 | 1.226 | 1.226 | |
| 12/31/2019 | 04:25 | 3.70 | 18:20 | 6.24 | 5.21 | 04:20 | 2.55 | 19:10 | 4.68 | 4.13 | 04:20 | 0.469 | 18:20 | 1.787 | 1.275 | 1.275 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:40 | 3.47 12:10 | 6.24 | 5.04 | 05:20 | 2.63 12:00 | 4.67 | 4.08 | 05:40 | 0.463 12:10 | 1.796 | 1.205 | 1.205 | |
| 01/02/2020 | 03:45 | 3.46 21:10 | 6.01 | 5.08 | 03:35 | 2.27 21:50 | 4.59 | 4.05 | 03:50 | 0.392 20:30 | 1.657 | 1.208 | 1.208 | |
| 01/03/2020 | 03:00 | 3.59 19:45 | 6.07 | 5.21 | 03:10 | 2.28 20:50 | 4.58 | 4.04 | 04:15 | 0.419 19:45 | 1.682 | 1.248 | 1.248 | |
| 01/04/2020 | 03:30 | 3.45 12:45 | 6.72 | 5.30 | 04:55 | 2.41 12:10 | 4.72 | 4.03 | 04:55 | 0.408 12:10 | 1.988 | 1.299 | 1.299 | |
| 01/05/2020 | 04:25 | 3.38 10:25 | 6.66 | 5.37 | 04:20 | 2.27 20:30 | 4.76 | 4.08 | 04:20 | 0.382 20:30 | 1.966 | 1.341 | 1.341 | |
| 01/06/2020 | 04:00 | 3.46 20:35 | 6.33 | 5.15 | 03:40 | 2.12 19:45 | 4.73 | 4.04 | 04:15 | 0.376 20:35 | 1.813 | 1.235 | 1.235 | |
| 01/07/2020 | 03:25 | 3.53 21:00 | 6.38 | 5.16 | 04:50 | 2.25 21:00 | 4.66 | 3.96 | 03:30 | 0.400 21:00 | 1.848 | 1.216 | 1.216 | |
| 01/08/2020 | 03:55 | 3.50 09:50 | 6.39 | 5.25 | 03:45 | 2.18 20:45 | 4.63 | 3.94 | 03:45 | 0.375 21:00 | 1.820 | 1.242 | 1.242 | 0.02 |
| 01/09/2020 | 04:10 | 3.49 08:00 | 6.57 | 5.28 | 04:10 | 2.25 21:05 | 4.62 | 3.97 | 04:10 | 0.379 08:00 | 1.894 | 1.262 | 1.262 | 0.18 |
| 01/10/2020 | 03:10 | 3.51 08:05 | 6.34 | 5.23 | 03:50 | 2.12 08:05 | 4.61 | 3.96 | 03:55 | 0.364 08:05 | 1.808 | 1.238 | 1.238 | 0.02 |
| 01/11/2020 | 04:05 | 3.58 11:35 | 6.58 | 5.31 | 04:35 | 2.26 10:30 | 4.77 | 4.01 | 04:35 | 0.416 11:45 | 1.934 | 1.292 | 1.292 | 0.01 |
| 01/12/2020 | 04:10 | 3.46 12:20 | 6.82 | 5.38 | 03:55 | 2.24 10:15 | 4.76 | 4.09 | 03:55 | 0.385 12:15 | 2.034 | 1.349 | 1.349 | |
| 01/13/2020 | 03:45 | 3.50 07:55 | 6.35 | 5.08 | 02:25 | 2.25 08:00 | 4.68 | 4.04 | 03:20 | 0.396 08:00 | 1.839 | 1.212 | 1.212 | 0.02 |
| 01/14/2020 | 02:30 | 3.65 08:00 | 6.31 | 5.11 | 02:10 | 2.42 21:45 | 4.74 | 4.01 | 02:35 | 0.451 21:45 | 1.839 | 1.209 | 1.209 | 0.11 |
| 01/15/2020 | 04:30 | 3.33 20:40 | 6.32 | 5.07 | 04:35 | 2.47 21:35 | 4.66 | 4.03 | 04:35 | 0.391 20:40 | 1.805 | 1.202 | 1.202 | 0.07 |
| 01/16/2020 | 03:25 | 3.54 20:35 | 6.43 | 5.32 | 03:20 | 2.27 13:05 | 4.79 | 4.08 | 03:30 | 0.393 20:25 | 1.902 | 1.311 | 1.311 | 0.66 |
| 01/17/2020 | 03:40 | 3.54 09:00 | 6.89 | 5.19 | 04:30 | 2.32 08:15 | 4.66 | 4.07 | 04:30 | 0.409 09:00 | 2.050 | 1.251 | 1.251 | |
| 01/18/2020 | 04:00 | 3.48 11:15 | 6.56 | 5.21 | 04:05 | 2.28 12:15 | 4.72 | 4.07 | 04:05 | 0.385 11:15 | 1.916 | 1.274 | 1.274 | |
| 01/19/2020 | 05:00 | 3.38 11:00 | 6.68 | 5.19 | 04:40 | 2.31 10:55 | 4.73 | 4.07 | 04:40 | 0.376 11:00 | 1.993 | 1.271 | 1.271 | |
| 01/20/2020 | 04:05 | 3.48 21:10 | 6.45 | 5.22 | 04:05 | 2.39 14:45 | 4.80 | 4.11 | 04:05 | 0.402 21:10 | 1.886 | 1.284 | 1.284 | |
| 01/21/2020 | 03:45 | 3.56 21:55 | 6.25 | 5.05 | 04:35 | 2.24 20:45 | 4.78 | 4.05 | 04:35 | 0.401 21:50 | 1.795 | 1.197 | 1.197 | |
| 01/22/2020 | 03:00 | 3.54 21:35 | 6.48 | 5.12 | 04:05 | 2.17 19:20 | 4.75 | 4.06 | 04:05 | 0.382 20:55 | 1.905 | 1.228 | 1.228 | 0.03 |
| 01/23/2020 | 04:35 | 3.50 08:05 | 6.41 | 5.15 | 03:30 | 2.13 07:20 | 4.67 | 4.03 | 03:30 | 0.369 08:00 | 1.835 | 1.228 | 1.228 | |
| 01/24/2020 | 03:15 | 3.53 10:35 | 6.15 | 5.26 | 04:20 | 2.15 19:40 | 4.60 | 4.04 | 03:45 | 0.374 10:35 | 1.697 | 1.275 | 1.275 | |
| 01/25/2020 | 05:20 | 3.52 11:35 | 6.75 | 5.30 | 04:20 | 2.18 11:25 | 4.69 | 4.01 | 04:20 | 0.382 11:35 | 1.967 | 1.286 | 1.286 | |
| 01/26/2020 | 04:10 | 3.54 12:15 | 6.80 | 5.42 | 03:40 | 2.33 19:40 | 4.68 | 4.09 | 04:10 | 0.415 11:30 | 2.006 | 1.352 | 1.352 | 0.16 |
| 01/27/2020 | 03:40 | 3.39 20:55 | 6.46 | 5.17 | 04:15 | 2.16 20:05 | 4.70 | 4.02 | 03:40 | 0.370 20:50 | 1.889 | 1.240 | 1.240 | |
| 01/28/2020 | 04:15 | 3.51 20:30 | 6.46 | 5.11 | 03:55 | 2.17 20:30 | 4.71 | 3.98 | 03:35 | 0.378 20:30 | 1.898 | 1.208 | 1.208 | 0.01 |
| 01/29/2020 | 04:20 | 3.46 21:05 | 6.37 | 5.15 | 03:50 | 2.09 22:15 | 4.66 | 3.99 | 03:50 | 0.369 19:50 | 1.819 | 1.220 | 1.220 | |
| 01/30/2020 | 03:45 | 3.58 21:55 | 6.44 | 5.21 | 04:30 | 2.14 20:50 | 4.78 | 3.98 | 02:50 | 0.392 20:50 | 1.917 | 1.237 | 1.237 | |
| 01/31/2020 | 04:00 | 3.40 08:05 | 6.34 | 5.18 | 02:55 | 2.12 18:35 | 4.69 | 3.98 | 04:00 | 0.361 08:10 | 1.782 | 1.228 | 1.228 | |
| 02/01/2020 | 04:15 | 3.53 10:45 | 6.85 | 5.42 | 04:15 | 2.34 10:05 | 4.76 | 4.06 | 04:15 | 0.401 10:45 | 2.032 | 1.344 | 1.344 | |
| 02/02/2020 | 04:50 | 3.38 11:35 | 7.06 | 5.34 | 03:50 | 2.18 12:00 | 4.87 | 4.09 | 03:50 | 0.370 12:00 | 2.186 | 1.340 | 1.340 | |
| 02/03/2020 | 03:50 | 3.43 21:10 | 6.29 | 5.02 | 03:40 | 2.25 19:25 | 4.72 | 4.05 | 03:40 | 0.380 21:10 | 1.832 | 1.194 | 1.194 | |
| 02/04/2020 | 04:15 | 3.40 20:45 | 6.49 | 5.05 | 04:10 | 2.22 20:55 | 4.72 | 4.04 | 04:10 | 0.363 20:45 | 1.911 | 1.203 | 1.203 | |
| 02/05/2020 | 03:10 | 3.42 20:45 | 6.34 | 5.05 | 03:00 | 2.20 21:05 | 4.71 | 4.02 | 03:00 | 0.369 21:00 | 1.849 | 1.197 | 1.197 | |
| 02/06/2020 | 04:10 | 3.37 21:25 | 6.28 | 5.06 | 03:40 | 2.13 20:45 | 4.68 | 4.02 | 04:10 | 0.358 21:25 | 1.801 | 1.198 | 1.198 | |
| 02/07/2020 | 03:25 | 3.49 08:05 | 6.37 | 5.09 | 03:30 | 2.12 07:50 | 4.64 | 4.00 | 03:20 | 0.367 08:05 | 1.806 | 1.200 | 1.200 | |
| 02/08/2020 | 03:55 | 3.49 11:45 | 6.62 | 5.31 | 03:55 | 2.14 12:10 | 4.70 | 4.08 | 03:55 | 0.360 11:50 | 1.952 | 1.310 | 1.310 | |
| 02/09/2020 | 04:25 | 3.38 10:45 | 6.81 | 5.32 | 03:40 | 2.22 10:50 | 4.80 | 4.09 | 03:40 | 0.370 10:50 | 2.066 | 1.331 | 1.331 | |
| 02/10/2020 | 04:15 | 3.47 08:00 | 6.61 | 5.08 | 02:50 | 2.28 20:50 | 4.77 | 4.08 | 04:10 | 0.386 08:00 | 1.958 | 1.223 | 1.223 | |
| 02/11/2020 | 04:40 | 3.47 08:05 | 6.35 | 5.01 | 03:15 | 2.18 20:00 | 4.67 | 4.00 | 03:15 | 0.365 20:45 | 1.806 | 1.176 | 1.176 | |
| 02/12/2020 | 04:10 | 3.35 08:05 | 6.35 | 5.07 | 04:15 | 2.16 08:15 | 4.67 | 4.02 | 04:15 | 0.345 08:15 | 1.828 | 1.204 | 1.204 | |
| 02/13/2020 | 04:10 | 3.32 07:55 | 6.36 | 5.07 | 03:30 | 2.19 07:55 | 4.70 | 4.00 | 04:10 | 0.349 07:55 | 1.852 | 1.198 | 1.198 | |
| 02/14/2020 | 04:00 | 3.40 08:05 | 6.19 | 5.14 | 04:55 | 2.19 18:10 | 4.60 | 4.00 | 04:00 | 0.360 07:55 | 1.735 | 1.215 | 1.215 | |
| 02/15/2020 | 04:25 | 3.41 10:45 | 6.81 | 5.38 | 04:40 | 2.24 11:05 | 4.66 | 4.03 | 04:25 | 0.388 11:05 | 1.992 | 1.323 | 1.323 | |
| 02/16/2020 | 03:40 | 3.34 11:15 | 6.86 | 5.34 | 03:30 | 2.18 10:30 | 4.67 | 3.98 | 03:45 | 0.367 11:10 | 2.015 | 1.308 | 1.308 | |
| 02/17/2020 | 04:25 | 3.43 10:45 | 6.50 | 5.28 | 04:05 | 2.14 10:55 | 4.62 | 3.99 | 03:50 | 0.380 10:55 | 1.868 | 1.277 | 1.277 | |
| 02/18/2020 | 04:25 | 3.30 20:20 | 6.30 | 5.10 | 03:20 | 2.24 20:10 | 4.62 | 4.01 | 04:20 | 0.368 20:20 | 1.798 | 1.208 | 1.208 | |
| 02/19/2020 | 03:00 | 3.45 22:00 | 6.53 | 5.22 | 03:25 | 2.20 18:35 | 4.58 | 3.95 | 03:00 | 0.372 22:00 | 1.855 | 1.238 | 1.238 | |
| 02/20/2020 | 03:30 | 3.38 21:10 | 6.55 | 5.32 | 04:45 | 2.12 20:55 | 4.80 | 3.93 | 04:35 | 0.357 20:55 | 1.911 | 1.265 | 1.265 | |
| 02/21/2020 | 04:15 | 3.53 09:10 | 6.47 | 5.36 | 04:55 | 2.16 09:10 | 4.57 | 3.91 | 03:35 | 0.381 09:10 | 1.845 | 1.273 | 1.273 | |
| 02/22/2020 | 04:25 | 3.42 11:25 | 7.00 | 5.53 | 04:25 | 2.07 09:20 | 4.67 | 3.93 | 04:25 | 0.340 11:25 | 2.061 | 1.355 | 1.355 | |
| 02/23/2020 | 04:40 | 3.39 11:05 | 6.89 | 5.59 | 03:45 | 2.17 12:50 | 4.70 | 4.02 | 04:40 | 0.370 10:55 | 2.051 | 1.410 | 1.410 | |
| 02/24/2020 | 04:05 | 3.43 21:45 | 6.49 | 5.24 | 04:30 | 2.15 20:10 | 4.71 | 3.98 | 04:30 | 0.365 21:40 | 1.863 | 1.255 | 1.255 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 03:20 | 3.52 | 21:50 | 6.55 | 5.24 | 03:50 | 2.11 | 20:40 | 4.66 | 3.93 | 03:50 | 0.374 | 20:45 | 1.907 | 1.239 | 1.239 | |
| 02/26/2020 | 03:35 | 3.29 | 08:05 | 6.65 | 5.27 | 04:15 | 2.06 | 21:30 | 4.65 | 3.89 | 04:15 | 0.337 | 08:05 | 1.927 | 1.241 | 1.241 | |
| 02/27/2020 | 04:05 | 3.36 | 07:55 | 6.60 | 5.31 | 04:30 | 2.04 | 20:10 | 4.56 | 3.90 | 03:20 | 0.341 | 08:00 | 1.868 | 1.250 | 1.250 | |
| 02/28/2020 | 02:55 | 3.41 | 08:35 | 6.63 | 5.35 | 04:05 | 2.12 | 20:10 | 4.55 | 3.90 | 04:05 | 0.355 | 08:35 | 1.870 | 1.264 | 1.264 | |
| 02/29/2020 | 04:10 | 3.42 | 11:30 | 6.93 | 5.55 | 04:20 | 2.04 | 18:05 | 4.64 | 3.95 | 04:20 | 0.340 | 11:30 | 2.053 | 1.364 | 1.364 | |
| 03/01/2020 | 04:55 | 3.36 | 11:05 | 6.91 | 5.51 | 04:20 | 2.09 | 10:40 | 4.83 | 4.00 | 04:20 | 0.342 | 10:40 | 2.097 | 1.380 | 1.380 | |
| 03/02/2020 | 04:00 | 3.34 | 07:50 | 6.60 | 5.23 | 04:00 | 1.93 | 07:35 | 4.69 | 3.94 | 04:00 | 0.306 | 07:50 | 1.945 | 1.239 | 1.239 | |
| 03/03/2020 | 04:00 | 3.29 | 08:00 | 6.50 | 5.23 | 04:10 | 2.04 | 19:50 | 4.63 | 3.88 | 04:35 | 0.336 | 08:05 | 1.856 | 1.226 | 1.226 | |
| 03/04/2020 | 03:30 | 3.40 | 07:55 | 6.73 | 5.31 | 04:05 | 2.14 | 07:55 | 4.83 | 3.91 | 04:05 | 0.353 | 07:55 | 2.059 | 1.256 | 1.256 | |
| 03/05/2020 | 04:50 | 3.42 | 20:15 | 6.57 | 5.32 | 04:25 | 2.15 | 20:15 | 4.63 | 3.92 | 04:00 | 0.362 | 20:15 | 1.912 | 1.264 | 1.264 | |
| 03/06/2020 | 04:10 | 3.53 | 08:00 | 6.59 | 5.43 | 03:55 | 2.06 | 07:50 | 4.56 | 3.89 | 03:55 | 0.354 | 07:55 | 1.887 | 1.286 | 1.286 | |
| 03/07/2020 | 04:45 | 3.52 | 11:35 | 7.03 | 5.66 | 03:35 | 2.14 | 12:30 | 4.70 | 3.96 | 04:45 | 0.376 | 12:30 | 2.101 | 1.410 | 1.410 | |
| 03/08/2020 | 05:15 | 3.65 | 11:40 | 7.12 | 5.65 | 03:50 | 2.10 | 09:50 | 4.77 | 4.02 | 03:50 | 0.378 | 11:40 | 2.161 | 1.427 | 1.427 | |
| 03/09/2020 | 02:35 | 3.46 | 20:35 | 6.75 | 5.39 | 02:35 | 2.06 | 20:10 | 4.72 | 3.95 | 02:35 | 0.343 | 20:10 | 1.980 | 1.296 | 1.295 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 145.284 | 4.90 |
| Avg | 5.25 | 4.00 | 1.263 | |

## Site Commentary

### Site Information

| MIL_1193 | |
|---|---|
| Pipe Dimensions | 21 |
| Silt Level | 0.00" |

### Overview

Site MIL_1193 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited a small response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location. Due to a meter malfunction, data confidence is less than typical during December 16, 2019 through December 20, 2019. A data gap occurs during December 20, 2020 at 10:00 pm through December 27, 2020 at 6:00 am.

This location was installed upstream of sites MIL_1043 and MIL_2840. (See MIL_1043 and MIL_2840 Site Commentary for More Details)

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 4.15 | 2.59 | 0.600 |
| Minimum | 2.34 | 1.36 | 0.136 |
| Maximum | 6.11 | 3.72 | 1.368 |
| Time of Minimum | 11/19/2019 4:20 AM | 3/4/2020 3:15 AM | 2/18/2020 3:50 AM |
| Time of Maximum | 1/8/2020 9:25 AM | 2/2/2020 1:10 PM | 1/8/2020 9:25 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 95 |
| Velocity (ft/s) | 95 |
| Quantity (MGD) | 95 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_1193

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Yosemite Dr and Dempsey Rd, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.426666° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.883676° | 21.00"x21.00" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 1193 | Residential/Commercial |
| Access | Traffic |
| Drive | Light |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Thursday, November 14, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 8:09:00 AM | 21.00"x21.00" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 5.13" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 3.50' | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 15' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Drilled Pavement / Concrete |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |

# SCATTERGRAPH REPORT

MIL_1193

**Flow Monitor**

**MIL_1193**

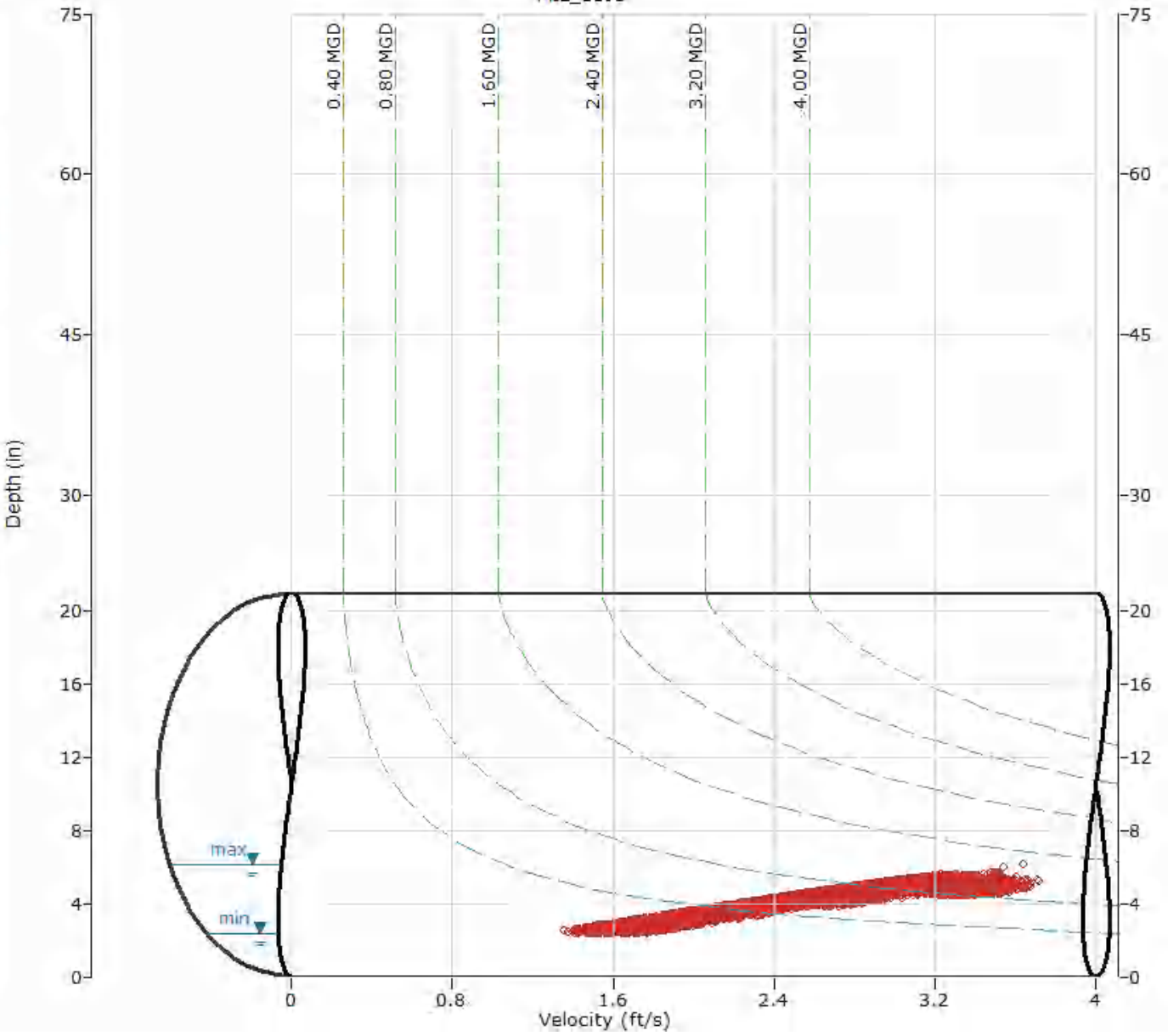
Pipe Height
21.00 in

**Report Period**

11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth

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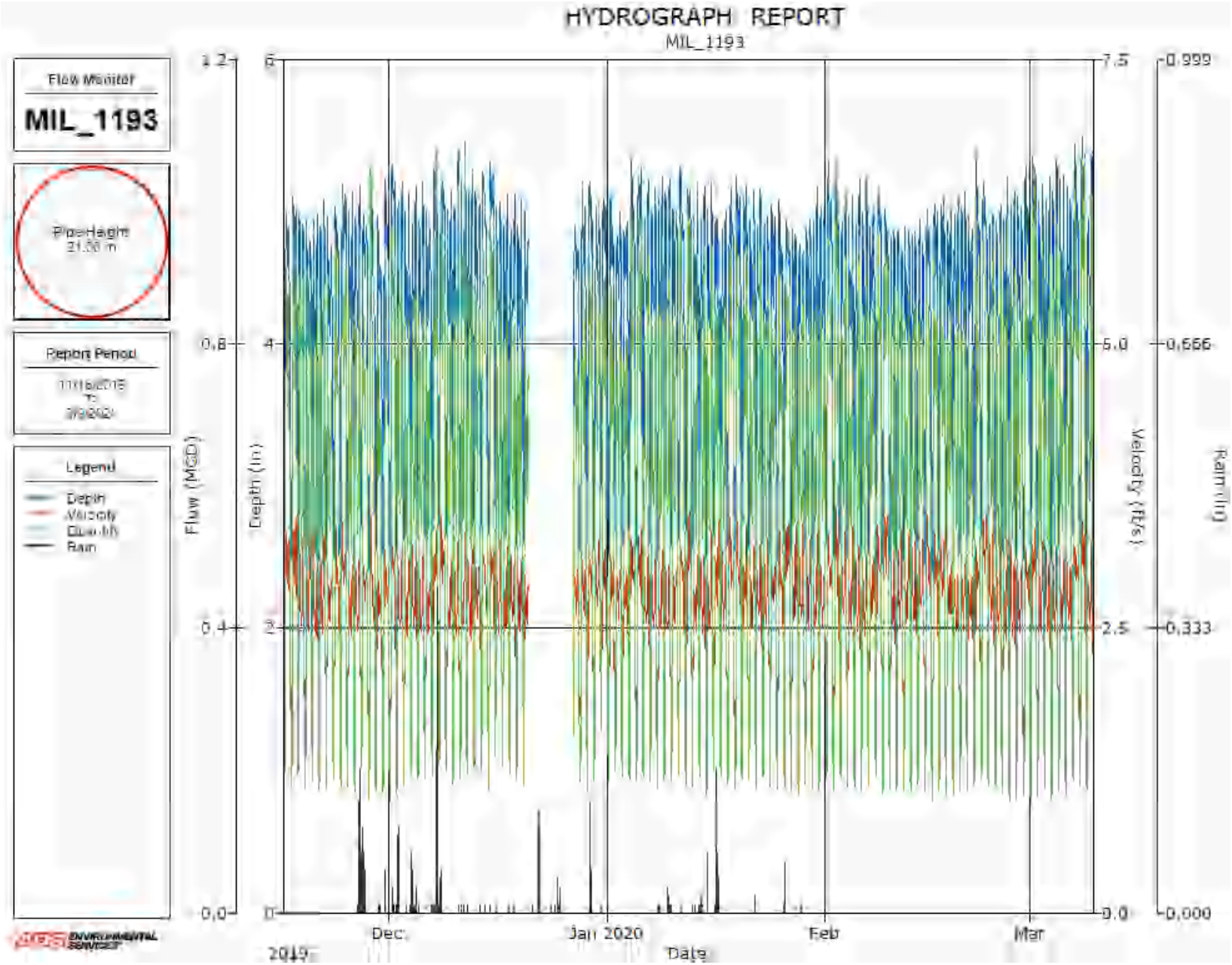

HYDROGRAPH REPORT
MIL_1193
Flow Monitor
MIL_1193
Pipe Height
21.00 in
Report Period
11/16/2019
To
3/3/2020
Legend
Depth
Velocity
Flow
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
1.2
0.8
0.4
0.0
6
4
2
0
7.5
5.0
2.5
0.0
0.999
0.666
0.333
0.000
Dec.
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_1193, Pipe Height: 21.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 04:20 | 2.45 | 10:35 | 4.97 | 4.10 | 05:00 | 1.62 | 12:00 | 3.42 | 2.66 | 04:20 | 0.176 | 10:35 | 0.938 | 0.607 | 0.607 | |
| 11/17/2019 | 05:25 | 2.41 | 10:20 | 5.31 | 4.16 | 04:00 | 1.60 | 10:20 | 3.60 | 2.76 | 05:25 | 0.161 | 10:20 | 1.111 | 0.653 | 0.653 | |
| 11/18/2019 | 03:15 | 2.54 | 07:45 | 5.11 | 4.01 | 04:40 | 1.67 | 07:50 | 3.54 | 2.62 | 04:40 | 0.186 | 07:50 | 1.027 | 0.572 | 0.572 | |
| 11/19/2019 | 04:20 | 2.34 | 07:50 | 5.05 | 3.92 | 04:45 | 1.62 | 21:40 | 3.44 | 2.61 | 04:15 | 0.161 | 07:50 | 0.981 | 0.555 | 0.555 | |
| 11/20/2019 | 04:20 | 2.37 | 07:50 | 5.24 | 3.99 | 04:15 | 1.53 | 07:45 | 3.48 | 2.57 | 04:15 | 0.150 | 07:50 | 1.053 | 0.558 | 0.558 | |
| 11/21/2019 | 03:55 | 2.39 | 07:45 | 5.11 | 4.01 | 03:45 | 1.52 | 22:00 | 3.50 | 2.59 | 03:55 | 0.149 | 07:45 | 0.993 | 0.568 | 0.568 | |
| 11/22/2019 | 03:55 | 2.37 | 07:50 | 5.13 | 4.02 | 03:40 | 1.60 | 07:45 | 3.50 | 2.56 | 03:40 | 0.156 | 07:50 | 1.024 | 0.560 | 0.560 | |
| 11/23/2019 | 05:30 | 2.36 | 09:00 | 5.14 | 4.12 | 05:25 | 1.52 | 12:00 | 3.58 | 2.68 | 05:25 | 0.149 | 10:40 | 1.038 | 0.617 | 0.617 | |
| 11/24/2019 | 04:20 | 2.41 | 11:05 | 5.21 | 4.23 | 04:10 | 1.54 | 10:50 | 3.62 | 2.67 | 04:10 | 0.154 | 10:50 | 1.080 | 0.643 | 0.643 | |
| 11/25/2019 | 04:20 | 2.44 | 21:45 | 5.13 | 4.08 | 02:35 | 1.54 | 07:45 | 3.51 | 2.51 | 04:00 | 0.164 | 07:45 | 0.991 | 0.566 | 0.566 | |
| 11/26/2019 | 04:10 | 2.42 | 20:40 | 5.20 | 4.09 | 04:10 | 1.49 | 07:40 | 3.55 | 2.51 | 04:10 | 0.148 | 07:40 | 1.050 | 0.570 | 0.570 | 0.36 |
| 11/27/2019 | 03:10 | 2.64 | 09:30 | 5.03 | 4.20 | 04:20 | 1.57 | 10:45 | 3.25 | 2.59 | 03:10 | 0.189 | 10:55 | 0.908 | 0.604 | 0.604 | 0.63 |
| 11/28/2019 | 04:45 | 2.37 | 10:55 | 5.34 | 4.12 | 04:35 | 1.47 | 13:10 | 3.60 | 2.57 | 04:35 | 0.143 | 11:50 | 1.082 | 0.598 | 0.598 | |
| 11/29/2019 | 03:55 | 2.43 | 10:55 | 5.14 | 4.02 | 04:35 | 1.47 | 10:50 | 3.16 | 2.45 | 04:35 | 0.154 | 10:50 | 0.933 | 0.542 | 0.542 | 0.02 |
| 11/30/2019 | 04:55 | 2.46 | 12:45 | 5.23 | 4.20 | 04:05 | 1.47 | 13:35 | 3.30 | 2.53 | 04:45 | 0.152 | 13:35 | 0.968 | 0.603 | 0.603 | 0.10 |
| 12/01/2019 | 04:10 | 2.43 | 11:50 | 5.43 | 4.32 | 04:30 | 1.43 | 21:05 | 3.39 | 2.60 | 04:30 | 0.143 | 11:45 | 1.051 | 0.651 | 0.651 | 0.06 |
| 12/02/2019 | 03:10 | 2.51 | 21:30 | 5.46 | 4.18 | 03:35 | 1.43 | 08:00 | 3.38 | 2.51 | 03:35 | 0.151 | 21:30 | 1.067 | 0.588 | 0.588 | 0.30 |
| 12/03/2019 | 04:20 | 2.52 | 07:45 | 5.36 | 4.09 | 02:40 | 1.52 | 07:45 | 3.30 | 2.49 | 04:20 | 0.166 | 07:45 | 1.032 | 0.562 | 0.562 | 0.01 |
| 12/04/2019 | 03:05 | 2.53 | 21:40 | 5.18 | 4.13 | 02:55 | 1.54 | 07:45 | 3.55 | 2.54 | 02:55 | 0.167 | 07:15 | 0.999 | 0.578 | 0.578 | 0.39 |
| 12/05/2019 | 04:00 | 2.48 | 20:45 | 5.23 | 4.13 | 04:00 | 1.41 | 07:35 | 3.39 | 2.51 | 04:00 | 0.145 | 21:35 | 0.967 | 0.573 | 0.573 | 0.01 |
| 12/06/2019 | 04:05 | 2.59 | 07:55 | 5.18 | 4.14 | 04:00 | 1.56 | 07:55 | 3.18 | 2.49 | 04:00 | 0.173 | 07:55 | 0.949 | 0.567 | 0.567 | 0.01 |
| 12/07/2019 | 04:00 | 2.60 | 18:00 | 5.68 | 4.33 | 04:15 | 1.64 | 18:20 | 3.54 | 2.65 | 04:15 | 0.184 | 18:00 | 1.195 | 0.656 | 0.656 | 0.67 |
| 12/08/2019 | 04:35 | 2.68 | 19:10 | 5.37 | 4.34 | 04:25 | 1.67 | 10:50 | 3.61 | 2.73 | 04:25 | 0.194 | 13:05 | 1.058 | 0.676 | 0.676 | 0.20 |
| 12/09/2019 | 04:15 | 2.60 | 07:35 | 5.25 | 4.16 | 03:20 | 1.56 | 07:55 | 3.42 | 2.53 | 03:20 | 0.178 | 07:45 | 1.007 | 0.582 | 0.582 | |
| 12/10/2019 | 03:20 | 2.50 | 20:30 | 5.44 | 4.17 | 03:00 | 1.49 | 20:30 | 3.36 | 2.52 | 03:00 | 0.159 | 20:30 | 1.073 | 0.586 | 0.586 | |
| 12/11/2019 | 04:10 | 2.56 | 21:40 | 5.63 | 4.24 | 04:20 | 1.42 | 21:40 | 3.48 | 2.56 | 04:20 | 0.157 | 21:40 | 1.167 | 0.609 | 0.609 | 0.03 |
| 12/12/2019 | 03:45 | 2.61 | 08:00 | 5.53 | 4.22 | 02:45 | 1.52 | 08:00 | 3.41 | 2.55 | 02:45 | 0.182 | 08:00 | 1.116 | 0.599 | 0.599 | 0.01 |
| 12/13/2019 | 03:15 | 2.66 | 21:35 | 5.49 | 4.27 | 04:40 | 1.54 | 21:35 | 3.39 | 2.59 | 04:40 | 0.184 | 21:35 | 1.096 | 0.616 | 0.616 | 0.01 |
| 12/14/2019 | 04:25 | 2.68 | 09:00 | 5.35 | 4.33 | 04:10 | 1.51 | 09:00 | 3.29 | 2.61 | 04:10 | 0.180 | 09:00 | 1.027 | 0.638 | 0.638 | 0.01 |
| 12/15/2019 | 05:25 | 2.56 | 10:25 | 5.50 | 4.42 | 04:30 | 1.43 | 10:35 | 3.34 | 2.66 | 04:30 | 0.155 | 10:35 | 1.069 | 0.682 | 0.682 | 0.01 |
| 12/16/2019 | 04:15 | 2.75 | 07:35 | 5.13 | 4.18 | 03:45 | 1.54 | 21:25 | 3.51 | 2.60 | 03:45 | 0.189 | 07:40 | 0.985 | 0.598 | 0.598 | 0.01 |
| 12/17/2019 | 04:35 | 2.63 | 20:25 | 5.30 | 4.10 | 03:55 | 1.68 | 21:20 | 3.51 | 2.57 | 04:30 | 0.196 | 20:55 | 1.018 | 0.578 | 0.578 | 0.01 |
| 12/18/2019 | 03:30 | 2.63 | 21:30 | 5.12 | 4.10 | 03:10 | 1.58 | 21:35 | 3.52 | 2.56 | 03:10 | 0.183 | 21:35 | 0.959 | 0.578 | 0.578 | 0.01 |
| 12/19/2019 | 04:00 | 2.53 | 07:40 | 5.23 | 4.03 | 04:50 | 1.51 | 07:45 | 3.32 | 2.50 | 04:50 | 0.164 | 19:55 | 0.941 | 0.551 | 0.551 | |
| 12/20/2019 | 04:50 | 2.56 | 08:05 | 5.23 | 4.14 | 04:20 | 1.53 | 08:10 | 3.17 | 2.50 | 04:20 | 0.167 | 08:10 | 0.941 | 0.572 | 0.467 | |
| 12/21/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | 0.01 |
| 12/22/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | 0.41 |
| 12/23/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 12/24/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | 0.02 |
| 12/25/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | 0.08 |
| 12/26/2019 | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | 00:00 | | 00:00 | | | | |
| 12/27/2019 | 05:50 | 2.90 | 21:50 | 5.20 | 4.47 | 06:15 | 1.82 | 21:35 | 3.54 | 2.72 | 05:50 | 0.246 | 21:50 | 1.001 | 0.669 | 0.506 | |
| 12/28/2019 | 04:55 | 2.49 | 19:50 | 5.39 | 4.16 | 02:50 | 1.60 | 19:50 | 3.32 | 2.53 | 05:35 | 0.171 | 19:50 | 1.048 | 0.591 | 0.591 | |
| 12/29/2019 | 05:20 | 2.49 | 13:20 | 5.33 | 4.25 | 05:10 | 1.43 | 10:30 | 3.33 | 2.57 | 05:10 | 0.150 | 13:20 | 1.019 | 0.622 | 0.622 | 0.22 |
| 12/30/2019 | 04:30 | 2.52 | 22:00 | 5.16 | 4.18 | 04:30 | 1.59 | 21:05 | 3.56 | 2.59 | 04:30 | 0.168 | 21:05 | 0.977 | 0.605 | 0.605 | |
| 12/31/2019 | 03:55 | 2.95 | 18:45 | 5.17 | 4.26 | 03:20 | 1.72 | 10:55 | 3.61 | 2.64 | 03:20 | 0.233 | 10:55 | 1.013 | 0.623 | 0.623 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:15 | 2.39 11:45 | 5.15 | 4.10 | 05:20 | 1.57 10:50 | 3.47 | 2.56 | 05:15 | 0.162 12:00 | 0.966 | 0.581 | 0.581 | |
| 01/02/2020 | 03:25 | 2.60 22:00 | 5.08 | 4.14 | 03:25 | 1.59 22:00 | 3.29 | 2.54 | 03:25 | 0.177 22:00 | 0.956 | 0.577 | 0.577 | |
| 01/03/2020 | 03:45 | 2.44 18:00 | 4.98 | 4.16 | 03:50 | 1.57 18:00 | 3.20 | 2.56 | 03:50 | 0.166 18:00 | 0.903 | 0.587 | 0.587 | |
| 01/04/2020 | 03:35 | 2.46 12:25 | 5.60 | 4.24 | 03:35 | 1.56 12:25 | 3.46 | 2.62 | 03:35 | 0.159 12:25 | 1.152 | 0.630 | 0.630 | |
| 01/05/2020 | 04:40 | 2.54 19:05 | 5.53 | 4.30 | 03:25 | 1.52 21:30 | 3.68 | 2.66 | 04:30 | 0.174 19:05 | 1.117 | 0.657 | 0.657 | |
| 01/06/2020 | 03:55 | 2.54 19:20 | 5.25 | 4.22 | 04:10 | 1.54 19:20 | 3.37 | 2.55 | 04:10 | 0.172 19:20 | 1.025 | 0.599 | 0.599 | |
| 01/07/2020 | 04:15 | 2.51 19:45 | 5.19 | 4.19 | 04:05 | 1.48 19:40 | 3.23 | 2.52 | 04:05 | 0.161 19:45 | 0.962 | 0.589 | 0.589 | |
| 01/08/2020 | 03:25 | 2.37 09:25 | 6.11 | 4.17 | 03:35 | 1.50 09:25 | 3.64 | 2.53 | 03:35 | 0.146 09:25 | 1.368 | 0.590 | 0.590 | 0.02 |
| 01/09/2020 | 03:20 | 2.58 07:50 | 5.26 | 4.19 | 04:00 | 1.63 21:25 | 3.17 | 2.51 | 04:00 | 0.181 07:45 | 0.958 | 0.587 | 0.587 | 0.18 |
| 01/10/2020 | 04:05 | 2.45 07:45 | 5.30 | 4.18 | 03:50 | 1.57 21:50 | 3.24 | 2.53 | 03:50 | 0.162 07:50 | 0.975 | 0.586 | 0.586 | 0.02 |
| 01/11/2020 | 04:35 | 2.59 10:00 | 5.33 | 4.27 | 04:25 | 1.60 10:10 | 3.36 | 2.64 | 04:25 | 0.177 10:10 | 1.002 | 0.641 | 0.641 | 0.01 |
| 01/12/2020 | 04:25 | 2.60 17:45 | 5.36 | 4.31 | 03:35 | 1.53 20:55 | 3.68 | 2.73 | 04:25 | 0.171 10:40 | 1.056 | 0.676 | 0.676 | |
| 01/13/2020 | 03:55 | 2.51 20:30 | 5.25 | 4.14 | 03:35 | 1.55 07:45 | 3.49 | 2.55 | 03:50 | 0.166 07:45 | 1.015 | 0.584 | 0.584 | 0.02 |
| 01/14/2020 | 04:05 | 2.57 20:45 | 5.29 | 4.15 | 02:55 | 1.62 08:00 | 3.53 | 2.55 | 04:20 | 0.181 21:25 | 1.010 | 0.588 | 0.588 | 0.11 |
| 01/15/2020 | 03:15 | 2.44 07:40 | 5.26 | 4.10 | 03:55 | 1.47 21:35 | 3.65 | 2.55 | 03:55 | 0.150 07:40 | 1.037 | 0.582 | 0.582 | 0.07 |
| 01/16/2020 | 04:10 | 2.57 07:30 | 5.12 | 4.15 | 05:05 | 1.58 07:45 | 3.57 | 2.71 | 04:15 | 0.180 09:20 | 0.994 | 0.623 | 0.623 | 0.66 |
| 01/17/2020 | 04:10 | 2.52 09:00 | 5.10 | 4.13 | 03:50 | 1.54 07:50 | 3.55 | 2.59 | 04:25 | 0.165 07:50 | 0.955 | 0.590 | 0.590 | |
| 01/18/2020 | 03:35 | 2.53 12:45 | 5.43 | 4.18 | 03:55 | 1.55 11:00 | 3.59 | 2.66 | 03:35 | 0.174 12:45 | 1.028 | 0.629 | 0.629 | |
| 01/19/2020 | 04:30 | 2.48 09:55 | 5.32 | 4.23 | 04:20 | 1.49 12:00 | 3.65 | 2.65 | 04:20 | 0.161 10:40 | 1.063 | 0.638 | 0.638 | |
| 01/20/2020 | 03:45 | 2.54 19:20 | 5.33 | 4.24 | 04:55 | 1.57 21:05 | 3.64 | 2.62 | 04:20 | 0.173 19:05 | 1.016 | 0.627 | 0.627 | |
| 01/21/2020 | 04:20 | 2.48 07:35 | 5.29 | 4.12 | 03:15 | 1.59 21:30 | 3.53 | 2.55 | 03:15 | 0.172 21:30 | 1.001 | 0.580 | 0.580 | |
| 01/22/2020 | 03:40 | 2.43 19:45 | 5.18 | 4.15 | 04:05 | 1.54 21:35 | 3.63 | 2.61 | 04:05 | 0.161 21:35 | 1.044 | 0.601 | 0.601 | 0.03 |
| 01/23/2020 | 04:15 | 2.48 07:45 | 5.07 | 4.07 | 04:25 | 1.52 21:35 | 3.49 | 2.58 | 04:25 | 0.159 07:45 | 1.001 | 0.577 | 0.577 | |
| 01/24/2020 | 04:10 | 2.41 09:15 | 5.16 | 4.16 | 04:00 | 1.59 08:30 | 3.20 | 2.61 | 04:00 | 0.158 21:45 | 0.906 | 0.602 | 0.602 | |
| 01/25/2020 | 03:50 | 2.45 12:55 | 5.15 | 4.09 | 04:20 | 1.61 10:55 | 3.57 | 2.63 | 04:20 | 0.166 10:55 | 1.024 | 0.600 | 0.600 | |
| 01/26/2020 | 04:50 | 2.40 17:30 | 5.02 | 4.10 | 04:50 | 1.62 12:05 | 3.57 | 2.77 | 04:50 | 0.159 11:35 | 0.980 | 0.635 | 0.635 | 0.16 |
| 01/27/2020 | 04:20 | 2.39 18:30 | 5.05 | 4.01 | 04:30 | 1.53 21:20 | 3.64 | 2.63 | 04:20 | 0.150 21:05 | 0.975 | 0.578 | 0.578 | |
| 01/28/2020 | 03:50 | 2.36 08:00 | 5.34 | 3.95 | 04:25 | 1.54 21:40 | 3.61 | 2.63 | 03:50 | 0.152 08:00 | 1.085 | 0.564 | 0.564 | 0.01 |
| 01/29/2020 | 03:55 | 2.49 08:15 | 5.17 | 4.05 | 04:25 | 1.56 19:25 | 3.46 | 2.58 | 04:25 | 0.171 21:05 | 0.963 | 0.574 | 0.574 | |
| 01/30/2020 | 03:40 | 2.46 21:50 | 5.27 | 4.10 | 03:05 | 1.60 20:30 | 3.46 | 2.56 | 03:50 | 0.167 21:35 | 0.988 | 0.581 | 0.581 | |
| 01/31/2020 | 04:10 | 2.48 08:15 | 5.19 | 4.10 | 03:10 | 1.59 07:50 | 3.46 | 2.55 | 03:55 | 0.166 07:35 | 0.969 | 0.574 | 0.574 | |
| 02/01/2020 | 04:35 | 2.56 10:25 | 5.55 | 4.29 | 04:35 | 1.60 10:35 | 3.48 | 2.64 | 04:35 | 0.172 10:25 | 1.134 | 0.644 | 0.644 | |
| 02/02/2020 | 04:25 | 2.41 11:50 | 5.28 | 4.23 | 04:35 | 1.59 13:10 | 3.72 | 2.72 | 04:25 | 0.159 11:50 | 1.137 | 0.660 | 0.660 | |
| 02/03/2020 | 04:10 | 2.43 20:05 | 5.25 | 4.09 | 04:05 | 1.50 21:05 | 3.50 | 2.61 | 04:05 | 0.150 20:00 | 0.981 | 0.589 | 0.589 | |
| 02/04/2020 | 04:00 | 2.43 19:50 | 5.22 | 4.07 | 04:10 | 1.60 20:30 | 3.49 | 2.59 | 04:00 | 0.162 07:35 | 1.013 | 0.581 | 0.581 | |
| 02/05/2020 | 03:05 | 2.47 21:15 | 5.43 | 4.08 | 03:45 | 1.63 20:20 | 3.51 | 2.55 | 03:05 | 0.171 21:15 | 1.066 | 0.575 | 0.575 | |
| 02/06/2020 | 04:15 | 2.46 21:10 | 5.27 | 4.13 | 04:30 | 1.54 08:00 | 3.46 | 2.52 | 04:15 | 0.161 08:00 | 1.009 | 0.578 | 0.578 | |
| 02/07/2020 | 03:50 | 2.46 19:20 | 5.09 | 4.15 | 03:25 | 1.64 07:35 | 3.36 | 2.56 | 03:50 | 0.171 19:20 | 0.964 | 0.589 | 0.589 | |
| 02/08/2020 | 03:45 | 2.52 09:00 | 5.25 | 4.25 | 04:50 | 1.65 10:10 | 3.58 | 2.71 | 04:50 | 0.179 12:25 | 1.010 | 0.654 | 0.654 | |
| 02/09/2020 | 04:50 | 2.40 14:25 | 5.04 | 4.08 | 04:40 | 1.53 20:15 | 3.64 | 2.80 | 04:40 | 0.152 10:45 | 1.024 | 0.644 | 0.644 | |
| 02/10/2020 | 04:20 | 2.46 22:10 | 5.05 | 3.97 | 03:20 | 1.62 21:40 | 3.49 | 2.64 | 03:50 | 0.167 07:45 | 0.992 | 0.572 | 0.572 | |
| 02/11/2020 | 04:20 | 2.42 07:45 | 5.00 | 3.95 | 03:00 | 1.52 07:40 | 3.59 | 2.62 | 03:00 | 0.155 07:40 | 1.005 | 0.563 | 0.563 | |
| 02/12/2020 | 04:05 | 2.39 18:55 | 5.04 | 3.99 | 03:50 | 1.49 20:05 | 3.46 | 2.60 | 03:50 | 0.150 07:50 | 0.946 | 0.566 | 0.566 | |
| 02/13/2020 | 03:50 | 2.37 19:10 | 5.07 | 3.98 | 02:30 | 1.64 19:50 | 3.49 | 2.61 | 03:50 | 0.159 19:50 | 0.983 | 0.567 | 0.567 | |
| 02/14/2020 | 04:15 | 2.40 08:55 | 4.98 | 4.00 | 03:35 | 1.52 21:50 | 3.46 | 2.66 | 03:35 | 0.160 07:25 | 0.907 | 0.580 | 0.580 | |
| 02/15/2020 | 04:40 | 2.38 11:00 | 5.12 | 4.08 | 04:30 | 1.54 11:00 | 3.66 | 2.73 | 04:30 | 0.150 11:00 | 1.075 | 0.623 | 0.623 | |
| 02/16/2020 | 04:20 | 2.35 13:40 | 5.13 | 4.11 | 04:40 | 1.48 18:55 | 3.60 | 2.67 | 04:40 | 0.143 18:55 | 0.994 | 0.618 | 0.618 | |
| 02/17/2020 | 04:00 | 2.49 12:40 | 5.15 | 4.17 | 04:30 | 1.41 10:15 | 3.49 | 2.61 | 04:30 | 0.151 11:45 | 0.969 | 0.614 | 0.614 | |
| 02/18/2020 | 04:00 | 2.36 19:55 | 5.24 | 4.10 | 03:50 | 1.41 20:00 | 3.45 | 2.51 | 03:50 | 0.136 20:00 | 0.966 | 0.571 | 0.571 | |
| 02/19/2020 | 03:40 | 2.47 21:35 | 5.18 | 4.09 | 04:10 | 1.49 21:25 | 3.31 | 2.47 | 04:10 | 0.157 21:40 | 0.979 | 0.558 | 0.558 | |
| 02/20/2020 | 03:40 | 2.48 21:40 | 5.25 | 4.12 | 03:35 | 1.49 21:15 | 3.18 | 2.51 | 03:35 | 0.158 21:40 | 0.960 | 0.573 | 0.573 | |
| 02/21/2020 | 04:00 | 2.47 08:50 | 5.03 | 4.10 | 04:15 | 1.52 20:45 | 3.09 | 2.50 | 04:15 | 0.159 08:50 | 0.878 | 0.565 | 0.565 | |
| 02/22/2020 | 03:20 | 2.58 11:00 | 5.51 | 4.23 | 04:20 | 1.48 10:35 | 3.37 | 2.59 | 04:25 | 0.169 10:45 | 1.081 | 0.621 | 0.621 | |
| 02/23/2020 | 05:10 | 2.60 11:05 | 5.23 | 4.25 | 03:45 | 1.55 20:55 | 3.66 | 2.76 | 04:15 | 0.176 12:25 | 1.035 | 0.671 | 0.671 | |
| 02/24/2020 | 04:20 | 2.44 20:45 | 5.13 | 4.08 | 02:10 | 1.50 21:25 | 3.50 | 2.61 | 04:20 | 0.162 19:45 | 0.975 | 0.589 | 0.589 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:15 | 2.51 | 21:15 | 5.13 | 4.05 | 04:30 | 1.54 | 20:25 | 3.58 | 2.57 | 04:00 | 0.163 | 20:25 | 1.004 | 0.574 | 0.574 | |
| 02/26/2020 | 04:15 | 2.39 | 21:00 | 5.36 | 4.11 | 03:55 | 1.45 | 21:05 | 3.50 | 2.53 | 04:15 | 0.144 | 21:40 | 1.058 | 0.579 | 0.579 | |
| 02/27/2020 | 04:20 | 2.42 | 07:40 | 5.31 | 4.14 | 04:00 | 1.38 | 07:35 | 3.56 | 2.51 | 04:00 | 0.140 | 07:40 | 1.097 | 0.580 | 0.580 | |
| 02/28/2020 | 03:15 | 2.43 | 07:30 | 5.41 | 4.16 | 04:15 | 1.49 | 07:45 | 3.46 | 2.49 | 03:20 | 0.152 | 07:40 | 1.029 | 0.577 | 0.577 | |
| 02/29/2020 | 03:45 | 2.39 | 11:10 | 5.42 | 4.27 | 05:25 | 1.42 | 11:10 | 3.26 | 2.59 | 05:25 | 0.148 | 11:10 | 1.037 | 0.635 | 0.635 | |
| 03/01/2020 | 05:00 | 2.40 | 19:00 | 5.40 | 4.33 | 04:35 | 1.40 | 20:05 | 3.57 | 2.65 | 04:35 | 0.137 | 22:15 | 1.089 | 0.671 | 0.671 | |
| 03/02/2020 | 04:00 | 2.39 | 07:50 | 5.24 | 4.11 | 03:50 | 1.43 | 07:20 | 3.56 | 2.53 | 03:55 | 0.143 | 07:35 | 1.031 | 0.582 | 0.582 | |
| 03/03/2020 | 04:05 | 2.43 | 07:20 | 5.26 | 4.13 | 02:45 | 1.46 | 07:45 | 3.41 | 2.53 | 04:05 | 0.157 | 21:15 | 0.997 | 0.584 | 0.584 | |
| 03/04/2020 | 04:10 | 2.40 | 20:25 | 5.49 | 4.13 | 03:15 | 1.36 | 07:30 | 3.54 | 2.53 | 03:15 | 0.139 | 20:25 | 1.099 | 0.585 | 0.585 | |
| 03/05/2020 | 04:20 | 2.38 | 21:15 | 5.45 | 4.19 | 04:15 | 1.42 | 07:35 | 3.33 | 2.53 | 04:15 | 0.139 | 07:35 | 1.053 | 0.595 | 0.595 | |
| 03/06/2020 | 04:05 | 2.45 | 07:30 | 5.37 | 4.18 | 03:50 | 1.43 | 07:35 | 3.33 | 2.53 | 03:50 | 0.146 | 07:45 | 1.036 | 0.591 | 0.591 | |
| 03/07/2020 | 04:30 | 2.55 | 10:30 | 5.47 | 4.32 | 05:00 | 1.58 | 10:10 | 3.36 | 2.64 | 04:15 | 0.174 | 10:10 | 1.079 | 0.655 | 0.655 | |
| 03/08/2020 | 04:30 | 2.57 | 11:35 | 5.58 | 4.40 | 03:05 | 1.52 | 20:35 | 3.60 | 2.69 | 04:30 | 0.170 | 12:00 | 1.135 | 0.689 | 0.689 | |
| 03/09/2020 | 03:15 | 2.47 | 19:55 | 5.60 | 4.21 | 03:15 | 1.41 | 19:40 | 3.48 | 2.55 | 03:15 | 0.144 | 19:55 | 1.100 | 0.602 | 0.602 | |

## Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 65.190 | 4.90 |
| Avg | 4.15 | 2.59 | 0.600 | |

## Site Commentary

### Site Information

| MIL_1564 | |
|---|---|
| Pipe Dimensions | 8 |
| Silt Level | 0.00" |

### Overview

Site MIL_1564 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019 and December 7, 2019 - December 8, 2019. Surcharge conditions were experienced at this location. Review of the scattergraph shows that both free flow and backwater flows were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 1.60 | 2.40 | 0.078 |
| Minimum | 1.17 | 0.49 | 0.011 |
| Maximum | 21.57 | 4.82 | 0.785 |
| Time of Minimum | 2/10/2020 4:45 AM | 2/16/2020 4:10 AM | 2/16/2020 4:10 AM |
| Time of Maximum | 1/29/2020 6:30 PM | 1/24/2020 9:45 PM | 1/29/2020 6:20 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_1564

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Country Club Dr and Park Victoria Dr, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.449480° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.887946° | 8.00"x8.00" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 1564 | Residential/Commercial |
| Access | Traffic |
| Drive | Medium |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Thursday, November 14, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 4:25:00 AM | 8.00"x8.00" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 0.63" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.69 | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

Shallow depth with moderate velocity

## Manhole / Pipe Information:

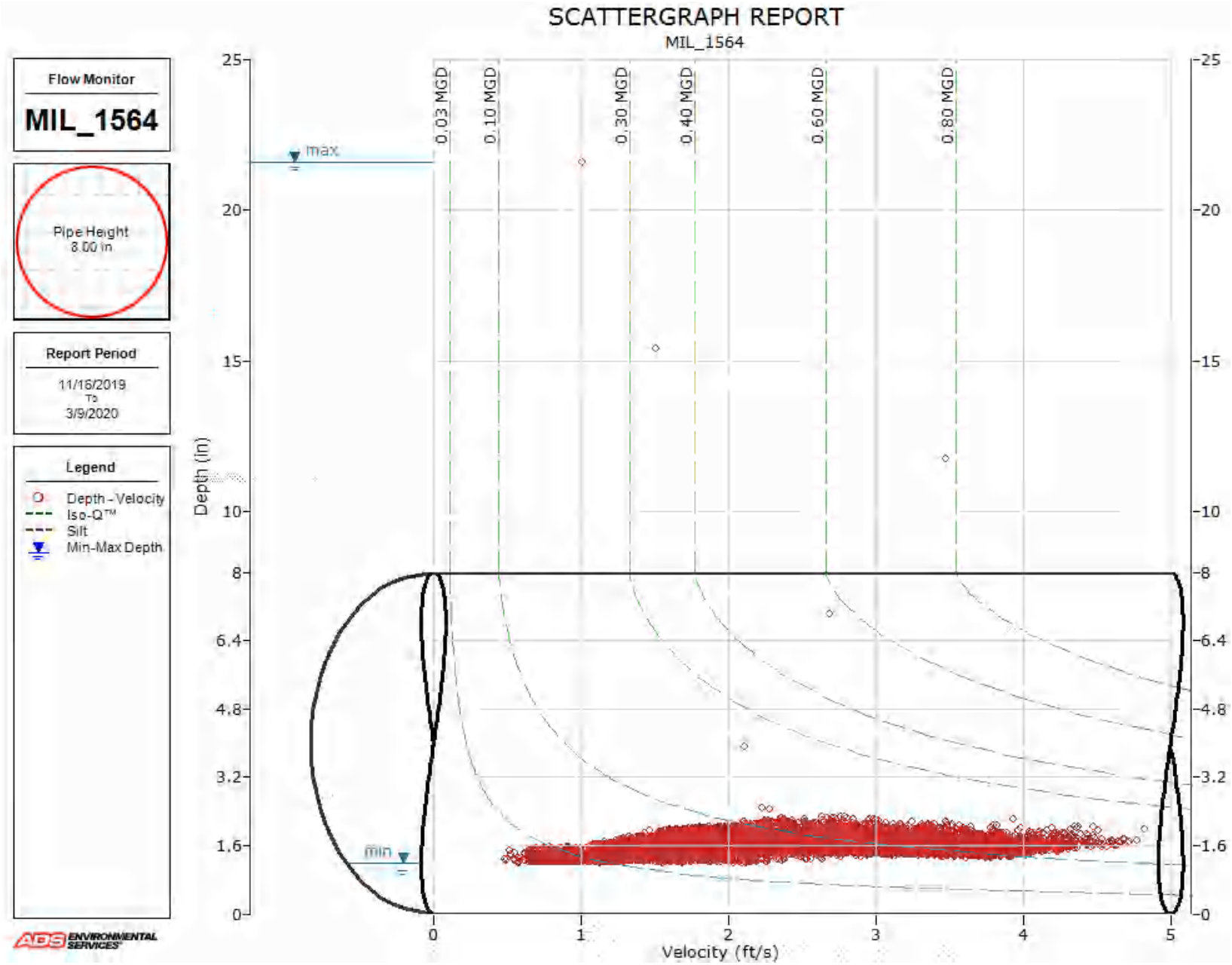
| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 4' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

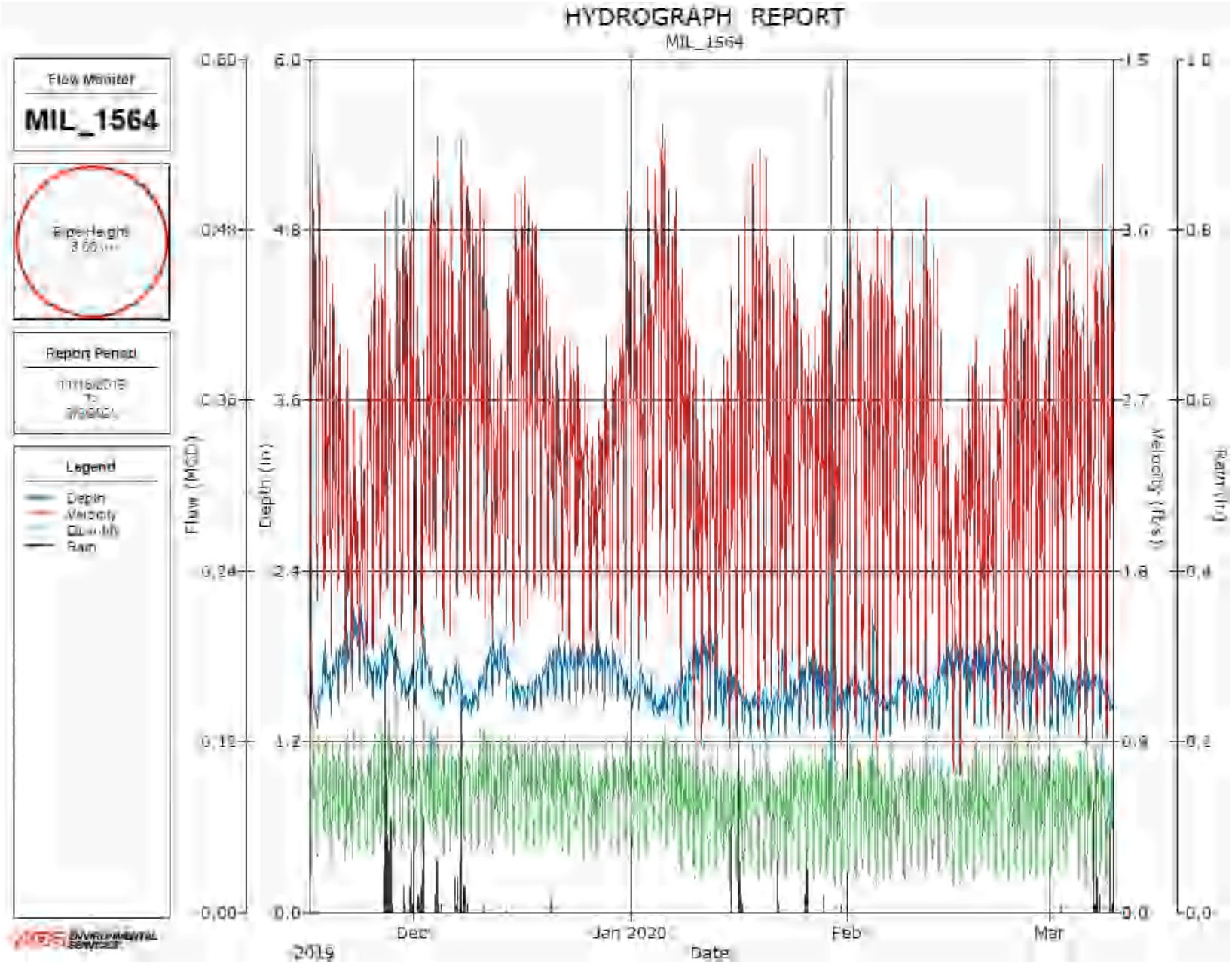
## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Drilled Pavement / Concrete |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |


SCATTERGRAPH REPORT
MIL_1564
Flow Monitor
MIL_1564
Pipe Height
8.00 in
Report Period
11/16/2019
To
3/9/2020
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
ADS ENVIRONMENTAL SERVICES
0.03 MGD
0.10 MGD
0.30 MGD
0.40 MGD
0.60 MGD
0.80 MGD
max
min
Depth (in)
Velocity (ft/s)
25
20
15
10
8
6.4
4.8
3.2
1.6
0
1
2
3
4
5


HYDROGRAPH REPORT
MIL_1564
Flow Monitor
MIL_1564
Pipe Height
Report Period
Legend
Depth
Velocity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
0.60
0.48
0.36
0.24
0.12
0.00
6.0
4.8
3.6
2.4
1.2
0.0
1.5
1.2
0.9
0.6
0.3
0.0
1.0
0.8
0.6
0.4
0.2
0.0
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_1564, Pipe Height: 8.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 05:00 | 1.30 | 08:25 | 1.81 | 1.47 | 04:40 | 0.86 | 09:30 | 4.23 | 2.63 | 04:40 | 0.021 | 09:30 | 0.149 | 0.076 | 0.076 | |
| 11/17/2019 | 03:45 | 1.28 | 23:55 | 1.80 | 1.49 | 06:40 | 1.25 | 08:50 | 4.53 | 2.74 | 06:40 | 0.030 | 08:50 | 0.143 | 0.081 | 0.081 | |
| 11/18/2019 | 16:10 | 1.46 | 07:10 | 2.48 | 1.70 | 05:20 | 1.07 | 10:15 | 4.44 | 2.45 | 05:20 | 0.034 | 10:15 | 0.174 | 0.086 | 0.086 | |
| 11/19/2019 | 03:35 | 1.34 | 22:15 | 1.94 | 1.64 | 04:55 | 0.92 | 09:30 | 4.01 | 2.31 | 04:55 | 0.023 | 09:30 | 0.146 | 0.079 | 0.079 | |
| 11/20/2019 | 04:35 | 1.46 | 21:20 | 2.10 | 1.74 | 05:35 | 1.42 | 12:40 | 3.62 | 2.30 | 05:35 | 0.040 | 21:25 | 0.152 | 0.085 | 0.085 | |
| 11/21/2019 | 03:45 | 1.52 | 08:25 | 2.08 | 1.81 | 03:35 | 1.04 | 10:25 | 3.44 | 1.96 | 03:35 | 0.031 | 10:25 | 0.152 | 0.077 | 0.077 | |
| 11/22/2019 | 04:40 | 1.58 | 09:35 | 2.22 | 1.91 | 04:35 | 1.08 | 10:25 | 3.01 | 1.86 | 04:35 | 0.035 | 08:40 | 0.152 | 0.079 | 0.079 | |
| 11/23/2019 | 04:35 | 1.61 | 09:55 | 2.28 | 1.88 | 04:35 | 1.15 | 21:10 | 3.21 | 1.91 | 04:35 | 0.037 | 09:50 | 0.147 | 0.079 | 0.079 | |
| 11/24/2019 | 07:10 | 1.54 | 00:40 | 1.88 | 1.69 | 02:55 | 1.20 | 21:50 | 3.80 | 2.33 | 02:55 | 0.037 | 10:20 | 0.133 | 0.082 | 0.082 | |
| 11/25/2019 | 04:30 | 1.46 | 11:50 | 1.89 | 1.65 | 05:40 | 1.17 | 08:25 | 4.05 | 2.35 | 05:40 | 0.034 | 08:25 | 0.164 | 0.081 | 0.081 | |
| 11/26/2019 | 04:15 | 1.56 | 20:20 | 2.05 | 1.75 | 03:40 | 1.42 | 20:20 | 4.47 | 2.40 | 03:40 | 0.044 | 20:20 | 0.204 | 0.089 | 0.089 | 0.63 |
| 11/27/2019 | 01:55 | 1.61 | 10:25 | 2.08 | 1.85 | 03:55 | 1.45 | 11:25 | 3.80 | 2.46 | 01:55 | 0.047 | 08:45 | 0.166 | 0.099 | 0.099 | 0.77 |
| 11/28/2019 | 04:50 | 1.55 | 11:45 | 2.01 | 1.73 | 04:50 | 1.39 | 11:50 | 4.51 | 2.66 | 04:50 | 0.043 | 11:50 | 0.191 | 0.097 | 0.097 | |
| 11/29/2019 | 22:55 | 1.42 | 00:40 | 1.88 | 1.59 | 03:45 | 1.36 | 11:15 | 4.28 | 2.70 | 06:20 | 0.040 | 11:20 | 0.159 | 0.086 | 0.086 | 0.05 |
| 11/30/2019 | 05:50 | 1.39 | 13:45 | 1.82 | 1.60 | 05:25 | 1.34 | 12:15 | 3.97 | 2.68 | 05:25 | 0.036 | 12:15 | 0.147 | 0.087 | 0.087 | 0.14 |
| 12/01/2019 | 05:35 | 1.40 | 21:15 | 1.98 | 1.68 | 04:15 | 1.20 | 17:55 | 3.81 | 2.44 | 04:15 | 0.035 | 12:15 | 0.149 | 0.086 | 0.086 | 0.06 |
| 12/02/2019 | 03:00 | 1.51 | 08:10 | 2.16 | 1.76 | 05:00 | 0.97 | 23:10 | 3.86 | 2.23 | 05:00 | 0.029 | 08:15 | 0.177 | 0.084 | 0.084 | 0.36 |
| 12/03/2019 | 22:45 | 1.46 | 10:15 | 1.88 | 1.61 | 17:00 | 1.32 | 21:15 | 4.72 | 2.67 | 17:00 | 0.042 | 10:15 | 0.171 | 0.087 | 0.087 | |
| 12/04/2019 | 11:30 | 1.40 | 07:55 | 1.75 | 1.53 | 04:40 | 1.40 | 10:40 | 4.59 | 2.85 | 04:40 | 0.041 | 10:40 | 0.157 | 0.086 | 0.086 | 0.44 |
| 12/05/2019 | 04:20 | 1.43 | 13:55 | 1.76 | 1.59 | 04:30 | 1.36 | 22:05 | 4.29 | 2.57 | 04:30 | 0.037 | 22:05 | 0.134 | 0.083 | 0.083 | |
| 12/06/2019 | 04:20 | 1.44 | 23:05 | 1.80 | 1.62 | 04:15 | 1.22 | 10:10 | 3.99 | 2.56 | 04:15 | 0.034 | 10:10 | 0.147 | 0.084 | 0.084 | 0.06 |
| 12/07/2019 | 21:05 | 1.36 | 10:05 | 1.97 | 1.60 | 04:10 | 1.39 | 19:05 | 4.67 | 2.81 | 04:10 | 0.041 | 10:05 | 0.186 | 0.090 | 0.090 | 0.84 |
| 12/08/2019 | 13:00 | 1.35 | 20:55 | 1.72 | 1.48 | 13:10 | 1.51 | 11:50 | 4.66 | 3.18 | 13:10 | 0.039 | 11:50 | 0.159 | 0.091 | 0.091 | 0.10 |
| 12/09/2019 | 04:20 | 1.37 | 09:55 | 1.66 | 1.49 | 03:25 | 1.50 | 09:35 | 4.20 | 2.83 | 03:25 | 0.039 | 09:00 | 0.138 | 0.082 | 0.082 | |
| 12/10/2019 | 03:20 | 1.40 | 22:05 | 1.90 | 1.59 | 04:35 | 1.43 | 22:05 | 4.26 | 2.75 | 04:35 | 0.039 | 22:05 | 0.175 | 0.089 | 0.089 | 0.01 |
| 12/11/2019 | 04:25 | 1.47 | 21:10 | 1.96 | 1.73 | 04:20 | 1.27 | 10:20 | 3.80 | 2.49 | 04:20 | 0.036 | 21:30 | 0.146 | 0.091 | 0.091 | 0.00 |
| 12/12/2019 | 04:25 | 1.50 | 05:35 | 2.06 | 1.75 | 04:20 | 1.21 | 09:00 | 3.66 | 2.20 | 04:20 | 0.036 | 05:35 | 0.154 | 0.082 | 0.082 | |
| 12/13/2019 | 04:00 | 1.55 | 01:20 | 2.04 | 1.77 | 03:55 | 1.41 | 09:25 | 3.48 | 2.26 | 03:55 | 0.043 | 09:25 | 0.154 | 0.085 | 0.085 | |
| 12/14/2019 | 04:25 | 1.49 | 00:10 | 1.93 | 1.68 | 04:35 | 1.21 | 08:25 | 4.21 | 2.69 | 04:35 | 0.036 | 08:25 | 0.160 | 0.093 | 0.093 | 0.01 |
| 12/15/2019 | 18:20 | 1.37 | 12:10 | 1.85 | 1.56 | 04:10 | 1.21 | 11:55 | 4.69 | 2.87 | 04:10 | 0.035 | 12:10 | 0.173 | 0.090 | 0.090 | |
| 12/16/2019 | 04:20 | 1.39 | 04:55 | 1.75 | 1.54 | 03:50 | 1.31 | 21:10 | 4.43 | 2.82 | 03:50 | 0.037 | 07:35 | 0.151 | 0.086 | 0.086 | |
| 12/17/2019 | 03:10 | 1.40 | 21:45 | 1.88 | 1.53 | 03:50 | 1.40 | 08:05 | 4.22 | 2.84 | 03:55 | 0.038 | 21:45 | 0.171 | 0.086 | 0.086 | |
| 12/18/2019 | 03:45 | 1.41 | 12:15 | 1.79 | 1.57 | 03:25 | 1.47 | 09:15 | 4.31 | 2.72 | 05:50 | 0.040 | 09:20 | 0.159 | 0.086 | 0.086 | |
| 12/19/2019 | 03:40 | 1.42 | 21:45 | 1.89 | 1.66 | 03:40 | 1.41 | 08:10 | 3.99 | 2.61 | 03:40 | 0.038 | 08:10 | 0.150 | 0.090 | 0.090 | |
| 12/20/2019 | 02:10 | 1.48 | 23:50 | 1.94 | 1.72 | 05:35 | 1.28 | 11:00 | 3.75 | 2.35 | 05:35 | 0.038 | 08:55 | 0.148 | 0.085 | 0.085 | 0.02 |
| 12/21/2019 | 04:25 | 1.46 | 17:20 | 2.04 | 1.74 | 05:40 | 1.43 | 11:50 | 3.59 | 2.36 | 05:40 | 0.042 | 11:50 | 0.150 | 0.087 | 0.087 | |
| 12/22/2019 | 06:10 | 1.45 | 13:25 | 2.07 | 1.71 | 05:45 | 1.24 | 13:25 | 3.80 | 2.28 | 05:45 | 0.035 | 13:25 | 0.175 | 0.083 | 0.083 | |
| 12/23/2019 | 05:30 | 1.45 | 09:00 | 2.22 | 1.69 | 05:20 | 1.23 | 09:00 | 3.94 | 2.31 | 05:20 | 0.034 | 09:00 | 0.201 | 0.082 | 0.082 | |
| 12/24/2019 | 04:10 | 1.44 | 09:20 | 1.93 | 1.72 | 03:20 | 1.23 | 10:55 | 3.80 | 2.36 | 03:20 | 0.038 | 10:55 | 0.158 | 0.085 | 0.085 | |
| 12/25/2019 | 03:40 | 1.48 | 09:10 | 1.96 | 1.73 | 05:05 | 1.06 | 00:35 | 3.36 | 2.17 | 05:10 | 0.031 | 10:45 | 0.138 | 0.079 | 0.079 | |
| 12/26/2019 | 04:50 | 1.52 | 21:20 | 1.97 | 1.74 | 04:45 | 1.28 | 09:30 | 2.97 | 2.09 | 04:45 | 0.038 | 09:30 | 0.125 | 0.077 | 0.077 | |
| 12/27/2019 | 04:45 | 1.52 | 08:45 | 1.99 | 1.74 | 04:15 | 1.13 | 21:00 | 2.89 | 2.10 | 04:15 | 0.034 | 08:45 | 0.124 | 0.077 | 0.077 | |
| 12/28/2019 | 04:25 | 1.41 | 11:35 | 2.01 | 1.68 | 01:40 | 1.70 | 11:30 | 3.60 | 2.37 | 04:30 | 0.049 | 10:30 | 0.146 | 0.083 | 0.083 | |
| 12/29/2019 | 02:35 | 1.50 | 11:35 | 2.07 | 1.69 | 06:20 | 1.30 | 11:25 | 3.65 | 2.31 | 06:20 | 0.038 | 11:25 | 0.166 | 0.082 | 0.082 | |
| 12/30/2019 | 04:00 | 1.48 | 10:00 | 1.87 | 1.66 | 03:30 | 1.26 | 08:55 | 3.85 | 2.45 | 04:30 | 0.038 | 08:55 | 0.140 | 0.084 | 0.084 | |
| 12/31/2019 | 19:35 | 1.46 | 09:15 | 1.73 | 1.57 | 03:55 | 1.23 | 20:10 | 4.47 | 2.72 | 03:55 | 0.036 | 20:10 | 0.153 | 0.086 | 0.086 | |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:35 | 1.41 23:45 | 1.67 | 1.53 | 06:35 | 1.59 10:20 | 4.49 | 2.71 | 06:35 | 0.044 10:20 | 0.146 | 0.083 | 0.083 | |
| 01/02/2020 | 05:10 | 1.42 10:55 | 1.82 | 1.61 | 05:10 | 1.20 23:00 | 4.02 | 2.36 | 05:10 | 0.032 10:55 | 0.141 | 0.078 | 0.078 | |
| 01/03/2020 | 14:15 | 1.38 09:50 | 1.90 | 1.54 | 03:25 | 1.25 12:00 | 4.35 | 2.78 | 03:25 | 0.036 09:50 | 0.169 | 0.084 | 0.084 | |
| 01/04/2020 | 14:05 | 1.29 13:40 | 1.82 | 1.44 | 14:05 | 1.25 20:35 | 4.51 | 3.06 | 14:05 | 0.030 13:40 | 0.164 | 0.085 | 0.085 | |
| 01/05/2020 | 10:40 | 1.34 12:10 | 1.68 | 1.46 | 05:55 | 1.43 11:20 | 4.72 | 3.14 | 05:55 | 0.037 12:10 | 0.158 | 0.089 | 0.089 | |
| 01/06/2020 | 03:40 | 1.36 08:25 | 1.70 | 1.51 | 05:10 | 1.42 08:20 | 4.44 | 2.72 | 05:10 | 0.037 08:25 | 0.145 | 0.081 | 0.081 | |
| 01/07/2020 | 04:00 | 1.37 09:50 | 1.88 | 1.53 | 03:20 | 1.56 08:15 | 4.77 | 2.73 | 04:00 | 0.041 08:15 | 0.169 | 0.084 | 0.084 | |
| 01/08/2020 | 03:30 | 1.27 09:30 | 1.83 | 1.54 | 05:45 | 0.81 10:10 | 3.97 | 2.47 | 05:45 | 0.019 09:30 | 0.139 | 0.078 | 0.078 | |
| 01/09/2020 | 05:30 | 1.29 07:55 | 2.00 | 1.63 | 05:00 | 0.65 07:55 | 3.99 | 2.43 | 05:00 | 0.015 07:55 | 0.176 | 0.081 | 0.081 | |
| 01/10/2020 | 04:55 | 1.34 09:45 | 1.99 | 1.69 | 05:00 | 0.71 09:50 | 3.68 | 1.98 | 05:00 | 0.018 09:55 | 0.148 | 0.071 | 0.071 | |
| 01/11/2020 | 04:30 | 1.28 08:35 | 2.11 | 1.71 | 04:20 | 0.63 10:25 | 3.59 | 1.91 | 04:20 | 0.015 10:20 | 0.160 | 0.071 | 0.071 | |
| 01/12/2020 | 04:50 | 1.33 10:50 | 2.12 | 1.72 | 04:20 | 0.67 18:00 | 3.52 | 2.07 | 04:20 | 0.017 18:00 | 0.167 | 0.076 | 0.076 | |
| 01/13/2020 | 05:00 | 1.32 08:40 | 2.13 | 1.61 | 04:55 | 0.73 20:55 | 3.09 | 1.96 | 04:55 | 0.018 08:40 | 0.148 | 0.065 | 0.065 | |
| 01/14/2020 | 04:55 | 1.28 21:50 | 1.89 | 1.53 | 06:15 | 0.76 20:50 | 3.87 | 2.13 | 06:15 | 0.019 20:50 | 0.148 | 0.066 | 0.066 | |
| 01/15/2020 | 05:15 | 1.19 08:20 | 1.93 | 1.52 | 05:35 | 0.58 08:10 | 4.48 | 2.08 | 05:35 | 0.012 08:10 | 0.173 | 0.065 | 0.065 | 0.10 |
| 01/16/2020 | 05:35 | 1.21 10:40 | 1.89 | 1.50 | 05:10 | 0.77 10:40 | 4.06 | 2.36 | 05:40 | 0.017 10:40 | 0.165 | 0.071 | 0.071 | 0.66 |
| 01/17/2020 | 20:05 | 1.19 07:25 | 1.59 | 1.43 | 04:05 | 0.75 22:00 | 4.28 | 2.40 | 04:05 | 0.017 09:50 | 0.133 | 0.067 | 0.067 | |
| 01/18/2020 | 04:40 | 1.21 14:35 | 1.69 | 1.44 | 06:50 | 1.05 11:30 | 4.62 | 2.92 | 04:45 | 0.023 14:35 | 0.150 | 0.082 | 0.082 | |
| 01/19/2020 | 05:40 | 1.26 11:50 | 1.85 | 1.47 | 05:30 | 0.78 11:15 | 4.38 | 2.62 | 05:30 | 0.018 11:50 | 0.166 | 0.076 | 0.076 | |
| 01/20/2020 | 04:40 | 1.22 10:35 | 1.80 | 1.44 | 04:25 | 0.96 11:20 | 4.52 | 2.64 | 04:25 | 0.021 08:45 | 0.160 | 0.074 | 0.074 | |
| 01/21/2020 | 03:00 | 1.23 22:50 | 1.63 | 1.44 | 05:35 | 0.95 08:05 | 3.80 | 2.36 | 03:00 | 0.021 08:05 | 0.114 | 0.067 | 0.067 | 0.01 |
| 01/22/2020 | 04:25 | 1.21 17:15 | 1.97 | 1.52 | 02:10 | 0.92 22:40 | 3.85 | 2.27 | 05:10 | 0.021 21:25 | 0.112 | 0.069 | 0.069 | 0.09 |
| 01/23/2020 | 04:15 | 1.22 23:10 | 1.79 | 1.48 | 02:35 | 0.89 08:15 | 3.81 | 2.32 | 02:35 | 0.020 20:20 | 0.131 | 0.069 | 0.069 | |
| 01/24/2020 | 02:55 | 1.28 21:45 | 1.97 | 1.51 | 04:10 | 0.92 21:45 | 4.82 | 2.62 | 04:10 | 0.023 21:45 | 0.208 | 0.079 | 0.079 | |
| 01/25/2020 | 04:50 | 1.22 22:55 | 1.91 | 1.56 | 04:00 | 0.85 09:55 | 3.80 | 2.44 | 04:00 | 0.019 23:00 | 0.140 | 0.078 | 0.078 | |
| 01/26/2020 | 03:15 | 1.31 18:00 | 1.92 | 1.61 | 03:10 | 1.14 11:15 | 3.64 | 2.32 | 03:10 | 0.027 22:25 | 0.137 | 0.077 | 0.077 | 0.16 |
| 01/27/2020 | 04:05 | 1.27 08:10 | 1.94 | 1.60 | 03:50 | 0.83 10:10 | 3.66 | 2.24 | 03:50 | 0.019 08:20 | 0.147 | 0.076 | 0.076 | |
| 01/28/2020 | 04:05 | 1.27 07:30 | 1.81 | 1.55 | 04:00 | 0.87 21:25 | 4.07 | 2.26 | 04:00 | 0.020 21:20 | 0.149 | 0.072 | 0.072 | 0.02 |
| 01/29/2020 | 02:15 | 1.20 18:30 | 21.57 | 1.72 | 01:25 | 0.68 08:20 | 3.89 | 2.16 | 01:25 | 0.017 18:20 | 0.785 | 0.074 | 0.074 | |
| 01/30/2020 | 04:00 | 1.22 07:40 | 1.81 | 1.49 | 03:45 | 0.58 11:35 | 3.80 | 2.16 | 03:45 | 0.013 11:35 | 0.135 | 0.065 | 0.065 | |
| 01/31/2020 | 04:10 | 1.21 20:55 | 1.66 | 1.46 | 04:10 | 0.70 07:40 | 4.05 | 2.45 | 04:10 | 0.015 07:40 | 0.133 | 0.072 | 0.072 | 0.01 |
| 02/01/2020 | 03:45 | 1.21 05:20 | 1.84 | 1.53 | 02:55 | 0.79 10:10 | 4.19 | 2.52 | 02:55 | 0.018 10:10 | 0.154 | 0.078 | 0.078 | |
| 02/02/2020 | 05:25 | 1.28 07:50 | 1.78 | 1.51 | 04:35 | 0.76 12:15 | 3.90 | 2.50 | 04:35 | 0.018 12:15 | 0.127 | 0.076 | 0.076 | |
| 02/03/2020 | 02:50 | 1.23 08:10 | 1.68 | 1.48 | 05:00 | 1.02 07:45 | 3.65 | 2.32 | 05:00 | 0.024 07:50 | 0.117 | 0.068 | 0.068 | |
| 02/04/2020 | 03:30 | 1.22 14:40 | 2.24 | 1.54 | 03:30 | 0.85 07:45 | 4.24 | 2.39 | 03:30 | 0.019 07:45 | 0.148 | 0.075 | 0.075 | |
| 02/05/2020 | 04:40 | 1.22 08:20 | 1.69 | 1.44 | 05:50 | 0.58 08:20 | 4.00 | 2.40 | 05:50 | 0.013 08:20 | 0.139 | 0.068 | 0.068 | |
| 02/06/2020 | 04:05 | 1.21 07:50 | 1.56 | 1.43 | 03:50 | 0.84 08:15 | 4.09 | 2.39 | 03:50 | 0.018 07:50 | 0.122 | 0.067 | 0.067 | |
| 02/07/2020 | 05:25 | 1.22 08:40 | 1.77 | 1.44 | 03:55 | 0.93 08:20 | 4.43 | 2.44 | 03:55 | 0.020 08:40 | 0.148 | 0.069 | 0.069 | |
| 02/08/2020 | 02:50 | 1.27 04:30 | 1.97 | 1.59 | 02:55 | 1.15 08:35 | 4.21 | 2.47 | 02:50 | 0.027 08:35 | 0.133 | 0.079 | 0.079 | |
| 02/09/2020 | 05:20 | 1.26 12:15 | 1.79 | 1.53 | 05:50 | 0.84 12:05 | 3.95 | 2.36 | 05:50 | 0.019 09:10 | 0.129 | 0.074 | 0.074 | |
| 02/10/2020 | 04:45 | 1.17 08:30 | 1.89 | 1.51 | 04:10 | 0.99 08:30 | 4.08 | 2.40 | 04:10 | 0.026 08:30 | 0.166 | 0.072 | 0.072 | |
| 02/11/2020 | 03:30 | 1.28 09:00 | 1.88 | 1.53 | 01:15 | 0.95 20:15 | 3.84 | 2.40 | 04:50 | 0.023 09:00 | 0.154 | 0.074 | 0.074 | |
| 02/12/2020 | 04:00 | 1.25 08:25 | 1.82 | 1.49 | 04:00 | 0.76 08:25 | 4.34 | 2.48 | 04:00 | 0.017 08:25 | 0.168 | 0.074 | 0.074 | |
| 02/13/2020 | 01:35 | 1.23 09:40 | 1.86 | 1.54 | 02:50 | 1.23 09:40 | 4.28 | 2.45 | 04:35 | 0.030 09:40 | 0.170 | 0.076 | 0.076 | |
| 02/14/2020 | 03:25 | 1.27 18:45 | 1.95 | 1.61 | 05:35 | 1.04 08:25 | 3.50 | 2.16 | 05:35 | 0.024 09:25 | 0.139 | 0.072 | 0.072 | |
| 02/15/2020 | 04:25 | 1.38 20:20 | 2.12 | 1.69 | 05:30 | 1.06 10:05 | 2.85 | 1.80 | 05:30 | 0.028 12:00 | 0.126 | 0.065 | 0.065 | |
| 02/16/2020 | 04:25 | 1.26 12:15 | 2.19 | 1.69 | 04:10 | 0.49 09:50 | 3.35 | 1.70 | 04:10 | 0.011 09:50 | 0.149 | 0.062 | 0.062 | |
| 02/17/2020 | 06:10 | 1.44 11:55 | 1.96 | 1.69 | 03:45 | 0.52 09:20 | 3.53 | 1.92 | 03:45 | 0.015 09:20 | 0.146 | 0.069 | 0.069 | |
| 02/18/2020 | 05:05 | 1.32 08:00 | 1.89 | 1.62 | 04:10 | 0.89 09:35 | 3.40 | 2.13 | 04:10 | 0.023 08:00 | 0.130 | 0.072 | 0.072 | |
| 02/19/2020 | 04:05 | 1.28 08:35 | 2.09 | 1.67 | 03:55 | 0.88 07:40 | 3.61 | 2.12 | 03:55 | 0.021 08:40 | 0.160 | 0.076 | 0.076 | |
| 02/20/2020 | 04:00 | 1.29 22:00 | 2.09 | 1.68 | 04:30 | 0.70 22:00 | 3.12 | 2.04 | 04:30 | 0.019 22:00 | 0.146 | 0.073 | 0.073 | |
| 02/21/2020 | 03:35 | 1.28 19:25 | 2.10 | 1.71 | 03:20 | 0.76 08:40 | 3.43 | 1.94 | 03:20 | 0.018 08:40 | 0.153 | 0.070 | 0.070 | |
| 02/22/2020 | 04:05 | 1.31 11:10 | 2.06 | 1.69 | 03:45 | 0.83 23:55 | 3.33 | 2.05 | 03:45 | 0.020 23:55 | 0.140 | 0.074 | 0.074 | |
| 02/23/2020 | 07:05 | 1.26 12:05 | 1.93 | 1.62 | 07:05 | 0.49 11:35 | 3.79 | 2.25 | 07:05 | 0.011 11:35 | 0.145 | 0.077 | 0.077 | |
| 02/24/2020 | 05:35 | 1.26 21:50 | 1.88 | 1.59 | 05:35 | 0.84 20:15 | 3.88 | 2.16 | 05:35 | 0.019 20:15 | 0.143 | 0.072 | 0.072 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 02:40 | 1.32 | 08:30 | 2.00 | 1.60 | 05:05 | 0.88 | 19:50 | 4.28 | 2.21 | 05:05 | 0.021 | 19:50 | 0.153 | 0.074 | 0.074 | |
| 02/26/2020 | 04:50 | 1.26 | 20:50 | 1.85 | 1.57 | 04:40 | 0.87 | 20:50 | 4.22 | 2.29 | 04:40 | 0.020 | 20:50 | 0.167 | 0.074 | 0.074 | |
| 02/27/2020 | 04:50 | 1.25 | 17:45 | 1.91 | 1.59 | 04:20 | 0.88 | 14:30 | 4.09 | 2.42 | 04:20 | 0.020 | 14:30 | 0.150 | 0.079 | 0.079 | |
| 02/28/2020 | 04:10 | 1.23 | 22:45 | 1.90 | 1.61 | 04:10 | 0.72 | 08:40 | 3.85 | 2.08 | 04:10 | 0.016 | 08:40 | 0.146 | 0.071 | 0.071 | |
| 02/29/2020 | 04:30 | 1.29 | 20:35 | 1.93 | 1.63 | 04:25 | 0.88 | 20:45 | 3.99 | 2.21 | 04:30 | 0.021 | 20:40 | 0.147 | 0.075 | 0.075 | |
| 03/01/2020 | 06:15 | 1.27 | 15:55 | 2.03 | 1.55 | 06:15 | 0.73 | 15:55 | 4.35 | 2.23 | 06:15 | 0.017 | 15:55 | 0.196 | 0.070 | 0.070 | |
| 03/02/2020 | 05:30 | 1.20 | 07:40 | 2.04 | 1.51 | 04:15 | 0.93 | 07:40 | 4.37 | 2.50 | 04:45 | 0.020 | 07:40 | 0.198 | 0.076 | 0.076 | 0.01 |
| 03/03/2020 | 02:00 | 1.24 | 22:50 | 1.71 | 1.49 | 05:55 | 0.92 | 22:50 | 4.36 | 2.48 | 05:55 | 0.021 | 22:50 | 0.154 | 0.074 | 0.074 | |
| 03/04/2020 | 04:15 | 1.19 | 01:35 | 2.27 | 1.55 | 01:00 | 1.67 | 07:40 | 4.32 | 2.72 | 01:00 | 0.041 | 07:40 | 0.145 | 0.084 | 0.084 | |
| 03/05/2020 | 03:40 | 1.22 | 09:15 | 1.94 | 1.59 | 02:55 | 0.82 | 21:00 | 3.98 | 2.26 | 03:40 | 0.018 | 09:15 | 0.148 | 0.075 | 0.075 | |
| 03/06/2020 | 04:00 | 1.25 | 08:45 | 1.93 | 1.56 | 03:50 | 0.71 | 08:25 | 4.11 | 2.24 | 03:50 | 0.016 | 08:25 | 0.172 | 0.072 | 0.072 | |
| 03/07/2020 | 03:40 | 1.23 | 01:15 | 1.79 | 1.57 | 04:10 | 0.68 | 10:30 | 3.98 | 2.55 | 03:40 | 0.018 | 10:35 | 0.136 | 0.082 | 0.082 | 0.58 |
| 03/08/2020 | 05:55 | 1.30 | 11:35 | 1.88 | 1.53 | 04:15 | 0.92 | 11:00 | 4.60 | 2.51 | 04:15 | 0.023 | 11:35 | 0.173 | 0.077 | 0.077 | 0.02 |
| 03/09/2020 | 03:40 | 1.22 | 20:10 | 1.69 | 1.43 | 03:40 | 0.81 | 20:10 | 4.20 | 2.45 | 03:40 | 0.018 | 20:10 | 0.146 | 0.069 | 0.069 | 0.11 |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 9.014 | 5.26 |
| Avg | 1.60 | 2.40 | 0.078 | |

## Site Commentary

### Site Information

| MIL_1790 | |
|---|---|
| Pipe Dimensions | 28 |
| Silt Level | 0.00" |

### Overview

Site MIL_1790 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed downstream of sites MIL_0190, MIL_0649 and MIL_1795. A check of balancing shows a net flow of 0.837 MGD between the sites.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 10.91 | 1.97 | 2.006 |
| Minimum | 7.93 | 1.32 | 0.852 |
| Maximum | 13.37 | 2.51 | 3.219 |
| Time of Minimum | 3/1/2020 5:45 AM | 3/1/2020 5:40 AM | 3/1/2020 5:40 AM |
| Time of Maximum | 12/23/2019 12:05 PM | 11/27/2019 10:55 AM | 12/23/2019 12:05 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

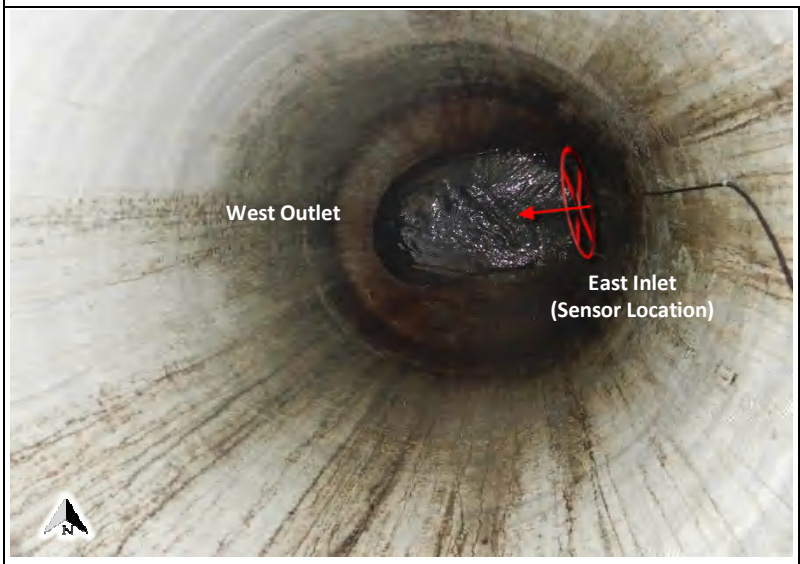
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_1790

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | 490 N McCarthy Blvd, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.435578° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.919933° | 28.00"x28.00" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 1790 | Residential/Commercial |
| Access | Traffic |
| Drive | Light |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Friday, November 15, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 4:26:00 AM | 28.00"x28.00" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 9.00" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.82' | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

Smooth flow with deep depth and moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 12' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Drilled Pavement / Concrete |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |

# SCATTERGRAPH REPORT

MIL_1790

**Flow Monitor**

**MIL_1790**

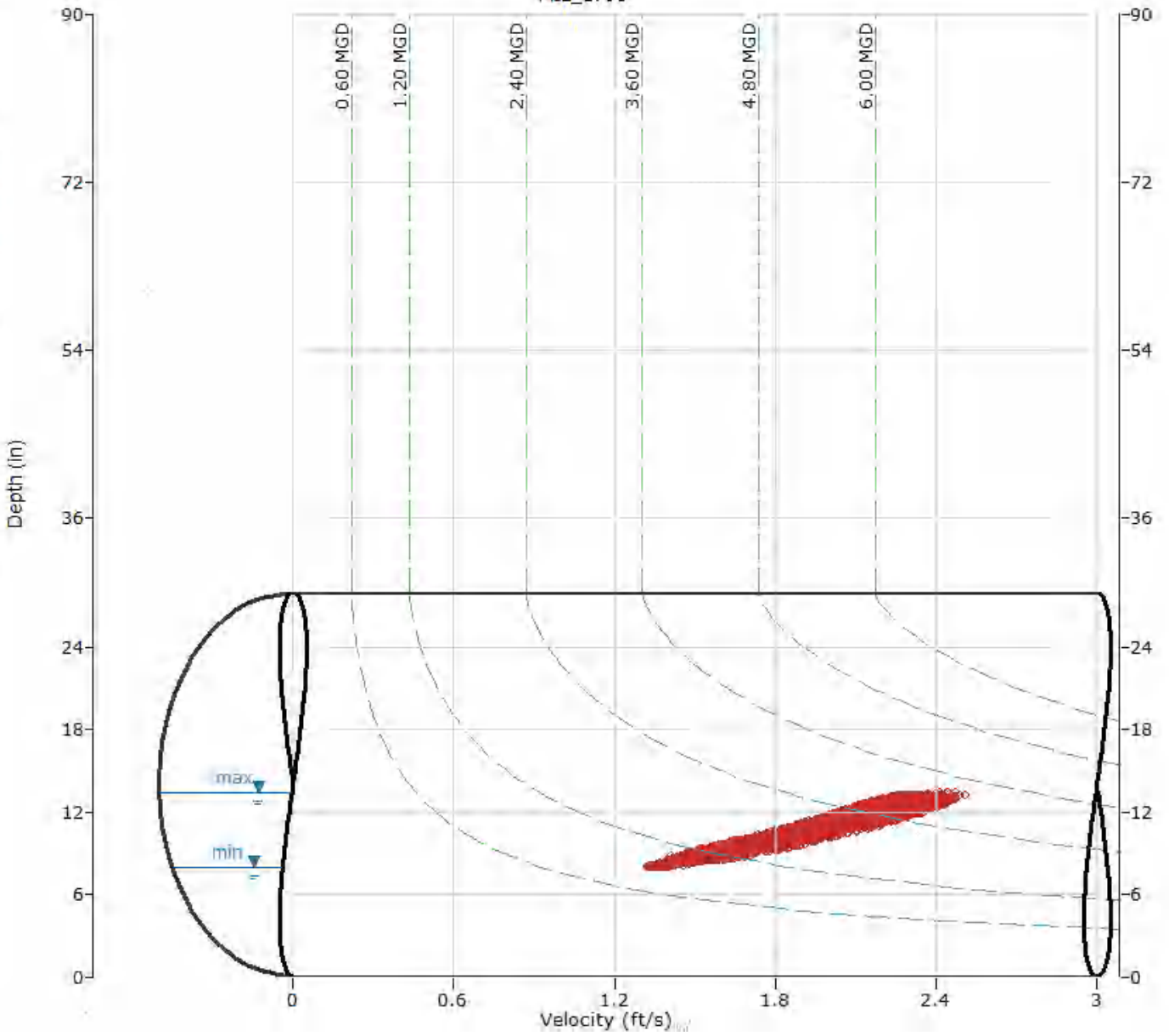
Pipe Height
28.00 in

**Report Period**

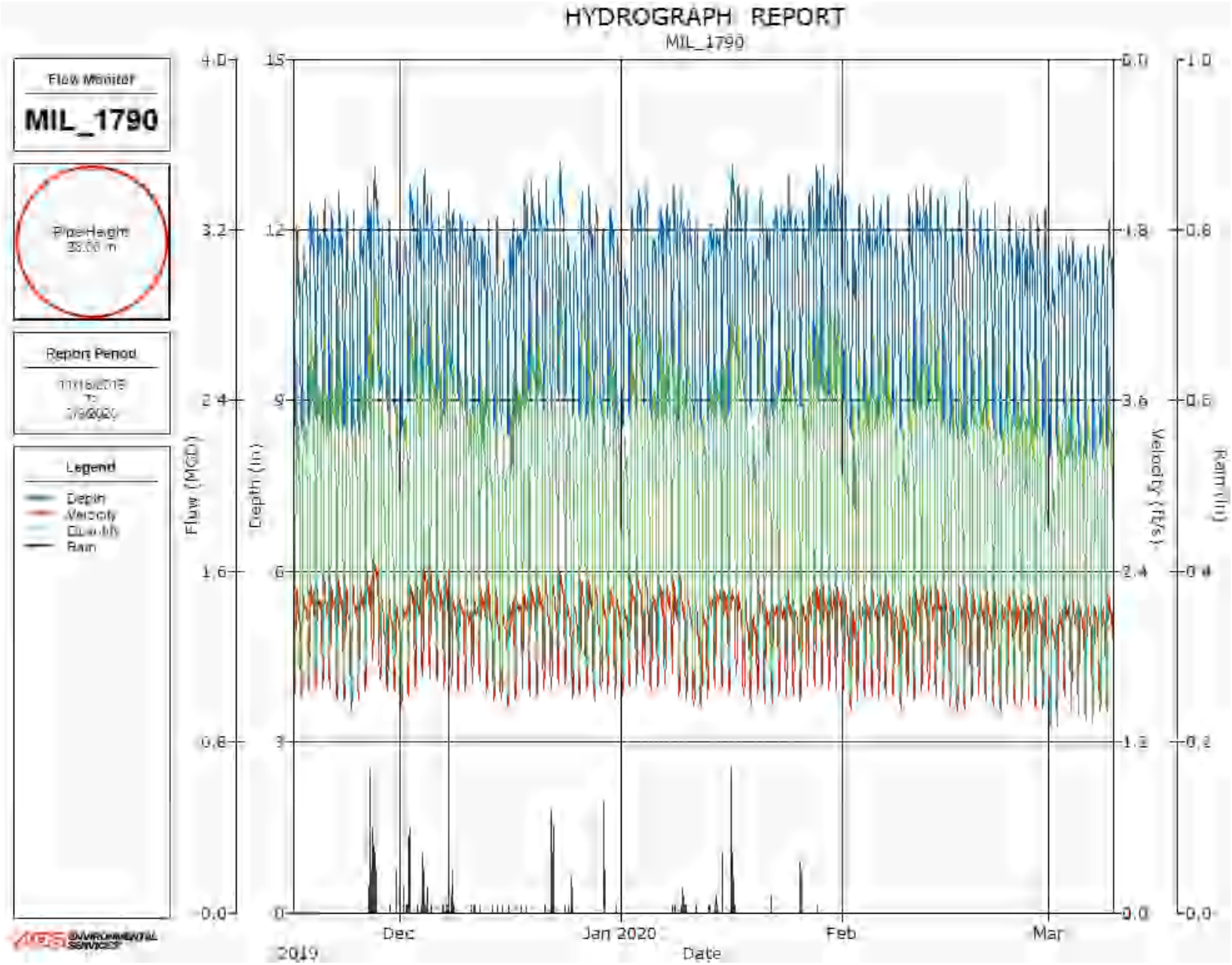
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_1790
Flow Monitor
MIL_1790
Pipe Height
Report Period
Legend
Depth
Velocity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
4.0
3.2
2.4
1.6
0.8
0.0
15
12
9
6
3
0
6.0
4.8
3.6
2.4
1.2
0.0
1.0
0.8
0.6
0.4
0.2
0.0
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_1790, Pipe Height: 28.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 04:50 | 8.41 | 13:00 | 12.14 | 10.48 | 04:50 | 1.49 | 13:05 | 2.35 | 1.96 | 04:50 | 1.042 | 13:05 | 2.693 | 1.892 | 1.892 | |
| 11/17/2019 | 05:10 | 8.36 | 11:25 | 11.76 | 10.38 | 05:00 | 1.50 | 11:30 | 2.26 | 1.96 | 05:00 | 1.043 | 11:15 | 2.492 | 1.863 | 1.863 | |
| 11/18/2019 | 03:55 | 8.47 | 10:55 | 12.74 | 11.03 | 04:05 | 1.54 | 10:40 | 2.41 | 2.05 | 04:05 | 1.085 | 10:45 | 2.934 | 2.124 | 2.124 | |
| 11/19/2019 | 04:30 | 8.64 | 10:30 | 12.37 | 11.03 | 04:35 | 1.56 | 09:20 | 2.31 | 2.04 | 04:30 | 1.130 | 10:30 | 2.717 | 2.101 | 2.101 | |
| 11/20/2019 | 04:20 | 8.59 | 10:20 | 12.63 | 10.92 | 03:55 | 1.56 | 10:40 | 2.36 | 2.02 | 03:55 | 1.124 | 10:40 | 2.840 | 2.058 | 2.058 | |
| 11/21/2019 | 04:45 | 8.43 | 09:55 | 12.75 | 10.93 | 04:35 | 1.56 | 10:00 | 2.36 | 2.04 | 04:35 | 1.095 | 09:55 | 2.893 | 2.079 | 2.079 | |
| 11/22/2019 | 04:05 | 8.48 | 10:30 | 12.74 | 11.03 | 05:05 | 1.49 | 10:40 | 2.39 | 2.03 | 03:55 | 1.059 | 10:40 | 2.911 | 2.105 | 2.105 | |
| 11/23/2019 | 05:30 | 8.52 | 13:00 | 12.43 | 10.62 | 05:00 | 1.49 | 11:25 | 2.33 | 1.96 | 04:55 | 1.057 | 11:25 | 2.735 | 1.929 | 1.929 | |
| 11/24/2019 | 04:50 | 8.32 | 11:50 | 12.42 | 10.50 | 04:35 | 1.42 | 11:00 | 2.33 | 1.95 | 04:50 | 0.980 | 11:55 | 2.752 | 1.897 | 1.897 | |
| 11/25/2019 | 04:10 | 8.35 | 13:00 | 12.08 | 10.80 | 03:55 | 1.49 | 12:15 | 2.31 | 2.03 | 03:55 | 1.031 | 12:15 | 2.618 | 2.041 | 2.041 | |
| 11/26/2019 | 03:45 | 8.54 | 10:00 | 12.85 | 11.16 | 03:40 | 1.49 | 10:00 | 2.46 | 2.10 | 03:40 | 1.064 | 10:00 | 3.038 | 2.202 | 2.202 | 0.36 |
| 11/27/2019 | 03:30 | 9.16 | 10:35 | 13.21 | 11.60 | 03:30 | 1.64 | 10:55 | 2.51 | 2.20 | 03:30 | 1.285 | 10:55 | 3.198 | 2.420 | 2.420 | 0.63 |
| 11/28/2019 | 05:55 | 9.13 | 12:15 | 12.16 | 10.64 | 05:55 | 1.63 | 10:45 | 2.29 | 1.95 | 05:55 | 1.274 | 12:15 | 2.542 | 1.896 | 1.896 | |
| 11/29/2019 | 05:05 | 8.72 | 14:45 | 12.30 | 10.67 | 05:05 | 1.53 | 18:15 | 2.24 | 1.94 | 05:05 | 1.123 | 14:45 | 2.601 | 1.910 | 1.910 | 0.02 |
| 11/30/2019 | 06:50 | 8.72 | 13:05 | 11.84 | 10.52 | 06:50 | 1.53 | 13:05 | 2.16 | 1.91 | 06:50 | 1.126 | 13:05 | 2.400 | 1.843 | 1.843 | 0.10 |
| 12/01/2019 | 06:55 | 8.39 | 16:00 | 11.80 | 10.50 | 06:55 | 1.45 | 22:05 | 2.16 | 1.89 | 06:55 | 1.010 | 22:10 | 2.376 | 1.833 | 1.833 | 0.06 |
| 12/02/2019 | 04:40 | 8.91 | 09:20 | 12.88 | 11.47 | 04:20 | 1.52 | 10:50 | 2.35 | 2.06 | 04:25 | 1.151 | 09:30 | 2.909 | 2.240 | 2.240 | 0.30 |
| 12/03/2019 | 04:25 | 9.10 | 10:15 | 12.85 | 11.19 | 04:55 | 1.57 | 21:30 | 2.35 | 2.04 | 04:55 | 1.227 | 10:30 | 2.880 | 2.133 | 2.133 | 0.01 |
| 12/04/2019 | 04:25 | 8.62 | 10:05 | 13.23 | 11.53 | 04:25 | 1.51 | 09:45 | 2.44 | 2.14 | 04:25 | 1.090 | 10:00 | 3.092 | 2.336 | 2.336 | 0.39 |
| 12/05/2019 | 04:35 | 8.92 | 09:40 | 12.68 | 11.22 | 04:30 | 1.62 | 10:55 | 2.42 | 2.09 | 04:30 | 1.228 | 09:40 | 2.931 | 2.197 | 2.197 | 0.01 |
| 12/06/2019 | 04:25 | 8.85 | 09:45 | 12.34 | 10.95 | 03:00 | 1.52 | 09:45 | 2.39 | 2.05 | 03:00 | 1.162 | 09:45 | 2.800 | 2.090 | 2.090 | 0.01 |
| 12/07/2019 | 04:00 | 8.72 | 19:55 | 12.74 | 10.99 | 03:25 | 1.55 | 20:15 | 2.44 | 2.07 | 04:50 | 1.150 | 19:55 | 2.988 | 2.135 | 2.135 | 0.67 |
| 12/08/2019 | 06:20 | 9.41 | 11:30 | 12.40 | 11.14 | 06:30 | 1.56 | 13:40 | 2.23 | 1.97 | 06:30 | 1.273 | 10:50 | 2.621 | 2.046 | 2.046 | 0.20 |
| 12/09/2019 | 04:45 | 8.99 | 09:50 | 12.37 | 11.20 | 03:55 | 1.51 | 09:30 | 2.27 | 1.99 | 03:55 | 1.172 | 09:45 | 2.644 | 2.088 | 2.088 | |
| 12/10/2019 | 04:30 | 8.80 | 10:05 | 12.20 | 10.96 | 04:15 | 1.49 | 09:20 | 2.25 | 1.97 | 04:15 | 1.119 | 09:25 | 2.587 | 2.004 | 2.004 | |
| 12/11/2019 | 03:50 | 8.74 | 11:20 | 12.19 | 10.87 | 04:05 | 1.55 | 09:05 | 2.27 | 2.00 | 04:05 | 1.148 | 11:20 | 2.570 | 2.010 | 2.010 | 0.03 |
| 12/12/2019 | 04:35 | 8.56 | 09:55 | 11.95 | 10.77 | 03:05 | 1.57 | 11:35 | 2.32 | 2.05 | 04:20 | 1.161 | 11:35 | 2.574 | 2.040 | 2.040 | 0.01 |
| 12/13/2019 | 03:55 | 8.75 | 10:10 | 12.54 | 10.61 | 03:55 | 1.54 | 10:15 | 2.37 | 1.96 | 03:55 | 1.137 | 10:10 | 2.832 | 1.916 | 1.916 | 0.01 |
| 12/14/2019 | 04:45 | 8.48 | 14:40 | 12.24 | 10.45 | 04:45 | 1.47 | 12:00 | 2.34 | 1.90 | 04:45 | 1.040 | 12:00 | 2.658 | 1.827 | 1.827 | 0.01 |
| 12/15/2019 | 03:45 | 8.49 | 12:15 | 11.66 | 10.25 | 03:45 | 1.47 | 12:15 | 2.13 | 1.86 | 03:45 | 1.043 | 12:15 | 2.322 | 1.732 | 1.732 | 0.01 |
| 12/16/2019 | 03:50 | 8.27 | 21:35 | 12.25 | 10.76 | 03:50 | 1.42 | 22:10 | 2.32 | 1.95 | 03:50 | 0.971 | 22:10 | 2.668 | 1.951 | 1.951 | 0.01 |
| 12/17/2019 | 04:15 | 8.56 | 10:55 | 12.12 | 10.94 | 04:15 | 1.49 | 10:55 | 2.20 | 1.99 | 04:15 | 1.068 | 10:55 | 2.523 | 2.024 | 2.024 | 0.01 |
| 12/18/2019 | 04:50 | 8.81 | 11:10 | 12.72 | 11.41 | 04:50 | 1.55 | 10:15 | 2.28 | 2.04 | 04:50 | 1.159 | 11:10 | 2.775 | 2.192 | 2.192 | 0.01 |
| 12/19/2019 | 04:15 | 8.96 | 10:40 | 12.98 | 11.54 | 04:00 | 1.51 | 11:05 | 2.36 | 2.04 | 04:20 | 1.155 | 10:40 | 2.908 | 2.238 | 2.238 | |
| 12/20/2019 | 05:35 | 8.91 | 10:55 | 12.85 | 11.40 | 05:00 | 1.51 | 10:45 | 2.37 | 2.04 | 05:00 | 1.145 | 10:50 | 2.925 | 2.195 | 2.195 | |
| 12/21/2019 | 04:50 | 8.76 | 11:10 | 12.98 | 10.98 | 04:45 | 1.54 | 12:00 | 2.38 | 2.00 | 04:45 | 1.139 | 11:25 | 2.970 | 2.048 | 2.048 | 0.01 |
| 12/22/2019 | 04:30 | 8.77 | 14:25 | 12.58 | 10.86 | 04:25 | 1.55 | 15:00 | 2.36 | 1.99 | 04:25 | 1.152 | 15:00 | 2.816 | 2.014 | 2.014 | 0.41 |
| 12/23/2019 | 04:20 | 8.98 | 12:05 | 13.37 | 11.47 | 04:30 | 1.60 | 12:05 | 2.47 | 2.09 | 04:30 | 1.226 | 12:05 | 3.219 | 2.280 | 2.280 | |
| 12/24/2019 | 04:55 | 9.01 | 11:45 | 11.85 | 10.67 | 04:55 | 1.58 | 12:55 | 2.19 | 1.95 | 04:55 | 1.212 | 11:45 | 2.436 | 1.910 | 1.910 | 0.02 |
| 12/25/2019 | 07:20 | 8.64 | 11:55 | 11.72 | 10.39 | 06:15 | 1.41 | 11:55 | 2.18 | 1.90 | 06:15 | 1.037 | 11:55 | 2.385 | 1.805 | 1.805 | 0.08 |
| 12/26/2019 | 04:10 | 8.56 | 13:45 | 12.77 | 11.05 | 04:15 | 1.49 | 12:50 | 2.39 | 2.02 | 04:10 | 1.071 | 13:20 | 2.889 | 2.101 | 2.101 | |
| 12/27/2019 | 04:35 | 8.59 | 11:25 | 12.92 | 11.09 | 05:35 | 1.55 | 11:20 | 2.39 | 2.02 | 04:30 | 1.117 | 11:25 | 2.969 | 2.107 | 2.107 | |
| 12/28/2019 | 06:15 | 8.43 | 11:30 | 12.54 | 10.69 | 05:00 | 1.45 | 14:55 | 2.29 | 1.94 | 05:00 | 1.036 | 11:30 | 2.729 | 1.926 | 1.926 | |
| 12/29/2019 | 03:55 | 8.63 | 13:00 | 12.08 | 10.52 | 03:45 | 1.53 | 11:50 | 2.26 | 1.93 | 03:55 | 1.117 | 11:50 | 2.567 | 1.865 | 1.865 | 0.22 |
| 12/30/2019 | 05:00 | 8.63 | 12:05 | 12.49 | 11.06 | 04:10 | 1.52 | 12:10 | 2.30 | 2.03 | 04:50 | 1.112 | 12:10 | 2.745 | 2.100 | 2.100 | |
| 12/31/2019 | 04:55 | 8.48 | 12:10 | 11.96 | 10.57 | 04:00 | 1.49 | 12:00 | 2.25 | 1.95 | 04:55 | 1.056 | 12:00 | 2.512 | 1.897 | 1.897 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 06:40 | 8.45 11:15 | 11.44 | 10.24 | 06:05 | 1.50 13:00 | 2.15 | 1.90 | 06:50 | 1.062 13:40 | 2.250 | 1.769 | 1.769 | |
| 01/02/2020 | 04:55 | 8.64 14:00 | 12.47 | 11.10 | 04:45 | 1.57 14:05 | 2.36 | 2.06 | 05:00 | 1.141 14:05 | 2.803 | 2.140 | 2.140 | |
| 01/03/2020 | 04:15 | 8.73 12:50 | 12.84 | 11.17 | 04:10 | 1.57 12:40 | 2.42 | 2.04 | 04:10 | 1.158 12:40 | 2.975 | 2.147 | 2.147 | |
| 01/04/2020 | 04:40 | 8.87 11:50 | 13.21 | 10.98 | 04:35 | 1.61 11:50 | 2.42 | 2.03 | 04:50 | 1.213 11:50 | 3.104 | 2.078 | 2.078 | |
| 01/05/2020 | 04:15 | 8.67 12:00 | 11.86 | 10.68 | 04:05 | 1.55 12:15 | 2.32 | 1.98 | 04:15 | 1.134 12:15 | 2.581 | 1.951 | 1.951 | |
| 01/06/2020 | 05:00 | 8.63 13:45 | 12.51 | 11.13 | 04:50 | 1.55 10:45 | 2.35 | 2.05 | 04:50 | 1.128 10:45 | 2.804 | 2.142 | 2.142 | |
| 01/07/2020 | 04:25 | 8.73 09:55 | 12.56 | 11.21 | 04:25 | 1.59 09:30 | 2.39 | 2.06 | 04:25 | 1.166 09:30 | 2.848 | 2.173 | 2.173 | |
| 01/08/2020 | 05:00 | 9.14 10:50 | 12.92 | 11.34 | 04:50 | 1.60 10:40 | 2.45 | 2.07 | 04:50 | 1.261 10:40 | 3.044 | 2.202 | 2.202 | 0.02 |
| 01/09/2020 | 04:20 | 8.55 11:15 | 13.09 | 11.17 | 03:40 | 1.51 10:45 | 2.39 | 2.01 | 04:20 | 1.080 11:05 | 3.005 | 2.110 | 2.110 | 0.18 |
| 01/10/2020 | 04:30 | 8.79 10:20 | 12.42 | 11.06 | 04:00 | 1.49 10:05 | 2.22 | 1.94 | 04:20 | 1.113 10:40 | 2.629 | 2.007 | 2.007 | 0.02 |
| 01/11/2020 | 04:00 | 8.51 12:55 | 12.28 | 10.62 | 04:00 | 1.42 12:50 | 2.23 | 1.85 | 04:00 | 1.006 12:50 | 2.596 | 1.823 | 1.823 | 0.01 |
| 01/12/2020 | 04:10 | 8.51 11:50 | 11.85 | 10.50 | 06:15 | 1.44 11:50 | 2.16 | 1.86 | 04:10 | 1.023 11:50 | 2.406 | 1.797 | 1.797 | |
| 01/13/2020 | 04:20 | 8.58 13:55 | 12.28 | 10.93 | 04:25 | 1.48 22:35 | 2.28 | 1.98 | 04:25 | 1.066 13:55 | 2.606 | 2.016 | 2.016 | 0.02 |
| 01/14/2020 | 04:00 | 8.64 09:50 | 12.09 | 10.94 | 02:15 | 1.52 10:35 | 2.34 | 2.03 | 04:00 | 1.125 10:35 | 2.645 | 2.077 | 2.077 | 0.11 |
| 01/15/2020 | 04:25 | 8.64 20:10 | 12.45 | 11.09 | 04:25 | 1.56 11:10 | 2.36 | 2.06 | 04:25 | 1.128 11:10 | 2.687 | 2.129 | 2.129 | 0.07 |
| 01/16/2020 | 04:50 | 8.69 14:25 | 13.23 | 11.54 | 04:50 | 1.52 12:45 | 2.32 | 2.04 | 04:50 | 1.114 14:00 | 2.970 | 2.243 | 2.243 | 0.66 |
| 01/17/2020 | 04:10 | 9.72 10:35 | 12.87 | 11.64 | 04:55 | 1.64 09:40 | 2.28 | 2.03 | 04:05 | 1.407 09:40 | 2.809 | 2.226 | 2.226 | |
| 01/18/2020 | 04:40 | 9.03 12:55 | 12.88 | 10.93 | 04:40 | 1.52 10:50 | 2.26 | 1.89 | 04:40 | 1.168 12:45 | 2.801 | 1.929 | 1.929 | |
| 01/19/2020 | 06:00 | 8.73 11:45 | 11.92 | 10.57 | 04:15 | 1.45 14:35 | 2.11 | 1.84 | 04:15 | 1.076 11:45 | 2.359 | 1.794 | 1.794 | |
| 01/20/2020 | 03:45 | 8.99 15:25 | 12.78 | 11.27 | 04:10 | 1.51 12:55 | 2.25 | 1.97 | 03:45 | 1.170 15:15 | 2.750 | 2.096 | 2.096 | |
| 01/21/2020 | 04:55 | 8.63 10:15 | 12.24 | 11.02 | 04:45 | 1.44 10:15 | 2.18 | 1.93 | 04:45 | 1.043 10:15 | 2.529 | 1.977 | 1.977 | |
| 01/22/2020 | 04:20 | 8.72 20:10 | 12.46 | 11.16 | 04:20 | 1.46 19:55 | 2.22 | 1.94 | 04:20 | 1.072 20:00 | 2.633 | 2.037 | 2.037 | 0.03 |
| 01/23/2020 | 04:35 | 9.06 09:50 | 12.69 | 11.30 | 04:50 | 1.49 09:25 | 2.23 | 1.97 | 04:50 | 1.152 09:50 | 2.687 | 2.093 | 2.093 | |
| 01/24/2020 | 04:45 | 9.02 11:30 | 13.07 | 11.46 | 04:45 | 1.50 12:00 | 2.29 | 1.99 | 04:45 | 1.158 11:30 | 2.891 | 2.159 | 2.159 | |
| 01/25/2020 | 04:35 | 9.03 15:15 | 12.37 | 10.91 | 04:35 | 1.51 12:15 | 2.18 | 1.88 | 04:35 | 1.166 11:30 | 2.537 | 1.907 | 1.907 | |
| 01/26/2020 | 05:35 | 8.87 11:30 | 12.42 | 10.90 | 04:55 | 1.47 13:40 | 2.20 | 1.91 | 04:55 | 1.112 11:40 | 2.599 | 1.940 | 1.940 | 0.16 |
| 01/27/2020 | 04:20 | 9.13 20:40 | 12.82 | 11.47 | 03:20 | 1.59 09:40 | 2.33 | 2.02 | 04:35 | 1.252 09:40 | 2.855 | 2.193 | 2.193 | |
| 01/28/2020 | 04:05 | 9.12 10:30 | 13.20 | 11.57 | 04:00 | 1.56 11:00 | 2.34 | 2.04 | 04:00 | 1.217 10:55 | 2.986 | 2.245 | 2.245 | 0.01 |
| 01/29/2020 | 04:20 | 9.14 10:15 | 13.19 | 11.53 | 02:55 | 1.58 09:40 | 2.37 | 2.03 | 04:20 | 1.246 09:40 | 3.013 | 2.212 | 2.212 | |
| 01/30/2020 | 04:30 | 9.07 21:30 | 12.86 | 11.45 | 03:20 | 1.56 10:55 | 2.31 | 2.02 | 04:30 | 1.213 10:55 | 2.855 | 2.190 | 2.190 | |
| 01/31/2020 | 04:45 | 9.04 09:35 | 13.05 | 11.54 | 04:45 | 1.55 09:55 | 2.38 | 2.03 | 04:45 | 1.193 09:55 | 2.995 | 2.227 | 2.227 | |
| 02/01/2020 | 04:30 | 8.93 11:50 | 12.66 | 10.87 | 04:35 | 1.54 10:35 | 2.28 | 1.92 | 04:35 | 1.173 10:40 | 2.756 | 1.936 | 1.936 | |
| 02/02/2020 | 05:50 | 8.37 13:20 | 12.05 | 10.42 | 05:40 | 1.39 13:50 | 2.14 | 1.83 | 05:40 | 0.966 12:30 | 2.413 | 1.754 | 1.754 | |
| 02/03/2020 | 04:15 | 8.60 10:50 | 12.57 | 11.06 | 04:30 | 1.45 11:10 | 2.26 | 1.95 | 04:00 | 1.052 11:10 | 2.703 | 2.019 | 2.019 | |
| 02/04/2020 | 03:45 | 8.73 09:50 | 12.47 | 11.14 | 03:50 | 1.50 09:20 | 2.25 | 1.96 | 03:50 | 1.102 09:25 | 2.660 | 2.050 | 2.050 | |
| 02/05/2020 | 04:15 | 8.88 10:40 | 12.68 | 11.19 | 04:10 | 1.50 10:35 | 2.26 | 1.99 | 04:15 | 1.131 10:40 | 2.740 | 2.084 | 2.084 | |
| 02/06/2020 | 04:30 | 8.67 10:05 | 12.55 | 11.15 | 04:30 | 1.50 09:50 | 2.25 | 1.99 | 04:30 | 1.091 10:05 | 2.693 | 2.082 | 2.082 | |
| 02/07/2020 | 04:20 | 8.71 10:50 | 12.66 | 11.16 | 04:05 | 1.52 11:25 | 2.28 | 1.99 | 04:25 | 1.120 11:25 | 2.761 | 2.083 | 2.083 | |
| 02/08/2020 | 04:35 | 8.67 16:10 | 12.60 | 10.62 | 03:45 | 1.51 16:10 | 2.26 | 1.90 | 04:35 | 1.105 16:10 | 2.726 | 1.858 | 1.858 | |
| 02/09/2020 | 05:10 | 8.41 11:40 | 11.84 | 10.41 | 06:15 | 1.42 12:05 | 2.15 | 1.86 | 05:10 | 0.997 12:05 | 2.372 | 1.774 | 1.774 | |
| 02/10/2020 | 04:30 | 8.66 09:45 | 12.79 | 11.02 | 04:25 | 1.50 10:10 | 2.34 | 1.97 | 04:25 | 1.090 10:10 | 2.866 | 2.025 | 2.025 | |
| 02/11/2020 | 05:00 | 8.73 09:35 | 12.83 | 11.31 | 04:55 | 1.49 09:45 | 2.32 | 1.99 | 05:00 | 1.094 09:45 | 2.850 | 2.128 | 2.128 | |
| 02/12/2020 | 05:00 | 8.79 10:40 | 12.82 | 11.40 | 04:45 | 1.52 10:00 | 2.32 | 2.03 | 04:55 | 1.136 10:40 | 2.859 | 2.187 | 2.187 | |
| 02/13/2020 | 04:40 | 8.81 09:35 | 12.81 | 11.16 | 05:20 | 1.52 09:20 | 2.33 | 2.00 | 05:15 | 1.142 09:25 | 2.868 | 2.089 | 2.089 | |
| 02/14/2020 | 04:40 | 8.71 11:05 | 12.67 | 11.19 | 04:35 | 1.52 11:05 | 2.30 | 2.00 | 04:35 | 1.116 11:05 | 2.791 | 2.102 | 2.102 | |
| 02/15/2020 | 04:00 | 8.50 12:15 | 12.72 | 10.65 | 04:00 | 1.47 12:20 | 2.31 | 1.91 | 04:00 | 1.042 12:15 | 2.818 | 1.881 | 1.881 | |
| 02/16/2020 | 04:50 | 8.31 13:10 | 12.24 | 10.40 | 04:40 | 1.41 13:05 | 2.18 | 1.86 | 04:45 | 0.969 13:05 | 2.531 | 1.774 | 1.774 | |
| 02/17/2020 | 05:15 | 8.29 11:30 | 12.82 | 10.70 | 06:00 | 1.40 11:35 | 2.33 | 1.90 | 06:00 | 0.959 11:35 | 2.864 | 1.908 | 1.908 | |
| 02/18/2020 | 04:30 | 8.31 10:45 | 12.93 | 10.89 | 04:25 | 1.41 10:15 | 2.32 | 1.96 | 04:25 | 0.969 10:50 | 2.855 | 1.984 | 1.984 | |
| 02/19/2020 | 04:35 | 8.51 10:45 | 12.39 | 10.85 | 03:05 | 1.46 10:35 | 2.29 | 1.96 | 03:40 | 1.045 10:45 | 2.701 | 1.987 | 1.987 | |
| 02/20/2020 | 05:00 | 8.69 11:30 | 12.43 | 10.95 | 04:55 | 1.50 11:30 | 2.25 | 1.97 | 04:55 | 1.097 11:30 | 2.667 | 2.000 | 2.000 | |
| 02/21/2020 | 04:40 | 8.56 10:55 | 12.63 | 10.77 | 03:55 | 1.46 10:50 | 2.33 | 1.93 | 03:55 | 1.046 10:50 | 2.795 | 1.926 | 1.926 | |
| 02/22/2020 | 06:35 | 8.46 11:30 | 12.56 | 10.54 | 06:50 | 1.44 11:15 | 2.29 | 1.89 | 06:20 | 1.016 11:15 | 2.737 | 1.836 | 1.836 | |
| 02/23/2020 | 06:45 | 8.26 20:50 | 11.96 | 10.49 | 06:00 | 1.39 11:40 | 2.19 | 1.88 | 06:40 | 0.952 11:30 | 2.444 | 1.826 | 1.826 | |
| 02/24/2020 | 03:55 | 8.42 11:30 | 12.52 | 10.87 | 05:00 | 1.43 11:30 | 2.27 | 1.96 | 05:00 | 1.003 11:30 | 2.718 | 1.984 | 1.984 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 05:15 | 8.41 | 10:15 | 12.22 | 10.84 | 05:00 | 1.41 | 10:20 | 2.24 | 1.95 | 05:05 | 0.995 | 10:20 | 2.584 | 1.967 | 1.967 | |
| 02/26/2020 | 05:00 | 8.35 | 10:55 | 12.23 | 10.78 | 04:50 | 1.43 | 10:55 | 2.22 | 1.95 | 05:00 | 0.993 | 10:55 | 2.581 | 1.942 | 1.942 | |
| 02/27/2020 | 05:20 | 8.44 | 09:55 | 12.33 | 10.84 | 04:30 | 1.46 | 10:10 | 2.24 | 1.95 | 05:20 | 1.034 | 09:55 | 2.618 | 1.959 | 1.959 | |
| 02/28/2020 | 04:20 | 8.37 | 11:05 | 12.44 | 10.75 | 03:50 | 1.43 | 09:55 | 2.26 | 1.92 | 04:35 | 0.994 | 11:05 | 2.664 | 1.924 | 1.924 | |
| 02/29/2020 | 04:05 | 8.25 | 14:10 | 12.89 | 10.38 | 03:50 | 1.40 | 14:00 | 2.33 | 1.85 | 03:50 | 0.957 | 14:10 | 2.893 | 1.760 | 1.760 | |
| 03/01/2020 | 05:45 | 7.93 | 12:35 | 11.38 | 10.01 | 05:40 | 1.32 | 12:10 | 2.08 | 1.77 | 05:40 | 0.852 | 12:10 | 2.189 | 1.611 | 1.611 | |
| 03/02/2020 | 04:35 | 7.99 | 09:45 | 12.02 | 10.50 | 04:35 | 1.33 | 20:50 | 2.21 | 1.88 | 04:35 | 0.864 | 20:50 | 2.488 | 1.827 | 1.827 | |
| 03/03/2020 | 05:55 | 8.52 | 11:00 | 12.07 | 10.65 | 04:50 | 1.46 | 11:00 | 2.27 | 1.95 | 05:50 | 1.050 | 11:00 | 2.588 | 1.914 | 1.914 | |
| 03/04/2020 | 03:45 | 8.00 | 09:40 | 12.22 | 10.51 | 03:45 | 1.40 | 09:35 | 2.26 | 1.93 | 03:45 | 0.911 | 09:35 | 2.607 | 1.868 | 1.868 | |
| 03/05/2020 | 04:15 | 7.99 | 10:55 | 11.62 | 10.43 | 04:25 | 1.36 | 11:00 | 2.20 | 1.91 | 04:25 | 0.888 | 11:00 | 2.379 | 1.831 | 1.831 | |
| 03/06/2020 | 04:20 | 7.96 | 12:35 | 11.81 | 10.44 | 04:10 | 1.35 | 12:30 | 2.21 | 1.90 | 04:10 | 0.877 | 12:35 | 2.447 | 1.827 | 1.827 | |
| 03/07/2020 | 04:30 | 7.94 | 12:10 | 11.94 | 10.24 | 03:40 | 1.34 | 10:20 | 2.21 | 1.86 | 03:40 | 0.872 | 12:05 | 2.474 | 1.745 | 1.745 | |
| 03/08/2020 | 05:30 | 8.22 | 15:05 | 12.34 | 10.08 | 04:25 | 1.39 | 15:00 | 2.26 | 1.83 | 04:25 | 0.947 | 15:05 | 2.655 | 1.678 | 1.678 | |
| 03/09/2020 | 03:25 | 8.15 | 12:20 | 12.27 | 10.71 | 03:15 | 1.41 | 12:10 | 2.25 | 1.94 | 03:25 | 0.942 | 12:20 | 2.618 | 1.930 | 1.928 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 230.723 | 4.90 |
| Avg | 10.91 | 1.97 | 2.006 | |

## Site Commentary

### Site Information

| MIL_1795 | |
|---|---|
| Pipe Dimensions | 27 |
| Silt Level | 1.50" |

### Overview

Site MIL_1795 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location. Sediment and slow flow conditions render data of lower confidence than typical.

This location was installed upstream of site MIL_1790. (See MIL_1790 Site Commentary for More Details)

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 9.47 | 0.40 | 0.299 |
| Minimum | 6.32 | 0.17 | 0.087 |
| Maximum | 12.80 | 0.54 | 0.503 |
| Time of Minimum | 2/7/2020 3:55 AM | 11/22/2019 4:40 AM | 2/7/2020 3:55 AM |
| Time of Maximum | 1/9/2020 11:40 AM | 3/8/2020 1:35 PM | 12/30/2019 12:35 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_1795

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Marylinn Dr and Penitencia St, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.435797° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.911864° | 27.00"x27.00" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 1795 | Residential/Commercial |
| Access | Traffic |
| Drive | Medium |

| Installation Information | |
|---|---|
| Installation Date: | Installation Type: |
| Friday, November 15, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |
| **Installation Confirmation:** | |
| Confirmation Time: | Pipe Size (HxW) |
| 6:23:00 AM | 27.00"x27.00" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 9.75" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 0.34' | 0'' |
| Silt (in) | Silt Type |
| 3.0" | Soft / Loose |
| Hydraulic Comments: | |
| Smooth flow with deep depth and slow velocity | |
| **Manhole / Pipe Information:** | |
| Manhole Depth (Approx. FT): | Manhole Configuration |
| 8' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |
| **Communication Information:** | |
| Communication Type | Antenna Location |
| Wireless | Drilled Pavement / Concrete |
| **Additional Site Info. / Comments:** | |

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |

# SCATTERGRAPH REPORT

MIL_1795

**Flow Monitor**

**MIL_1795**

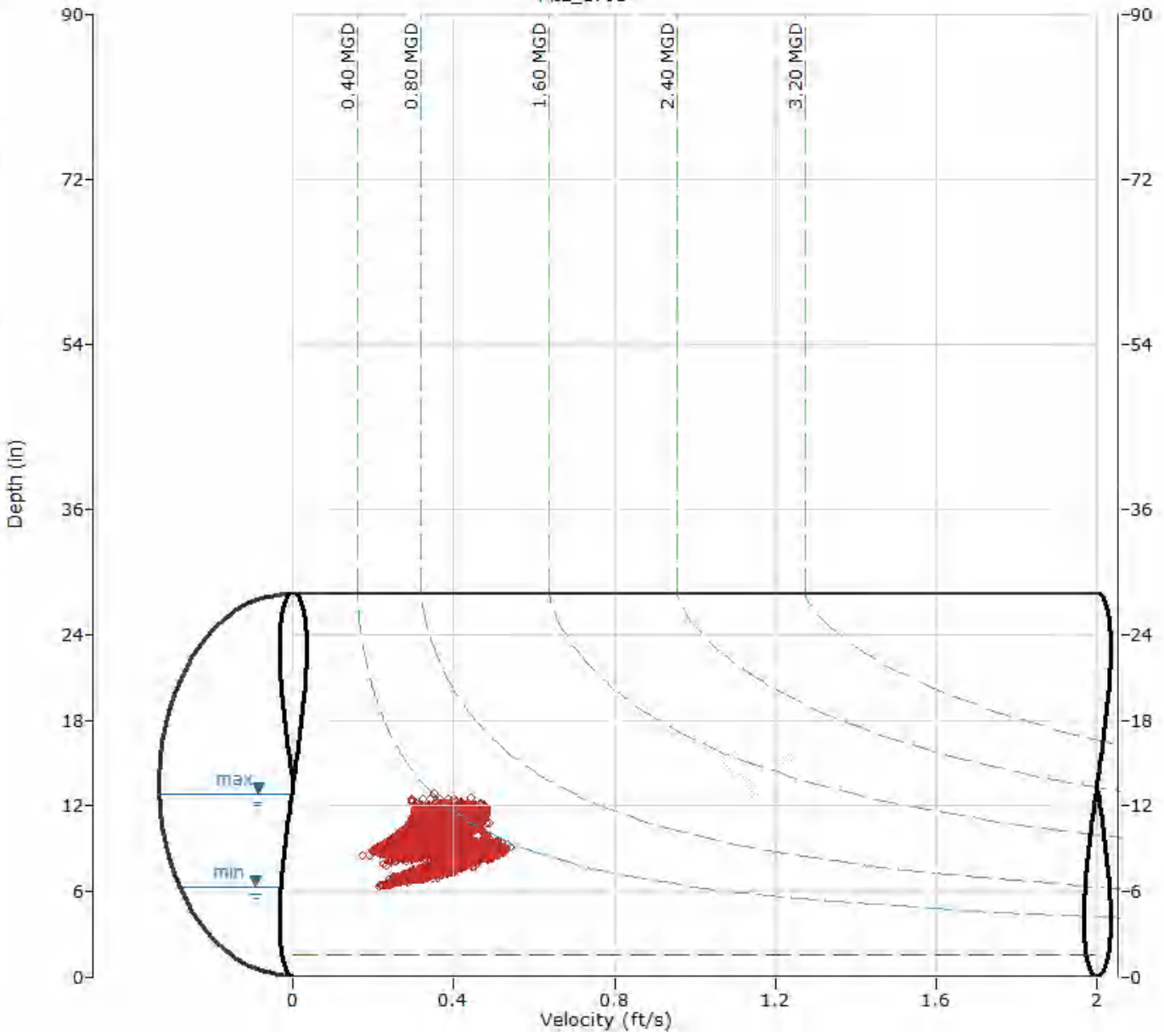
Pipe Height
27.00 in

**Report Period**

11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth

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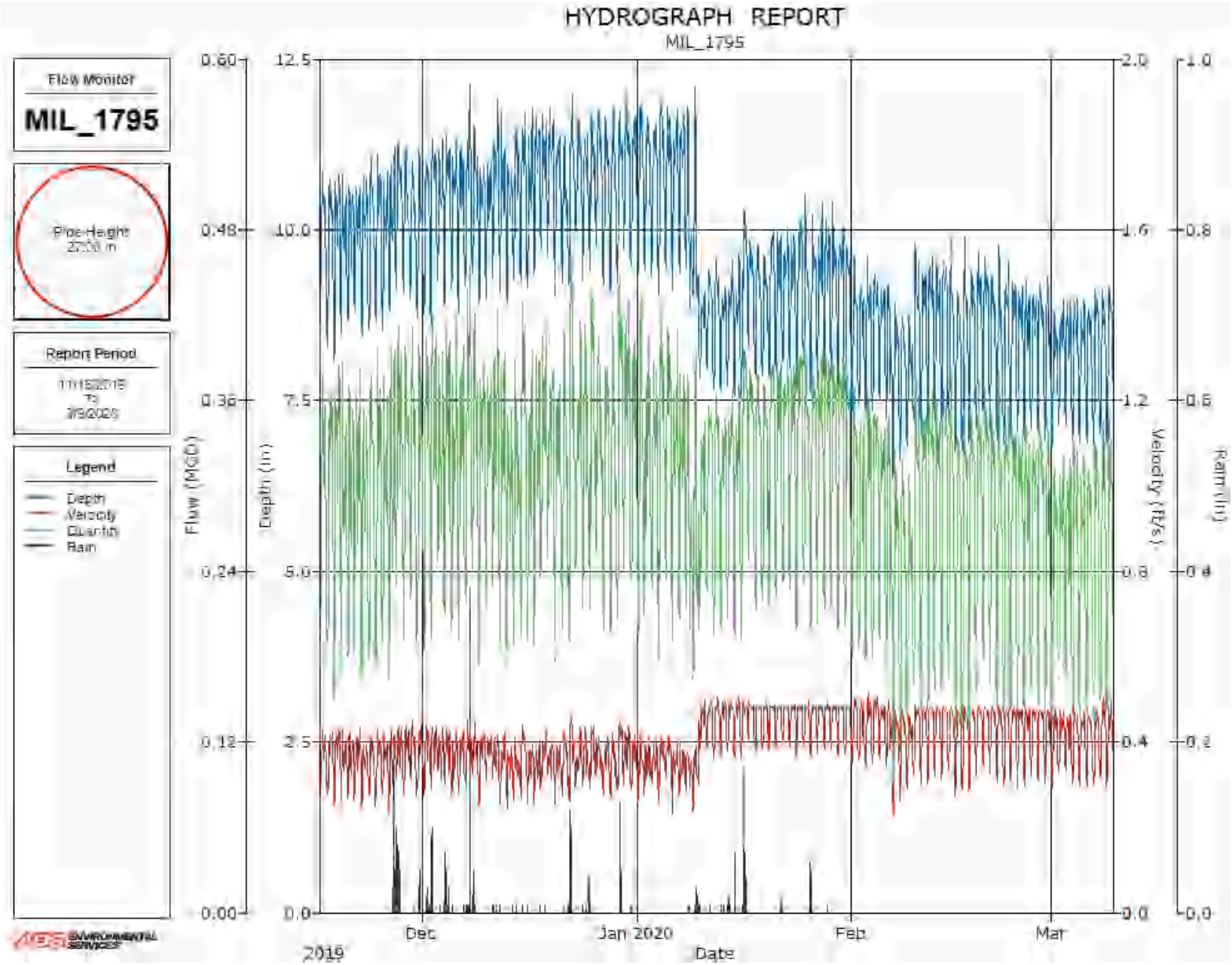

HYDROGRAPH REPORT
MIL_1795
Flow Monitor
MIL_1795
Pipe Height
2.00 in
Report Period
11/15/2019
To
3/9/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
0.60
0.48
0.36
0.24
0.12
0.00
12.5
10.0
7.5
5.0
2.5
0.0
2.0
1.6
1.2
0.8
0.4
0.0
1.0
0.8
0.6
0.4
0.2
0.0
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_1795, Pipe Height: 27.00 in, Silt: 1.50 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 04:40 | 8.99 | 11:20 | 10.88 | 10.01 | 04:15 | 0.22 | 13:40 | 0.46 | 0.36 | 04:15 | 0.156 | 13:40 | 0.412 | 0.297 | 0.297 | |
| 11/17/2019 | 05:20 | 8.24 | 13:15 | 10.80 | 9.77 | 05:50 | 0.24 | 11:15 | 0.46 | 0.36 | 05:50 | 0.148 | 11:15 | 0.409 | 0.287 | 0.287 | |
| 11/18/2019 | 04:20 | 8.06 | 08:10 | 10.91 | 9.74 | 04:05 | 0.24 | 21:55 | 0.47 | 0.37 | 04:05 | 0.140 | 21:55 | 0.427 | 0.292 | 0.292 | |
| 11/19/2019 | 03:30 | 8.46 | 07:55 | 10.99 | 9.73 | 04:35 | 0.22 | 08:50 | 0.46 | 0.35 | 04:35 | 0.142 | 08:45 | 0.408 | 0.278 | 0.278 | |
| 11/20/2019 | 02:40 | 8.63 | 17:40 | 10.85 | 9.82 | 04:10 | 0.21 | 07:30 | 0.46 | 0.36 | 04:10 | 0.140 | 09:05 | 0.398 | 0.286 | 0.286 | |
| 11/21/2019 | 02:40 | 8.76 | 20:40 | 10.77 | 9.93 | 02:20 | 0.24 | 20:45 | 0.46 | 0.36 | 02:20 | 0.158 | 20:45 | 0.409 | 0.295 | 0.295 | |
| 11/22/2019 | 04:15 | 8.41 | 17:05 | 11.12 | 9.87 | 04:40 | 0.17 | 21:50 | 0.47 | 0.34 | 04:40 | 0.110 | 21:50 | 0.410 | 0.275 | 0.275 | |
| 11/23/2019 | 03:55 | 8.51 | 13:20 | 11.32 | 9.92 | 05:25 | 0.23 | 13:05 | 0.47 | 0.35 | 05:25 | 0.147 | 13:05 | 0.448 | 0.287 | 0.287 | |
| 11/24/2019 | 04:45 | 8.62 | 12:00 | 11.14 | 10.10 | 02:50 | 0.21 | 09:05 | 0.47 | 0.36 | 02:50 | 0.142 | 10:45 | 0.432 | 0.299 | 0.299 | |
| 11/25/2019 | 03:30 | 8.47 | 20:20 | 10.88 | 9.94 | 04:45 | 0.20 | 19:40 | 0.45 | 0.36 | 04:45 | 0.132 | 19:40 | 0.405 | 0.290 | 0.290 | |
| 11/26/2019 | 04:15 | 8.80 | 21:05 | 11.28 | 10.08 | 04:10 | 0.20 | 07:45 | 0.47 | 0.35 | 04:10 | 0.135 | 07:45 | 0.439 | 0.292 | 0.292 | 0.36 |
| 11/27/2019 | 03:20 | 9.00 | 09:50 | 11.41 | 10.48 | 05:05 | 0.29 | 12:00 | 0.48 | 0.39 | 03:20 | 0.208 | 10:35 | 0.459 | 0.337 | 0.337 | 0.63 |
| 11/28/2019 | 05:25 | 9.04 | 11:05 | 11.32 | 10.25 | 05:30 | 0.22 | 14:50 | 0.47 | 0.37 | 05:30 | 0.155 | 12:30 | 0.437 | 0.313 | 0.313 | |
| 11/29/2019 | 04:05 | 8.87 | 10:55 | 11.05 | 10.09 | 04:20 | 0.23 | 10:40 | 0.47 | 0.38 | 04:20 | 0.160 | 10:40 | 0.436 | 0.311 | 0.311 | 0.02 |
| 11/30/2019 | 06:00 | 8.66 | 11:35 | 11.32 | 9.98 | 03:15 | 0.21 | 11:30 | 0.48 | 0.36 | 03:15 | 0.142 | 11:30 | 0.458 | 0.299 | 0.299 | 0.10 |
| 12/01/2019 | 05:50 | 8.76 | 15:10 | 11.11 | 10.17 | 06:40 | 0.21 | 12:50 | 0.48 | 0.37 | 06:40 | 0.150 | 12:50 | 0.444 | 0.313 | 0.313 | 0.06 |
| 12/02/2019 | 03:35 | 8.62 | 08:50 | 11.52 | 10.37 | 04:45 | 0.24 | 16:00 | 0.48 | 0.38 | 04:45 | 0.157 | 08:20 | 0.458 | 0.326 | 0.326 | 0.30 |
| 12/03/2019 | 03:10 | 9.15 | 19:15 | 11.56 | 10.43 | 04:35 | 0.27 | 22:10 | 0.47 | 0.38 | 04:35 | 0.207 | 20:10 | 0.451 | 0.325 | 0.325 | 0.01 |
| 12/04/2019 | 03:10 | 8.77 | 08:45 | 11.59 | 10.53 | 03:25 | 0.26 | 20:55 | 0.47 | 0.38 | 03:25 | 0.176 | 10:35 | 0.461 | 0.332 | 0.332 | 0.39 |
| 12/05/2019 | 04:00 | 9.10 | 21:25 | 11.42 | 10.43 | 05:00 | 0.23 | 21:55 | 0.48 | 0.36 | 05:00 | 0.166 | 21:55 | 0.455 | 0.310 | 0.310 | 0.01 |
| 12/06/2019 | 04:10 | 8.72 | 07:50 | 11.41 | 10.33 | 03:55 | 0.21 | 12:10 | 0.47 | 0.37 | 03:55 | 0.137 | 12:10 | 0.443 | 0.316 | 0.316 | 0.01 |
| 12/07/2019 | 02:50 | 9.15 | 18:35 | 12.16 | 10.63 | 05:55 | 0.26 | 12:00 | 0.48 | 0.38 | 05:55 | 0.193 | 17:45 | 0.501 | 0.339 | 0.339 | 0.67 |
| 12/08/2019 | 05:50 | 9.33 | 10:20 | 11.56 | 10.56 | 23:55 | 0.28 | 11:35 | 0.48 | 0.38 | 23:55 | 0.230 | 11:35 | 0.476 | 0.335 | 0.335 | 0.20 |
| 12/09/2019 | 04:10 | 8.91 | 06:50 | 11.26 | 10.25 | 04:05 | 0.21 | 19:40 | 0.47 | 0.37 | 04:05 | 0.142 | 19:40 | 0.437 | 0.311 | 0.311 | |
| 12/10/2019 | 04:20 | 8.95 | 08:40 | 11.04 | 10.30 | 04:40 | 0.27 | 20:25 | 0.47 | 0.38 | 04:40 | 0.184 | 20:25 | 0.432 | 0.321 | 0.321 | |
| 12/11/2019 | 04:10 | 9.24 | 20:25 | 12.06 | 10.70 | 04:50 | 0.25 | 20:00 | 0.46 | 0.37 | 04:50 | 0.181 | 20:00 | 0.474 | 0.334 | 0.334 | 0.03 |
| 12/12/2019 | 04:55 | 9.03 | 08:20 | 11.94 | 10.45 | 04:05 | 0.23 | 22:00 | 0.47 | 0.35 | 04:05 | 0.164 | 22:00 | 0.443 | 0.305 | 0.305 | 0.01 |
| 12/13/2019 | 04:05 | 8.91 | 07:00 | 11.11 | 10.26 | 04:20 | 0.21 | 07:05 | 0.45 | 0.34 | 04:20 | 0.142 | 07:05 | 0.417 | 0.290 | 0.290 | 0.01 |
| 12/14/2019 | 03:35 | 9.23 | 19:35 | 11.88 | 10.53 | 04:30 | 0.24 | 14:55 | 0.46 | 0.33 | 04:30 | 0.175 | 14:55 | 0.433 | 0.291 | 0.291 | 0.01 |
| 12/15/2019 | 05:30 | 9.22 | 19:20 | 11.90 | 10.67 | 06:10 | 0.24 | 11:55 | 0.48 | 0.38 | 05:15 | 0.175 | 11:55 | 0.471 | 0.337 | 0.337 | 0.01 |
| 12/16/2019 | 03:25 | 9.04 | 19:15 | 12.04 | 10.56 | 04:30 | 0.23 | 20:55 | 0.47 | 0.35 | 04:30 | 0.168 | 20:55 | 0.475 | 0.306 | 0.306 | 0.01 |
| 12/17/2019 | 03:00 | 9.35 | 11:25 | 11.82 | 10.81 | 03:20 | 0.23 | 21:00 | 0.47 | 0.34 | 03:20 | 0.171 | 21:00 | 0.460 | 0.310 | 0.310 | 0.01 |
| 12/18/2019 | 03:20 | 9.69 | 09:05 | 11.84 | 10.90 | 03:30 | 0.25 | 08:55 | 0.48 | 0.37 | 03:30 | 0.198 | 08:55 | 0.488 | 0.340 | 0.340 | 0.01 |
| 12/19/2019 | 03:10 | 9.40 | 21:45 | 11.97 | 10.96 | 05:30 | 0.27 | 16:10 | 0.47 | 0.36 | 05:30 | 0.216 | 17:55 | 0.449 | 0.335 | 0.335 | |
| 12/20/2019 | 04:00 | 8.98 | 19:15 | 11.49 | 10.60 | 04:10 | 0.23 | 21:35 | 0.45 | 0.34 | 04:10 | 0.157 | 18:55 | 0.421 | 0.306 | 0.306 | |
| 12/21/2019 | 05:05 | 9.18 | 14:15 | 11.67 | 10.37 | 05:55 | 0.23 | 12:45 | 0.48 | 0.36 | 05:40 | 0.164 | 14:30 | 0.462 | 0.309 | 0.309 | 0.01 |
| 12/22/2019 | 06:00 | 9.09 | 15:05 | 12.18 | 10.70 | 05:50 | 0.22 | 12:45 | 0.48 | 0.37 | 05:50 | 0.158 | 12:40 | 0.474 | 0.333 | 0.333 | 0.41 |
| 12/23/2019 | 05:10 | 9.93 | 10:40 | 11.67 | 10.90 | 02:45 | 0.28 | 20:25 | 0.48 | 0.36 | 01:20 | 0.228 | 20:45 | 0.457 | 0.329 | 0.329 | |
| 12/24/2019 | 04:50 | 9.20 | 19:15 | 11.56 | 10.58 | 04:55 | 0.28 | 13:45 | 0.48 | 0.36 | 04:55 | 0.199 | 13:45 | 0.450 | 0.319 | 0.319 | 0.02 |
| 12/25/2019 | 05:10 | 9.37 | 11:55 | 11.70 | 10.65 | 04:20 | 0.25 | 19:10 | 0.47 | 0.37 | 04:20 | 0.187 | 12:00 | 0.465 | 0.333 | 0.333 | 0.08 |
| 12/26/2019 | 02:45 | 9.69 | 12:55 | 11.93 | 10.97 | 02:50 | 0.27 | 14:10 | 0.48 | 0.37 | 02:50 | 0.212 | 14:10 | 0.480 | 0.339 | 0.339 | |
| 12/27/2019 | 04:55 | 9.18 | 11:35 | 11.70 | 10.65 | 04:45 | 0.24 | 16:25 | 0.47 | 0.35 | 04:45 | 0.172 | 12:25 | 0.439 | 0.318 | 0.318 | |
| 12/28/2019 | 05:05 | 9.03 | 14:20 | 11.92 | 10.57 | 05:30 | 0.24 | 13:50 | 0.48 | 0.34 | 05:30 | 0.171 | 13:50 | 0.470 | 0.305 | 0.305 | |
| 12/29/2019 | 05:05 | 9.20 | 13:25 | 11.80 | 10.72 | 06:55 | 0.27 | 13:40 | 0.48 | 0.37 | 05:40 | 0.196 | 09:45 | 0.488 | 0.337 | 0.337 | 0.22 |
| 12/30/2019 | 03:55 | 9.62 | 12:50 | 12.09 | 11.03 | 03:10 | 0.26 | 15:55 | 0.48 | 0.38 | 03:35 | 0.203 | 12:35 | 0.503 | 0.357 | 0.357 | |
| 12/31/2019 | 04:10 | 9.43 | 19:50 | 11.96 | 10.81 | 06:00 | 0.26 | 19:00 | 0.48 | 0.36 | 06:00 | 0.207 | 19:00 | 0.459 | 0.328 | 0.328 | 0.01 |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 01/01/2020 | 06:20 | 9.37 | 18:45 | 12.51 | 10.90 | 05:00 | 0.24 | 20:00 | 0.47 | 0.34 | 05:00 | 0.185 | 18:45 | 0.491 | 0.318 | 0.318 | |
| 01/02/2020 | 03:35 | 9.39 | 13:40 | 11.71 | 10.83 | 02:25 | 0.25 | 19:10 | 0.47 | 0.34 | 04:30 | 0.188 | 19:10 | 0.467 | 0.314 | 0.314 | |
| 01/03/2020 | 03:00 | 9.16 | 19:35 | 11.60 | 10.72 | 05:20 | 0.24 | 20:50 | 0.47 | 0.35 | 05:20 | 0.182 | 20:50 | 0.459 | 0.316 | 0.316 | |
| 01/04/2020 | 04:15 | 9.03 | 13:25 | 11.96 | 10.76 | 04:15 | 0.21 | 13:05 | 0.45 | 0.35 | 04:15 | 0.149 | 13:05 | 0.464 | 0.320 | 0.320 | |
| 01/05/2020 | 04:45 | 9.38 | 12:20 | 11.88 | 10.84 | 05:15 | 0.24 | 09:20 | 0.47 | 0.37 | 05:15 | 0.178 | 09:20 | 0.456 | 0.341 | 0.341 | |
| 01/06/2020 | 04:00 | 9.02 | 21:40 | 11.80 | 10.72 | 04:05 | 0.22 | 21:20 | 0.48 | 0.34 | 04:00 | 0.151 | 21:20 | 0.490 | 0.310 | 0.310 | |
| 01/07/2020 | 04:50 | 9.35 | 20:05 | 11.71 | 10.90 | 04:50 | 0.26 | 06:15 | 0.47 | 0.34 | 04:50 | 0.190 | 06:20 | 0.435 | 0.311 | 0.311 | |
| 01/08/2020 | 15:20 | 7.76 | 10:15 | 11.81 | 10.31 | 15:25 | 0.23 | 14:35 | 0.47 | 0.34 | 15:25 | 0.129 | 14:35 | 0.434 | 0.292 | 0.292 | 0.02 |
| 01/09/2020 | 23:55 | 8.58 | 11:40 | 12.80 | 9.84 | 03:00 | 0.22 | 10:40 | 0.45 | 0.32 | 04:25 | 0.150 | 11:45 | 0.465 | 0.258 | 0.258 | 0.18 |
| 01/10/2020 | 03:50 | 7.77 | 19:20 | 9.17 | 8.61 | 03:35 | 0.38 | 19:00 | 0.52 | 0.45 | 03:35 | 0.212 | 19:00 | 0.364 | 0.296 | 0.296 | 0.02 |
| 01/11/2020 | 05:10 | 7.93 | 11:00 | 9.52 | 8.81 | 05:10 | 0.39 | 12:30 | 0.52 | 0.45 | 05:10 | 0.223 | 12:30 | 0.380 | 0.308 | 0.308 | 0.01 |
| 01/12/2020 | 05:00 | 7.61 | 11:00 | 9.82 | 8.72 | 04:50 | 0.34 | 15:55 | 0.52 | 0.45 | 04:50 | 0.181 | 11:00 | 0.380 | 0.299 | 0.299 | |
| 01/13/2020 | 04:15 | 7.61 | 19:40 | 9.24 | 8.59 | 04:15 | 0.37 | 21:15 | 0.52 | 0.45 | 04:15 | 0.199 | 21:15 | 0.367 | 0.291 | 0.291 | 0.02 |
| 01/14/2020 | 02:15 | 7.68 | 20:30 | 9.62 | 8.74 | 03:35 | 0.35 | 08:15 | 0.52 | 0.45 | 03:35 | 0.194 | 20:30 | 0.370 | 0.304 | 0.304 | 0.11 |
| 01/15/2020 | 04:55 | 7.52 | 20:30 | 9.69 | 8.65 | 04:20 | 0.36 | 19:00 | 0.52 | 0.45 | 04:20 | 0.194 | 21:20 | 0.380 | 0.298 | 0.298 | 0.07 |
| 01/16/2020 | 04:00 | 7.44 | 13:15 | 10.33 | 9.21 | 04:00 | 0.36 | 10:05 | 0.52 | 0.45 | 04:00 | 0.186 | 13:15 | 0.395 | 0.330 | 0.330 | 0.66 |
| 01/17/2020 | 04:50 | 8.28 | 09:50 | 9.95 | 9.22 | 04:50 | 0.40 | 07:20 | 0.52 | 0.47 | 04:50 | 0.247 | 09:50 | 0.386 | 0.339 | 0.339 | |
| 01/18/2020 | 05:40 | 7.83 | 14:15 | 9.85 | 8.91 | 05:55 | 0.35 | 22:25 | 0.52 | 0.45 | 05:55 | 0.200 | 14:15 | 0.382 | 0.312 | 0.312 | |
| 01/19/2020 | 04:55 | 7.85 | 11:55 | 9.74 | 8.86 | 04:55 | 0.38 | 22:50 | 0.52 | 0.45 | 04:55 | 0.217 | 11:55 | 0.376 | 0.310 | 0.310 | |
| 01/20/2020 | 04:40 | 7.84 | 15:20 | 10.01 | 9.16 | 04:40 | 0.38 | 23:35 | 0.52 | 0.46 | 04:40 | 0.216 | 15:20 | 0.388 | 0.329 | 0.329 | |
| 01/21/2020 | 03:55 | 7.87 | 11:45 | 10.30 | 9.14 | 03:55 | 0.39 | 07:25 | 0.52 | 0.46 | 03:55 | 0.219 | 11:45 | 0.395 | 0.329 | 0.329 | |
| 01/22/2020 | 05:00 | 8.01 | 21:15 | 10.12 | 9.17 | 05:00 | 0.39 | 07:35 | 0.52 | 0.46 | 05:00 | 0.229 | 21:15 | 0.391 | 0.331 | 0.331 | 0.03 |
| 01/23/2020 | 04:35 | 7.98 | 19:45 | 10.10 | 9.12 | 04:35 | 0.39 | 23:30 | 0.52 | 0.46 | 04:35 | 0.227 | 19:45 | 0.391 | 0.328 | 0.328 | |
| 01/24/2020 | 04:50 | 7.59 | 17:45 | 10.20 | 9.19 | 04:55 | 0.36 | 08:35 | 0.51 | 0.45 | 04:55 | 0.194 | 17:45 | 0.393 | 0.327 | 0.327 | |
| 01/25/2020 | 05:05 | 8.00 | 10:35 | 10.74 | 9.09 | 05:05 | 0.39 | 21:20 | 0.52 | 0.46 | 05:05 | 0.228 | 10:35 | 0.438 | 0.327 | 0.327 | |
| 01/26/2020 | 05:05 | 7.59 | 11:15 | 10.31 | 9.05 | 05:10 | 0.37 | 09:00 | 0.52 | 0.45 | 05:05 | 0.197 | 11:15 | 0.395 | 0.319 | 0.319 | 0.16 |
| 01/27/2020 | 05:20 | 7.67 | 21:20 | 10.68 | 9.17 | 05:05 | 0.34 | 08:10 | 0.48 | 0.46 | 05:05 | 0.184 | 21:05 | 0.396 | 0.328 | 0.328 | |
| 01/28/2020 | 04:30 | 7.76 | 10:45 | 10.40 | 9.18 | 04:30 | 0.38 | 14:35 | 0.52 | 0.46 | 04:30 | 0.211 | 10:45 | 0.396 | 0.332 | 0.332 | 0.01 |
| 01/29/2020 | 04:05 | 7.76 | 10:05 | 10.69 | 9.20 | 04:05 | 0.38 | 00:00 | 0.52 | 0.46 | 04:05 | 0.211 | 10:20 | 0.396 | 0.331 | 0.331 | |
| 01/30/2020 | 04:05 | 7.59 | 22:25 | 10.33 | 9.14 | 04:05 | 0.37 | 07:35 | 0.51 | 0.46 | 04:05 | 0.198 | 22:25 | 0.395 | 0.328 | 0.328 | |
| 01/31/2020 | 04:55 | 7.62 | 10:40 | 9.84 | 8.99 | 04:55 | 0.37 | 22:50 | 0.51 | 0.45 | 04:55 | 0.200 | 10:40 | 0.381 | 0.318 | 0.318 | |
| 02/01/2020 | 04:40 | 7.32 | 11:30 | 9.64 | 8.60 | 04:40 | 0.35 | 09:50 | 0.52 | 0.44 | 04:40 | 0.176 | 11:30 | 0.371 | 0.290 | 0.290 | |
| 02/02/2020 | 04:55 | 7.41 | 10:45 | 9.24 | 8.40 | 04:55 | 0.35 | 21:30 | 0.52 | 0.43 | 04:55 | 0.183 | 21:30 | 0.366 | 0.271 | 0.271 | |
| 02/03/2020 | 04:05 | 7.32 | 08:55 | 10.48 | 8.57 | 04:05 | 0.35 | 13:30 | 0.52 | 0.44 | 04:05 | 0.176 | 09:00 | 0.396 | 0.289 | 0.289 | |
| 02/04/2020 | 04:35 | 7.34 | 13:50 | 9.45 | 8.62 | 06:10 | 0.34 | 08:20 | 0.52 | 0.45 | 04:35 | 0.177 | 08:20 | 0.364 | 0.295 | 0.295 | |
| 02/05/2020 | 05:30 | 7.48 | 20:55 | 9.34 | 8.56 | 03:50 | 0.33 | 19:15 | 0.52 | 0.44 | 03:50 | 0.176 | 09:15 | 0.368 | 0.286 | 0.286 | |
| 02/06/2020 | 15:00 | 6.59 | 14:50 | 9.92 | 8.19 | 15:00 | 0.26 | 11:40 | 0.52 | 0.42 | 15:00 | 0.114 | 14:50 | 0.385 | 0.258 | 0.258 | |
| 02/07/2020 | 03:55 | 6.32 | 11:20 | 8.99 | 7.91 | 03:55 | 0.22 | 20:10 | 0.50 | 0.39 | 03:55 | 0.087 | 11:20 | 0.328 | 0.231 | 0.231 | |
| 02/08/2020 | 04:00 | 6.57 | 12:00 | 8.81 | 7.88 | 04:45 | 0.24 | 11:00 | 0.50 | 0.40 | 04:00 | 0.107 | 12:10 | 0.337 | 0.233 | 0.233 | |
| 02/09/2020 | 03:50 | 6.83 | 11:20 | 8.82 | 7.82 | 04:35 | 0.25 | 21:55 | 0.48 | 0.39 | 04:35 | 0.117 | 11:20 | 0.316 | 0.224 | 0.224 | |
| 02/10/2020 | 03:20 | 7.20 | 09:25 | 9.88 | 8.65 | 01:45 | 0.29 | 15:55 | 0.50 | 0.43 | 01:45 | 0.144 | 09:25 | 0.383 | 0.289 | 0.289 | |
| 02/11/2020 | 03:40 | 6.95 | 21:05 | 9.40 | 8.58 | 04:50 | 0.29 | 10:05 | 0.48 | 0.43 | 04:50 | 0.138 | 09:10 | 0.353 | 0.285 | 0.285 | |
| 02/12/2020 | 04:05 | 7.00 | 20:10 | 9.76 | 8.68 | 04:15 | 0.27 | 16:25 | 0.51 | 0.44 | 04:15 | 0.127 | 20:10 | 0.377 | 0.294 | 0.294 | |
| 02/13/2020 | 04:00 | 7.13 | 11:55 | 9.57 | 8.65 | 03:35 | 0.29 | 21:00 | 0.51 | 0.44 | 03:35 | 0.142 | 21:00 | 0.376 | 0.293 | 0.293 | |
| 02/14/2020 | 04:00 | 7.12 | 11:25 | 9.65 | 8.74 | 03:50 | 0.28 | 22:55 | 0.51 | 0.44 | 03:50 | 0.138 | 19:20 | 0.372 | 0.299 | 0.299 | |
| 02/15/2020 | 05:30 | 7.13 | 12:20 | 9.92 | 8.50 | 06:15 | 0.30 | 13:55 | 0.48 | 0.43 | 06:15 | 0.150 | 12:20 | 0.385 | 0.280 | 0.280 | |
| 02/16/2020 | 04:45 | 6.74 | 13:10 | 9.27 | 8.18 | 04:45 | 0.24 | 19:55 | 0.49 | 0.41 | 04:45 | 0.107 | 13:10 | 0.344 | 0.255 | 0.255 | |
| 02/17/2020 | 04:50 | 6.75 | 13:25 | 9.99 | 8.37 | 03:00 | 0.27 | 10:45 | 0.51 | 0.41 | 04:50 | 0.122 | 13:25 | 0.387 | 0.267 | 0.267 | |
| 02/18/2020 | 03:50 | 6.85 | 11:00 | 9.50 | 8.45 | 04:55 | 0.27 | 08:30 | 0.50 | 0.43 | 05:25 | 0.123 | 11:00 | 0.358 | 0.277 | 0.277 | |
| 02/19/2020 | 04:30 | 7.06 | 12:10 | 9.75 | 8.61 | 04:30 | 0.31 | 13:25 | 0.51 | 0.44 | 04:30 | 0.150 | 13:25 | 0.383 | 0.289 | 0.289 | |
| 02/20/2020 | 03:30 | 7.30 | 11:20 | 9.64 | 8.72 | 04:20 | 0.31 | 21:45 | 0.51 | 0.45 | 04:20 | 0.160 | 11:20 | 0.371 | 0.299 | 0.299 | |
| 02/21/2020 | 04:20 | 7.10 | 11:00 | 9.56 | 8.48 | 03:50 | 0.29 | 11:00 | 0.48 | 0.44 | 03:50 | 0.145 | 11:00 | 0.367 | 0.281 | 0.281 | |
| 02/22/2020 | 05:40 | 6.88 | 12:05 | 9.91 | 8.34 | 03:40 | 0.28 | 12:35 | 0.48 | 0.42 | 05:45 | 0.135 | 12:05 | 0.384 | 0.267 | 0.267 | |
| 02/23/2020 | 05:35 | 6.85 | 20:20 | 9.71 | 8.32 | 03:00 | 0.28 | 17:55 | 0.50 | 0.42 | 05:15 | 0.129 | 20:20 | 0.375 | 0.265 | 0.265 | |
| 02/24/2020 | 04:30 | 6.91 | 11:40 | 9.34 | 8.37 | 01:50 | 0.29 | 14:50 | 0.51 | 0.42 | 03:50 | 0.137 | 14:50 | 0.360 | 0.271 | 0.271 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 05:10 | 7.00 | 20:45 | 9.19 | 8.44 | 03:55 | 0.28 | 10:55 | 0.50 | 0.43 | 03:55 | 0.133 | 10:55 | 0.351 | 0.277 | 0.277 | |
| 02/26/2020 | 04:15 | 6.90 | 08:30 | 9.34 | 8.33 | 05:15 | 0.27 | 08:50 | 0.48 | 0.43 | 05:15 | 0.127 | 08:30 | 0.348 | 0.268 | 0.268 | |
| 02/27/2020 | 04:10 | 7.06 | 12:30 | 9.10 | 8.41 | 04:05 | 0.29 | 07:50 | 0.50 | 0.43 | 04:05 | 0.139 | 07:50 | 0.336 | 0.276 | 0.276 | |
| 02/28/2020 | 04:05 | 7.00 | 11:00 | 9.33 | 8.41 | 04:55 | 0.29 | 12:25 | 0.50 | 0.43 | 04:55 | 0.140 | 11:00 | 0.350 | 0.276 | 0.276 | |
| 02/29/2020 | 03:55 | 6.85 | 13:55 | 9.42 | 8.13 | 03:45 | 0.26 | 12:10 | 0.50 | 0.41 | 03:45 | 0.118 | 12:10 | 0.363 | 0.250 | 0.250 | |
| 03/01/2020 | 05:30 | 6.79 | 12:55 | 8.88 | 7.97 | 03:10 | 0.25 | 20:40 | 0.51 | 0.41 | 03:15 | 0.116 | 14:25 | 0.328 | 0.239 | 0.239 | |
| 03/02/2020 | 04:25 | 7.12 | 20:55 | 9.06 | 8.22 | 01:50 | 0.29 | 08:55 | 0.52 | 0.42 | 04:00 | 0.146 | 08:40 | 0.336 | 0.256 | 0.256 | |
| 03/03/2020 | 04:40 | 7.14 | 20:20 | 9.01 | 8.18 | 04:40 | 0.33 | 07:55 | 0.52 | 0.41 | 04:40 | 0.160 | 07:55 | 0.353 | 0.247 | 0.247 | |
| 03/04/2020 | 03:50 | 6.87 | 09:40 | 9.11 | 8.21 | 03:50 | 0.30 | 11:45 | 0.53 | 0.42 | 03:50 | 0.137 | 11:45 | 0.361 | 0.258 | 0.258 | |
| 03/05/2020 | 03:35 | 6.84 | 20:45 | 9.08 | 8.16 | 04:30 | 0.29 | 09:40 | 0.48 | 0.41 | 04:30 | 0.133 | 20:45 | 0.331 | 0.251 | 0.251 | |
| 03/06/2020 | 05:35 | 6.83 | 10:35 | 8.98 | 8.16 | 05:35 | 0.29 | 10:35 | 0.47 | 0.41 | 05:35 | 0.134 | 10:35 | 0.323 | 0.252 | 0.252 | |
| 03/07/2020 | 05:15 | 6.78 | 11:05 | 9.25 | 8.19 | 04:55 | 0.28 | 20:40 | 0.52 | 0.40 | 04:55 | 0.126 | 20:40 | 0.348 | 0.248 | 0.248 | |
| 03/08/2020 | 04:50 | 6.98 | 11:30 | 9.18 | 8.17 | 04:50 | 0.31 | 13:35 | 0.54 | 0.42 | 04:50 | 0.146 | 13:35 | 0.379 | 0.257 | 0.257 | |
| 03/09/2020 | 03:30 | 6.86 | 10:25 | 9.21 | 8.25 | 01:40 | 0.27 | 10:20 | 0.53 | 0.41 | 02:40 | 0.130 | 10:20 | 0.383 | 0.257 | 0.257 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 34.416 | 4.90 |
| Avg | 9.47 | 0.40 | 0.299 | |

## Site Commentary

### Site Information

| MIL_2300 | |
|---|---|
| Pipe Dimensions | 10.25 |
| Silt Level | 0.00" |

### Overview

Site MIL_2300 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited a small response to the wet weather events of November 26, 2019 - November 27, 2019 and December 7, 2019 - December 8, 2019. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 1.65 | 1.40 | 0.056 |
| Minimum | 0.93 | 0.33 | 0.006 |
| Maximum | 2.44 | 2.89 | 0.177 |
| Time of Minimum | 1/13/2020 4:15 AM | 2/27/2020 3:50 AM | 1/13/2020 3:55 AM |
| Time of Maximum | 11/28/2019 12:45 PM | 12/13/2019 11:10 AM | 11/28/2019 12:50 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

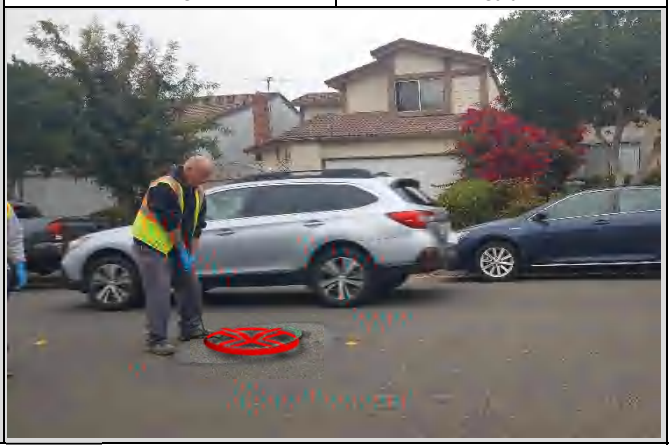
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_2300

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Washington Dr and Fontainbleu Avenue, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | In between lanes w/buses | Latitude: | 37.452734 | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.909412 | 10.25" x 10.25" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 2300 | Residential |
| Access | Traffic |
| Drive | Medium |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 3:03:34 AM | 10.25" x 10.25" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 1.13" | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.2 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

Good flow shallow depth, moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 6' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |

# SCATTERGRAPH REPORT

MIL_2300

**Flow Monitor**

**MIL_2300**

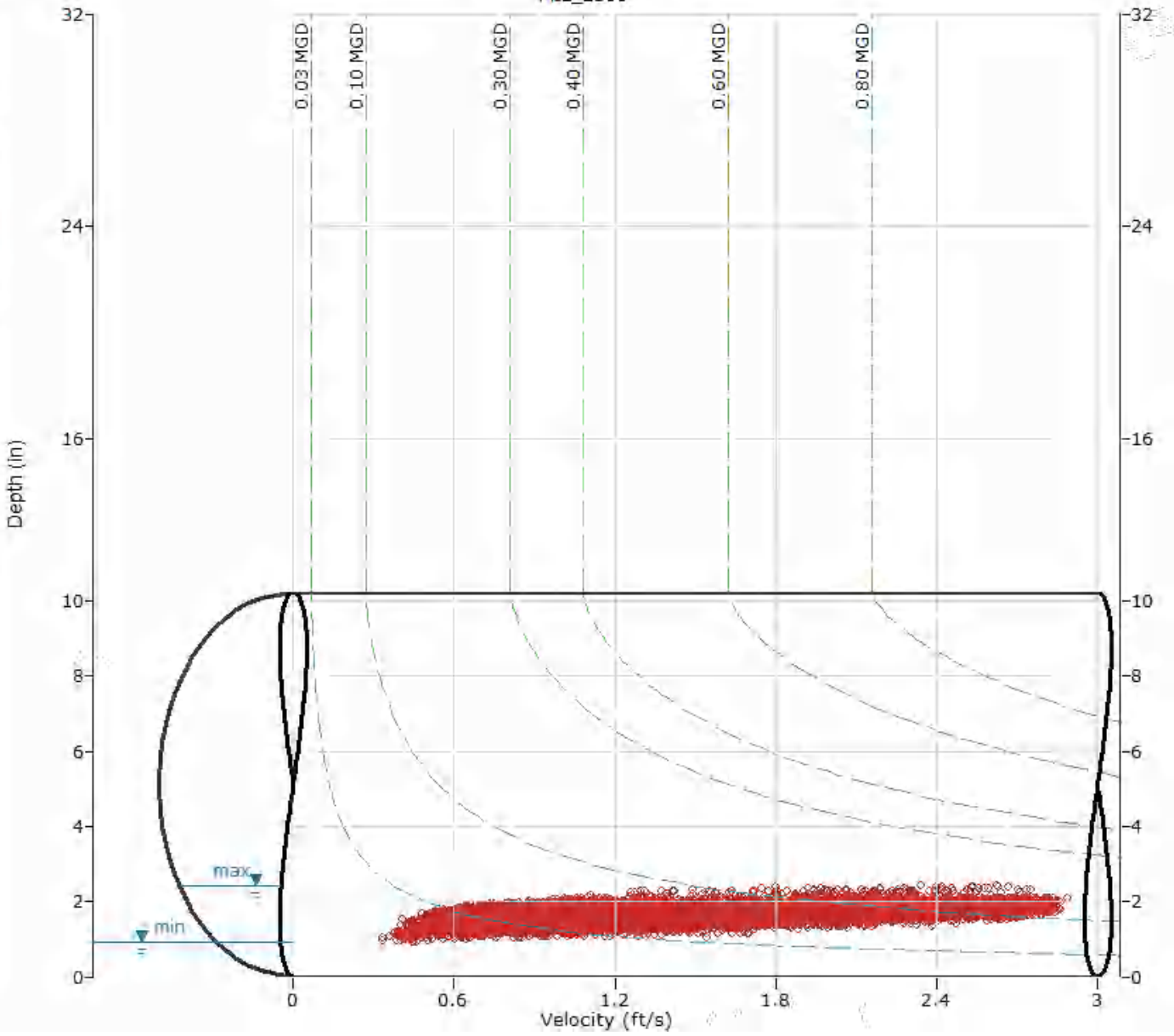
Pipe Height
10.25 in

**Report Period**

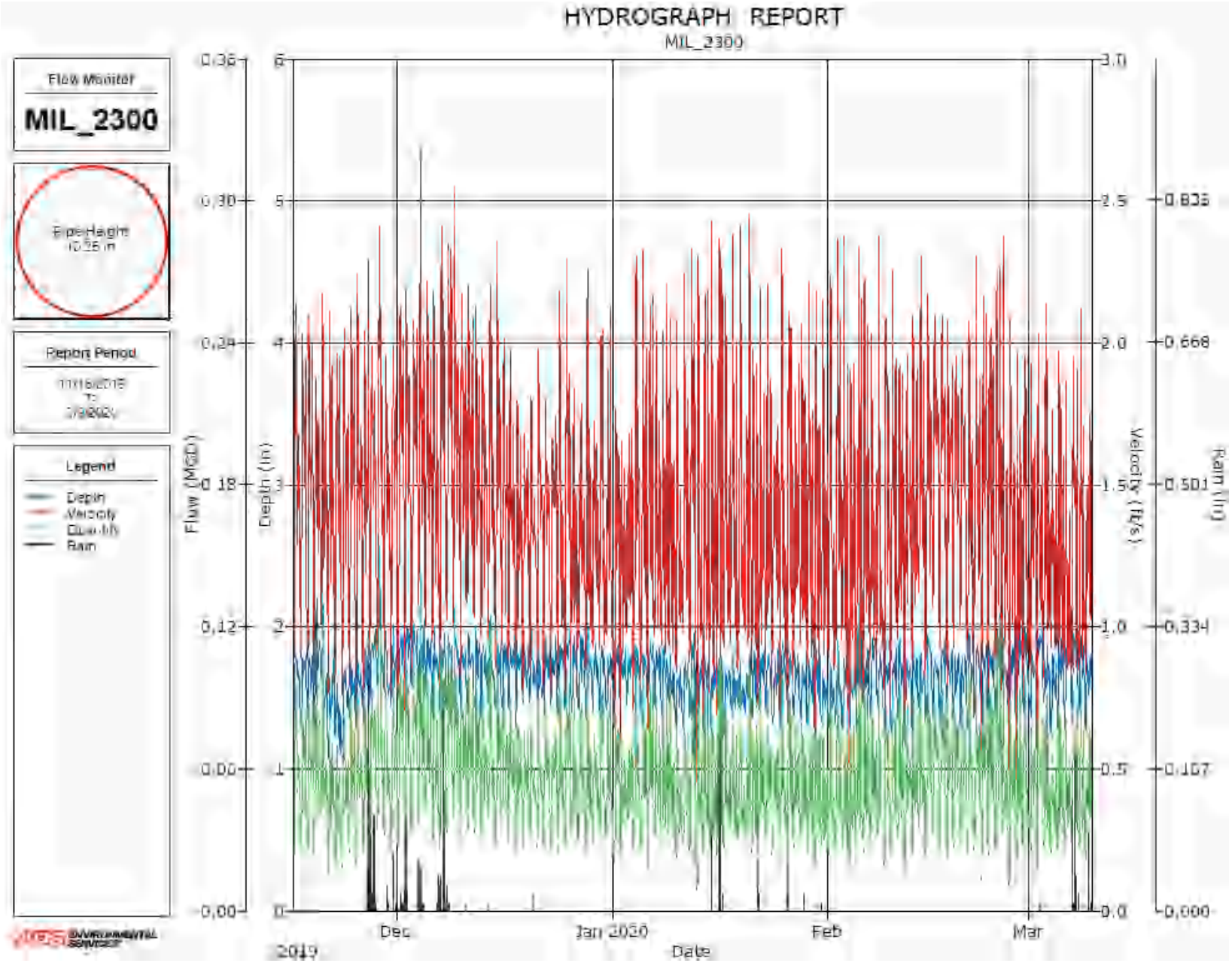
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_2300
Flow Monitor
MIL_2300
Pipe Height
10.25 in
Report Period
Legend
Depth
Velocity
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
0.36
0.30
0.24
0.18
0.12
0.00
6
5
4
3
2
1
0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.835
0.668
0.501
0.334
0.167
0.000
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2300, Pipe Height: 10.25 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 05:45 | 1.20 | 11:55 | 1.86 | 1.60 | 04:05 | 0.54 | 11:55 | 2.71 | 1.45 | 04:05 | 0.014 | 11:55 | 0.125 | 0.055 | 0.055 | |
| 11/17/2019 | 05:25 | 1.27 | 20:00 | 2.02 | 1.61 | 05:25 | 0.65 | 20:00 | 2.83 | 1.47 | 05:25 | 0.017 | 20:00 | 0.146 | 0.057 | 0.057 | |
| 11/18/2019 | 01:55 | 1.30 | 19:25 | 1.93 | 1.63 | 00:35 | 0.65 | 18:50 | 2.58 | 1.49 | 04:25 | 0.020 | 18:50 | 0.118 | 0.058 | 0.058 | |
| 11/19/2019 | 03:05 | 1.22 | 11:15 | 2.33 | 1.74 | 23:50 | 0.54 | 07:50 | 2.59 | 1.40 | 02:25 | 0.015 | 11:20 | 0.143 | 0.061 | 0.061 | |
| 11/20/2019 | 23:40 | 1.32 | 07:35 | 2.40 | 1.67 | 02:40 | 0.65 | 07:40 | 2.63 | 1.43 | 23:25 | 0.021 | 07:40 | 0.172 | 0.058 | 0.058 | |
| 11/21/2019 | 04:15 | 0.99 | 14:00 | 2.04 | 1.43 | 03:40 | 0.36 | 14:10 | 2.66 | 1.37 | 03:40 | 0.008 | 14:00 | 0.133 | 0.045 | 0.045 | |
| 11/22/2019 | 23:50 | 1.05 | 07:55 | 1.71 | 1.34 | 02:30 | 0.49 | 10:10 | 2.67 | 1.43 | 02:35 | 0.013 | 14:20 | 0.100 | 0.042 | 0.042 | |
| 11/23/2019 | 00:15 | 1.04 | 13:40 | 2.05 | 1.46 | 03:20 | 0.54 | 12:25 | 2.82 | 1.48 | 03:15 | 0.012 | 12:25 | 0.115 | 0.050 | 0.050 | |
| 11/24/2019 | 03:50 | 1.31 | 09:50 | 1.95 | 1.54 | 05:15 | 0.50 | 09:50 | 2.82 | 1.46 | 05:15 | 0.014 | 09:50 | 0.138 | 0.052 | 0.052 | |
| 11/25/2019 | 02:40 | 1.24 | 11:15 | 1.88 | 1.56 | 03:15 | 0.46 | 11:25 | 2.76 | 1.45 | 03:15 | 0.012 | 11:25 | 0.127 | 0.053 | 0.053 | |
| 11/26/2019 | 03:40 | 1.29 | 23:55 | 2.22 | 1.69 | 04:00 | 0.50 | 21:50 | 2.74 | 1.47 | 04:00 | 0.014 | 20:50 | 0.143 | 0.061 | 0.061 | 0.63 |
| 11/27/2019 | 03:30 | 1.43 | 22:05 | 2.09 | 1.78 | 03:55 | 0.45 | 22:05 | 2.67 | 1.53 | 03:55 | 0.015 | 22:05 | 0.144 | 0.067 | 0.067 | 0.77 |
| 11/28/2019 | 04:15 | 1.55 | 12:45 | 2.44 | 1.89 | 04:10 | 0.61 | 11:45 | 2.75 | 1.58 | 04:10 | 0.021 | 12:50 | 0.177 | 0.078 | 0.078 | |
| 11/29/2019 | 18:05 | 1.43 | 08:55 | 2.08 | 1.66 | 05:20 | 0.56 | 10:25 | 2.44 | 1.43 | 05:20 | 0.019 | 10:25 | 0.118 | 0.057 | 0.057 | 0.05 |
| 11/30/2019 | 04:10 | 1.42 | 10:25 | 2.14 | 1.70 | 02:40 | 0.53 | 19:15 | 2.73 | 1.51 | 02:40 | 0.017 | 19:15 | 0.143 | 0.063 | 0.063 | 0.14 |
| 12/01/2019 | 03:40 | 1.47 | 14:30 | 2.07 | 1.77 | 05:05 | 0.41 | 12:10 | 2.70 | 1.58 | 05:05 | 0.014 | 14:30 | 0.144 | 0.070 | 0.070 | 0.06 |
| 12/02/2019 | 04:50 | 1.35 | 14:50 | 2.17 | 1.79 | 05:05 | 0.49 | 14:30 | 2.76 | 1.57 | 04:25 | 0.017 | 14:50 | 0.148 | 0.071 | 0.071 | 0.36 |
| 12/03/2019 | 04:35 | 1.45 | 09:55 | 2.18 | 1.84 | 03:20 | 0.58 | 08:05 | 2.73 | 1.59 | 03:20 | 0.020 | 08:05 | 0.147 | 0.074 | 0.074 | |
| 12/04/2019 | 03:10 | 1.45 | 22:00 | 2.12 | 1.80 | 04:05 | 0.80 | 09:50 | 2.84 | 1.70 | 04:05 | 0.027 | 09:50 | 0.154 | 0.077 | 0.077 | 0.44 |
| 12/05/2019 | 23:55 | 1.51 | 09:40 | 2.01 | 1.78 | 04:30 | 0.61 | 07:30 | 2.80 | 1.58 | 04:30 | 0.027 | 07:30 | 0.136 | 0.069 | 0.069 | |
| 12/06/2019 | 05:20 | 1.32 | 09:00 | 2.15 | 1.68 | 02:00 | 0.62 | 11:10 | 2.75 | 1.49 | 02:00 | 0.019 | 09:20 | 0.147 | 0.061 | 0.061 | 0.06 |
| 12/07/2019 | 03:30 | 1.37 | 20:15 | 2.04 | 1.72 | 04:20 | 0.50 | 17:45 | 2.84 | 1.66 | 04:50 | 0.015 | 19:45 | 0.138 | 0.070 | 0.070 | 0.84 |
| 12/08/2019 | 01:25 | 1.34 | 10:25 | 2.00 | 1.72 | 04:45 | 0.55 | 19:20 | 2.82 | 1.73 | 04:45 | 0.018 | 12:00 | 0.132 | 0.073 | 0.073 | 0.10 |
| 12/09/2019 | 04:05 | 1.28 | 07:40 | 2.04 | 1.75 | 04:10 | 0.58 | 07:15 | 2.84 | 1.66 | 04:10 | 0.016 | 07:20 | 0.147 | 0.072 | 0.072 | |
| 12/10/2019 | 03:30 | 1.29 | 09:15 | 2.03 | 1.70 | 02:55 | 0.61 | 10:10 | 2.74 | 1.57 | 03:30 | 0.018 | 10:25 | 0.132 | 0.065 | 0.065 | 0.01 |
| 12/11/2019 | 03:05 | 1.35 | 08:30 | 2.08 | 1.71 | 00:55 | 0.47 | 21:00 | 2.78 | 1.58 | 00:55 | 0.015 | 08:30 | 0.135 | 0.066 | 0.066 | 0.00 |
| 12/12/2019 | 05:10 | 1.36 | 07:35 | 2.07 | 1.73 | 01:45 | 0.68 | 15:30 | 2.75 | 1.53 | 01:45 | 0.022 | 08:05 | 0.142 | 0.065 | 0.065 | |
| 12/13/2019 | 02:50 | 1.29 | 11:20 | 2.12 | 1.69 | 05:05 | 0.57 | 11:10 | 2.89 | 1.48 | 03:05 | 0.017 | 11:10 | 0.157 | 0.061 | 0.061 | |
| 12/14/2019 | 03:00 | 1.27 | 13:30 | 2.21 | 1.71 | 03:55 | 0.49 | 08:40 | 2.79 | 1.51 | 03:55 | 0.016 | 08:40 | 0.145 | 0.063 | 0.063 | 0.01 |
| 12/15/2019 | 05:35 | 1.35 | 09:20 | 2.12 | 1.68 | 07:25 | 0.65 | 18:45 | 2.73 | 1.53 | 03:20 | 0.020 | 11:05 | 0.141 | 0.063 | 0.063 | |
| 12/16/2019 | 05:05 | 1.39 | 12:15 | 2.13 | 1.71 | 02:40 | 0.61 | 08:30 | 2.74 | 1.46 | 02:40 | 0.020 | 08:30 | 0.135 | 0.061 | 0.061 | |
| 12/17/2019 | 02:55 | 1.37 | 09:15 | 2.16 | 1.72 | 02:50 | 0.59 | 07:35 | 2.72 | 1.38 | 02:50 | 0.018 | 07:35 | 0.139 | 0.058 | 0.058 | |
| 12/18/2019 | 01:50 | 1.18 | 07:00 | 2.03 | 1.67 | 03:45 | 0.60 | 09:10 | 2.41 | 1.34 | 03:45 | 0.018 | 11:25 | 0.109 | 0.054 | 0.054 | |
| 12/19/2019 | 02:55 | 1.41 | 08:50 | 2.01 | 1.69 | 03:05 | 0.63 | 11:30 | 2.39 | 1.34 | 03:05 | 0.020 | 21:25 | 0.112 | 0.054 | 0.054 | |
| 12/20/2019 | 04:40 | 1.41 | 10:35 | 2.08 | 1.66 | 02:40 | 0.66 | 08:25 | 2.45 | 1.31 | 02:40 | 0.023 | 08:25 | 0.118 | 0.052 | 0.052 | 0.02 |
| 12/21/2019 | 05:35 | 1.42 | 09:35 | 1.97 | 1.62 | 05:05 | 0.69 | 09:35 | 2.51 | 1.39 | 05:05 | 0.022 | 09:35 | 0.125 | 0.053 | 0.053 | |
| 12/22/2019 | 04:35 | 1.33 | 11:30 | 2.26 | 1.70 | 03:50 | 0.57 | 10:50 | 2.40 | 1.33 | 03:50 | 0.017 | 10:50 | 0.134 | 0.055 | 0.055 | |
| 12/23/2019 | 02:40 | 1.39 | 20:30 | 2.00 | 1.70 | 23:35 | 0.66 | 22:45 | 2.70 | 1.37 | 02:30 | 0.022 | 22:45 | 0.128 | 0.056 | 0.056 | |
| 12/24/2019 | 04:20 | 1.31 | 09:55 | 2.01 | 1.70 | 00:25 | 0.56 | 13:55 | 2.71 | 1.35 | 03:20 | 0.019 | 09:50 | 0.132 | 0.055 | 0.055 | |
| 12/25/2019 | 06:40 | 1.36 | 20:40 | 2.06 | 1.74 | 23:55 | 0.56 | 11:50 | 2.75 | 1.44 | 05:45 | 0.019 | 09:45 | 0.139 | 0.062 | 0.062 | |
| 12/26/2019 | 04:50 | 1.33 | 11:05 | 2.08 | 1.69 | 23:25 | 0.54 | 11:05 | 2.77 | 1.23 | 04:50 | 0.018 | 11:05 | 0.149 | 0.050 | 0.050 | |
| 12/27/2019 | 04:20 | 1.32 | 21:15 | 2.07 | 1.70 | 00:15 | 0.55 | 11:40 | 2.59 | 1.33 | 00:15 | 0.019 | 09:10 | 0.133 | 0.055 | 0.055 | |
| 12/28/2019 | 03:55 | 1.26 | 10:35 | 2.05 | 1.68 | 05:00 | 0.45 | 10:35 | 2.77 | 1.33 | 05:00 | 0.014 | 10:35 | 0.146 | 0.055 | 0.055 | |
| 12/29/2019 | 05:45 | 1.38 | 13:45 | 1.97 | 1.67 | 17:35 | 0.54 | 10:35 | 2.65 | 1.30 | 05:50 | 0.017 | 08:25 | 0.122 | 0.052 | 0.052 | |
| 12/30/2019 | 04:50 | 1.32 | 11:35 | 1.97 | 1.68 | 23:15 | 0.60 | 11:35 | 2.65 | 1.38 | 03:00 | 0.021 | 11:35 | 0.132 | 0.056 | 0.056 | |
| 12/31/2019 | 03:05 | 1.33 | 22:00 | 1.88 | 1.64 | 15:40 | 0.63 | 16:20 | 2.80 | 1.34 | 03:15 | 0.019 | 17:30 | 0.124 | 0.052 | 0.052 | |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:10 | 1.24 11:00 | 2.00 | 1.68 | 05:05 | 0.41 11:00 | 2.73 | 1.20 | 05:05 | 0.011 11:00 | 0.138 | 0.050 | 0.050 | |
| 01/02/2020 | 05:05 | 1.47 09:10 | 1.96 | 1.71 | 02:25 | 0.48 08:35 | 2.69 | 1.21 | 03:20 | 0.018 09:05 | 0.130 | 0.050 | 0.050 | |
| 01/03/2020 | 01:30 | 1.40 09:05 | 1.90 | 1.67 | 06:55 | 0.50 19:10 | 2.69 | 1.31 | 06:55 | 0.016 19:10 | 0.126 | 0.052 | 0.052 | |
| 01/04/2020 | 04:10 | 1.40 10:10 | 1.96 | 1.67 | 03:25 | 0.47 09:50 | 2.83 | 1.39 | 03:25 | 0.016 11:30 | 0.135 | 0.056 | 0.056 | |
| 01/05/2020 | 04:30 | 1.27 09:30 | 1.94 | 1.64 | 01:00 | 0.50 11:20 | 2.82 | 1.36 | 05:15 | 0.018 11:20 | 0.129 | 0.054 | 0.054 | |
| 01/06/2020 | 03:15 | 1.29 12:00 | 2.02 | 1.71 | 04:05 | 0.40 09:50 | 2.78 | 1.41 | 04:05 | 0.012 09:50 | 0.134 | 0.059 | 0.059 | |
| 01/07/2020 | 03:05 | 1.33 08:40 | 1.97 | 1.69 | 23:50 | 0.55 19:25 | 2.76 | 1.34 | 23:50 | 0.021 07:35 | 0.131 | 0.054 | 0.054 | |
| 01/08/2020 | 02:45 | 1.32 08:00 | 1.94 | 1.65 | 14:25 | 0.51 21:30 | 2.79 | 1.32 | 02:30 | 0.017 11:10 | 0.131 | 0.052 | 0.052 | |
| 01/09/2020 | 10:40 | 1.32 09:45 | 1.86 | 1.59 | 23:35 | 0.57 10:10 | 2.76 | 1.32 | 23:35 | 0.017 07:15 | 0.124 | 0.050 | 0.050 | |
| 01/10/2020 | 04:35 | 1.12 20:20 | 1.75 | 1.53 | 01:00 | 0.58 09:30 | 2.71 | 1.30 | 04:30 | 0.015 08:20 | 0.107 | 0.046 | 0.046 | |
| 01/11/2020 | 03:45 | 1.21 23:10 | 1.94 | 1.57 | 07:10 | 0.54 13:50 | 2.80 | 1.45 | 05:25 | 0.017 11:05 | 0.116 | 0.053 | 0.053 | |
| 01/12/2020 | 23:50 | 1.14 19:50 | 2.02 | 1.64 | 01:05 | 0.47 10:40 | 2.86 | 1.52 | 01:05 | 0.014 19:10 | 0.144 | 0.061 | 0.061 | |
| 01/13/2020 | 04:15 | 0.93 17:35 | 2.03 | 1.47 | 03:55 | 0.33 20:50 | 2.74 | 1.15 | 03:55 | 0.006 12:00 | 0.127 | 0.041 | 0.041 | |
| 01/14/2020 | 04:35 | 1.26 21:00 | 1.87 | 1.59 | 06:35 | 0.47 20:25 | 2.84 | 1.22 | 03:20 | 0.015 21:00 | 0.129 | 0.046 | 0.046 | |
| 01/15/2020 | 04:40 | 1.20 20:00 | 1.78 | 1.55 | 23:50 | 0.53 21:30 | 2.71 | 1.27 | 23:50 | 0.018 21:30 | 0.116 | 0.046 | 0.046 | 0.10 |
| 01/16/2020 | 23:45 | 1.34 12:50 | 1.93 | 1.62 | 00:45 | 0.49 19:50 | 2.77 | 1.50 | 00:45 | 0.016 07:25 | 0.131 | 0.059 | 0.059 | 0.66 |
| 01/17/2020 | 01:20 | 1.22 14:50 | 1.98 | 1.55 | 01:00 | 0.52 12:20 | 2.79 | 1.39 | 01:00 | 0.014 07:55 | 0.121 | 0.050 | 0.050 | |
| 01/18/2020 | 22:45 | 1.33 10:25 | 1.86 | 1.55 | 01:10 | 0.50 10:15 | 2.79 | 1.39 | 01:10 | 0.017 10:25 | 0.124 | 0.050 | 0.050 | |
| 01/19/2020 | 05:30 | 1.38 09:45 | 1.81 | 1.55 | 01:30 | 0.58 14:50 | 2.85 | 1.42 | 03:50 | 0.020 14:50 | 0.120 | 0.051 | 0.051 | |
| 01/20/2020 | 23:55 | 1.35 19:15 | 1.97 | 1.57 | 01:10 | 0.61 18:10 | 2.86 | 1.40 | 01:10 | 0.020 18:50 | 0.135 | 0.052 | 0.052 | |
| 01/21/2020 | 04:25 | 1.24 20:35 | 2.05 | 1.59 | 00:20 | 0.55 12:30 | 2.80 | 1.34 | 00:20 | 0.016 20:35 | 0.137 | 0.050 | 0.050 | 0.01 |
| 01/22/2020 | 00:35 | 1.34 17:45 | 1.89 | 1.65 | 01:10 | 0.51 13:25 | 2.71 | 1.30 | 00:55 | 0.018 17:45 | 0.125 | 0.051 | 0.051 | 0.09 |
| 01/23/2020 | 23:50 | 1.33 17:10 | 1.93 | 1.62 | 00:10 | 0.55 19:45 | 2.71 | 1.36 | 23:50 | 0.017 07:25 | 0.124 | 0.052 | 0.052 | |
| 01/24/2020 | 12:10 | 1.19 10:55 | 2.05 | 1.57 | 00:10 | 0.68 13:05 | 2.68 | 1.35 | 00:10 | 0.017 22:20 | 0.114 | 0.049 | 0.049 | |
| 01/25/2020 | 03:20 | 1.19 13:10 | 1.98 | 1.64 | 01:05 | 0.54 09:30 | 2.82 | 1.36 | 05:00 | 0.014 13:10 | 0.137 | 0.054 | 0.054 | |
| 01/26/2020 | 18:30 | 1.13 21:55 | 1.88 | 1.62 | 04:50 | 0.52 11:10 | 2.83 | 1.45 | 04:50 | 0.014 11:10 | 0.130 | 0.056 | 0.056 | 0.16 |
| 01/27/2020 | 01:15 | 1.18 19:00 | 1.87 | 1.61 | 23:50 | 0.45 19:50 | 2.74 | 1.31 | 23:50 | 0.013 19:00 | 0.123 | 0.050 | 0.050 | |
| 01/28/2020 | 18:10 | 1.18 15:05 | 1.83 | 1.55 | 00:35 | 0.46 21:25 | 2.79 | 1.32 | 00:35 | 0.014 15:05 | 0.121 | 0.047 | 0.047 | 0.02 |
| 01/29/2020 | 00:55 | 1.05 08:40 | 1.98 | 1.56 | 01:35 | 0.52 19:20 | 2.81 | 1.36 | 00:55 | 0.013 19:20 | 0.134 | 0.050 | 0.050 | |
| 01/30/2020 | 00:05 | 1.23 10:35 | 2.17 | 1.60 | 01:10 | 0.43 10:00 | 2.73 | 1.30 | 01:10 | 0.013 19:45 | 0.133 | 0.050 | 0.050 | |
| 01/31/2020 | 17:35 | 1.20 16:05 | 1.78 | 1.49 | 15:40 | 0.57 16:10 | 2.82 | 1.31 | 17:35 | 0.015 16:10 | 0.121 | 0.045 | 0.045 | 0.01 |
| 02/01/2020 | 03:05 | 1.15 10:05 | 1.86 | 1.49 | 07:45 | 0.58 11:05 | 2.73 | 1.37 | 07:45 | 0.018 13:10 | 0.114 | 0.047 | 0.047 | |
| 02/02/2020 | 01:55 | 1.20 11:45 | 2.04 | 1.57 | 23:10 | 0.57 14:10 | 2.74 | 1.48 | 23:10 | 0.016 11:45 | 0.127 | 0.056 | 0.056 | |
| 02/03/2020 | 05:10 | 1.12 21:05 | 1.95 | 1.59 | 00:10 | 0.49 07:10 | 2.81 | 1.33 | 00:10 | 0.014 21:05 | 0.122 | 0.050 | 0.050 | |
| 02/04/2020 | 00:40 | 1.15 20:30 | 1.88 | 1.53 | 03:35 | 0.39 22:25 | 2.79 | 1.26 | 03:35 | 0.009 22:25 | 0.118 | 0.045 | 0.045 | |
| 02/05/2020 | 03:50 | 1.21 12:05 | 2.40 | 1.75 | 04:40 | 0.47 20:25 | 2.81 | 1.26 | 04:40 | 0.013 12:05 | 0.168 | 0.056 | 0.056 | |
| 02/06/2020 | 03:20 | 1.34 13:45 | 1.98 | 1.65 | 03:25 | 0.52 20:20 | 2.75 | 1.40 | 03:25 | 0.015 20:20 | 0.130 | 0.056 | 0.056 | |
| 02/07/2020 | 05:00 | 1.28 11:15 | 2.13 | 1.73 | 15:55 | 0.64 14:15 | 2.81 | 1.29 | 04:25 | 0.019 14:15 | 0.147 | 0.054 | 0.054 | |
| 02/08/2020 | 06:50 | 1.39 19:25 | 1.95 | 1.63 | 22:45 | 0.57 10:00 | 2.75 | 1.23 | 22:45 | 0.019 14:00 | 0.121 | 0.047 | 0.047 | |
| 02/09/2020 | 04:50 | 1.10 08:25 | 1.87 | 1.53 | 23:30 | 0.44 19:45 | 2.82 | 1.37 | 23:30 | 0.014 08:30 | 0.121 | 0.050 | 0.050 | |
| 02/10/2020 | 04:10 | 1.16 11:30 | 2.00 | 1.60 | 00:20 | 0.58 19:55 | 2.84 | 1.45 | 04:40 | 0.018 13:25 | 0.128 | 0.056 | 0.056 | |
| 02/11/2020 | 02:15 | 1.34 08:30 | 1.98 | 1.65 | 13:25 | 0.67 07:30 | 2.81 | 1.34 | 16:25 | 0.023 07:30 | 0.137 | 0.053 | 0.053 | |
| 02/12/2020 | 02:05 | 1.08 10:15 | 2.02 | 1.59 | 06:10 | 0.50 10:05 | 2.86 | 1.37 | 02:00 | 0.012 10:15 | 0.146 | 0.052 | 0.052 | |
| 02/13/2020 | 02:00 | 1.25 09:50 | 1.90 | 1.61 | 14:05 | 0.58 13:20 | 2.83 | 1.41 | 04:35 | 0.019 07:55 | 0.127 | 0.054 | 0.054 | |
| 02/14/2020 | 04:00 | 1.40 13:00 | 2.01 | 1.62 | 15:30 | 0.63 10:05 | 2.83 | 1.55 | 15:30 | 0.021 13:00 | 0.140 | 0.060 | 0.060 | |
| 02/15/2020 | 02:20 | 1.27 09:30 | 2.04 | 1.70 | 03:00 | 0.60 09:05 | 2.75 | 1.51 | 03:00 | 0.016 09:30 | 0.141 | 0.064 | 0.064 | |
| 02/16/2020 | 05:35 | 1.26 16:20 | 1.85 | 1.61 | 00:25 | 0.53 16:30 | 2.69 | 1.61 | 00:25 | 0.018 16:20 | 0.112 | 0.061 | 0.061 | |
| 02/17/2020 | 04:15 | 1.26 20:50 | 1.94 | 1.67 | 04:15 | 0.58 17:40 | 2.51 | 1.57 | 04:15 | 0.015 14:45 | 0.121 | 0.064 | 0.064 | |
| 02/18/2020 | 04:20 | 1.20 18:55 | 1.94 | 1.62 | 04:35 | 0.55 18:55 | 2.83 | 1.52 | 04:35 | 0.013 18:55 | 0.138 | 0.059 | 0.059 | |
| 02/19/2020 | 04:35 | 1.30 08:05 | 1.96 | 1.62 | 23:55 | 0.60 20:25 | 2.53 | 1.53 | 04:20 | 0.017 08:10 | 0.122 | 0.059 | 0.059 | |
| 02/20/2020 | 04:20 | 1.24 10:20 | 1.92 | 1.60 | 00:00 | 0.55 09:25 | 2.44 | 1.47 | 00:00 | 0.018 09:25 | 0.109 | 0.056 | 0.056 | |
| 02/21/2020 | 03:30 | 1.25 09:15 | 2.10 | 1.63 | 02:20 | 0.43 09:15 | 2.73 | 1.38 | 02:20 | 0.013 09:15 | 0.149 | 0.054 | 0.054 | |
| 02/22/2020 | 03:45 | 1.30 14:10 | 1.95 | 1.68 | 00:35 | 0.50 09:35 | 2.83 | 1.52 | 00:35 | 0.018 09:35 | 0.130 | 0.061 | 0.061 | |
| 02/23/2020 | 04:05 | 1.10 19:50 | 2.00 | 1.63 | 04:25 | 0.38 18:05 | 2.74 | 1.46 | 04:10 | 0.009 18:05 | 0.131 | 0.058 | 0.058 | |
| 02/24/2020 | 03:25 | 1.33 11:30 | 2.06 | 1.67 | 23:40 | 0.50 11:30 | 2.81 | 1.47 | 03:05 | 0.015 11:30 | 0.149 | 0.059 | 0.059 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:05 | 1.27 | 13:40 | 2.25 | 1.79 | 03:50 | 0.75 | 21:35 | 2.86 | 1.57 | 03:55 | 0.020 | 20:45 | 0.151 | 0.071 | 0.071 | |
| 02/26/2020 | 23:50 | 1.44 | 00:00 | 2.04 | 1.71 | 02:40 | 0.50 | 10:00 | 2.84 | 1.32 | 23:05 | 0.017 | 10:00 | 0.143 | 0.055 | 0.055 | |
| 02/27/2020 | 04:10 | 0.99 | 12:30 | 1.95 | 1.62 | 03:50 | 0.33 | 07:35 | 2.68 | 1.22 | 03:50 | 0.006 | 18:00 | 0.120 | 0.049 | 0.049 | |
| 02/28/2020 | 03:55 | 1.03 | 14:35 | 2.40 | 1.64 | 03:50 | 0.41 | 14:35 | 2.67 | 1.15 | 03:50 | 0.009 | 14:35 | 0.176 | 0.047 | 0.047 | |
| 02/29/2020 | 05:15 | 1.33 | 11:25 | 2.07 | 1.71 | 05:00 | 0.49 | 11:40 | 2.57 | 1.23 | 05:00 | 0.014 | 11:40 | 0.132 | 0.051 | 0.051 | |
| 03/01/2020 | 05:40 | 1.29 | 16:40 | 1.95 | 1.62 | 00:05 | 0.55 | 21:05 | 2.50 | 1.32 | 00:05 | 0.020 | 21:05 | 0.120 | 0.051 | 0.051 | |
| 03/02/2020 | 01:50 | 1.20 | 12:50 | 2.10 | 1.75 | 02:30 | 0.47 | 07:30 | 2.70 | 1.27 | 02:30 | 0.012 | 07:30 | 0.138 | 0.056 | 0.056 | 0.01 |
| 03/03/2020 | 04:25 | 1.35 | 14:00 | 1.99 | 1.63 | 23:15 | 0.53 | 14:05 | 2.85 | 1.29 | 04:25 | 0.016 | 14:00 | 0.144 | 0.050 | 0.050 | |
| 03/04/2020 | 04:25 | 1.18 | 12:50 | 1.97 | 1.56 | 03:25 | 0.45 | 10:25 | 2.72 | 1.23 | 03:25 | 0.011 | 12:50 | 0.123 | 0.045 | 0.045 | |
| 03/05/2020 | 04:00 | 1.21 | 13:35 | 2.25 | 1.66 | 04:00 | 0.53 | 10:10 | 2.74 | 1.30 | 04:00 | 0.013 | 13:55 | 0.144 | 0.052 | 0.052 | |
| 03/06/2020 | 03:20 | 1.17 | 21:10 | 1.99 | 1.69 | 11:25 | 0.60 | 20:45 | 2.46 | 1.12 | 03:20 | 0.019 | 20:45 | 0.116 | 0.045 | 0.045 | |
| 03/07/2020 | 04:55 | 1.24 | 14:05 | 2.04 | 1.72 | 03:15 | 0.47 | 14:00 | 2.74 | 1.30 | 03:15 | 0.014 | 14:00 | 0.142 | 0.055 | 0.055 | 0.58 |
| 03/08/2020 | 04:35 | 1.34 | 09:45 | 2.03 | 1.68 | 03:35 | 0.51 | 21:50 | 2.72 | 1.25 | 03:35 | 0.016 | 09:45 | 0.125 | 0.051 | 0.051 | 0.02 |
| 03/09/2020 | 04:20 | 1.22 | 22:00 | 1.90 | 1.59 | 04:25 | 0.50 | 07:10 | 2.60 | 1.27 | 04:25 | 0.013 | 19:45 | 0.108 | 0.047 | 0.047 | 0.11 |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 6.402 | 5.26 |
| Avg | 1.65 | 1.40 | 0.056 | |

## Site Commentary

### Site Information

| MIL_2334 | |
|---|---|
| Pipe Dimensions | 12.5 |
| Silt Level | 0.00" |

### Overview

Site MIL_2334 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited little to no response to the wet weather events of November 26, 2019 - November 27, 2019 and December 7, 2019 - December 8, 2019. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 2.12 | 2.77 | 0.175 |
| Minimum | 1.55 | 1.24 | 0.052 |
| Maximum | 3.31 | 3.62 | 0.352 |
| Time of Minimum | 11/25/2019 3:50 AM | 2/28/2020 3:55 AM | 2/28/2020 3:55 AM |
| Time of Maximum | 12/8/2019 2:25 PM | 3/6/2020 9:45 AM | 12/8/2019 2:25 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

## *Flow Monitoring Site Report*

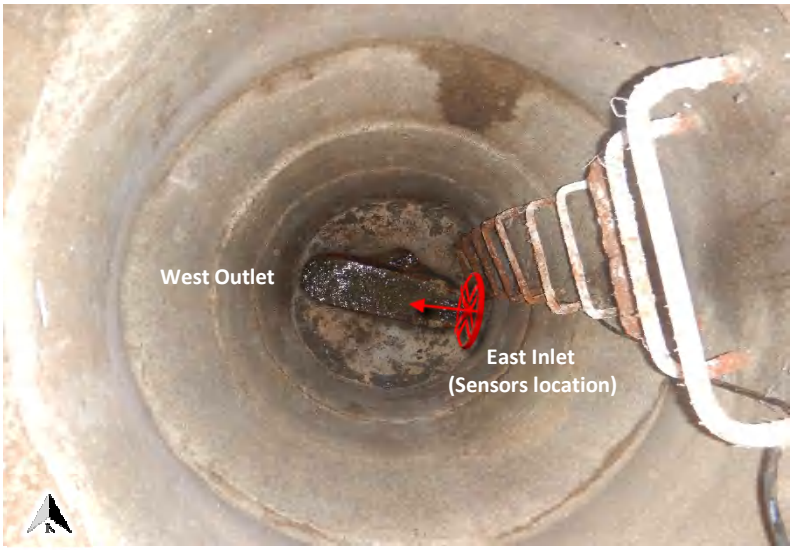
ADS ENVIRONMENTAL SERVICES®

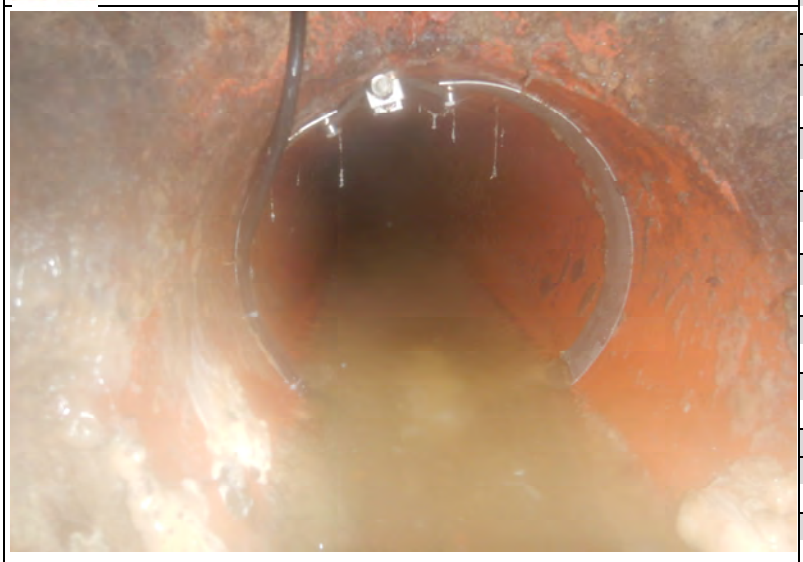
## Site Name

# MIL_2334

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Tramway Dr and Strickroth Dr | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Drive | Latitude: | 37.44209 | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.903338 | 12.5" x 12.5" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 2334 | Residential |
| Access | Traffic |
| Drive | Light |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Friday, November 15, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 7:47:00 AM | 12.5" x 12.5" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 2.25" | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 3.52 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

good flow, shallow and moderate velocity

## Manhole / Pipe Information:

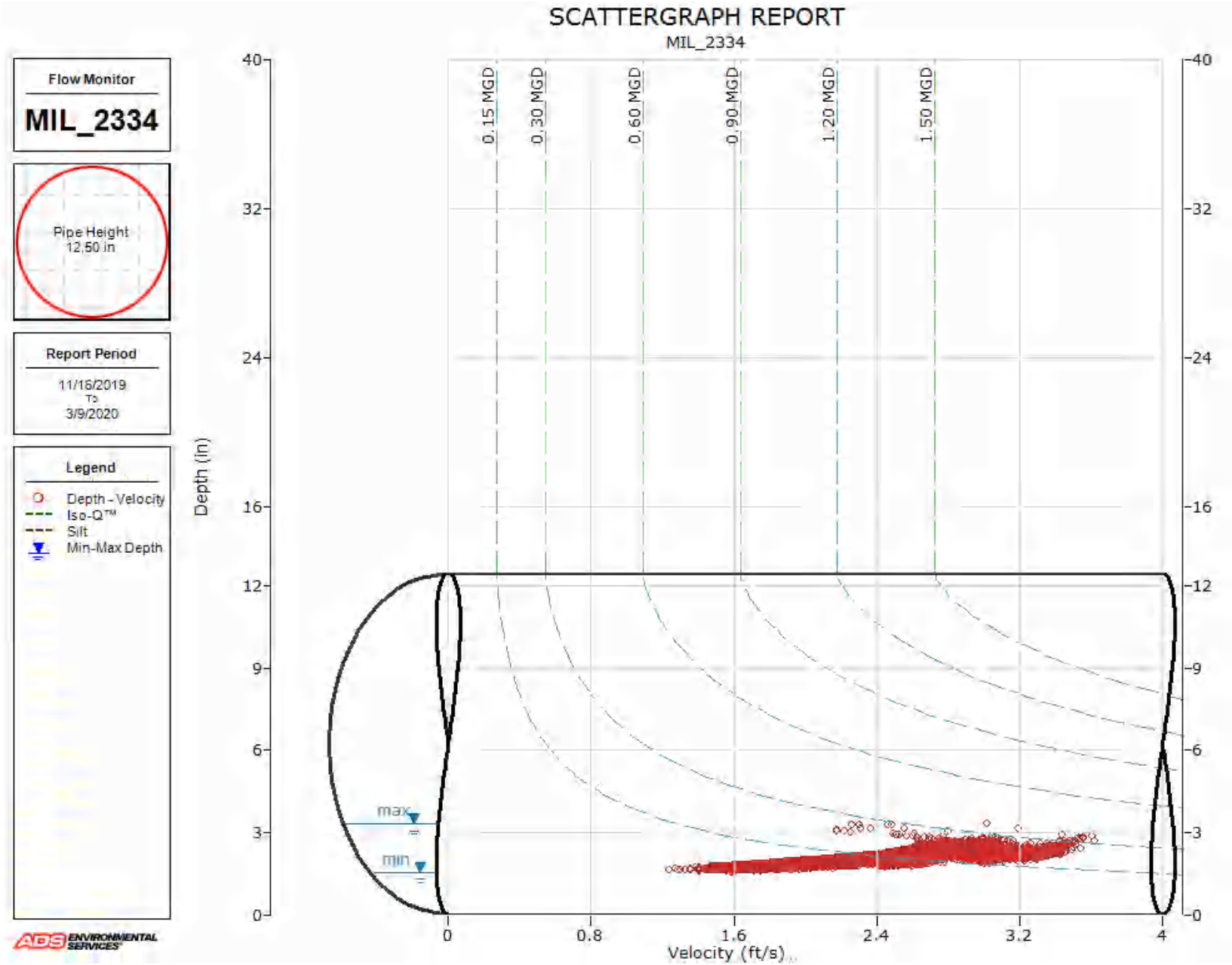
| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 12' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Vitrified Clay Pipe | Good |

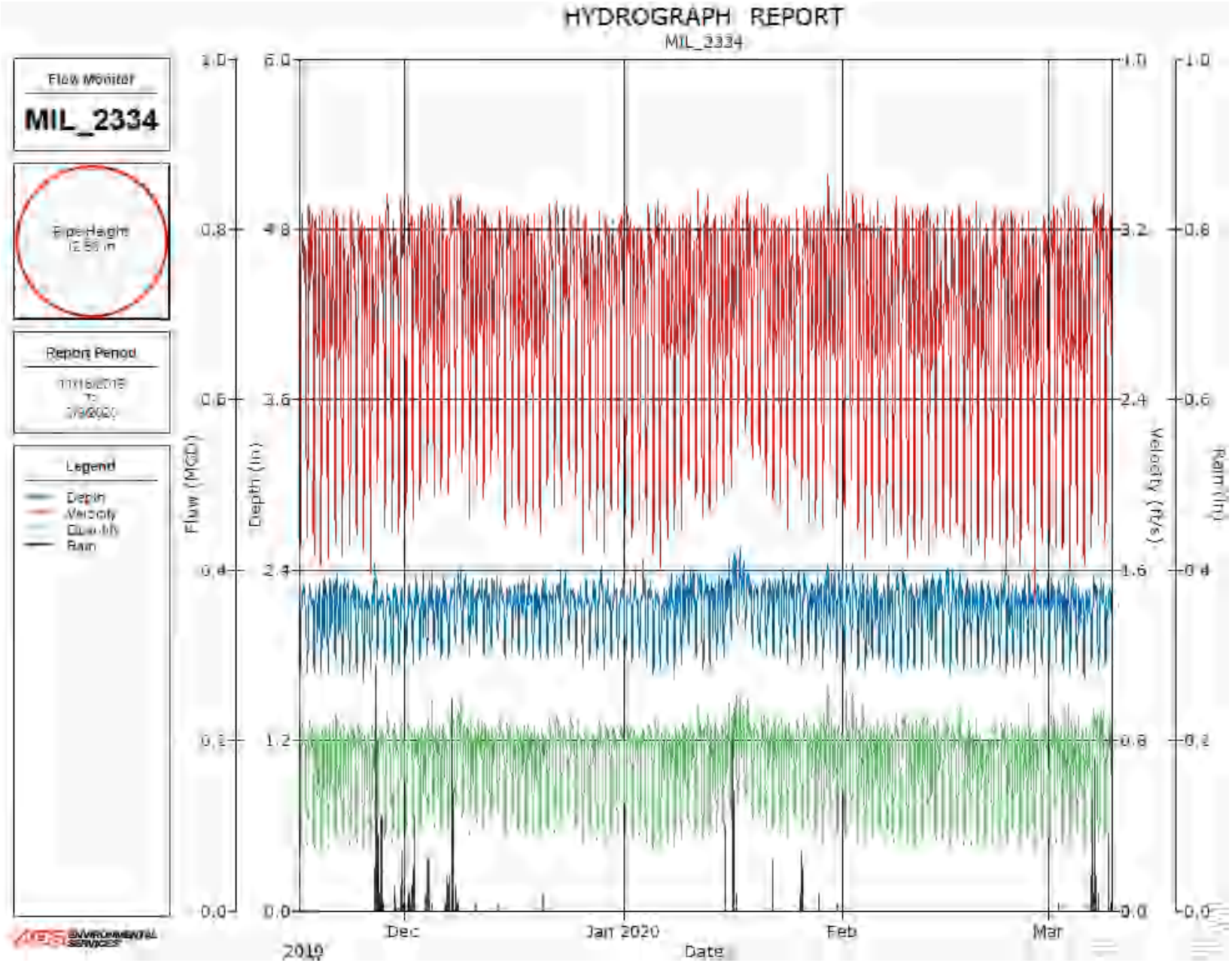
## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |


SCATTERGRAPH REPORT
MIL_2334
Flow Monitor
MIL_2334
Pipe Height
12.50 in
Report Period
11/16/2019
To
3/9/2020
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
ADS ENVIRONMENTAL SERVICES
0.15 MGD
0.30 MGD
0.60 MGD
0.90 MGD
1.20 MGD
1.50 MGD
Depth (in)
0
3
6
9
12
16
24
32
40
max
min
0
0.8
1.6
2.4
3.2
4
Velocity (ft/s)


HYDROGRAPH REPORT
MIL_2334
Flow Monitor
MIL_2334
Pipe Height
12.56 in
Report Period
11/15/2019
To
3/9/2020
Legend
Depth
Velocity
Flow
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
1.0
0.8
0.6
0.4
0.2
0.0
6.0
4.8
3.6
2.4
1.2
0.0
3.2
2.4
1.6
0.8
0.0
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2334, Pipe Height: 12.50 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 03:55 | 1.64 | 18:45 | 2.65 | 2.08 | 04:10 | 1.41 | 12:05 | 3.37 | 2.74 | 04:10 | 0.062 | 17:40 | 0.252 | 0.170 | 0.170 | |
| 11/17/2019 | 04:05 | 1.63 | 12:25 | 2.68 | 2.09 | 03:45 | 1.50 | 11:15 | 3.41 | 2.81 | 03:50 | 0.067 | 14:30 | 0.254 | 0.175 | 0.175 | |
| 11/18/2019 | 04:00 | 1.63 | 17:25 | 2.50 | 2.07 | 03:55 | 1.47 | 08:15 | 3.35 | 2.70 | 03:55 | 0.062 | 07:50 | 0.239 | 0.165 | 0.165 | |
| 11/19/2019 | 03:10 | 1.66 | 19:15 | 2.58 | 2.09 | 03:10 | 1.36 | 20:20 | 3.38 | 2.71 | 03:10 | 0.059 | 11:15 | 0.237 | 0.168 | 0.168 | |
| 11/20/2019 | 03:50 | 1.64 | 07:10 | 2.65 | 2.10 | 03:50 | 1.46 | 20:25 | 3.38 | 2.67 | 03:50 | 0.062 | 07:10 | 0.245 | 0.168 | 0.168 | |
| 11/21/2019 | 03:55 | 1.72 | 23:00 | 2.48 | 2.10 | 04:00 | 1.51 | 07:35 | 3.41 | 2.65 | 04:00 | 0.070 | 07:35 | 0.256 | 0.166 | 0.166 | |
| 11/22/2019 | 03:55 | 1.59 | 09:15 | 2.52 | 2.10 | 03:40 | 1.51 | 07:55 | 3.38 | 2.66 | 03:40 | 0.063 | 07:40 | 0.242 | 0.167 | 0.167 | |
| 11/23/2019 | 04:05 | 1.63 | 16:55 | 2.87 | 2.10 | 04:15 | 1.33 | 10:45 | 3.35 | 2.78 | 04:15 | 0.057 | 16:55 | 0.290 | 0.174 | 0.174 | |
| 11/24/2019 | 05:30 | 1.67 | 10:55 | 2.75 | 2.08 | 04:35 | 1.53 | 10:25 | 3.39 | 2.82 | 04:35 | 0.071 | 10:55 | 0.276 | 0.173 | 0.173 | |
| 11/25/2019 | 03:50 | 1.55 | 11:40 | 2.50 | 2.05 | 04:10 | 1.41 | 21:20 | 3.34 | 2.73 | 04:10 | 0.057 | 11:45 | 0.225 | 0.165 | 0.165 | |
| 11/26/2019 | 04:00 | 1.63 | 19:05 | 2.59 | 2.13 | 03:55 | 1.29 | 08:40 | 3.34 | 2.66 | 03:55 | 0.054 | 20:35 | 0.238 | 0.170 | 0.170 | 0.63 |
| 11/27/2019 | 03:00 | 1.76 | 14:45 | 2.46 | 2.10 | 01:40 | 1.78 | 11:40 | 3.38 | 2.89 | 01:40 | 0.089 | 17:45 | 0.220 | 0.179 | 0.179 | 0.77 |
| 11/28/2019 | 03:55 | 1.72 | 11:50 | 2.50 | 2.10 | 03:40 | 1.56 | 11:50 | 3.47 | 2.91 | 03:40 | 0.073 | 11:50 | 0.271 | 0.180 | 0.180 | |
| 11/29/2019 | 04:40 | 1.60 | 16:35 | 2.69 | 2.08 | 05:30 | 1.56 | 09:35 | 3.33 | 2.80 | 05:30 | 0.067 | 16:40 | 0.260 | 0.171 | 0.171 | 0.05 |
| 11/30/2019 | 03:30 | 1.70 | 12:00 | 2.96 | 2.06 | 03:35 | 1.52 | 11:20 | 3.37 | 2.83 | 03:35 | 0.068 | 12:00 | 0.248 | 0.172 | 0.172 | 0.14 |
| 12/01/2019 | 04:30 | 1.79 | 13:55 | 3.12 | 2.09 | 04:05 | 1.79 | 10:45 | 3.39 | 2.89 | 04:05 | 0.088 | 13:55 | 0.254 | 0.178 | 0.178 | 0.06 |
| 12/02/2019 | 03:15 | 1.69 | 13:05 | 2.45 | 2.10 | 02:35 | 1.65 | 07:45 | 3.36 | 2.80 | 03:10 | 0.077 | 08:00 | 0.244 | 0.174 | 0.174 | 0.36 |
| 12/03/2019 | 03:45 | 1.76 | 12:15 | 2.47 | 2.07 | 03:40 | 1.70 | 08:30 | 3.35 | 2.78 | 03:40 | 0.081 | 08:05 | 0.223 | 0.169 | 0.169 | |
| 12/04/2019 | 02:15 | 1.77 | 19:15 | 2.88 | 2.13 | 02:10 | 1.86 | 19:15 | 3.61 | 2.85 | 03:10 | 0.089 | 19:15 | 0.346 | 0.180 | 0.180 | 0.44 |
| 12/05/2019 | 03:35 | 1.80 | 07:30 | 2.46 | 2.11 | 02:25 | 1.75 | 20:45 | 3.34 | 2.81 | 02:25 | 0.086 | 07:35 | 0.234 | 0.174 | 0.174 | |
| 12/06/2019 | 03:45 | 1.75 | 10:20 | 2.50 | 2.13 | 03:35 | 1.80 | 08:05 | 3.35 | 2.77 | 03:35 | 0.086 | 08:05 | 0.240 | 0.174 | 0.174 | 0.06 |
| 12/07/2019 | 04:20 | 1.75 | 00:00 | 2.52 | 2.13 | 04:10 | 1.76 | 20:55 | 3.39 | 2.92 | 04:10 | 0.084 | 20:55 | 0.234 | 0.185 | 0.185 | 0.84 |
| 12/08/2019 | 02:35 | 1.86 | 14:25 | 3.31 | 2.18 | 04:40 | 1.86 | 19:40 | 3.56 | 3.00 | 04:45 | 0.098 | 14:25 | 0.352 | 0.195 | 0.195 | 0.10 |
| 12/09/2019 | 03:50 | 1.79 | 09:50 | 2.52 | 2.16 | 03:05 | 1.80 | 08:10 | 3.38 | 2.84 | 03:05 | 0.091 | 07:55 | 0.244 | 0.183 | 0.183 | |
| 12/10/2019 | 03:20 | 1.77 | 16:20 | 2.58 | 2.13 | 03:30 | 1.62 | 07:35 | 3.39 | 2.79 | 03:30 | 0.077 | 07:35 | 0.250 | 0.176 | 0.176 | 0.01 |
| 12/11/2019 | 01:20 | 1.83 | 23:45 | 2.47 | 2.18 | 03:45 | 1.93 | 07:55 | 3.41 | 2.83 | 03:25 | 0.099 | 07:55 | 0.252 | 0.184 | 0.184 | 0.00 |
| 12/12/2019 | 03:45 | 1.78 | 10:30 | 2.54 | 2.12 | 04:35 | 1.84 | 22:15 | 3.39 | 2.78 | 03:50 | 0.090 | 07:30 | 0.251 | 0.175 | 0.175 | |
| 12/13/2019 | 05:20 | 1.78 | 09:05 | 2.52 | 2.16 | 03:00 | 1.78 | 08:05 | 3.34 | 2.77 | 03:00 | 0.088 | 09:05 | 0.233 | 0.179 | 0.179 | |
| 12/14/2019 | 05:55 | 1.86 | 17:25 | 2.60 | 2.16 | 03:50 | 1.90 | 11:10 | 3.31 | 2.91 | 03:50 | 0.101 | 17:25 | 0.243 | 0.187 | 0.187 | 0.01 |
| 12/15/2019 | 04:05 | 1.75 | 18:15 | 3.13 | 2.11 | 04:10 | 1.63 | 21:05 | 3.39 | 2.85 | 04:10 | 0.077 | 18:15 | 0.249 | 0.179 | 0.179 | |
| 12/16/2019 | 03:40 | 1.79 | 09:10 | 2.83 | 2.14 | 04:00 | 1.75 | 08:05 | 3.35 | 2.80 | 04:00 | 0.086 | 07:50 | 0.248 | 0.177 | 0.177 | |
| 12/17/2019 | 03:35 | 1.80 | 10:45 | 2.58 | 2.13 | 02:30 | 1.75 | 07:35 | 3.36 | 2.77 | 02:30 | 0.087 | 11:40 | 0.231 | 0.175 | 0.175 | |
| 12/18/2019 | 03:05 | 1.79 | 13:45 | 2.47 | 2.14 | 03:55 | 1.67 | 08:10 | 3.42 | 2.76 | 03:55 | 0.083 | 08:10 | 0.241 | 0.175 | 0.175 | |
| 12/19/2019 | 03:20 | 1.73 | 09:05 | 2.58 | 2.10 | 03:20 | 1.73 | 07:45 | 3.34 | 2.75 | 03:20 | 0.079 | 07:40 | 0.242 | 0.171 | 0.171 | |
| 12/20/2019 | 03:50 | 1.74 | 11:45 | 2.53 | 2.14 | 03:15 | 1.59 | 07:35 | 3.38 | 2.74 | 03:15 | 0.075 | 07:35 | 0.232 | 0.175 | 0.175 | 0.02 |
| 12/21/2019 | 06:35 | 1.75 | 23:25 | 2.50 | 2.11 | 04:10 | 1.80 | 12:25 | 3.37 | 2.85 | 04:10 | 0.086 | 23:15 | 0.236 | 0.178 | 0.178 | |
| 12/22/2019 | 04:20 | 1.76 | 18:55 | 2.67 | 2.13 | 04:20 | 1.65 | 17:10 | 3.50 | 2.87 | 04:20 | 0.078 | 17:10 | 0.267 | 0.183 | 0.183 | |
| 12/23/2019 | 04:50 | 1.77 | 13:30 | 2.52 | 2.13 | 04:55 | 1.63 | 09:50 | 3.42 | 2.84 | 04:55 | 0.078 | 13:20 | 0.236 | 0.179 | 0.179 | |
| 12/24/2019 | 03:55 | 1.84 | 21:00 | 2.49 | 2.14 | 03:40 | 1.84 | 17:20 | 3.43 | 2.90 | 03:40 | 0.097 | 17:20 | 0.234 | 0.184 | 0.184 | |
| 12/25/2019 | 05:30 | 1.77 | 18:45 | 2.65 | 2.12 | 04:40 | 1.78 | 11:00 | 3.37 | 2.87 | 04:40 | 0.086 | 18:45 | 0.250 | 0.180 | 0.180 | |
| 12/26/2019 | 05:05 | 1.67 | 16:40 | 2.57 | 2.09 | 04:40 | 1.58 | 11:50 | 3.43 | 2.79 | 04:40 | 0.072 | 15:30 | 0.237 | 0.173 | 0.173 | |
| 12/27/2019 | 03:40 | 1.72 | 14:15 | 2.64 | 2.13 | 03:50 | 1.64 | 12:45 | 3.32 | 2.75 | 03:50 | 0.075 | 14:15 | 0.236 | 0.173 | 0.173 | |
| 12/28/2019 | 03:30 | 1.73 | 14:30 | 2.65 | 2.15 | 04:35 | 1.57 | 12:40 | 3.36 | 2.74 | 04:35 | 0.073 | 21:55 | 0.257 | 0.177 | 0.177 | |
| 12/29/2019 | 05:25 | 1.66 | 18:25 | 2.53 | 2.09 | 03:50 | 1.50 | 20:50 | 3.35 | 2.80 | 05:10 | 0.068 | 10:45 | 0.244 | 0.174 | 0.174 | |
| 12/30/2019 | 04:00 | 1.74 | 17:05 | 2.63 | 2.12 | 04:00 | 1.55 | 11:15 | 3.31 | 2.79 | 04:00 | 0.072 | 14:50 | 0.243 | 0.176 | 0.176 | |
| 12/31/2019 | 04:45 | 1.76 | 17:05 | 2.67 | 2.13 | 03:10 | 1.61 | 18:15 | 3.36 | 2.81 | 03:10 | 0.078 | 17:05 | 0.254 | 0.178 | 0.178 | |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:20 | 1.76 22:55 | 2.55 | 2.11 | 05:55 | 1.78 10:25 | 3.38 | 2.84 | 05:55 | 0.085 22:55 | 0.235 | 0.177 | 0.177 | |
| 01/02/2020 | 03:55 | 1.72 14:45 | 2.46 | 2.12 | 03:05 | 1.59 11:55 | 3.35 | 2.77 | 03:55 | 0.074 11:55 | 0.223 | 0.175 | 0.175 | |
| 01/03/2020 | 04:40 | 1.76 21:50 | 2.59 | 2.15 | 04:45 | 1.66 07:45 | 3.26 | 2.74 | 04:45 | 0.079 17:50 | 0.241 | 0.176 | 0.176 | |
| 01/04/2020 | 05:40 | 1.67 20:40 | 2.64 | 2.11 | 03:35 | 1.57 10:35 | 3.38 | 2.78 | 03:35 | 0.073 20:40 | 0.253 | 0.175 | 0.175 | |
| 01/05/2020 | 04:20 | 1.64 11:35 | 2.33 | 2.09 | 04:20 | 1.48 14:05 | 3.39 | 2.83 | 04:20 | 0.063 11:40 | 0.236 | 0.176 | 0.176 | |
| 01/06/2020 | 03:35 | 1.68 09:20 | 2.55 | 2.08 | 03:10 | 1.38 08:20 | 3.38 | 2.73 | 03:10 | 0.062 09:20 | 0.232 | 0.169 | 0.169 | |
| 01/07/2020 | 03:40 | 1.69 06:40 | 2.51 | 2.11 | 03:45 | 1.56 21:30 | 3.38 | 2.73 | 03:45 | 0.069 17:50 | 0.225 | 0.171 | 0.171 | |
| 01/08/2020 | 04:00 | 1.61 09:00 | 2.60 | 2.12 | 03:45 | 1.67 08:00 | 3.32 | 2.71 | 03:45 | 0.069 09:00 | 0.245 | 0.172 | 0.172 | |
| 01/09/2020 | 03:20 | 1.68 23:05 | 2.55 | 2.13 | 04:25 | 1.59 08:05 | 3.36 | 2.71 | 03:20 | 0.072 07:50 | 0.252 | 0.173 | 0.173 | |
| 01/10/2020 | 01:10 | 1.85 08:10 | 2.60 | 2.18 | 03:40 | 1.81 07:35 | 3.41 | 2.77 | 03:40 | 0.094 08:10 | 0.271 | 0.181 | 0.181 | |
| 01/11/2020 | 05:15 | 1.76 17:50 | 2.64 | 2.16 | 05:10 | 1.77 11:00 | 3.49 | 2.80 | 05:10 | 0.084 11:00 | 0.252 | 0.181 | 0.181 | |
| 01/12/2020 | 04:10 | 1.67 10:45 | 3.06 | 2.12 | 02:50 | 1.61 21:20 | 3.40 | 2.82 | 05:10 | 0.076 14:50 | 0.270 | 0.179 | 0.179 | |
| 01/13/2020 | 03:50 | 1.70 09:50 | 2.56 | 2.13 | 02:10 | 1.74 07:40 | 3.35 | 2.74 | 03:45 | 0.079 09:50 | 0.250 | 0.174 | 0.174 | |
| 01/14/2020 | 02:40 | 1.72 06:45 | 2.62 | 2.13 | 02:20 | 1.71 22:15 | 3.33 | 2.72 | 02:40 | 0.082 14:25 | 0.247 | 0.173 | 0.173 | |
| 01/15/2020 | 04:15 | 1.76 22:15 | 2.81 | 2.16 | 02:40 | 1.75 07:45 | 3.40 | 2.71 | 04:30 | 0.085 22:15 | 0.285 | 0.176 | 0.176 | 0.10 |
| 01/16/2020 | 03:40 | 1.88 17:45 | 2.76 | 2.27 | 03:40 | 1.83 21:20 | 3.42 | 2.81 | 03:40 | 0.096 12:35 | 0.276 | 0.195 | 0.195 | 0.66 |
| 01/17/2020 | 01:25 | 1.90 21:40 | 2.80 | 2.28 | 03:05 | 2.03 08:00 | 3.45 | 2.83 | 03:05 | 0.114 21:40 | 0.282 | 0.197 | 0.197 | |
| 01/18/2020 | 03:40 | 1.93 00:55 | 2.69 | 2.24 | 05:10 | 2.00 11:15 | 3.42 | 2.92 | 05:10 | 0.112 00:55 | 0.263 | 0.197 | 0.197 | |
| 01/19/2020 | 03:15 | 1.81 18:50 | 2.75 | 2.17 | 02:15 | 1.83 19:25 | 3.46 | 2.90 | 02:15 | 0.095 18:50 | 0.243 | 0.188 | 0.188 | |
| 01/20/2020 | 05:40 | 1.84 13:45 | 2.69 | 2.15 | 05:00 | 1.99 17:50 | 3.37 | 2.88 | 05:00 | 0.102 13:50 | 0.245 | 0.184 | 0.184 | |
| 01/21/2020 | 03:50 | 1.76 17:35 | 2.50 | 2.15 | 02:40 | 1.78 23:50 | 3.40 | 2.77 | 03:45 | 0.088 23:50 | 0.252 | 0.178 | 0.178 | 0.01 |
| 01/22/2020 | 05:05 | 1.78 10:00 | 2.54 | 2.16 | 04:05 | 1.71 22:00 | 3.41 | 2.73 | 04:05 | 0.083 22:05 | 0.238 | 0.177 | 0.177 | 0.09 |
| 01/23/2020 | 03:50 | 1.74 09:50 | 2.56 | 2.17 | 03:55 | 1.72 07:45 | 3.35 | 2.75 | 03:55 | 0.080 12:15 | 0.244 | 0.180 | 0.180 | |
| 01/24/2020 | 03:55 | 1.71 22:35 | 2.61 | 2.17 | 03:20 | 1.58 09:00 | 3.37 | 2.79 | 03:20 | 0.073 22:35 | 0.245 | 0.181 | 0.181 | |
| 01/25/2020 | 04:10 | 1.77 19:20 | 2.59 | 2.17 | 04:00 | 1.84 13:00 | 3.33 | 2.81 | 04:00 | 0.088 23:45 | 0.239 | 0.183 | 0.183 | |
| 01/26/2020 | 04:10 | 1.67 11:05 | 2.97 | 2.13 | 04:00 | 1.64 12:25 | 3.37 | 2.85 | 04:00 | 0.073 11:05 | 0.262 | 0.182 | 0.182 | 0.16 |
| 01/27/2020 | 03:40 | 1.73 06:30 | 2.64 | 2.12 | 03:55 | 1.62 07:45 | 3.40 | 2.76 | 03:55 | 0.078 06:30 | 0.243 | 0.174 | 0.174 | |
| 01/28/2020 | 04:05 | 1.75 17:15 | 2.55 | 2.13 | 03:30 | 1.63 20:10 | 3.37 | 2.75 | 03:30 | 0.077 06:45 | 0.236 | 0.174 | 0.174 | 0.02 |
| 01/29/2020 | 03:40 | 1.68 12:55 | 2.59 | 2.17 | 03:45 | 1.74 20:00 | 3.54 | 2.79 | 03:45 | 0.078 20:15 | 0.276 | 0.184 | 0.184 | |
| 01/30/2020 | 04:15 | 1.79 18:25 | 2.56 | 2.18 | 04:15 | 1.92 20:35 | 3.37 | 2.82 | 04:15 | 0.093 07:50 | 0.251 | 0.183 | 0.183 | |
| 01/31/2020 | 03:40 | 1.73 22:10 | 2.55 | 2.13 | 02:40 | 1.60 08:25 | 3.36 | 2.70 | 03:45 | 0.074 07:50 | 0.238 | 0.172 | 0.172 | 0.01 |
| 02/01/2020 | 05:10 | 1.65 10:45 | 2.68 | 2.13 | 03:30 | 1.69 10:40 | 3.51 | 2.84 | 05:35 | 0.076 10:40 | 0.304 | 0.181 | 0.181 | |
| 02/02/2020 | 03:35 | 1.80 12:00 | 3.28 | 2.16 | 05:05 | 1.86 10:15 | 3.47 | 2.86 | 03:45 | 0.094 10:15 | 0.292 | 0.185 | 0.185 | |
| 02/03/2020 | 03:50 | 1.68 01:20 | 2.55 | 2.11 | 04:10 | 1.61 20:10 | 3.52 | 2.72 | 04:10 | 0.073 20:10 | 0.281 | 0.171 | 0.171 | |
| 02/04/2020 | 03:40 | 1.66 08:45 | 2.53 | 2.09 | 03:50 | 1.46 08:00 | 3.36 | 2.69 | 03:50 | 0.064 10:00 | 0.242 | 0.166 | 0.166 | |
| 02/05/2020 | 03:50 | 1.73 09:30 | 2.57 | 2.11 | 03:35 | 1.57 21:40 | 3.40 | 2.69 | 03:50 | 0.074 07:55 | 0.238 | 0.169 | 0.169 | |
| 02/06/2020 | 02:25 | 1.74 09:05 | 2.70 | 2.10 | 02:20 | 1.64 07:30 | 3.34 | 2.72 | 02:20 | 0.077 09:05 | 0.259 | 0.170 | 0.170 | |
| 02/07/2020 | 04:00 | 1.65 18:10 | 2.57 | 2.12 | 03:35 | 1.61 09:20 | 3.37 | 2.66 | 03:35 | 0.071 10:20 | 0.237 | 0.169 | 0.169 | |
| 02/08/2020 | 04:50 | 1.68 21:25 | 2.62 | 2.15 | 03:30 | 1.52 11:15 | 3.37 | 2.73 | 03:30 | 0.070 14:40 | 0.244 | 0.177 | 0.177 | |
| 02/09/2020 | 05:10 | 1.66 11:55 | 3.29 | 2.13 | 04:55 | 1.61 12:05 | 3.38 | 2.78 | 05:00 | 0.071 11:55 | 0.262 | 0.178 | 0.178 | |
| 02/10/2020 | 02:40 | 1.67 09:20 | 2.52 | 2.11 | 03:50 | 1.52 07:30 | 3.41 | 2.67 | 02:45 | 0.068 07:35 | 0.233 | 0.168 | 0.168 | |
| 02/11/2020 | 03:40 | 1.65 10:45 | 2.56 | 2.09 | 03:30 | 1.49 08:05 | 3.35 | 2.69 | 04:10 | 0.066 10:45 | 0.245 | 0.167 | 0.167 | |
| 02/12/2020 | 03:55 | 1.68 23:25 | 2.58 | 2.13 | 02:45 | 1.63 08:00 | 3.41 | 2.70 | 03:50 | 0.073 08:00 | 0.253 | 0.172 | 0.172 | |
| 02/13/2020 | 04:15 | 1.68 20:45 | 2.91 | 2.10 | 04:25 | 1.49 07:35 | 3.41 | 2.65 | 04:25 | 0.068 20:45 | 0.246 | 0.165 | 0.165 | |
| 02/14/2020 | 03:50 | 1.65 09:20 | 2.65 | 2.13 | 03:55 | 1.54 07:50 | 3.39 | 2.67 | 03:55 | 0.067 07:50 | 0.252 | 0.170 | 0.170 | |
| 02/15/2020 | 05:10 | 1.67 17:35 | 2.60 | 2.16 | 04:20 | 1.50 11:20 | 3.41 | 2.70 | 04:20 | 0.070 11:35 | 0.251 | 0.176 | 0.176 | |
| 02/16/2020 | 05:25 | 1.64 14:25 | 2.69 | 2.12 | 04:10 | 1.50 12:05 | 3.39 | 2.76 | 04:10 | 0.067 14:25 | 0.256 | 0.174 | 0.174 | |
| 02/17/2020 | 04:00 | 1.68 10:55 | 2.93 | 2.11 | 04:00 | 1.55 11:00 | 3.55 | 2.77 | 04:00 | 0.069 10:55 | 0.338 | 0.174 | 0.174 | |
| 02/18/2020 | 03:30 | 1.67 10:15 | 2.73 | 2.10 | 03:30 | 1.51 20:25 | 3.43 | 2.68 | 03:30 | 0.066 20:20 | 0.265 | 0.167 | 0.167 | |
| 02/19/2020 | 03:10 | 1.68 22:35 | 2.58 | 2.12 | 03:10 | 1.49 21:00 | 3.41 | 2.72 | 03:10 | 0.066 22:35 | 0.245 | 0.172 | 0.172 | |
| 02/20/2020 | 03:50 | 1.67 18:50 | 2.59 | 2.09 | 03:55 | 1.50 08:00 | 3.29 | 2.64 | 03:55 | 0.066 18:50 | 0.232 | 0.163 | 0.163 | |
| 02/21/2020 | 03:40 | 1.68 17:55 | 2.58 | 2.09 | 02:45 | 1.53 09:45 | 3.35 | 2.67 | 03:50 | 0.070 20:45 | 0.236 | 0.165 | 0.165 | |
| 02/22/2020 | 04:20 | 1.68 13:25 | 2.55 | 2.08 | 03:30 | 1.54 10:05 | 3.41 | 2.75 | 04:20 | 0.071 11:35 | 0.228 | 0.169 | 0.169 | |
| 02/23/2020 | 04:40 | 1.66 10:05 | 3.26 | 2.12 | 04:15 | 1.56 21:45 | 3.40 | 2.81 | 04:20 | 0.069 10:05 | 0.263 | 0.178 | 0.178 | |
| 02/24/2020 | 03:30 | 1.65 06:35 | 2.55 | 2.08 | 03:25 | 1.27 07:30 | 3.39 | 2.66 | 03:25 | 0.055 07:55 | 0.235 | 0.164 | 0.164 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 04:00 | 1.65 | 13:55 | 2.53 | 2.10 | 02:25 | 1.50 | 07:30 | 3.39 | 2.68 | 02:25 | 0.066 | 07:50 | 0.233 | 0.167 | 0.167 | |
| 02/26/2020 | 02:55 | 1.62 | 18:30 | 2.58 | 2.11 | 03:00 | 1.40 | 07:35 | 3.39 | 2.66 | 03:00 | 0.060 | 07:50 | 0.248 | 0.167 | 0.167 | |
| 02/27/2020 | 04:30 | 1.72 | 07:50 | 2.87 | 2.10 | 03:45 | 1.46 | 07:50 | 3.55 | 2.68 | 03:45 | 0.067 | 07:50 | 0.339 | 0.168 | 0.168 | |
| 02/28/2020 | 03:50 | 1.61 | 23:00 | 2.56 | 2.10 | 03:55 | 1.24 | 08:10 | 3.34 | 2.65 | 03:55 | 0.052 | 07:50 | 0.234 | 0.166 | 0.166 | |
| 02/29/2020 | 04:05 | 1.68 | 23:25 | 2.54 | 2.09 | 05:30 | 1.48 | 12:05 | 3.35 | 2.79 | 05:30 | 0.069 | 22:45 | 0.237 | 0.173 | 0.173 | |
| 03/01/2020 | 05:30 | 1.69 | 10:25 | 3.29 | 2.10 | 05:25 | 1.52 | 10:20 | 3.39 | 2.80 | 05:25 | 0.068 | 10:25 | 0.285 | 0.176 | 0.176 | |
| 03/02/2020 | 03:40 | 1.72 | 13:20 | 2.49 | 2.11 | 02:50 | 1.48 | 08:10 | 3.41 | 2.72 | 03:55 | 0.068 | 07:50 | 0.260 | 0.171 | 0.171 | 0.01 |
| 03/03/2020 | 02:50 | 1.66 | 06:40 | 2.58 | 2.08 | 03:00 | 1.46 | 21:20 | 3.47 | 2.66 | 03:00 | 0.064 | 21:20 | 0.279 | 0.164 | 0.164 | |
| 03/04/2020 | 03:35 | 1.61 | 09:55 | 2.50 | 2.13 | 03:35 | 1.42 | 08:05 | 3.39 | 2.68 | 03:35 | 0.059 | 07:55 | 0.238 | 0.171 | 0.171 | |
| 03/05/2020 | 03:30 | 1.69 | 17:45 | 2.73 | 2.08 | 03:15 | 1.50 | 07:55 | 3.36 | 2.70 | 03:30 | 0.068 | 17:45 | 0.246 | 0.166 | 0.166 | |
| 03/06/2020 | 03:35 | 1.62 | 09:45 | 2.70 | 2.08 | 04:05 | 1.49 | 09:45 | 3.62 | 2.70 | 04:05 | 0.064 | 09:45 | 0.317 | 0.167 | 0.167 | |
| 03/07/2020 | 03:05 | 1.67 | 12:50 | 2.74 | 2.12 | 05:05 | 1.46 | 12:05 | 3.42 | 2.86 | 05:05 | 0.065 | 12:50 | 0.259 | 0.182 | 0.182 | 0.58 |
| 03/08/2020 | 04:05 | 1.65 | 10:30 | 3.13 | 2.11 | 04:45 | 1.68 | 09:50 | 3.43 | 2.86 | 04:45 | 0.075 | 10:30 | 0.345 | 0.181 | 0.181 | 0.02 |
| 03/09/2020 | 02:50 | 1.70 | 12:05 | 2.58 | 2.09 | 02:30 | 1.56 | 21:15 | 3.37 | 2.78 | 02:30 | 0.073 | 19:45 | 0.235 | 0.172 | 0.172 | 0.11 |

## Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 20.139 | 5.26 |
| Avg | 2.12 | 2.77 | 0.175 | |

## Site Commentary

### Site Information

| MIL_2491 | |
|---|---|
| Pipe Dimensions | 15 |
| Silt Level | 0.00" |

### Overview

Site MIL_2491 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location. Due to a meter malfunction, data confidence is less than typical from January 28, 2020 through February 22, 2020. A data gap also occurs February 23, 2020 through March 2, 2020.

This location was installed upstream of site MIL_2569 and downstream of the combined flows of sites MIL_0386 and MIL_2840. A review of balancing with the combined flows of MIL_0386 and MIL_2840 into MIL_0649 and MIL_2491 shows a net flow between the sites of 0.426 MGD.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 2.34 | 2.36 | 0.216 |
| Minimum | 1.07 | 0.37 | 0.010 |
| Maximum | 4.18 | 3.84 | 0.682 |
| Time of Minimum | 1/3/2020 9:55 PM | 3/8/2020 3:05 AM | 3/8/2020 3:05 AM |
| Time of Maximum | 1/17/2020 1:15 PM | 11/21/2019 9:30 AM | 11/21/2019 9:30 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 91 |
| Velocity (ft/s) | 91 |
| Quantity (MGD) | 91 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_2491

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | N Milpitas Blvd and E Calaveras Blvd, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Drive | Latitude: | 37.433991 | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.900388 | 15.0" x 15.0" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 2491 | Residential/Commercial |
| Access | Traffic |
| Drive | Heavy |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Wednesday, November 13, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 9:04:37 AM | 15.0" x 15.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 3.25" | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 3.74 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

Good flow, Moderate depth and velocity

## Manhole / Pipe Information:

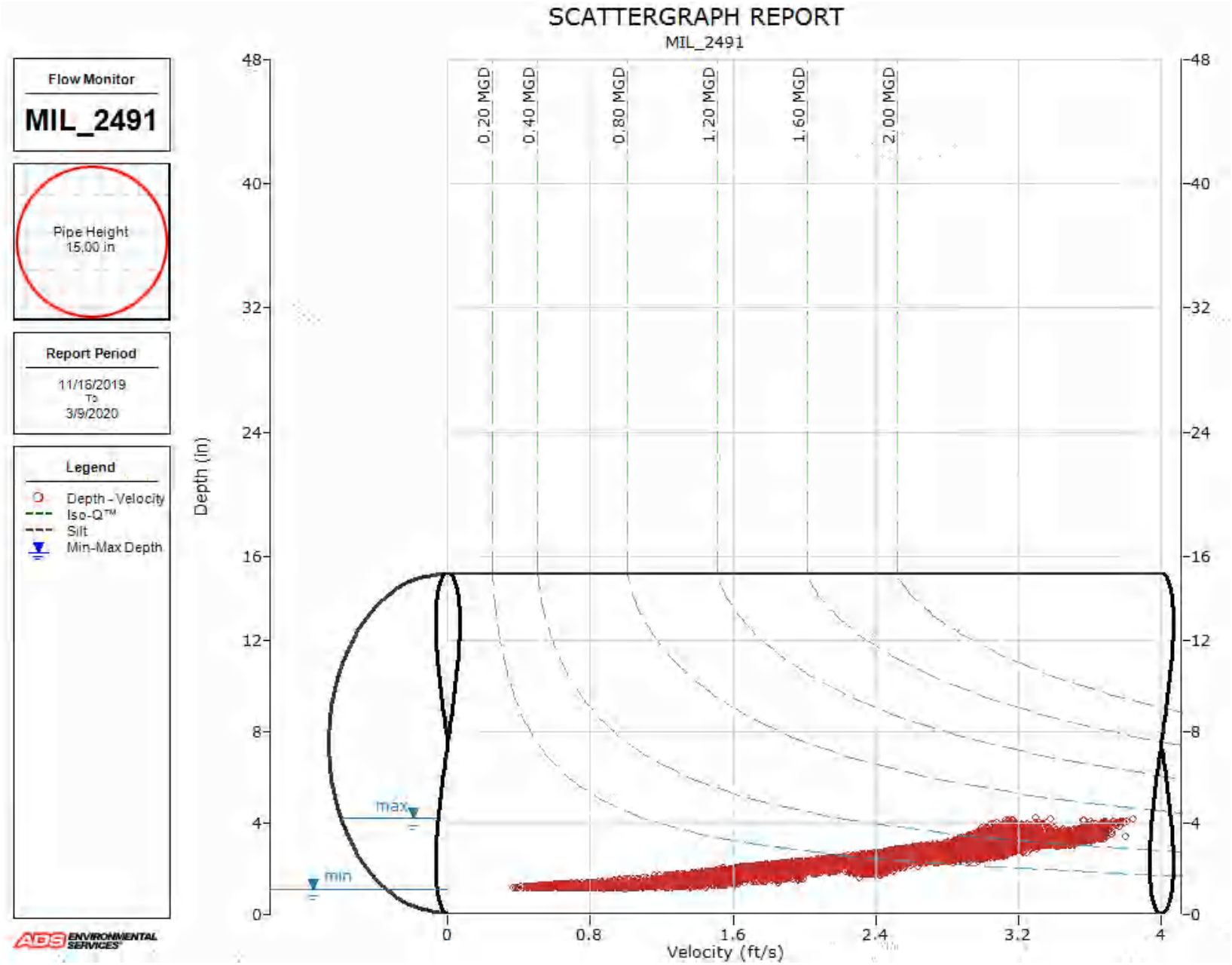
| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 10' | Single |
| Manhole Material: | Manhole Condition: |
| Vitrified Clay Pipe | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |

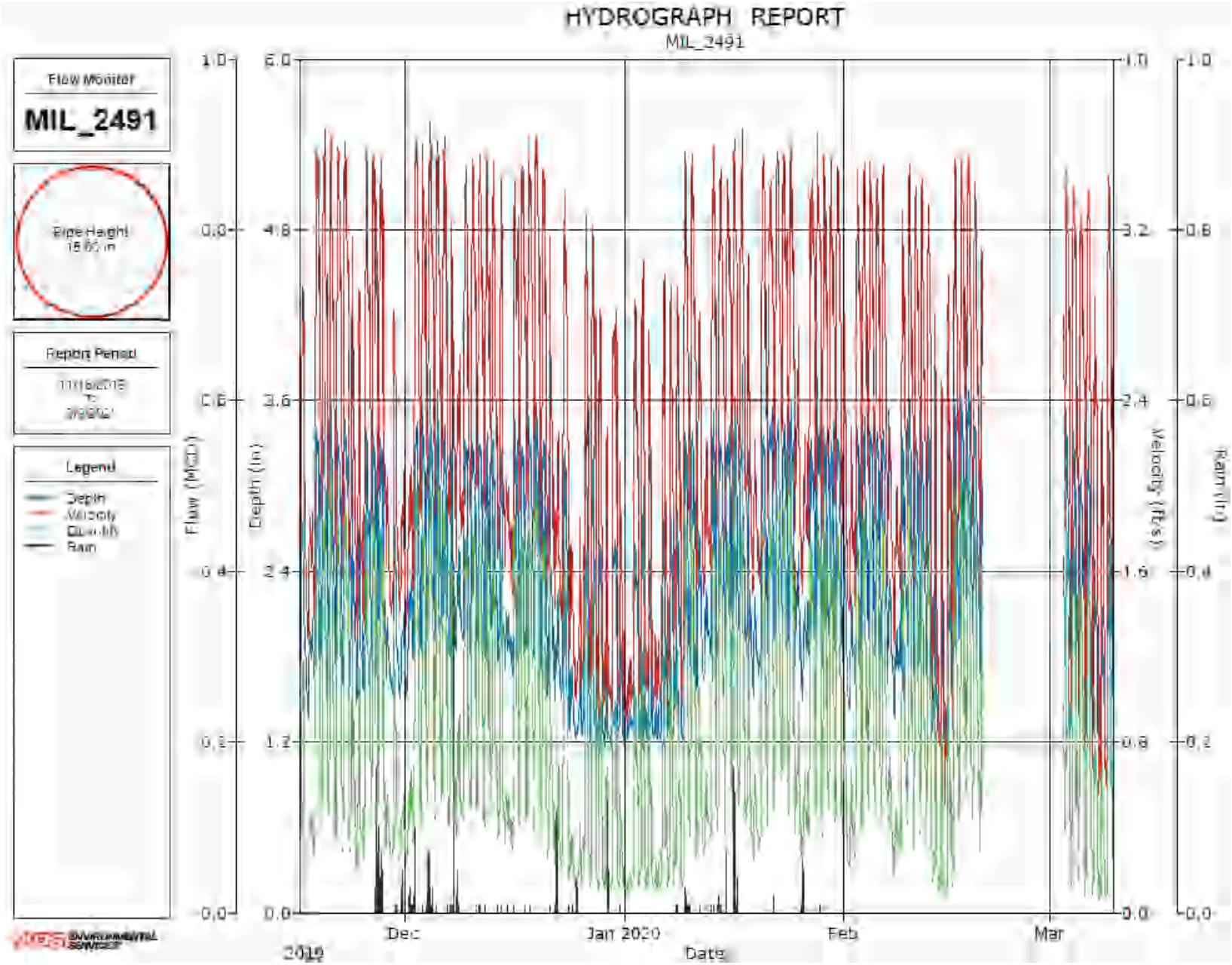
## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |


SCATTERGRAPH REPORT
MIL_2491
Flow Monitor
MIL_2491
Pipe Height
15.00 in
Report Period
11/16/2019
To
3/9/2020
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.20 MGD
0.40 MGD
0.80 MGD
1.20 MGD
1.60 MGD
2.00 MGD
Depth (in)
Velocity (ft/s)
max
min
0
0.8
1.6
2.4
3.2
4
8
12
16
24
32
40
48


HYDROGRAPH REPORT
MIL_2491
Flow Monitor
MIL_2491
Pipe Height
Report Period
Legend
Depth
Velocity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
1.0
0.8
0.6
0.4
0.2
0.0
6.0
4.8
3.6
2.4
1.2
0.0
3.2
2.4
1.6
0.8
0.0
Dec
Jan 2020
Feb
Mar
2019
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2491, Pipe Height: 15.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 23:25 | 1.71 | 12:20 | 3.63 | 2.11 | 22:35 | 1.41 | 12:20 | 3.30 | 2.11 | 22:35 | 0.071 | 12:20 | 0.488 | 0.153 | 0.153 | |
| 11/17/2019 | 06:30 | 1.33 | 19:25 | 2.32 | 1.75 | 07:55 | 1.17 | 19:30 | 2.22 | 1.60 | 06:20 | 0.042 | 19:25 | 0.171 | 0.085 | 0.085 | |
| 11/18/2019 | 00:45 | 1.57 | 14:50 | 3.97 | 2.72 | 01:00 | 1.25 | 13:25 | 3.72 | 2.77 | 00:45 | 0.056 | 13:25 | 0.582 | 0.300 | 0.300 | |
| 11/19/2019 | 04:45 | 1.76 | 15:30 | 3.93 | 2.76 | 04:55 | 1.72 | 15:45 | 3.72 | 2.88 | 04:55 | 0.092 | 15:30 | 0.615 | 0.308 | 0.308 | |
| 11/20/2019 | 03:25 | 1.82 | 12:20 | 3.94 | 2.66 | 03:05 | 1.81 | 12:20 | 3.72 | 2.75 | 03:25 | 0.100 | 12:20 | 0.618 | 0.280 | 0.280 | |
| 11/21/2019 | 04:10 | 1.68 | 09:30 | 4.13 | 2.70 | 03:00 | 1.60 | 09:30 | 3.84 | 2.81 | 04:15 | 0.080 | 09:30 | 0.682 | 0.295 | 0.295 | |
| 11/22/2019 | 04:30 | 1.58 | 11:30 | 3.91 | 2.79 | 04:20 | 1.52 | 11:30 | 3.69 | 2.88 | 04:20 | 0.069 | 11:30 | 0.607 | 0.315 | 0.315 | |
| 11/23/2019 | 05:00 | 1.55 | 12:05 | 3.76 | 2.14 | 04:55 | 1.47 | 12:00 | 3.41 | 2.15 | 04:55 | 0.064 | 12:05 | 0.504 | 0.159 | 0.159 | |
| 11/24/2019 | 03:20 | 1.44 | 09:30 | 3.57 | 1.98 | 05:30 | 1.05 | 11:15 | 3.21 | 1.89 | 05:30 | 0.044 | 09:30 | 0.452 | 0.128 | 0.128 | |
| 11/25/2019 | 02:00 | 1.51 | 16:45 | 3.74 | 2.58 | 02:20 | 1.12 | 12:40 | 3.63 | 2.65 | 02:05 | 0.047 | 12:25 | 0.519 | 0.268 | 0.268 | |
| 11/26/2019 | 04:10 | 1.75 | 13:35 | 3.61 | 2.75 | 05:10 | 1.58 | 13:10 | 3.68 | 2.89 | 05:10 | 0.085 | 13:35 | 0.493 | 0.306 | 0.306 | 0.36 |
| 11/27/2019 | 03:10 | 1.92 | 10:20 | 3.75 | 2.79 | 02:55 | 1.76 | 13:55 | 3.60 | 2.86 | 02:00 | 0.107 | 21:05 | 0.502 | 0.307 | 0.307 | 0.63 |
| 11/28/2019 | 20:05 | 1.59 | 02:50 | 2.32 | 1.86 | 22:45 | 1.22 | 00:00 | 2.34 | 1.77 | 20:00 | 0.058 | 09:20 | 0.177 | 0.102 | 0.102 | |
| 11/29/2019 | 04:15 | 1.50 | 09:10 | 3.87 | 2.01 | 05:55 | 1.28 | 14:05 | 3.35 | 1.98 | 04:25 | 0.057 | 09:10 | 0.524 | 0.137 | 0.137 | 0.02 |
| 11/30/2019 | 06:20 | 1.46 | 17:25 | 2.26 | 1.79 | 06:25 | 1.30 | 17:35 | 2.35 | 1.68 | 06:25 | 0.052 | 17:25 | 0.172 | 0.091 | 0.091 | 0.10 |
| 12/01/2019 | 06:00 | 1.49 | 21:25 | 2.54 | 1.94 | 04:15 | 1.25 | 21:40 | 2.62 | 1.73 | 04:15 | 0.054 | 21:40 | 0.223 | 0.107 | 0.107 | 0.06 |
| 12/02/2019 | 04:10 | 1.74 | 08:30 | 3.62 | 2.77 | 04:10 | 1.39 | 15:20 | 3.68 | 2.79 | 04:10 | 0.071 | 13:20 | 0.513 | 0.308 | 0.308 | 0.30 |
| 12/03/2019 | 04:05 | 1.79 | 10:00 | 4.05 | 2.75 | 04:10 | 1.82 | 09:55 | 3.69 | 2.80 | 04:05 | 0.097 | 10:00 | 0.636 | 0.298 | 0.298 | 0.01 |
| 12/04/2019 | 01:45 | 1.87 | 12:05 | 4.04 | 2.92 | 03:20 | 1.84 | 12:05 | 3.81 | 2.97 | 02:00 | 0.109 | 12:05 | 0.656 | 0.341 | 0.341 | 0.39 |
| 12/05/2019 | 03:25 | 1.88 | 14:30 | 4.04 | 2.82 | 03:10 | 1.72 | 13:25 | 3.80 | 2.92 | 03:10 | 0.102 | 14:30 | 0.643 | 0.318 | 0.318 | 0.01 |
| 12/06/2019 | 05:00 | 1.87 | 14:45 | 3.76 | 2.73 | 01:15 | 1.90 | 12:30 | 3.69 | 2.84 | 05:00 | 0.111 | 14:45 | 0.524 | 0.295 | 0.295 | 0.01 |
| 12/07/2019 | 06:00 | 1.76 | 11:35 | 3.72 | 2.35 | 05:45 | 1.74 | 12:15 | 3.51 | 2.39 | 05:45 | 0.091 | 11:35 | 0.508 | 0.200 | 0.200 | 0.67 |
| 12/08/2019 | 03:50 | 1.82 | 07:40 | 3.31 | 2.11 | 05:30 | 1.48 | 07:35 | 3.16 | 2.05 | 05:30 | 0.082 | 07:40 | 0.410 | 0.143 | 0.143 | 0.20 |
| 12/09/2019 | 04:20 | 1.82 | 17:05 | 3.83 | 2.69 | 01:10 | 1.53 | 13:30 | 3.58 | 2.79 | 04:15 | 0.086 | 17:05 | 0.507 | 0.288 | 0.288 | |
| 12/10/2019 | 04:55 | 1.78 | 09:20 | 3.94 | 2.70 | 05:10 | 1.80 | 14:40 | 3.63 | 2.81 | 05:10 | 0.096 | 09:20 | 0.540 | 0.291 | 0.291 | |
| 12/11/2019 | 04:15 | 1.87 | 09:40 | 3.85 | 2.74 | 02:40 | 1.88 | 13:10 | 3.63 | 2.85 | 03:55 | 0.109 | 14:20 | 0.532 | 0.298 | 0.298 | 0.03 |
| 12/12/2019 | 04:20 | 1.77 | 17:05 | 3.81 | 2.72 | 04:10 | 1.84 | 12:30 | 3.65 | 2.85 | 04:20 | 0.097 | 17:05 | 0.518 | 0.295 | 0.295 | 0.01 |
| 12/13/2019 | 01:40 | 1.92 | 12:55 | 3.75 | 2.57 | 23:50 | 1.89 | 12:25 | 3.57 | 2.66 | 01:40 | 0.119 | 12:55 | 0.515 | 0.254 | 0.254 | 0.01 |
| 12/14/2019 | 03:05 | 1.74 | 15:20 | 3.69 | 2.30 | 02:05 | 1.49 | 14:05 | 3.51 | 2.31 | 02:05 | 0.079 | 15:20 | 0.510 | 0.194 | 0.194 | 0.01 |
| 12/15/2019 | 06:15 | 1.61 | 11:30 | 2.25 | 1.93 | 23:45 | 1.46 | 06:35 | 2.29 | 1.85 | 03:10 | 0.071 | 11:35 | 0.160 | 0.111 | 0.111 | 0.01 |
| 12/16/2019 | 03:40 | 1.64 | 14:00 | 4.10 | 2.75 | 04:05 | 1.32 | 10:05 | 3.58 | 2.69 | 04:05 | 0.065 | 14:00 | 0.556 | 0.294 | 0.294 | 0.01 |
| 12/17/2019 | 05:10 | 1.75 | 09:40 | 3.65 | 2.74 | 05:10 | 1.78 | 15:35 | 3.59 | 2.86 | 05:10 | 0.092 | 16:45 | 0.470 | 0.303 | 0.303 | 0.01 |
| 12/18/2019 | 04:05 | 1.68 | 09:05 | 3.72 | 2.82 | 03:40 | 1.66 | 11:15 | 3.71 | 2.96 | 04:05 | 0.084 | 11:15 | 0.551 | 0.323 | 0.323 | 0.01 |
| 12/19/2019 | 03:35 | 1.77 | 18:35 | 3.79 | 2.84 | 04:25 | 1.78 | 10:15 | 3.70 | 2.96 | 04:25 | 0.094 | 13:10 | 0.561 | 0.328 | 0.328 | |
| 12/20/2019 | 04:55 | 1.63 | 15:50 | 3.84 | 2.69 | 04:30 | 1.60 | 10:20 | 3.58 | 2.80 | 05:00 | 0.076 | 15:50 | 0.538 | 0.287 | 0.287 | |
| 12/21/2019 | 04:20 | 1.50 | 11:15 | 3.82 | 2.15 | 04:25 | 1.44 | 11:20 | 3.32 | 2.16 | 04:25 | 0.060 | 11:15 | 0.514 | 0.166 | 0.166 | 0.01 |
| 12/22/2019 | 03:15 | 1.44 | 14:30 | 2.50 | 1.77 | 03:05 | 1.35 | 14:30 | 2.49 | 1.72 | 03:30 | 0.053 | 14:30 | 0.217 | 0.093 | 0.093 | 0.41 |
| 12/23/2019 | 01:05 | 1.40 | 16:20 | 3.71 | 2.47 | 01:20 | 1.23 | 09:50 | 3.52 | 2.50 | 01:20 | 0.046 | 16:20 | 0.493 | 0.238 | 0.238 | |
| 12/24/2019 | 22:40 | 1.25 | 00:00 | 2.57 | 1.49 | 20:20 | 1.03 | 00:00 | 2.53 | 1.43 | 23:50 | 0.033 | 00:00 | 0.229 | 0.061 | 0.061 | 0.02 |
| 12/25/2019 | 01:30 | 1.18 | 16:00 | 1.98 | 1.36 | 01:25 | 0.90 | 15:45 | 1.99 | 1.23 | 01:30 | 0.027 | 16:00 | 0.123 | 0.046 | 0.046 | 0.08 |
| 12/26/2019 | 02:05 | 1.17 | 15:20 | 3.72 | 2.27 | 03:40 | 1.01 | 13:15 | 3.39 | 2.24 | 02:15 | 0.031 | 14:40 | 0.486 | 0.199 | 0.199 | |
| 12/27/2019 | 02:50 | 1.16 | 09:50 | 3.66 | 2.23 | 02:50 | 1.03 | 10:55 | 3.53 | 2.29 | 02:50 | 0.029 | 13:50 | 0.494 | 0.197 | 0.197 | |
| 12/28/2019 | 03:55 | 1.10 | 12:05 | 2.92 | 1.73 | 06:35 | 0.82 | 13:00 | 3.05 | 1.73 | 06:35 | 0.022 | 13:00 | 0.318 | 0.109 | 0.109 | |
| 12/29/2019 | 03:20 | 1.10 | 11:40 | 2.73 | 1.41 | 01:45 | 0.78 | 09:15 | 2.79 | 1.29 | 01:45 | 0.022 | 11:40 | 0.252 | 0.056 | 0.056 | 0.22 |
| 12/30/2019 | 01:00 | 1.08 | 08:30 | 2.93 | 2.03 | 00:55 | 0.80 | 17:40 | 3.05 | 2.06 | 00:55 | 0.021 | 17:40 | 0.328 | 0.152 | 0.152 | |
| 12/31/2019 | 21:30 | 1.11 | 08:40 | 2.26 | 1.48 | 18:05 | 0.82 | 08:45 | 2.32 | 1.35 | 18:05 | 0.023 | 08:45 | 0.170 | 0.059 | 0.059 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 14:05 | 1.14 16:35 | 1.68 | 1.30 | 07:05 | 0.86 16:35 | 1.55 | 1.03 | 14:05 | 0.026 16:35 | 0.076 | 0.035 | 0.035 | |
| 01/02/2020 | 23:30 | 1.23 07:30 | 3.51 | 2.01 | 23:35 | 0.95 07:30 | 3.29 | 2.01 | 23:35 | 0.030 07:30 | 0.465 | 0.146 | 0.146 | |
| 01/03/2020 | 21:55 | 1.07 15:10 | 3.39 | 1.92 | 00:30 | 0.89 15:10 | 3.16 | 1.90 | 21:55 | 0.025 15:10 | 0.425 | 0.139 | 0.139 | |
| 01/04/2020 | 19:50 | 1.14 12:35 | 2.84 | 1.64 | 05:55 | 0.83 11:00 | 2.94 | 1.55 | 05:55 | 0.025 12:35 | 0.282 | 0.087 | 0.087 | |
| 01/05/2020 | 11:50 | 1.11 17:35 | 2.14 | 1.29 | 11:55 | 0.75 17:35 | 2.21 | 1.07 | 11:50 | 0.020 17:35 | 0.153 | 0.037 | 0.037 | |
| 01/06/2020 | 00:05 | 1.22 13:05 | 3.31 | 1.93 | 00:00 | 0.89 13:05 | 3.14 | 1.90 | 00:00 | 0.027 13:05 | 0.408 | 0.134 | 0.134 | |
| 01/07/2020 | 23:45 | 1.13 14:30 | 2.99 | 1.92 | 01:05 | 0.87 12:30 | 3.02 | 1.92 | 01:05 | 0.027 12:35 | 0.323 | 0.133 | 0.133 | |
| 01/08/2020 | 04:25 | 1.12 08:35 | 3.04 | 2.01 | 04:30 | 0.98 08:35 | 3.16 | 2.04 | 04:30 | 0.026 08:35 | 0.364 | 0.143 | 0.143 | 0.02 |
| 01/09/2020 | 02:05 | 1.09 10:45 | 4.03 | 2.41 | 05:05 | 0.86 10:45 | 3.69 | 2.42 | 02:05 | 0.023 10:45 | 0.633 | 0.245 | 0.245 | 0.18 |
| 01/10/2020 | 05:05 | 1.72 16:00 | 3.89 | 2.68 | 02:30 | 1.66 14:05 | 3.62 | 2.76 | 05:05 | 0.085 16:00 | 0.538 | 0.287 | 0.287 | 0.02 |
| 01/11/2020 | 06:05 | 1.53 13:50 | 3.23 | 2.09 | 06:05 | 1.43 17:45 | 2.96 | 2.12 | 06:05 | 0.061 13:50 | 0.371 | 0.151 | 0.151 | 0.01 |
| 01/12/2020 | 03:40 | 1.62 14:05 | 2.39 | 1.94 | 03:30 | 1.16 14:15 | 2.38 | 1.80 | 03:30 | 0.055 14:05 | 0.193 | 0.110 | 0.110 | |
| 01/13/2020 | 04:30 | 1.72 14:50 | 3.86 | 2.68 | 03:10 | 1.50 12:55 | 3.66 | 2.71 | 04:25 | 0.079 13:05 | 0.535 | 0.282 | 0.282 | 0.02 |
| 01/14/2020 | 04:50 | 1.74 08:25 | 3.94 | 2.70 | 04:50 | 1.68 12:50 | 3.55 | 2.75 | 04:50 | 0.086 08:25 | 0.555 | 0.287 | 0.287 | 0.11 |
| 01/15/2020 | 04:15 | 1.73 10:30 | 4.01 | 2.80 | 03:45 | 1.67 12:10 | 3.54 | 2.84 | 04:20 | 0.087 10:30 | 0.542 | 0.306 | 0.306 | 0.07 |
| 01/16/2020 | 04:20 | 1.75 14:00 | 4.00 | 2.84 | 04:05 | 1.78 14:00 | 3.75 | 2.93 | 04:20 | 0.093 14:00 | 0.637 | 0.323 | 0.323 | 0.66 |
| 01/17/2020 | 04:40 | 1.89 13:15 | 4.18 | 2.77 | 05:00 | 1.92 15:00 | 3.74 | 2.84 | 04:45 | 0.113 15:00 | 0.629 | 0.301 | 0.301 | |
| 01/18/2020 | 07:25 | 1.68 12:40 | 3.38 | 2.18 | 22:15 | 1.53 12:40 | 3.17 | 2.23 | 22:15 | 0.083 12:40 | 0.425 | 0.169 | 0.169 | |
| 01/19/2020 | 04:50 | 1.46 08:55 | 2.39 | 1.81 | 19:55 | 1.43 08:55 | 2.42 | 1.78 | 04:50 | 0.057 08:55 | 0.197 | 0.099 | 0.099 | |
| 01/20/2020 | 00:40 | 1.63 11:00 | 3.70 | 2.64 | 03:15 | 1.37 14:55 | 3.58 | 2.68 | 00:55 | 0.068 12:30 | 0.495 | 0.279 | 0.279 | |
| 01/21/2020 | 04:00 | 1.75 17:20 | 3.99 | 2.91 | 04:00 | 1.78 12:40 | 3.60 | 2.89 | 04:00 | 0.092 17:20 | 0.562 | 0.327 | 0.327 | |
| 01/22/2020 | 04:15 | 1.84 09:25 | 3.87 | 2.87 | 04:05 | 1.92 12:50 | 3.62 | 2.93 | 04:15 | 0.108 09:25 | 0.516 | 0.327 | 0.327 | 0.03 |
| 01/23/2020 | 04:10 | 1.94 13:15 | 3.75 | 2.92 | 04:10 | 1.92 08:55 | 3.61 | 2.96 | 04:10 | 0.116 15:05 | 0.503 | 0.333 | 0.333 | |
| 01/24/2020 | 04:50 | 1.88 19:00 | 4.11 | 2.81 | 02:45 | 1.90 11:05 | 3.72 | 2.87 | 04:45 | 0.112 11:05 | 0.594 | 0.313 | 0.313 | |
| 01/25/2020 | 23:15 | 1.66 14:00 | 2.76 | 2.07 | 23:15 | 1.50 11:10 | 2.95 | 2.12 | 23:15 | 0.072 11:10 | 0.287 | 0.145 | 0.145 | |
| 01/26/2020 | 03:20 | 1.42 19:10 | 2.70 | 1.88 | 02:30 | 1.32 08:15 | 2.91 | 1.84 | 03:20 | 0.054 08:15 | 0.270 | 0.108 | 0.108 | 0.16 |
| 01/27/2020 | 22:35 | 1.84 08:50 | 3.78 | 2.76 | 01:25 | 1.81 14:40 | 3.55 | 2.89 | 01:15 | 0.105 08:50 | 0.495 | 0.305 | 0.305 | |
| 01/28/2020 | 22:55 | 1.70 05:15 | 3.83 | 2.81 | 23:35 | 1.69 05:10 | 3.76 | 2.85 | 22:55 | 0.086 05:10 | 0.599 | 0.315 | 0.315 | 0.01 |
| 01/29/2020 | 21:05 | 1.84 10:25 | 3.82 | 2.69 | 21:10 | 1.88 03:25 | 3.61 | 2.80 | 21:05 | 0.105 03:25 | 0.505 | 0.285 | 0.285 | |
| 01/30/2020 | 18:25 | 1.78 05:50 | 3.87 | 2.76 | 18:00 | 1.82 03:20 | 3.69 | 2.84 | 18:25 | 0.097 05:50 | 0.529 | 0.299 | 0.299 | |
| 01/31/2020 | 17:50 | 1.67 02:45 | 3.90 | 2.67 | 17:40 | 1.68 03:05 | 3.59 | 2.72 | 17:50 | 0.082 02:45 | 0.528 | 0.280 | 0.280 | |
| 02/01/2020 | 14:55 | 1.39 03:30 | 2.78 | 1.84 | 15:00 | 1.35 03:30 | 2.96 | 1.85 | 15:00 | 0.050 03:30 | 0.300 | 0.111 | 0.111 | |
| 02/02/2020 | 13:00 | 1.58 19:45 | 3.71 | 2.24 | 12:55 | 1.21 23:15 | 3.53 | 2.20 | 12:55 | 0.055 19:45 | 0.490 | 0.189 | 0.189 | |
| 02/03/2020 | 13:05 | 1.73 20:15 | 3.73 | 2.77 | 12:55 | 1.73 21:15 | 3.62 | 2.82 | 13:00 | 0.089 21:45 | 0.524 | 0.302 | 0.302 | |
| 02/04/2020 | 11:10 | 1.85 21:40 | 3.65 | 2.80 | 11:05 | 1.88 16:10 | 3.58 | 2.88 | 11:10 | 0.106 21:40 | 0.490 | 0.307 | 0.307 | |
| 02/05/2020 | 09:25 | 1.75 17:00 | 3.82 | 2.75 | 09:25 | 1.73 17:35 | 3.68 | 2.83 | 09:25 | 0.089 17:35 | 0.584 | 0.297 | 0.297 | |
| 02/06/2020 | 04:50 | 1.73 14:50 | 3.81 | 2.76 | 04:25 | 1.73 13:10 | 3.57 | 2.79 | 04:50 | 0.088 14:50 | 0.505 | 0.295 | 0.295 | |
| 02/07/2020 | 03:25 | 1.55 11:00 | 2.68 | 1.94 | 22:55 | 1.23 10:40 | 2.47 | 1.88 | 22:55 | 0.053 10:55 | 0.234 | 0.117 | 0.117 | |
| 02/08/2020 | 01:15 | 1.34 11:15 | 2.26 | 1.75 | 02:40 | 1.16 11:15 | 2.26 | 1.65 | 03:55 | 0.041 11:15 | 0.170 | 0.087 | 0.087 | |
| 02/09/2020 | 01:55 | 1.65 10:10 | 3.64 | 2.50 | 00:15 | 1.46 04:30 | 3.36 | 2.45 | 01:55 | 0.069 10:10 | 0.456 | 0.230 | 0.230 | |
| 02/10/2020 | 20:35 | 1.62 08:05 | 4.14 | 2.71 | 20:55 | 1.44 06:30 | 3.58 | 2.70 | 21:00 | 0.067 08:05 | 0.603 | 0.284 | 0.284 | |
| 02/11/2020 | 16:45 | 1.70 02:50 | 4.00 | 2.80 | 15:55 | 1.56 02:00 | 3.54 | 2.78 | 16:45 | 0.085 02:50 | 0.537 | 0.304 | 0.304 | |
| 02/12/2020 | 16:20 | 1.57 22:00 | 4.10 | 2.62 | 16:15 | 1.53 00:10 | 3.50 | 2.62 | 16:25 | 0.068 22:00 | 0.553 | 0.262 | 0.262 | |
| 02/13/2020 | 12:25 | 1.15 01:50 | 3.91 | 2.17 | 13:10 | 0.81 00:00 | 3.39 | 2.13 | 12:45 | 0.026 01:50 | 0.522 | 0.180 | 0.180 | |
| 02/14/2020 | 16:20 | 1.13 21:40 | 2.89 | 1.67 | 16:15 | 0.43 19:25 | 2.77 | 1.48 | 16:15 | 0.012 21:40 | 0.280 | 0.088 | 0.088 | |
| 02/15/2020 | 06:00 | 1.12 18:00 | 4.07 | 1.79 | 06:00 | 0.39 16:35 | 3.16 | 1.56 | 06:00 | 0.010 18:00 | 0.544 | 0.110 | 0.110 | |
| 02/16/2020 | 04:35 | 1.20 16:25 | 4.09 | 2.40 | 04:35 | 0.51 16:35 | 3.61 | 2.32 | 04:35 | 0.015 16:35 | 0.625 | 0.231 | 0.231 | |
| 02/17/2020 | 08:15 | 1.83 12:40 | 3.85 | 2.79 | 06:30 | 1.64 14:00 | 3.57 | 2.74 | 08:05 | 0.098 14:05 | 0.546 | 0.301 | 0.301 | |
| 02/18/2020 | 06:55 | 1.93 19:20 | 4.01 | 2.96 | 06:55 | 1.69 14:35 | 3.60 | 2.90 | 06:55 | 0.101 14:30 | 0.563 | 0.336 | 0.336 | |
| 02/19/2020 | 02:05 | 1.89 13:00 | 3.83 | 2.69 | 01:50 | 1.62 11:00 | 3.52 | 2.62 | 01:50 | 0.100 16:55 | 0.514 | 0.271 | 0.271 | |
| 02/20/2020 | 06:05 | 1.60 10:40 | 3.78 | 2.43 | 04:35 | 1.19 12:40 | 3.43 | 2.35 | 04:35 | 0.057 12:40 | 0.498 | 0.214 | 0.137 | |
| 02/21/2020 | | | | | | | | | | | | | | |
| 02/22/2020 | | | | | | | | | | | | | | |
| 02/23/2020 | | | | | | | | | | | | | | |
| 02/24/2020 | | | | | | | | | | | | | | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | | | | | | | | | | | | | | | | | |
| 02/26/2020 | | | | | | | | | | | | | | | | | |
| 02/27/2020 | | | | | | | | | | | | | | | | | |
| 02/28/2020 | | | | | | | | | | | | | | | | | |
| 02/29/2020 | | | | | | | | | | | | | | | | | |
| 03/01/2020 | | | | | | | | | | | | | | | | | |
| 03/02/2020 | | | | | | | | | | | | | | | | | |
| 03/03/2020 | 23:50 | 1.45 | 10:00 | 3.65 | 2.56 | 05:05 | 1.01 | 10:00 | 3.56 | 2.80 | 23:50 | 0.040 | 10:00 | 0.530 | 0.270 | 0.238 | |
| 03/04/2020 | 04:35 | 1.16 | 09:00 | 3.60 | 2.44 | 04:35 | 0.50 | 11:50 | 3.52 | 2.56 | 04:35 | 0.014 | 09:00 | 0.511 | 0.247 | 0.247 | |
| 03/05/2020 | 04:35 | 1.32 | 08:30 | 3.42 | 2.40 | 04:40 | 0.72 | 08:40 | 3.49 | 2.63 | 04:40 | 0.025 | 08:30 | 0.474 | 0.234 | 0.234 | |
| 03/06/2020 | 04:15 | 1.11 | 15:35 | 3.39 | 2.23 | 03:40 | 0.50 | 15:20 | 3.43 | 2.43 | 03:40 | 0.015 | 15:35 | 0.461 | 0.212 | 0.212 | |
| 03/07/2020 | 03:35 | 1.10 | 11:25 | 2.98 | 1.68 | 03:55 | 0.48 | 11:25 | 3.31 | 1.81 | 01:05 | 0.013 | 11:25 | 0.370 | 0.105 | 0.105 | |
| 03/08/2020 | 05:15 | 1.11 | 11:45 | 2.77 | 1.50 | 03:05 | 0.37 | 13:40 | 3.09 | 1.40 | 03:05 | 0.010 | 11:45 | 0.303 | 0.072 | 0.072 | |
| 03/09/2020 | 03:50 | 1.17 | 12:00 | 3.55 | 2.19 | 02:30 | 0.45 | 13:25 | 3.53 | 2.30 | 02:30 | 0.013 | 12:00 | 0.503 | 0.205 | 0.205 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 22.365 | 4.90 |
| Avg | 2.34 | 2.36 | 0.216 | |

## Site Commentary

### Site Information

| MIL_2569 | |
|---|---|
| Pipe Dimensions | 21 |
| Silt Level | 0.00" |

### Overview

Site MIL_2569 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited a small response to the wet weather events of November 26, 2019 - November 27, 2019 and December 7, 2019 - December 8, 2019. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed downstream of site MIL_2491. A check of balancing shows a net flow of 0.225 MGD between the sites.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 6.43 | 1.05 | 0.441 |
| Minimum | 4.32 | 0.45 | 0.121 |
| Maximum | 9.03 | 1.68 | 0.966 |
| Time of Minimum | 11/16/2019 5:00 AM | 2/18/2020 3:50 AM | 2/18/2020 3:50 AM |
| Time of Maximum | 12/23/2019 3:10 PM | 12/4/2019 12:25 PM | 12/23/2019 3:10 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

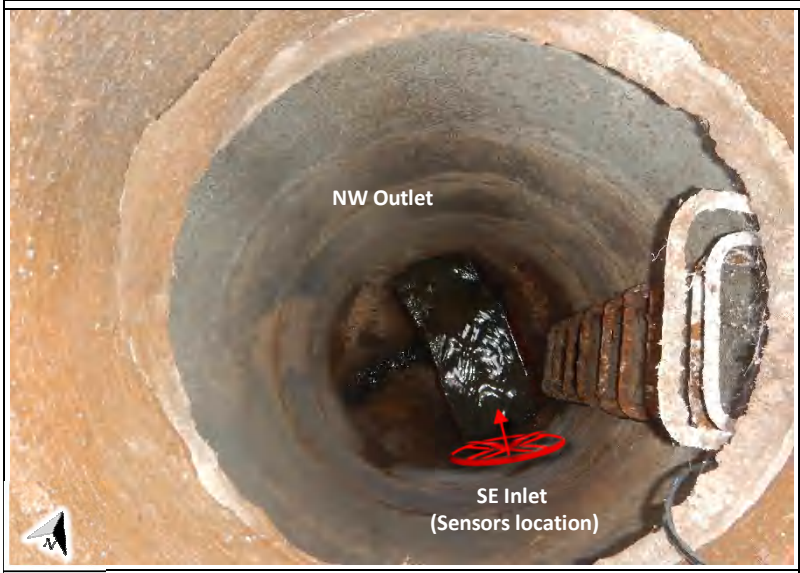
ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_2569

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | Milipitas Blvd and Tramway Dr | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Drive | Latitude: | 37.440801 | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.9044 | 21.0" x 21.0" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 2569 | Residential/Commercial |
| Access | Traffic |
| Drive | Medium |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Wednesday, November 13, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 8:15:00 AM | 21.0" x 21.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 7.5" | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.26 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

Smooth good flow, Medium depth and velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 10' | Single |
| Manhole Material: | Manhole Condition: |
| Vitrified Clay Pipe | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |

# SCATTERGRAPH REPORT

MIL_2569

**Flow Monitor**

**MIL_2569**

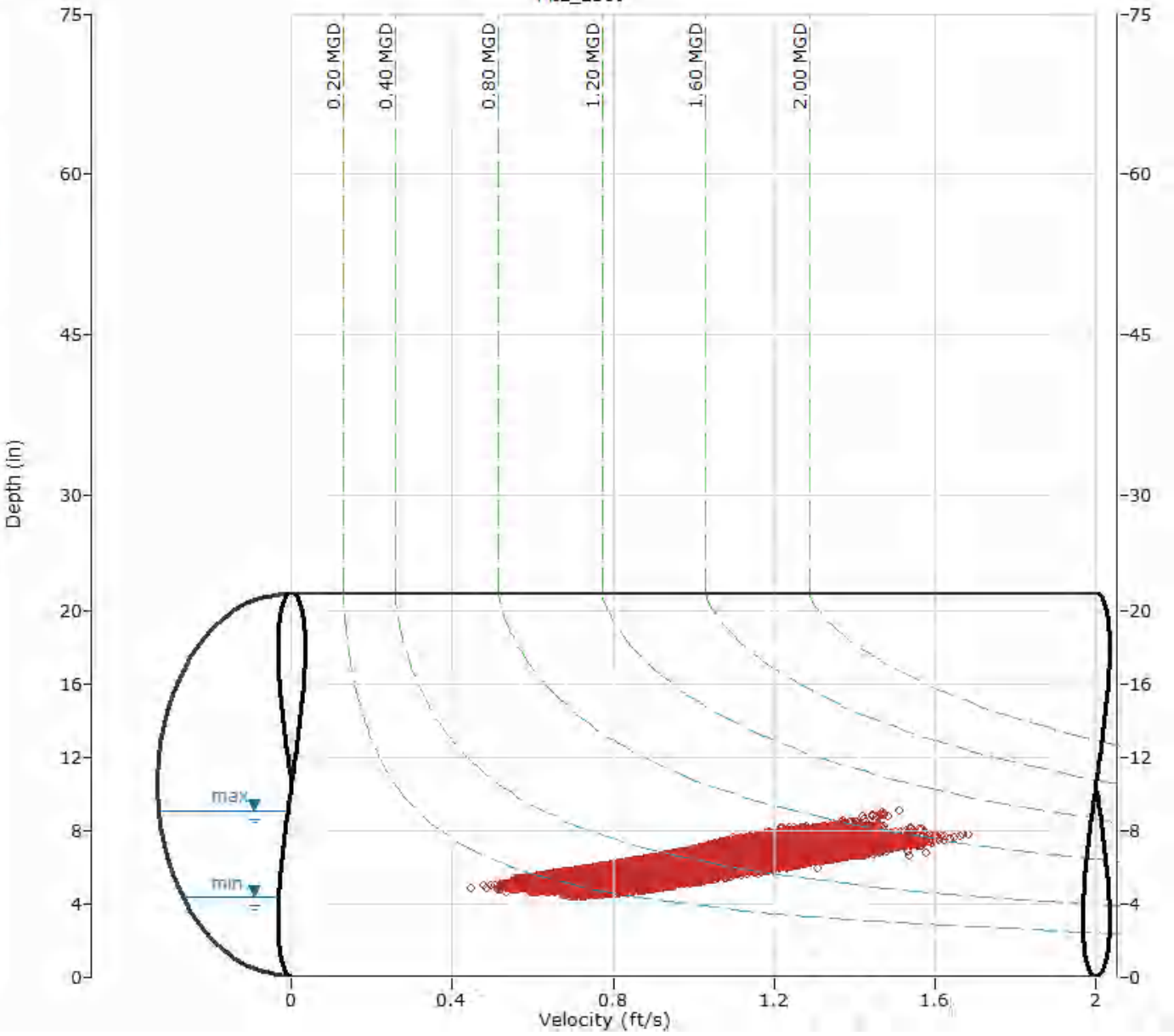
Pipe Height
21.00 in

**Report Period**

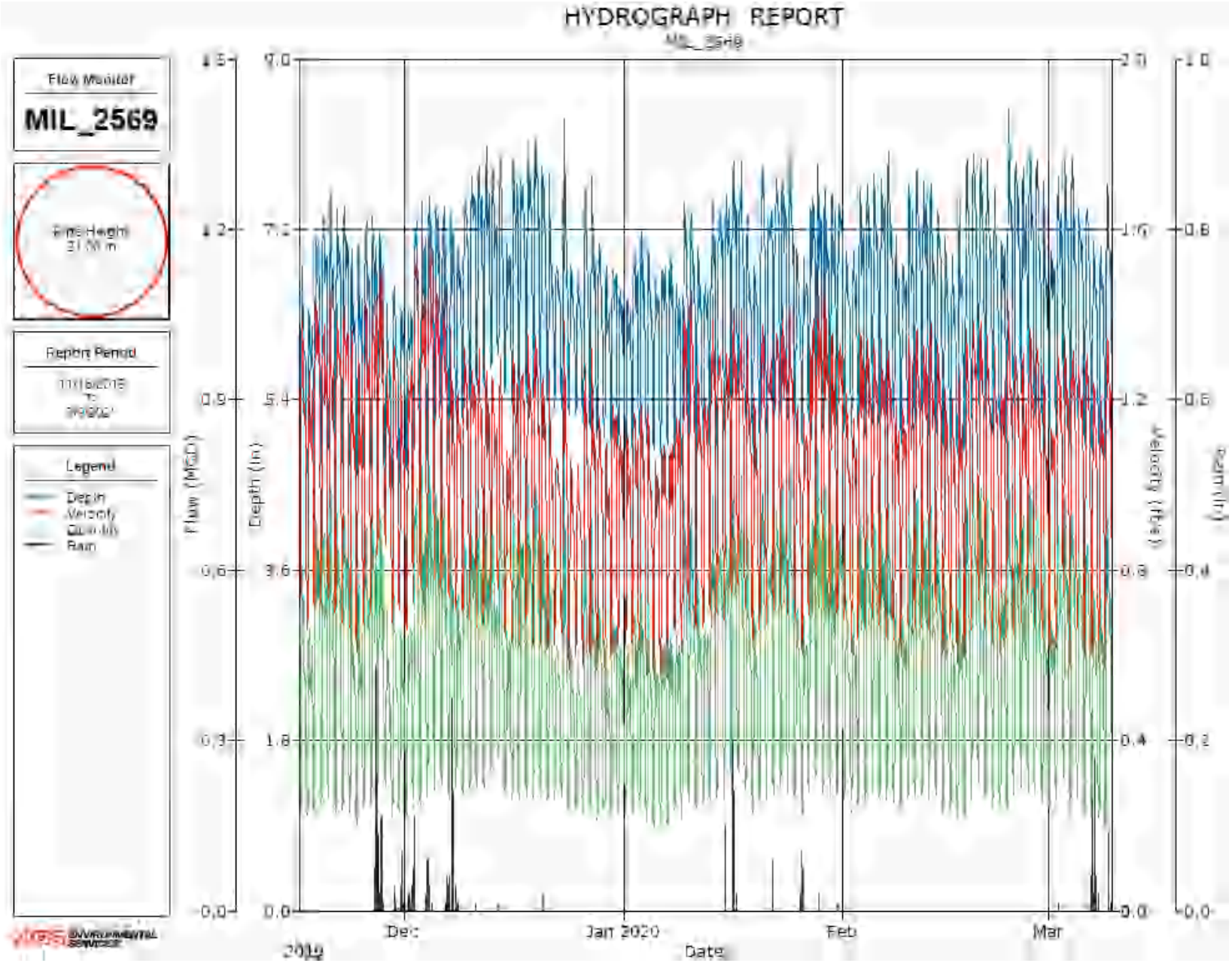
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_2569
Flow Monitor
MIL_2569
Pipe Height
Report Period
Legend
Depth
Velocity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
Dec
Jan 2020
Feb
Mar
2019
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2569, Pipe Height: 21.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 05:00 | 4.32 | 11:20 | 6.92 | 5.69 | 04:50 | 0.70 | 11:10 | 1.42 | 1.10 | 05:00 | 0.161 | 11:20 | 0.631 | 0.389 | 0.389 | |
| 11/17/2019 | 03:40 | 4.61 | 09:30 | 6.49 | 5.63 | 03:20 | 0.61 | 10:50 | 1.29 | 1.02 | 03:20 | 0.153 | 10:50 | 0.507 | 0.352 | 0.352 | |
| 11/18/2019 | 03:55 | 4.38 | 10:30 | 7.50 | 6.21 | 02:55 | 0.67 | 10:35 | 1.55 | 1.18 | 03:15 | 0.163 | 10:30 | 0.773 | 0.475 | 0.475 | |
| 11/19/2019 | 05:20 | 4.71 | 16:05 | 7.66 | 6.46 | 03:50 | 0.69 | 16:00 | 1.50 | 1.15 | 03:50 | 0.183 | 16:00 | 0.771 | 0.488 | 0.488 | |
| 11/20/2019 | 04:45 | 4.82 | 10:05 | 7.76 | 6.34 | 03:45 | 0.71 | 12:35 | 1.49 | 1.13 | 03:45 | 0.194 | 10:05 | 0.780 | 0.465 | 0.465 | |
| 11/21/2019 | 04:50 | 4.70 | 09:50 | 7.82 | 6.35 | 04:15 | 0.64 | 09:50 | 1.52 | 1.15 | 04:15 | 0.167 | 09:50 | 0.801 | 0.475 | 0.475 | |
| 11/22/2019 | 05:00 | 4.71 | 20:45 | 7.96 | 6.47 | 04:05 | 0.67 | 20:50 | 1.57 | 1.17 | 04:00 | 0.175 | 20:50 | 0.845 | 0.499 | 0.499 | |
| 11/23/2019 | 05:10 | 4.67 | 12:25 | 7.10 | 5.94 | 05:25 | 0.64 | 12:50 | 1.41 | 1.04 | 05:25 | 0.166 | 12:50 | 0.654 | 0.388 | 0.388 | |
| 11/24/2019 | 05:15 | 4.57 | 10:00 | 7.10 | 5.89 | 05:15 | 0.60 | 09:55 | 1.34 | 1.00 | 05:15 | 0.149 | 09:55 | 0.619 | 0.372 | 0.372 | |
| 11/25/2019 | 04:15 | 4.66 | 12:45 | 7.48 | 6.21 | 04:55 | 0.66 | 12:45 | 1.51 | 1.13 | 04:55 | 0.171 | 12:45 | 0.749 | 0.454 | 0.454 | |
| 11/26/2019 | 05:25 | 4.60 | 09:55 | 7.59 | 6.31 | 04:15 | 0.67 | 09:40 | 1.54 | 1.19 | 05:30 | 0.174 | 09:45 | 0.772 | 0.486 | 0.486 | 0.63 |
| 11/27/2019 | 03:30 | 4.60 | 09:15 | 7.38 | 6.17 | 03:20 | 0.81 | 10:10 | 1.57 | 1.26 | 03:20 | 0.205 | 10:15 | 0.759 | 0.497 | 0.497 | 0.77 |
| 11/28/2019 | 05:45 | 4.53 | 12:00 | 6.44 | 5.53 | 05:40 | 0.83 | 11:40 | 1.33 | 1.07 | 05:40 | 0.206 | 12:40 | 0.535 | 0.357 | 0.357 | |
| 11/29/2019 | 04:50 | 4.40 | 14:25 | 6.80 | 5.65 | 03:50 | 0.54 | 14:25 | 1.38 | 1.05 | 03:50 | 0.133 | 14:25 | 0.602 | 0.365 | 0.365 | 0.05 |
| 11/30/2019 | 04:55 | 4.48 | 12:00 | 6.43 | 5.60 | 03:50 | 0.68 | 11:40 | 1.26 | 1.00 | 03:50 | 0.166 | 11:40 | 0.506 | 0.341 | 0.341 | 0.14 |
| 12/01/2019 | 05:55 | 4.61 | 21:55 | 6.45 | 5.70 | 05:40 | 0.63 | 22:05 | 1.32 | 1.04 | 05:45 | 0.159 | 22:00 | 0.533 | 0.366 | 0.366 | 0.06 |
| 12/02/2019 | 04:50 | 4.50 | 17:20 | 7.33 | 6.29 | 02:00 | 0.67 | 17:00 | 1.59 | 1.27 | 02:00 | 0.178 | 17:05 | 0.763 | 0.521 | 0.521 | 0.36 |
| 12/03/2019 | 04:40 | 4.46 | 10:15 | 7.67 | 6.20 | 04:40 | 0.73 | 10:05 | 1.62 | 1.23 | 04:40 | 0.177 | 10:05 | 0.833 | 0.494 | 0.494 | |
| 12/04/2019 | 03:05 | 4.74 | 12:25 | 7.74 | 6.49 | 03:05 | 0.74 | 12:25 | 1.68 | 1.27 | 03:05 | 0.195 | 12:25 | 0.875 | 0.541 | 0.541 | 0.44 |
| 12/05/2019 | 04:30 | 4.83 | 14:55 | 7.78 | 6.51 | 04:25 | 0.76 | 14:50 | 1.56 | 1.23 | 04:25 | 0.205 | 14:50 | 0.814 | 0.521 | 0.521 | |
| 12/06/2019 | 05:35 | 4.97 | 12:55 | 7.57 | 6.44 | 03:00 | 0.69 | 12:55 | 1.52 | 1.18 | 05:35 | 0.209 | 12:55 | 0.765 | 0.493 | 0.493 | 0.06 |
| 12/07/2019 | 05:00 | 4.77 | 12:45 | 7.47 | 6.32 | 05:10 | 0.73 | 12:15 | 1.39 | 1.07 | 05:05 | 0.193 | 12:05 | 0.689 | 0.437 | 0.437 | 0.84 |
| 12/08/2019 | 05:15 | 5.27 | 11:30 | 7.07 | 6.33 | 06:00 | 0.66 | 11:10 | 1.23 | 1.01 | 06:00 | 0.202 | 11:10 | 0.562 | 0.410 | 0.410 | 0.10 |
| 12/09/2019 | 05:00 | 5.12 | 09:35 | 7.65 | 6.72 | 04:55 | 0.68 | 09:30 | 1.42 | 1.09 | 04:55 | 0.200 | 09:35 | 0.715 | 0.484 | 0.484 | |
| 12/10/2019 | 05:10 | 5.36 | 12:25 | 7.85 | 6.92 | 04:25 | 0.67 | 14:50 | 1.32 | 1.07 | 04:30 | 0.210 | 12:20 | 0.696 | 0.493 | 0.493 | 0.01 |
| 12/11/2019 | 03:30 | 5.52 | 11:10 | 7.96 | 7.00 | 03:15 | 0.65 | 13:35 | 1.33 | 1.06 | 03:15 | 0.213 | 13:35 | 0.715 | 0.495 | 0.495 | |
| 12/12/2019 | 04:55 | 5.50 | 12:55 | 8.11 | 7.06 | 05:10 | 0.64 | 12:55 | 1.33 | 1.05 | 05:10 | 0.209 | 12:55 | 0.735 | 0.496 | 0.496 | |
| 12/13/2019 | 05:10 | 5.63 | 12:40 | 7.99 | 6.96 | 05:10 | 0.67 | 12:40 | 1.33 | 1.05 | 05:10 | 0.226 | 12:40 | 0.720 | 0.482 | 0.482 | |
| 12/14/2019 | 05:25 | 5.84 | 13:35 | 8.06 | 6.87 | 04:30 | 0.73 | 11:05 | 1.34 | 1.03 | 04:30 | 0.260 | 13:40 | 0.728 | 0.464 | 0.464 | 0.01 |
| 12/15/2019 | 03:40 | 5.41 | 11:10 | 7.12 | 6.43 | 03:40 | 0.62 | 23:00 | 1.12 | 0.92 | 03:40 | 0.196 | 11:15 | 0.520 | 0.377 | 0.377 | |
| 12/16/2019 | 03:45 | 5.31 | 08:40 | 8.39 | 6.92 | 03:35 | 0.58 | 08:35 | 1.40 | 1.04 | 03:35 | 0.179 | 08:35 | 0.813 | 0.485 | 0.485 | |
| 12/17/2019 | 04:55 | 5.37 | 08:25 | 7.95 | 6.97 | 03:35 | 0.59 | 17:05 | 1.32 | 1.07 | 03:35 | 0.184 | 08:25 | 0.713 | 0.499 | 0.499 | |
| 12/18/2019 | 04:45 | 5.30 | 11:35 | 8.30 | 7.09 | 04:50 | 0.63 | 10:20 | 1.38 | 1.08 | 04:50 | 0.194 | 11:40 | 0.782 | 0.518 | 0.518 | |
| 12/19/2019 | 05:05 | 5.36 | 10:55 | 8.32 | 7.13 | 05:10 | 0.58 | 13:35 | 1.38 | 1.09 | 05:10 | 0.182 | 10:55 | 0.790 | 0.527 | 0.527 | |
| 12/20/2019 | 05:00 | 5.32 | 09:00 | 8.01 | 6.98 | 05:30 | 0.60 | 14:45 | 1.33 | 1.05 | 05:05 | 0.187 | 14:45 | 0.712 | 0.487 | 0.487 | 0.02 |
| 12/21/2019 | 03:45 | 5.31 | 10:00 | 7.85 | 6.51 | 03:50 | 0.57 | 11:35 | 1.29 | 0.95 | 03:50 | 0.175 | 10:05 | 0.685 | 0.403 | 0.403 | |
| 12/22/2019 | 04:30 | 5.28 | 11:05 | 6.97 | 6.26 | 04:45 | 0.61 | 11:05 | 1.12 | 0.91 | 04:45 | 0.189 | 11:05 | 0.503 | 0.360 | 0.360 | |
| 12/23/2019 | 05:20 | 5.29 | 15:10 | 9.03 | 6.68 | 05:55 | 0.64 | 15:10 | 1.51 | 1.00 | 05:55 | 0.196 | 15:10 | 0.966 | 0.446 | 0.446 | |
| 12/24/2019 | 05:05 | 5.20 | 12:10 | 6.85 | 6.18 | 05:00 | 0.55 | 12:50 | 1.17 | 0.86 | 05:00 | 0.165 | 12:50 | 0.514 | 0.334 | 0.334 | |
| 12/25/2019 | 05:00 | 5.23 | 12:15 | 6.85 | 6.09 | 04:45 | 0.55 | 11:25 | 1.09 | 0.85 | 04:45 | 0.169 | 11:25 | 0.475 | 0.324 | 0.324 | |
| 12/26/2019 | 03:50 | 5.12 | 13:40 | 7.71 | 6.51 | 03:40 | 0.55 | 13:35 | 1.33 | 0.97 | 03:40 | 0.162 | 13:35 | 0.685 | 0.416 | 0.416 | |
| 12/27/2019 | 04:55 | 5.06 | 11:15 | 7.87 | 6.45 | 05:00 | 0.57 | 11:15 | 1.35 | 0.97 | 05:00 | 0.164 | 11:15 | 0.720 | 0.411 | 0.411 | |
| 12/28/2019 | 05:20 | 4.97 | 11:10 | 7.25 | 6.18 | 04:50 | 0.55 | 11:35 | 1.30 | 0.91 | 04:50 | 0.156 | 11:35 | 0.584 | 0.361 | 0.361 | |
| 12/29/2019 | 05:20 | 4.96 | 11:35 | 6.86 | 5.94 | 05:15 | 0.56 | 09:50 | 1.12 | 0.87 | 05:15 | 0.156 | 11:05 | 0.490 | 0.321 | 0.321 | |
| 12/30/2019 | 03:40 | 4.93 | 19:10 | 6.92 | 6.13 | 03:25 | 0.57 | 19:05 | 1.26 | 0.97 | 03:25 | 0.160 | 19:05 | 0.561 | 0.381 | 0.381 | |
| 12/31/2019 | 05:25 | 4.91 | 11:00 | 6.59 | 5.90 | 04:50 | 0.60 | 10:55 | 1.13 | 0.92 | 05:15 | 0.168 | 11:00 | 0.473 | 0.337 | 0.337 | |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:25 | 4.85 12:15 | 6.51 | 5.83 | 05:55 | 0.60 12:15 | 1.14 | 0.91 | 05:55 | 0.163 12:15 | 0.467 | 0.328 | 0.328 | |
| 01/02/2020 | 04:45 | 4.83 10:40 | 7.01 | 6.17 | 03:45 | 0.60 10:35 | 1.21 | 0.96 | 03:45 | 0.165 10:35 | 0.549 | 0.380 | 0.380 | |
| 01/03/2020 | 04:45 | 4.99 12:40 | 7.24 | 6.21 | 02:50 | 0.58 12:40 | 1.24 | 0.94 | 02:50 | 0.169 12:40 | 0.587 | 0.375 | 0.375 | |
| 01/04/2020 | 05:05 | 4.88 11:50 | 7.28 | 6.06 | 05:20 | 0.52 11:50 | 1.21 | 0.88 | 05:20 | 0.143 11:50 | 0.579 | 0.339 | 0.339 | |
| 01/05/2020 | 05:25 | 4.84 11:05 | 6.79 | 6.00 | 05:15 | 0.52 12:00 | 1.08 | 0.86 | 05:15 | 0.142 11:05 | 0.468 | 0.325 | 0.325 | |
| 01/06/2020 | 04:50 | 4.79 12:40 | 7.01 | 6.15 | 04:00 | 0.49 10:35 | 1.16 | 0.91 | 04:00 | 0.131 12:45 | 0.522 | 0.357 | 0.357 | |
| 01/07/2020 | 03:20 | 4.90 12:55 | 7.03 | 6.17 | 05:25 | 0.51 12:55 | 1.13 | 0.90 | 05:25 | 0.143 12:55 | 0.518 | 0.356 | 0.356 | |
| 01/08/2020 | 04:45 | 4.67 10:55 | 6.68 | 5.90 | 04:45 | 0.63 12:50 | 1.20 | 0.98 | 04:45 | 0.163 10:55 | 0.508 | 0.361 | 0.361 | |
| 01/09/2020 | 04:40 | 4.67 11:10 | 7.79 | 6.39 | 03:45 | 0.59 11:10 | 1.49 | 1.10 | 03:45 | 0.153 11:10 | 0.783 | 0.467 | 0.467 | |
| 01/10/2020 | 04:40 | 4.82 13:10 | 7.44 | 6.39 | 03:20 | 0.68 13:15 | 1.48 | 1.15 | 03:20 | 0.185 13:15 | 0.728 | 0.479 | 0.479 | |
| 01/11/2020 | 05:20 | 4.76 11:15 | 7.15 | 6.08 | 03:50 | 0.64 11:15 | 1.36 | 1.02 | 05:30 | 0.172 11:15 | 0.635 | 0.393 | 0.393 | |
| 01/12/2020 | 05:30 | 4.94 11:35 | 6.70 | 5.99 | 05:10 | 0.65 11:30 | 1.22 | 1.00 | 05:35 | 0.181 11:35 | 0.518 | 0.374 | 0.374 | |
| 01/13/2020 | 03:30 | 4.84 13:25 | 7.66 | 6.42 | 03:20 | 0.68 13:35 | 1.49 | 1.13 | 03:25 | 0.185 13:35 | 0.760 | 0.474 | 0.474 | |
| 01/14/2020 | 04:40 | 4.87 13:25 | 7.50 | 6.52 | 02:15 | 0.68 08:55 | 1.36 | 1.10 | 04:40 | 0.189 13:20 | 0.670 | 0.470 | 0.470 | |
| 01/15/2020 | 04:40 | 5.06 12:15 | 7.69 | 6.74 | 04:15 | 0.67 12:25 | 1.35 | 1.10 | 04:15 | 0.194 12:25 | 0.691 | 0.489 | 0.489 | 0.10 |
| 01/16/2020 | 04:45 | 5.08 14:15 | 8.22 | 6.88 | 04:40 | 0.68 14:10 | 1.47 | 1.14 | 04:40 | 0.198 14:10 | 0.825 | 0.524 | 0.524 | 0.66 |
| 01/17/2020 | 05:10 | 5.35 15:20 | 8.19 | 6.79 | 05:10 | 0.74 15:25 | 1.45 | 1.12 | 05:10 | 0.231 15:20 | 0.815 | 0.499 | 0.499 | |
| 01/18/2020 | 04:35 | 5.14 13:00 | 7.56 | 6.34 | 03:35 | 0.69 13:00 | 1.44 | 1.04 | 04:35 | 0.204 13:00 | 0.725 | 0.424 | 0.424 | |
| 01/19/2020 | 05:20 | 4.89 10:30 | 6.86 | 6.07 | 05:20 | 0.60 10:25 | 1.25 | 0.95 | 05:20 | 0.166 10:25 | 0.551 | 0.366 | 0.366 | |
| 01/20/2020 | 05:20 | 5.01 12:45 | 8.10 | 6.72 | 03:45 | 0.60 15:00 | 1.40 | 1.09 | 03:45 | 0.172 12:45 | 0.770 | 0.491 | 0.491 | |
| 01/21/2020 | 04:15 | 5.06 21:55 | 7.60 | 6.73 | 04:05 | 0.66 21:45 | 1.36 | 1.11 | 04:05 | 0.190 21:55 | 0.690 | 0.492 | 0.492 | 0.01 |
| 01/22/2020 | 04:40 | 5.18 12:55 | 7.81 | 6.85 | 04:35 | 0.67 17:15 | 1.39 | 1.14 | 04:35 | 0.199 13:05 | 0.721 | 0.521 | 0.521 | 0.09 |
| 01/23/2020 | 04:40 | 5.16 09:15 | 8.02 | 6.84 | 04:40 | 0.70 19:25 | 1.47 | 1.15 | 04:40 | 0.207 09:15 | 0.797 | 0.522 | 0.522 | |
| 01/24/2020 | 04:45 | 5.14 11:20 | 8.24 | 6.83 | 05:05 | 0.68 11:10 | 1.47 | 1.13 | 05:05 | 0.201 11:20 | 0.829 | 0.515 | 0.515 | |
| 01/25/2020 | 03:40 | 5.15 11:55 | 7.03 | 6.21 | 03:45 | 0.66 12:40 | 1.20 | 0.97 | 03:45 | 0.194 11:50 | 0.543 | 0.383 | 0.383 | |
| 01/26/2020 | 05:35 | 4.90 11:05 | 7.06 | 6.11 | 05:30 | 0.59 10:45 | 1.28 | 0.95 | 05:30 | 0.161 11:05 | 0.584 | 0.369 | 0.369 | 0.16 |
| 01/27/2020 | 03:00 | 5.12 18:35 | 7.84 | 6.67 | 02:10 | 0.66 18:40 | 1.46 | 1.13 | 02:55 | 0.202 18:35 | 0.758 | 0.500 | 0.500 | |
| 01/28/2020 | 04:05 | 5.19 10:15 | 8.02 | 6.70 | 03:50 | 0.77 10:30 | 1.58 | 1.20 | 03:55 | 0.230 10:15 | 0.856 | 0.531 | 0.531 | 0.02 |
| 01/29/2020 | 04:55 | 5.04 10:00 | 7.69 | 6.52 | 04:35 | 0.71 10:00 | 1.51 | 1.16 | 04:50 | 0.203 10:00 | 0.780 | 0.493 | 0.493 | |
| 01/30/2020 | 04:45 | 4.95 11:30 | 7.66 | 6.59 | 02:45 | 0.66 10:30 | 1.38 | 1.12 | 02:45 | 0.190 10:30 | 0.700 | 0.483 | 0.483 | |
| 01/31/2020 | 03:30 | 5.12 12:50 | 7.71 | 6.69 | 03:30 | 0.68 12:40 | 1.41 | 1.13 | 03:30 | 0.200 12:45 | 0.730 | 0.497 | 0.497 | 0.01 |
| 02/01/2020 | 04:10 | 5.04 11:40 | 7.11 | 6.22 | 03:45 | 0.66 11:35 | 1.30 | 0.99 | 03:45 | 0.191 11:35 | 0.600 | 0.390 | 0.390 | |
| 02/02/2020 | 05:20 | 4.98 12:50 | 7.10 | 6.15 | 05:15 | 0.59 12:35 | 1.19 | 0.93 | 05:15 | 0.167 12:50 | 0.550 | 0.364 | 0.364 | |
| 02/03/2020 | 04:45 | 5.09 10:35 | 7.73 | 6.60 | 03:35 | 0.62 11:20 | 1.43 | 1.09 | 03:35 | 0.181 10:40 | 0.715 | 0.476 | 0.476 | |
| 02/04/2020 | 04:50 | 5.00 13:30 | 7.77 | 6.64 | 03:15 | 0.62 13:20 | 1.39 | 1.09 | 03:15 | 0.177 13:25 | 0.724 | 0.478 | 0.478 | |
| 02/05/2020 | 04:45 | 5.10 09:50 | 7.91 | 6.75 | 04:45 | 0.67 10:00 | 1.38 | 1.11 | 04:45 | 0.196 10:00 | 0.737 | 0.495 | 0.495 | |
| 02/06/2020 | 04:40 | 5.09 11:30 | 8.02 | 6.79 | 05:20 | 0.65 11:25 | 1.45 | 1.09 | 04:40 | 0.188 11:30 | 0.784 | 0.493 | 0.493 | |
| 02/07/2020 | 03:30 | 5.20 11:15 | 8.10 | 6.83 | 03:10 | 0.62 08:45 | 1.37 | 1.08 | 03:10 | 0.187 11:10 | 0.757 | 0.490 | 0.490 | |
| 02/08/2020 | 03:45 | 5.18 11:35 | 7.37 | 6.24 | 04:25 | 0.58 11:35 | 1.26 | 0.97 | 04:25 | 0.174 11:35 | 0.612 | 0.382 | 0.382 | |
| 02/09/2020 | 05:40 | 4.90 11:05 | 6.87 | 6.12 | 05:45 | 0.58 13:55 | 1.20 | 0.97 | 05:45 | 0.161 11:25 | 0.526 | 0.376 | 0.376 | |
| 02/10/2020 | 03:55 | 5.10 08:20 | 7.98 | 6.52 | 03:05 | 0.63 08:20 | 1.47 | 1.06 | 03:05 | 0.193 08:20 | 0.796 | 0.453 | 0.453 | |
| 02/11/2020 | 05:00 | 5.07 13:20 | 7.97 | 6.78 | 04:45 | 0.64 13:15 | 1.44 | 1.11 | 04:55 | 0.184 13:15 | 0.776 | 0.502 | 0.502 | |
| 02/12/2020 | 04:40 | 5.26 09:05 | 7.86 | 6.82 | 03:25 | 0.56 12:15 | 1.35 | 1.12 | 03:25 | 0.170 09:05 | 0.715 | 0.505 | 0.505 | |
| 02/13/2020 | 04:40 | 5.00 11:15 | 7.82 | 6.53 | 03:10 | 0.63 11:15 | 1.44 | 1.09 | 03:10 | 0.182 11:15 | 0.759 | 0.469 | 0.469 | |
| 02/14/2020 | 03:55 | 5.04 10:50 | 7.50 | 6.52 | 03:40 | 0.68 10:20 | 1.36 | 1.09 | 03:40 | 0.195 10:45 | 0.667 | 0.463 | 0.463 | |
| 02/15/2020 | 03:50 | 4.87 12:10 | 7.48 | 6.10 | 03:20 | 0.55 12:05 | 1.31 | 0.95 | 03:20 | 0.153 12:05 | 0.650 | 0.371 | 0.371 | |
| 02/16/2020 | 05:10 | 4.86 11:10 | 7.04 | 6.00 | 05:10 | 0.63 12:45 | 1.26 | 0.95 | 05:10 | 0.171 12:45 | 0.572 | 0.358 | 0.358 | |
| 02/17/2020 | 05:10 | 4.78 12:45 | 7.56 | 6.16 | 05:55 | 0.48 11:05 | 1.33 | 0.96 | 05:55 | 0.135 11:05 | 0.667 | 0.381 | 0.381 | |
| 02/18/2020 | 03:45 | 4.83 12:25 | 8.16 | 6.56 | 03:50 | 0.45 12:15 | 1.54 | 1.05 | 03:50 | 0.121 12:20 | 0.856 | 0.458 | 0.458 | |
| 02/19/2020 | 05:00 | 5.16 12:55 | 8.14 | 6.88 | 03:10 | 0.56 11:25 | 1.45 | 1.11 | 03:10 | 0.167 11:25 | 0.796 | 0.515 | 0.515 | |
| 02/20/2020 | 04:55 | 5.24 11:25 | 8.09 | 6.93 | 04:55 | 0.70 11:15 | 1.44 | 1.13 | 04:55 | 0.212 11:15 | 0.793 | 0.522 | 0.522 | |
| 02/21/2020 | 04:40 | 5.21 10:15 | 7.98 | 6.71 | 03:20 | 0.59 10:20 | 1.38 | 1.07 | 03:20 | 0.181 10:20 | 0.747 | 0.475 | 0.475 | |
| 02/22/2020 | 05:10 | 5.01 11:35 | 7.71 | 6.42 | 05:05 | 0.61 11:40 | 1.39 | 1.03 | 05:05 | 0.174 11:40 | 0.718 | 0.428 | 0.428 | |
| 02/23/2020 | 05:55 | 5.06 10:00 | 7.14 | 6.31 | 06:05 | 0.56 20:40 | 1.27 | 1.00 | 06:05 | 0.162 20:40 | 0.585 | 0.407 | 0.407 | |
| 02/24/2020 | 03:45 | 4.89 11:05 | 8.78 | 6.87 | 03:55 | 0.60 11:20 | 1.48 | 1.11 | 03:55 | 0.166 11:05 | 0.905 | 0.513 | 0.513 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 05:00 | 5.30 | 12:40 | 8.03 | 6.93 | 05:10 | 0.62 | 12:50 | 1.38 | 1.07 | 05:10 | 0.190 | 12:50 | 0.750 | 0.498 | 0.498 | |
| 02/26/2020 | 04:55 | 5.34 | 10:35 | 7.98 | 6.92 | 05:00 | 0.63 | 12:55 | 1.48 | 1.07 | 05:00 | 0.197 | 12:55 | 0.784 | 0.492 | 0.492 | |
| 02/27/2020 | 04:55 | 5.32 | 12:55 | 8.12 | 6.98 | 04:50 | 0.61 | 12:50 | 1.41 | 1.10 | 04:50 | 0.190 | 12:50 | 0.781 | 0.513 | 0.513 | |
| 02/28/2020 | 03:35 | 5.21 | 10:40 | 8.05 | 6.79 | 02:45 | 0.64 | 12:05 | 1.37 | 1.07 | 03:35 | 0.194 | 10:55 | 0.740 | 0.486 | 0.486 | |
| 02/29/2020 | 03:30 | 5.14 | 11:10 | 8.12 | 6.39 | 03:05 | 0.62 | 11:15 | 1.37 | 0.98 | 03:05 | 0.183 | 11:15 | 0.760 | 0.405 | 0.405 | |
| 03/01/2020 | 05:50 | 5.08 | 12:35 | 7.05 | 6.23 | 05:20 | 0.55 | 11:30 | 1.18 | 0.94 | 05:20 | 0.161 | 12:35 | 0.536 | 0.376 | 0.376 | |
| 03/02/2020 | 03:35 | 5.00 | 10:40 | 7.86 | 6.69 | 03:55 | 0.60 | 10:55 | 1.36 | 1.06 | 03:45 | 0.170 | 10:55 | 0.715 | 0.473 | 0.473 | 0.01 |
| 03/03/2020 | 05:40 | 5.30 | 10:20 | 8.14 | 6.81 | 05:35 | 0.70 | 10:05 | 1.40 | 1.08 | 05:35 | 0.215 | 10:15 | 0.773 | 0.485 | 0.485 | |
| 03/04/2020 | 03:45 | 4.89 | 09:20 | 8.20 | 6.71 | 03:30 | 0.55 | 09:25 | 1.37 | 1.06 | 03:30 | 0.152 | 09:25 | 0.771 | 0.476 | 0.476 | |
| 03/05/2020 | 04:55 | 5.07 | 08:50 | 7.82 | 6.61 | 04:55 | 0.59 | 08:55 | 1.38 | 1.07 | 04:55 | 0.170 | 08:50 | 0.724 | 0.461 | 0.461 | |
| 03/06/2020 | 05:10 | 4.88 | 15:55 | 7.57 | 6.48 | 03:05 | 0.49 | 15:45 | 1.36 | 1.04 | 03:05 | 0.139 | 15:45 | 0.675 | 0.446 | 0.446 | |
| 03/07/2020 | 05:05 | 4.79 | 11:55 | 7.44 | 6.16 | 05:25 | 0.56 | 11:55 | 1.47 | 0.99 | 05:25 | 0.151 | 11:55 | 0.723 | 0.390 | 0.390 | 0.58 |
| 03/08/2020 | 04:55 | 4.90 | 11:00 | 7.14 | 6.11 | 05:20 | 0.50 | 10:55 | 1.24 | 0.95 | 05:20 | 0.139 | 11:00 | 0.577 | 0.370 | 0.370 | 0.02 |
| 03/09/2020 | 03:20 | 4.74 | 12:10 | 7.84 | 6.44 | 03:20 | 0.52 | 12:15 | 1.42 | 1.05 | 03:20 | 0.135 | 12:10 | 0.753 | 0.449 | 0.449 | 0.11 |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 50.750 | 5.26 |
| Avg | 6.43 | 1.05 | 0.441 | |

## Site Commentary

### Site Information

| MIL_2666 | |
|---|---|
| Pipe Dimensions | 17.88 |
| Silt Level | 0.00" |

### Overview

Site MIL_2666 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited a moderate response to the wet weather events of November 26, 2019 - November 27, 2019 and December 7, 2019 - December 8, 2019. Surcharge conditions were experienced at this site. Review of the scattergraph shows that both free flow and backwater conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 8.74 | 1.74 | 0.949 |
| Minimum | 5.81 | 0.77 | 0.363 |
| Maximum | 21.77 | 2.28 | 1.470 |
| Time of Minimum | 2/14/2020 2:55 AM | 3/3/2020 7:40 AM | 2/25/2020 3:25 AM |
| Time of Maximum | 1/26/2020 11:35 AM | 2/25/2020 7:30 AM | 1/13/2020 8:00 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

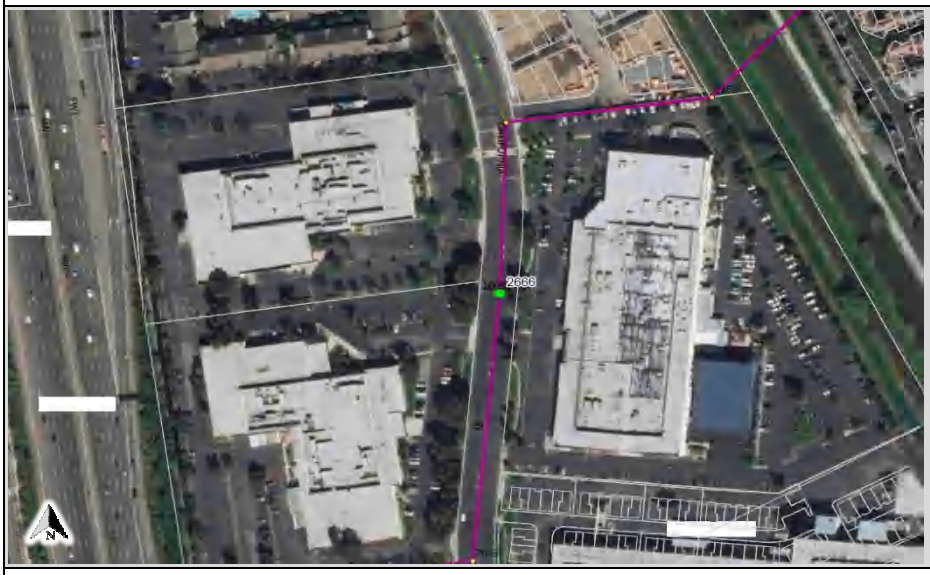
## *Flow Monitoring Site Report*

ADS ENVIRONMENTAL SERVICES®

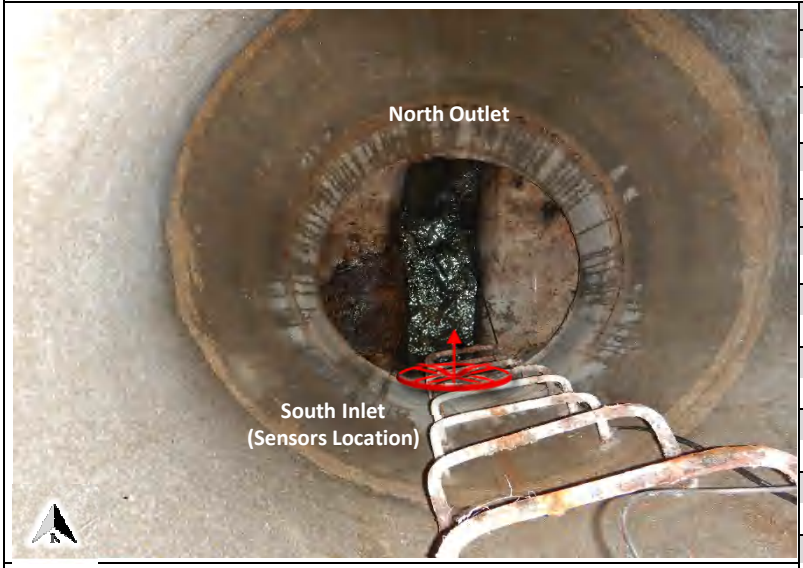
## Site Name

# MIL_2666

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | California Cir and Cadillac Court, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Drive | Latitude: | 37.449182° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.919254° | 17.88" x 17.88" | Circular |




| Manhole # | System Characteristics |
|---|---|
| 2666 | Residential/Commercial |
| Access | Traffic |
| Drive | Medium |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 4:33:04 AM | 17.88" x 17.88" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 6.25" | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.58 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |

Hydraulic Comments:

good flow, medium depth and velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 9' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |

# SCATTERGRAPH REPORT

MIL_2666

**Flow Monitor**

**MIL_2666**

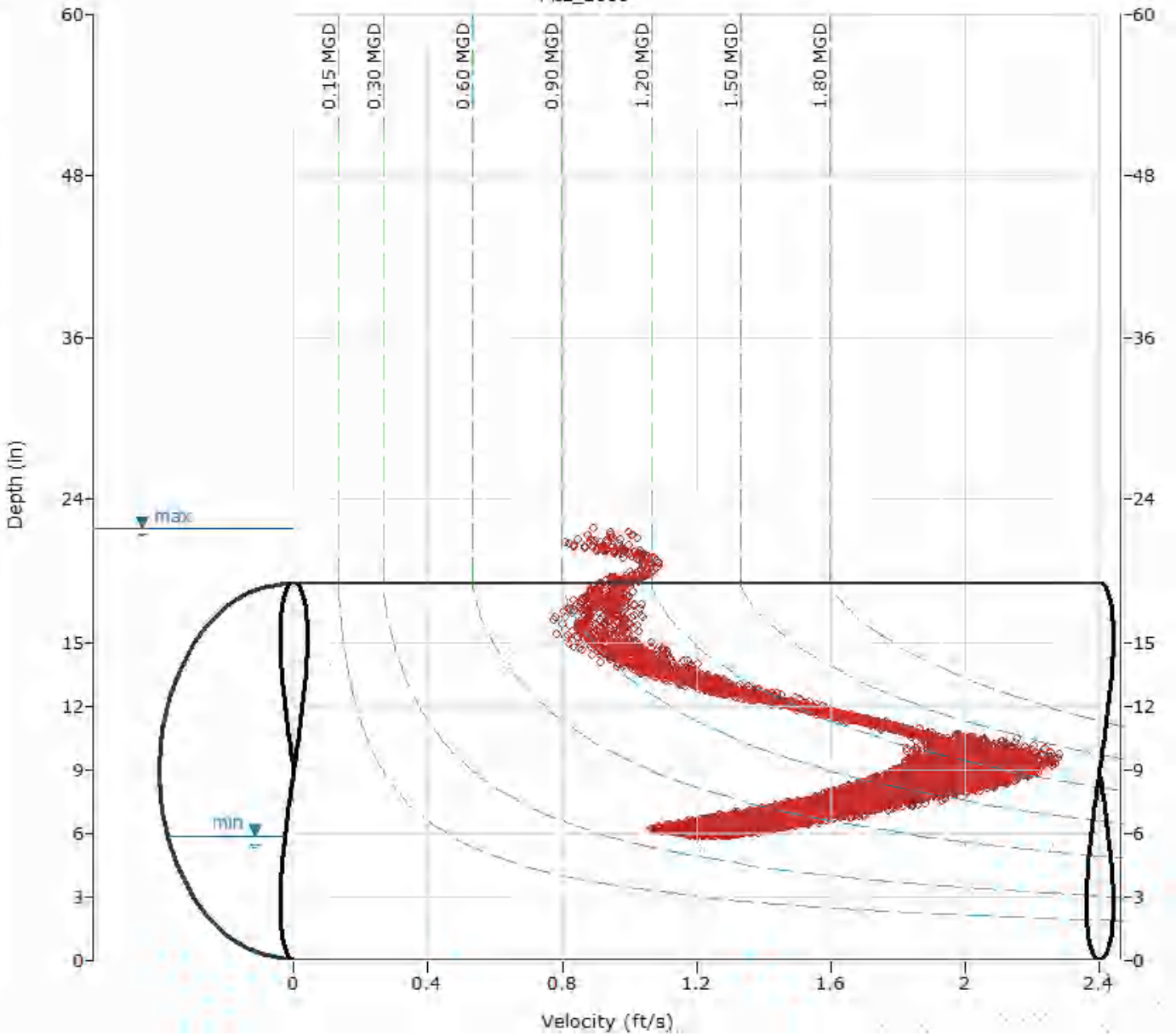
Pipe Height
17.66 in

**Report Period**

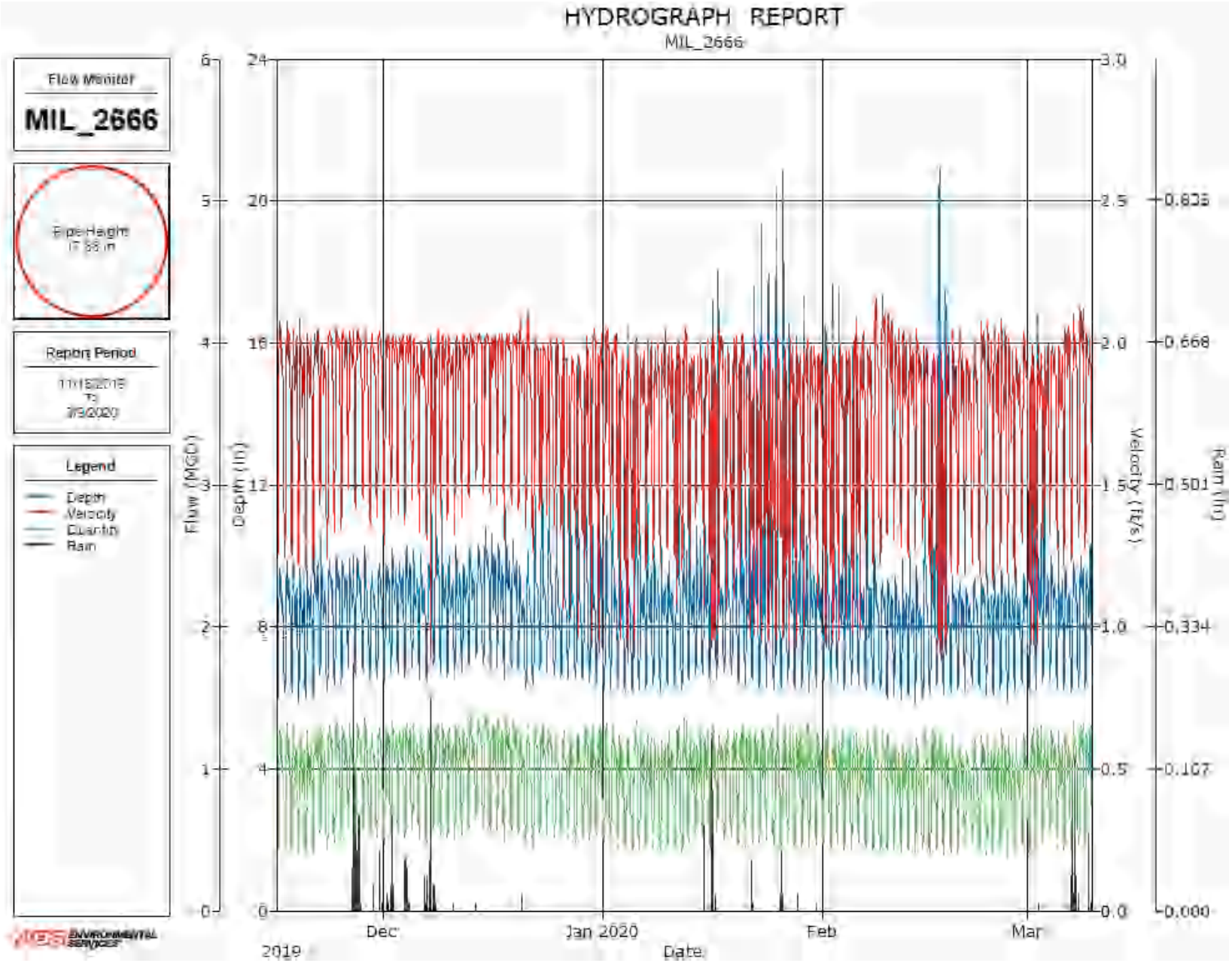
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_2666
Flow Monitor
MIL_2666
Pipe Height
11.88 in
Report Period
11/1/2019
To
3/3/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
0
4
8
12
16
20
24
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0.000
0.167
0.334
0.501
0.668
0.835
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2666, Pipe Height: 17.88 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 04:30 | 5.94 | 11:15 | 9.75 | 8.10 | 04:10 | 1.19 | 10:35 | 2.15 | 1.78 | 04:10 | 0.393 | 12:50 | 1.313 | 0.912 | 0.912 | |
| 11/17/2019 | 04:10 | 6.11 | 10:45 | 10.15 | 8.25 | 03:35 | 1.20 | 20:00 | 2.14 | 1.78 | 05:05 | 0.413 | 11:15 | 1.385 | 0.935 | 0.935 | |
| 11/18/2019 | 03:25 | 6.10 | 07:35 | 10.12 | 8.22 | 02:55 | 1.19 | 19:55 | 2.14 | 1.79 | 02:55 | 0.412 | 07:40 | 1.391 | 0.931 | 0.931 | |
| 11/19/2019 | 03:40 | 5.87 | 07:45 | 10.35 | 8.08 | 02:20 | 1.14 | 08:05 | 2.19 | 1.78 | 04:10 | 0.381 | 07:35 | 1.437 | 0.905 | 0.905 | |
| 11/20/2019 | 03:45 | 5.91 | 07:35 | 10.48 | 8.17 | 03:45 | 1.18 | 19:20 | 2.06 | 1.78 | 03:45 | 0.383 | 07:35 | 1.389 | 0.915 | 0.915 | |
| 11/21/2019 | 03:45 | 6.02 | 08:10 | 10.54 | 8.58 | 03:35 | 1.13 | 08:00 | 2.09 | 1.84 | 03:35 | 0.379 | 08:10 | 1.396 | 1.012 | 1.012 | |
| 11/22/2019 | 03:45 | 6.64 | 07:40 | 11.30 | 8.47 | 03:45 | 1.42 | 09:20 | 2.16 | 1.84 | 03:45 | 0.540 | 08:10 | 1.372 | 0.975 | 0.975 | |
| 11/23/2019 | 04:10 | 6.09 | 11:05 | 10.26 | 8.34 | 03:50 | 1.18 | 12:35 | 2.06 | 1.79 | 03:50 | 0.405 | 11:05 | 1.363 | 0.954 | 0.954 | |
| 11/24/2019 | 05:05 | 6.33 | 12:35 | 10.23 | 8.53 | 05:05 | 1.32 | 11:00 | 2.07 | 1.83 | 05:05 | 0.471 | 11:45 | 1.363 | 0.995 | 0.995 | |
| 11/25/2019 | 03:55 | 6.35 | 07:50 | 10.47 | 8.59 | 03:55 | 1.32 | 07:40 | 2.07 | 1.86 | 03:55 | 0.475 | 07:45 | 1.409 | 1.017 | 1.017 | |
| 11/26/2019 | 03:45 | 6.80 | 07:45 | 10.52 | 8.68 | 03:45 | 1.47 | 20:40 | 2.04 | 1.88 | 03:45 | 0.578 | 07:45 | 1.394 | 1.037 | 1.037 | 0.63 |
| 11/27/2019 | 03:30 | 6.63 | 08:40 | 10.23 | 8.82 | 03:25 | 1.37 | 09:40 | 2.04 | 1.90 | 03:25 | 0.520 | 08:40 | 1.359 | 1.069 | 1.069 | 0.77 |
| 11/28/2019 | 04:40 | 6.68 | 11:30 | 10.47 | 8.48 | 04:40 | 1.43 | 10:55 | 2.04 | 1.84 | 04:40 | 0.551 | 11:30 | 1.389 | 0.985 | 0.985 | |
| 11/29/2019 | 05:05 | 6.46 | 10:55 | 9.77 | 8.21 | 05:05 | 1.36 | 10:55 | 2.04 | 1.80 | 05:05 | 0.499 | 10:55 | 1.285 | 0.927 | 0.927 | 0.05 |
| 11/30/2019 | 05:25 | 6.50 | 12:05 | 10.15 | 8.34 | 05:25 | 1.38 | 11:55 | 2.04 | 1.82 | 05:25 | 0.509 | 12:05 | 1.348 | 0.957 | 0.957 | 0.14 |
| 12/01/2019 | 05:15 | 6.41 | 11:15 | 10.05 | 8.49 | 05:15 | 1.29 | 11:55 | 2.09 | 1.80 | 05:15 | 0.467 | 11:15 | 1.320 | 0.976 | 0.976 | 0.06 |
| 12/02/2019 | 03:35 | 6.68 | 07:55 | 10.76 | 8.77 | 03:35 | 1.38 | 08:00 | 2.06 | 1.86 | 03:35 | 0.529 | 08:00 | 1.398 | 1.044 | 1.044 | 0.36 |
| 12/03/2019 | 03:50 | 6.67 | 07:35 | 10.41 | 8.65 | 03:50 | 1.38 | 20:00 | 2.03 | 1.86 | 03:50 | 0.528 | 07:40 | 1.361 | 1.021 | 1.021 | |
| 12/04/2019 | 03:15 | 6.56 | 08:20 | 11.02 | 8.79 | 03:15 | 1.34 | 20:40 | 2.03 | 1.87 | 03:15 | 0.501 | 07:35 | 1.378 | 1.049 | 1.049 | 0.44 |
| 12/05/2019 | 03:40 | 6.84 | 08:20 | 10.59 | 8.62 | 03:40 | 1.43 | 19:00 | 2.12 | 1.84 | 03:40 | 0.568 | 08:20 | 1.377 | 1.003 | 1.003 | |
| 12/06/2019 | 03:40 | 6.48 | 07:55 | 10.81 | 8.50 | 03:40 | 1.31 | 09:20 | 2.08 | 1.83 | 03:40 | 0.483 | 08:15 | 1.339 | 0.980 | 0.980 | 0.06 |
| 12/07/2019 | 04:55 | 6.41 | 18:05 | 16.58 | 9.36 | 19:55 | 0.87 | 17:15 | 2.18 | 1.67 | 04:35 | 0.462 | 17:15 | 1.414 | 0.959 | 0.959 | 0.84 |
| 12/08/2019 | 03:55 | 6.90 | 11:55 | 13.35 | 9.32 | 12:00 | 1.12 | 15:50 | 2.16 | 1.77 | 05:00 | 0.567 | 17:55 | 1.412 | 1.044 | 1.044 | 0.10 |
| 12/09/2019 | 03:15 | 6.68 | 07:50 | 12.68 | 8.79 | 07:55 | 1.29 | 10:00 | 2.03 | 1.83 | 03:15 | 0.530 | 08:45 | 1.356 | 1.019 | 1.019 | |
| 12/10/2019 | 03:25 | 6.51 | 08:15 | 10.66 | 8.46 | 02:45 | 1.31 | 20:45 | 2.05 | 1.83 | 02:45 | 0.491 | 08:20 | 1.368 | 0.974 | 0.974 | 0.01 |
| 12/11/2019 | 03:25 | 6.51 | 08:30 | 10.68 | 8.55 | 03:30 | 1.29 | 14:05 | 2.07 | 1.82 | 03:30 | 0.477 | 08:15 | 1.384 | 0.988 | 0.988 | 0.00 |
| 12/12/2019 | 03:45 | 6.66 | 07:40 | 10.43 | 8.65 | 03:45 | 1.37 | 10:10 | 2.03 | 1.86 | 03:45 | 0.525 | 07:40 | 1.364 | 1.023 | 1.023 | |
| 12/13/2019 | 03:00 | 6.88 | 08:15 | 10.59 | 8.88 | 03:00 | 1.44 | 08:50 | 2.03 | 1.90 | 03:00 | 0.577 | 08:15 | 1.377 | 1.074 | 1.074 | |
| 12/14/2019 | 04:20 | 7.04 | 10:40 | 10.60 | 8.98 | 04:20 | 1.49 | 15:30 | 2.03 | 1.89 | 04:20 | 0.616 | 10:40 | 1.377 | 1.087 | 1.087 | 0.01 |
| 12/15/2019 | 04:40 | 6.93 | 11:05 | 10.95 | 9.10 | 04:40 | 1.46 | 14:25 | 2.03 | 1.87 | 04:40 | 0.590 | 10:50 | 1.383 | 1.096 | 1.096 | |
| 12/16/2019 | 03:45 | 6.77 | 08:25 | 10.78 | 9.05 | 03:45 | 1.41 | 20:50 | 2.03 | 1.89 | 03:45 | 0.552 | 08:40 | 1.377 | 1.095 | 1.095 | |
| 12/17/2019 | 03:35 | 6.81 | 07:40 | 10.73 | 8.87 | 03:35 | 1.42 | 11:10 | 2.03 | 1.89 | 03:35 | 0.559 | 07:35 | 1.376 | 1.067 | 1.067 | |
| 12/18/2019 | 03:45 | 6.43 | 08:20 | 11.98 | 8.99 | 04:10 | 1.26 | 21:05 | 2.03 | 1.86 | 04:10 | 0.464 | 08:50 | 1.383 | 1.073 | 1.073 | |
| 12/19/2019 | 03:35 | 6.82 | 08:00 | 10.95 | 9.02 | 03:35 | 1.42 | 19:15 | 2.03 | 1.89 | 03:35 | 0.562 | 07:40 | 1.380 | 1.093 | 1.093 | |
| 12/20/2019 | 05:05 | 6.59 | 08:25 | 10.05 | 8.25 | 05:10 | 1.38 | 09:30 | 2.26 | 1.86 | 05:10 | 0.523 | 07:40 | 1.408 | 0.961 | 0.961 | 0.02 |
| 12/21/2019 | 05:00 | 6.21 | 11:00 | 10.40 | 8.15 | 04:25 | 1.32 | 10:05 | 2.28 | 1.80 | 04:25 | 0.464 | 11:00 | 1.395 | 0.921 | 0.921 | |
| 12/22/2019 | 04:45 | 6.32 | 12:15 | 12.19 | 8.67 | 04:30 | 1.24 | 10:05 | 2.09 | 1.75 | 04:30 | 0.444 | 14:25 | 1.370 | 0.968 | 0.968 | |
| 12/23/2019 | 03:25 | 6.72 | 12:15 | 13.17 | 8.97 | 12:20 | 1.18 | 08:50 | 2.03 | 1.79 | 03:25 | 0.538 | 13:40 | 1.377 | 1.019 | 1.019 | |
| 12/24/2019 | 04:05 | 6.63 | 11:15 | 12.60 | 8.92 | 04:05 | 1.36 | 14:05 | 2.03 | 1.78 | 04:05 | 0.518 | 13:40 | 1.374 | 1.004 | 1.004 | |
| 12/25/2019 | 05:20 | 6.61 | 13:10 | 12.38 | 8.45 | 05:20 | 1.35 | 11:20 | 2.11 | 1.76 | 05:20 | 0.512 | 13:55 | 1.376 | 0.936 | 0.936 | |
| 12/26/2019 | 04:10 | 6.51 | 11:55 | 14.17 | 8.82 | 11:35 | 0.97 | 18:10 | 2.10 | 1.72 | 04:10 | 0.490 | 14:00 | 1.374 | 0.943 | 0.943 | |
| 12/27/2019 | 04:15 | 6.46 | 11:55 | 14.12 | 9.00 | 11:55 | 0.98 | 14:30 | 2.03 | 1.67 | 03:35 | 0.480 | 14:05 | 1.374 | 0.930 | 0.930 | |
| 12/28/2019 | 05:00 | 6.46 | 12:25 | 16.08 | 9.04 | 11:35 | 0.86 | 09:50 | 2.09 | 1.62 | 05:00 | 0.470 | 15:10 | 1.375 | 0.900 | 0.900 | |
| 12/29/2019 | 05:05 | 6.52 | 11:15 | 13.33 | 9.13 | 11:10 | 1.15 | 20:30 | 2.03 | 1.66 | 06:00 | 0.484 | 17:25 | 1.380 | 0.966 | 0.966 | |
| 12/30/2019 | 04:05 | 6.41 | 11:45 | 15.44 | 9.14 | 12:05 | 0.83 | 18:00 | 2.20 | 1.68 | 03:30 | 0.484 | 09:15 | 1.374 | 0.937 | 0.937 | |
| 12/31/2019 | 03:25 | 6.28 | 11:45 | 15.22 | 9.04 | 11:45 | 0.87 | 14:50 | 2.14 | 1.72 | 03:30 | 0.480 | 09:55 | 1.380 | 0.950 | 0.950 | |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 05:35 | 6.16 12:20 | 11.50 | 8.08 | 04:10 | 1.35 16:50 | 2.19 | 1.81 | 05:30 | 0.474 13:25 | 1.381 | 0.913 | 0.913 | |
| 01/02/2020 | 03:20 | 6.21 12:10 | 12.67 | 8.65 | 05:05 | 1.24 18:25 | 2.13 | 1.79 | 03:45 | 0.437 13:10 | 1.383 | 0.973 | 0.973 | |
| 01/03/2020 | 04:10 | 6.18 12:05 | 15.89 | 9.08 | 12:15 | 0.86 08:00 | 2.04 | 1.63 | 04:10 | 0.417 09:55 | 1.381 | 0.909 | 0.909 | |
| 01/04/2020 | 04:50 | 6.18 12:55 | 16.78 | 9.08 | 12:25 | 0.80 15:05 | 2.02 | 1.57 | 04:45 | 0.377 14:45 | 1.366 | 0.862 | 0.862 | |
| 01/05/2020 | 05:05 | 6.11 11:00 | 15.63 | 9.47 | 10:55 | 0.82 22:45 | 2.07 | 1.56 | 05:05 | 0.395 19:10 | 1.371 | 0.924 | 0.924 | |
| 01/06/2020 | 04:05 | 6.17 08:15 | 11.25 | 8.25 | 03:15 | 1.21 10:35 | 2.07 | 1.74 | 03:15 | 0.420 08:00 | 1.370 | 0.905 | 0.905 | |
| 01/07/2020 | 03:55 | 6.26 08:10 | 13.58 | 8.37 | 08:10 | 1.04 07:25 | 2.11 | 1.72 | 03:35 | 0.417 08:30 | 1.378 | 0.906 | 0.906 | |
| 01/08/2020 | 04:00 | 6.36 08:05 | 11.90 | 8.26 | 03:40 | 1.16 07:25 | 2.09 | 1.75 | 03:40 | 0.419 07:45 | 1.380 | 0.908 | 0.908 | |
| 01/09/2020 | 03:40 | 6.12 08:10 | 11.96 | 8.23 | 05:00 | 1.14 21:40 | 2.11 | 1.75 | 03:40 | 0.403 07:40 | 1.383 | 0.910 | 0.910 | |
| 01/10/2020 | 03:40 | 6.35 08:35 | 10.00 | 8.26 | 03:10 | 1.21 18:55 | 2.13 | 1.76 | 03:10 | 0.436 08:30 | 1.312 | 0.912 | 0.912 | |
| 01/11/2020 | 04:40 | 6.29 12:35 | 14.83 | 9.30 | 12:45 | 0.91 09:40 | 2.10 | 1.62 | 04:25 | 0.425 20:35 | 1.382 | 0.957 | 0.957 | |
| 01/12/2020 | 05:35 | 6.18 11:05 | 12.10 | 8.41 | 05:10 | 1.15 19:35 | 2.17 | 1.74 | 05:10 | 0.397 11:25 | 1.383 | 0.939 | 0.939 | |
| 01/13/2020 | 03:40 | 6.47 08:35 | 14.71 | 8.47 | 08:40 | 0.95 08:00 | 2.15 | 1.73 | 03:40 | 0.483 08:00 | 1.470 | 0.915 | 0.915 | |
| 01/14/2020 | 03:10 | 6.62 08:00 | 14.30 | 8.54 | 08:00 | 0.95 09:50 | 2.03 | 1.77 | 04:50 | 0.492 20:45 | 1.381 | 0.954 | 0.954 | |
| 01/15/2020 | 03:45 | 6.60 08:00 | 15.26 | 8.81 | 08:00 | 0.87 10:10 | 2.02 | 1.73 | 03:45 | 0.514 10:00 | 1.382 | 0.949 | 0.949 | 0.10 |
| 01/16/2020 | 04:15 | 6.44 13:20 | 17.95 | 10.81 | 08:00 | 0.80 15:35 | 2.02 | 1.45 | 03:35 | 0.445 11:05 | 1.381 | 0.954 | 0.954 | 0.66 |
| 01/17/2020 | 03:55 | 6.42 08:50 | 20.36 | 9.07 | 09:30 | 0.87 11:35 | 2.19 | 1.79 | 04:15 | 0.523 09:55 | 1.373 | 0.979 | 0.979 | |
| 01/18/2020 | 05:00 | 6.68 11:05 | 14.00 | 9.04 | 11:05 | 1.00 15:50 | 2.10 | 1.66 | 04:55 | 0.492 10:05 | 1.383 | 0.935 | 0.935 | |
| 01/19/2020 | 05:35 | 6.64 11:45 | 13.98 | 8.94 | 11:50 | 1.00 18:35 | 2.12 | 1.70 | 05:50 | 0.484 13:55 | 1.369 | 0.945 | 0.945 | |
| 01/20/2020 | 03:45 | 6.39 11:40 | 13.75 | 8.87 | 11:50 | 1.06 18:30 | 2.16 | 1.71 | 04:00 | 0.439 13:50 | 1.371 | 0.953 | 0.953 | |
| 01/21/2020 | 03:15 | 6.32 20:45 | 15.12 | 9.19 | 20:55 | 0.89 14:10 | 2.08 | 1.62 | 03:10 | 0.425 17:40 | 1.379 | 0.918 | 0.918 | 0.01 |
| 01/22/2020 | 03:55 | 6.45 08:20 | 18.11 | 9.90 | 09:05 | 0.87 07:15 | 2.11 | 1.62 | 04:10 | 0.472 10:25 | 1.383 | 0.978 | 0.978 | 0.09 |
| 01/23/2020 | 03:35 | 6.25 08:50 | 20.32 | 10.37 | 10:45 | 0.87 06:55 | 2.12 | 1.58 | 03:25 | 0.466 19:00 | 1.383 | 0.967 | 0.967 | |
| 01/24/2020 | 03:55 | 6.24 10:10 | 18.25 | 11.02 | 12:40 | 0.87 07:05 | 2.07 | 1.49 | 03:55 | 0.483 07:55 | 1.373 | 0.985 | 0.985 | |
| 01/25/2020 | 05:00 | 6.19 12:00 | 20.73 | 10.31 | 12:05 | 0.82 22:25 | 2.05 | 1.57 | 05:25 | 0.395 19:15 | 1.383 | 0.935 | 0.935 | |
| 01/26/2020 | 05:00 | 6.25 11:35 | 21.77 | 10.90 | 10:15 | 0.83 16:45 | 2.02 | 1.46 | 04:55 | 0.450 17:45 | 1.381 | 0.943 | 0.943 | 0.16 |
| 01/27/2020 | 03:55 | 6.45 08:15 | 16.90 | 9.44 | 08:00 | 0.78 07:15 | 2.14 | 1.63 | 03:45 | 0.448 11:15 | 1.383 | 0.949 | 0.949 | |
| 01/28/2020 | 03:45 | 6.20 08:10 | 17.31 | 9.02 | 08:40 | 0.87 07:25 | 2.06 | 1.68 | 03:50 | 0.428 09:40 | 1.379 | 0.944 | 0.944 | 0.02 |
| 01/29/2020 | 03:45 | 6.27 08:20 | 17.83 | 9.14 | 09:10 | 0.87 11:40 | 2.06 | 1.70 | 04:10 | 0.440 20:10 | 1.380 | 0.954 | 0.954 | |
| 01/30/2020 | 03:45 | 6.10 08:20 | 14.39 | 8.47 | 08:20 | 0.94 19:30 | 2.12 | 1.77 | 03:30 | 0.437 09:05 | 1.364 | 0.935 | 0.935 | |
| 01/31/2020 | 02:55 | 6.27 08:15 | 14.81 | 8.66 | 08:15 | 0.90 07:30 | 2.19 | 1.72 | 03:30 | 0.448 07:30 | 1.380 | 0.927 | 0.927 | 0.01 |
| 02/01/2020 | 03:35 | 6.45 12:10 | 16.80 | 9.52 | 11:05 | 0.87 08:50 | 2.05 | 1.57 | 03:40 | 0.433 15:10 | 1.304 | 0.915 | 0.915 | |
| 02/02/2020 | 05:05 | 6.41 12:10 | 18.12 | 9.75 | 10:55 | 0.87 16:40 | 2.07 | 1.53 | 04:25 | 0.437 09:55 | 1.312 | 0.902 | 0.902 | |
| 02/03/2020 | 03:50 | 6.43 08:15 | 18.18 | 9.21 | 08:55 | 0.83 07:15 | 2.18 | 1.66 | 03:30 | 0.440 07:15 | 1.388 | 0.940 | 0.940 | |
| 02/04/2020 | 03:35 | 6.23 07:55 | 15.84 | 8.73 | 07:45 | 0.85 07:20 | 2.08 | 1.69 | 03:30 | 0.407 10:00 | 1.304 | 0.918 | 0.918 | |
| 02/05/2020 | 04:10 | 6.30 08:15 | 17.09 | 9.05 | 08:10 | 0.86 18:55 | 2.19 | 1.67 | 04:10 | 0.420 07:25 | 1.361 | 0.935 | 0.935 | |
| 02/06/2020 | 03:40 | 6.35 08:10 | 17.37 | 8.70 | 08:25 | 0.82 11:25 | 2.17 | 1.73 | 03:20 | 0.467 09:50 | 1.303 | 0.925 | 0.925 | |
| 02/07/2020 | 03:45 | 6.19 08:05 | 14.72 | 8.40 | 08:00 | 0.85 18:40 | 2.08 | 1.75 | 02:25 | 0.441 08:40 | 1.303 | 0.917 | 0.917 | |
| 02/08/2020 | 05:10 | 6.28 08:30 | 15.11 | 8.18 | 08:30 | 0.87 13:15 | 2.27 | 1.77 | 05:00 | 0.414 11:50 | 1.345 | 0.909 | 0.909 | |
| 02/09/2020 | 05:30 | 6.17 10:40 | 9.52 | 8.05 | 05:30 | 1.17 12:05 | 2.26 | 1.81 | 05:30 | 0.404 10:40 | 1.357 | 0.920 | 0.920 | |
| 02/10/2020 | 03:40 | 5.93 07:55 | 10.11 | 7.99 | 03:40 | 1.29 07:30 | 2.23 | 1.85 | 03:40 | 0.422 07:55 | 1.449 | 0.923 | 0.923 | |
| 02/11/2020 | 03:50 | 5.99 07:55 | 10.11 | 7.93 | 02:30 | 1.28 07:45 | 2.25 | 1.80 | 02:50 | 0.428 07:45 | 1.388 | 0.888 | 0.888 | |
| 02/12/2020 | 03:25 | 5.96 08:10 | 11.00 | 7.92 | 02:25 | 1.24 07:40 | 2.21 | 1.79 | 03:35 | 0.409 07:40 | 1.393 | 0.883 | 0.883 | |
| 02/13/2020 | 03:20 | 6.06 07:55 | 11.30 | 7.96 | 03:05 | 1.22 09:40 | 2.18 | 1.77 | 03:00 | 0.412 07:35 | 1.354 | 0.879 | 0.879 | |
| 02/14/2020 | 02:55 | 5.81 08:30 | 10.12 | 7.85 | 03:45 | 1.22 07:25 | 2.17 | 1.80 | 03:45 | 0.391 08:30 | 1.300 | 0.878 | 0.878 | |
| 02/15/2020 | 04:40 | 5.96 12:20 | 12.23 | 8.30 | 04:40 | 1.14 18:55 | 2.14 | 1.72 | 04:40 | 0.374 13:15 | 1.304 | 0.900 | 0.900 | |
| 02/16/2020 | 04:00 | 6.08 11:30 | 14.05 | 8.73 | 11:30 | 0.99 17:25 | 2.12 | 1.62 | 05:10 | 0.389 13:30 | 1.311 | 0.895 | 0.895 | |
| 02/17/2020 | 04:15 | 6.31 13:10 | 21.29 | 11.84 | 13:30 | 0.81 08:25 | 2.03 | 1.33 | 04:10 | 0.414 18:05 | 1.304 | 0.913 | 0.913 | |
| 02/18/2020 | 03:00 | 6.05 09:15 | 17.91 | 9.05 | 08:20 | 0.78 12:20 | 2.15 | 1.63 | 03:20 | 0.368 07:45 | 1.304 | 0.881 | 0.881 | |
| 02/19/2020 | 03:15 | 6.09 08:10 | 9.70 | 8.05 | 03:20 | 1.14 08:40 | 2.21 | 1.74 | 03:20 | 0.386 08:05 | 1.312 | 0.878 | 0.878 | |
| 02/20/2020 | 03:55 | 6.15 09:00 | 9.50 | 8.05 | 03:50 | 1.17 10:50 | 2.16 | 1.74 | 03:50 | 0.401 10:10 | 1.252 | 0.874 | 0.874 | |
| 02/21/2020 | 04:10 | 6.02 08:20 | 9.30 | 8.03 | 04:00 | 1.13 14:00 | 2.06 | 1.72 | 04:00 | 0.377 12:10 | 1.169 | 0.865 | 0.865 | |
| 02/22/2020 | 04:35 | 6.34 12:15 | 9.46 | 8.10 | 04:40 | 1.15 11:55 | 2.09 | 1.71 | 04:40 | 0.411 11:55 | 1.234 | 0.869 | 0.869 | |
| 02/23/2020 | 04:50 | 6.26 11:10 | 9.60 | 8.11 | 05:35 | 1.11 11:45 | 2.25 | 1.75 | 05:35 | 0.391 11:45 | 1.343 | 0.899 | 0.899 | |
| 02/24/2020 | 03:35 | 6.01 07:25 | 9.90 | 8.01 | 02:55 | 1.16 07:35 | 2.25 | 1.77 | 03:35 | 0.389 07:35 | 1.388 | 0.887 | 0.887 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 03:15 | 6.07 | 07:40 | 10.11 | 8.00 | 03:25 | 1.07 | 07:30 | 2.28 | 1.74 | 03:25 | 0.363 | 08:00 | 1.448 | 0.872 | 0.872 | |
| 02/26/2020 | 03:10 | 6.17 | 07:25 | 10.20 | 8.15 | 03:15 | 1.18 | 07:20 | 2.16 | 1.77 | 03:15 | 0.408 | 07:25 | 1.411 | 0.903 | 0.903 | |
| 02/27/2020 | 03:40 | 5.85 | 07:35 | 10.02 | 7.99 | 04:00 | 1.14 | 08:25 | 2.21 | 1.73 | 04:00 | 0.373 | 08:25 | 1.381 | 0.866 | 0.866 | |
| 02/28/2020 | 03:25 | 6.14 | 07:50 | 10.19 | 8.08 | 03:25 | 1.08 | 07:30 | 2.01 | 1.73 | 03:25 | 0.371 | 07:30 | 1.313 | 0.876 | 0.876 | |
| 02/29/2020 | 04:30 | 6.32 | 11:20 | 9.65 | 8.16 | 04:30 | 1.27 | 11:25 | 2.16 | 1.75 | 04:30 | 0.451 | 11:25 | 1.338 | 0.899 | 0.899 | |
| 03/01/2020 | 05:05 | 6.23 | 12:00 | 15.82 | 9.83 | 11:40 | 0.83 | 15:25 | 2.02 | 1.46 | 05:10 | 0.391 | 18:45 | 1.316 | 0.890 | 0.890 | |
| 03/02/2020 | 03:40 | 6.18 | 08:00 | 18.41 | 9.10 | 08:40 | 0.85 | 11:20 | 2.02 | 1.65 | 03:35 | 0.368 | 19:55 | 1.316 | 0.930 | 0.930 | 0.01 |
| 03/03/2020 | 03:30 | 6.42 | 08:05 | 17.17 | 8.71 | 07:40 | 0.77 | 20:25 | 2.06 | 1.75 | 03:30 | 0.477 | 08:25 | 1.309 | 0.949 | 0.949 | |
| 03/04/2020 | 04:05 | 6.40 | 07:50 | 10.38 | 8.52 | 04:05 | 1.30 | 09:10 | 2.16 | 1.81 | 04:05 | 0.471 | 07:35 | 1.343 | 0.978 | 0.978 | |
| 03/05/2020 | 03:10 | 6.25 | 07:40 | 11.68 | 8.31 | 02:30 | 1.12 | 07:10 | 2.22 | 1.76 | 02:30 | 0.400 | 07:10 | 1.326 | 0.919 | 0.919 | |
| 03/06/2020 | 04:10 | 6.15 | 08:15 | 9.97 | 8.23 | 02:55 | 1.13 | 20:15 | 2.21 | 1.82 | 02:55 | 0.399 | 07:55 | 1.359 | 0.941 | 0.941 | |
| 03/07/2020 | 04:45 | 6.14 | 12:20 | 10.36 | 8.35 | 04:35 | 1.08 | 12:45 | 2.21 | 1.77 | 04:35 | 0.369 | 12:45 | 1.402 | 0.943 | 0.943 | 0.58 |
| 03/08/2020 | 05:05 | 6.31 | 11:20 | 10.38 | 8.42 | 02:45 | 1.22 | 20:55 | 2.25 | 1.83 | 04:20 | 0.439 | 20:10 | 1.428 | 0.981 | 0.981 | 0.02 |
| 03/09/2020 | 03:00 | 6.28 | 20:10 | 10.66 | 8.50 | 02:20 | 1.24 | 07:40 | 2.16 | 1.81 | 02:20 | 0.440 | 06:40 | 1.374 | 0.978 | 0.977 | 0.11 |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 109.178 | 5.26 |
| Avg | 8.74 | 1.74 | 0.949 | |

## Site Commentary

### Site Information

| MIL_2721 | |
|---|---|
| Pipe Dimensions | 8 |
| Silt Level | 0.00" |

### Overview

Site MIL_2721 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited a moderate response to the wet weather events of November 26, 2019 - November 27, 2019 and December 7, 2019 - December 8, 2019. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location. Due to the high flows at the creek, crews could not access the meter and data stops on March 02, 2020 for this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 6.23 | 1.05 | 0.198 |
| Minimum | 3.86 | 0.53 | 0.080 |
| Maximum | 9.28 | 1.61 | 0.363 |
| Time of Minimum | 3/2/2020 3:05 AM | 2/2/2020 5:45 AM | 2/2/2020 5:45 AM |
| Time of Maximum | 1/17/2020 8:05 AM | 1/17/2020 8:10 AM | 1/17/2020 8:10 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 2, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

## *Flow Monitoring Site Report*

ADS ENVIRONMENTAL SERVICES®

## Site Name

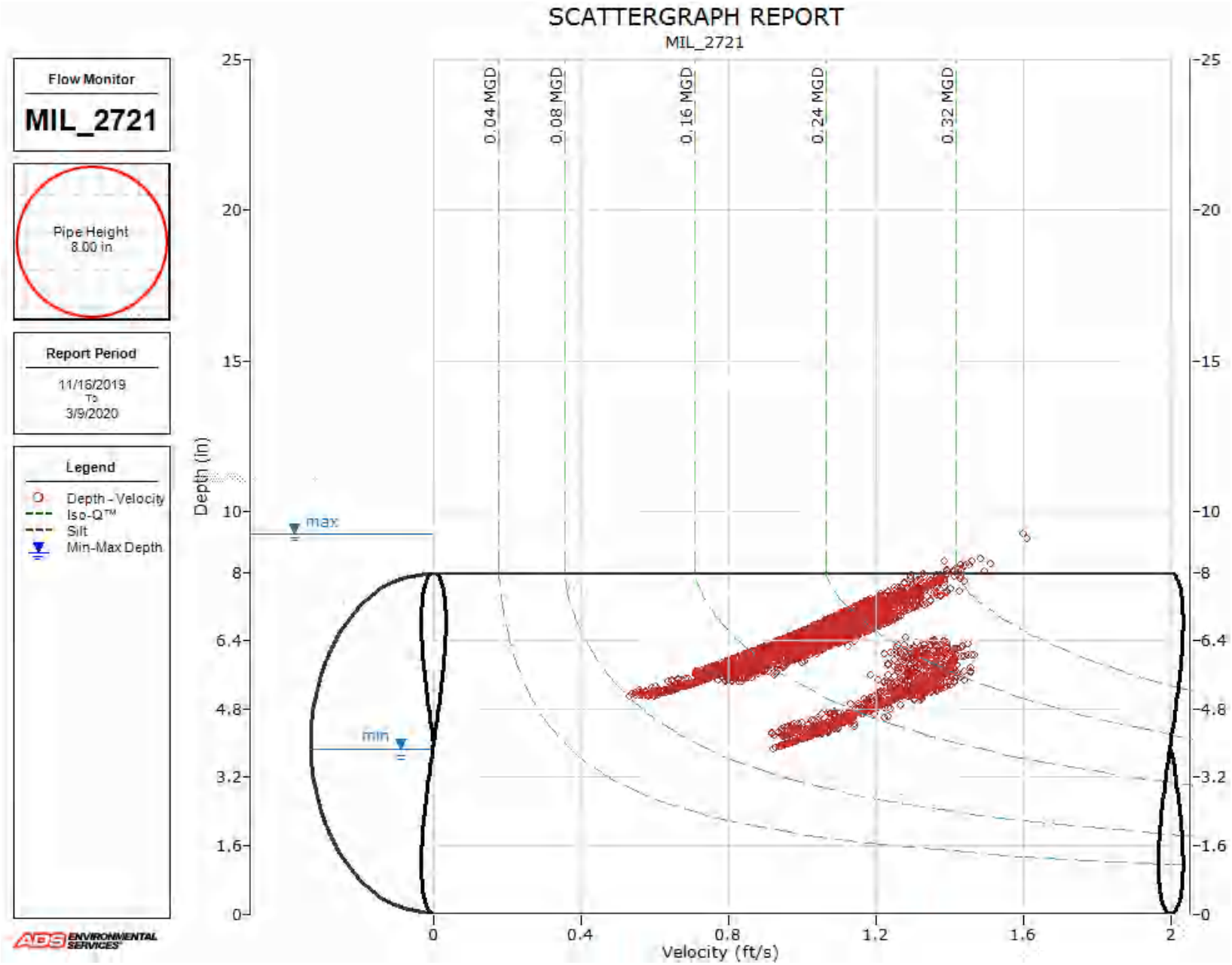
# MIL_2721

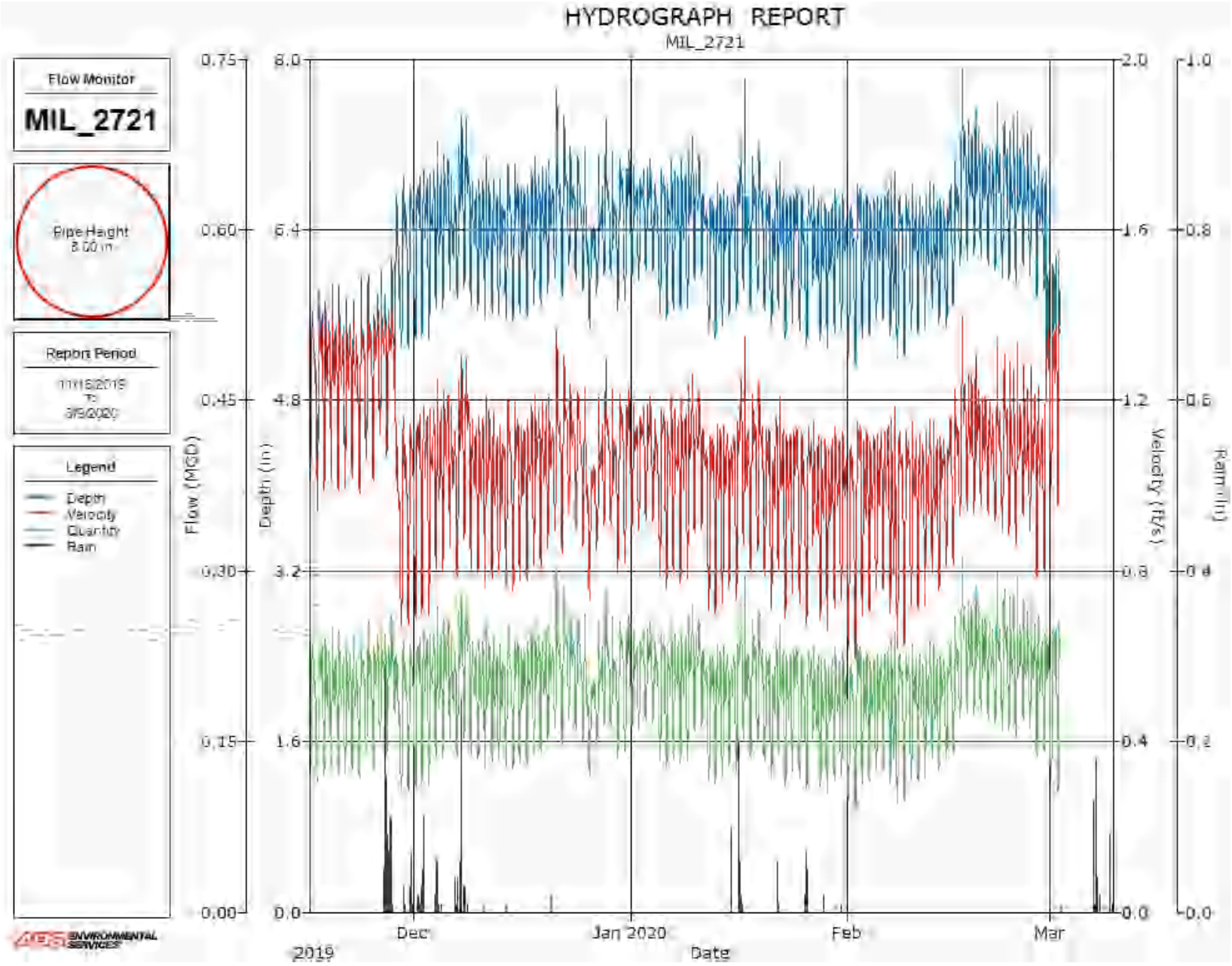
| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | 1545 N Milpitas Blvd | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Gate access. Need hip waders to cross stream. | Latitude: | 37.452946° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.914112° | 8.0" x 8.0" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 2721 | Residential |
| Access | Traffic |
| Drive | Light |

| Installation Information | |
|---|---|
| Installation Date: | Installation Type: |
| Friday, November 15, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |
| **Installation Confirmation:** | |
| Confirmation Time: | Pipe Size (HxW) |
| 9:56:00 AM | 8.0" x 8.0" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 5.50" | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.7 | 0'' |
| Silt (in) | Silt Type |
| 0'' | |
| Hydraulic Comments: | |
| Good flow medium depth and velocity | |
| **Manhole / Pipe Information:** | |
| Manhole Depth (Approx. FT): | Manhole Configuration |
| 6' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |
| **Communication Information:** | |
| Communication Type | Antenna Location |
| Wireless | Manhole Pick / Vent Hole |
| **Additional Site Info. / Comments:** | |

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |


SCATTERGRAPH REPORT
MIL_2721
Flow Monitor
MIL_2721
Pipe Height
8.00 in
Report Period
11/16/2019
To
3/9/2020
Legend
Depth - Velocity
Iso-Q™
Silt
Min-Max Depth
0.04 MGD
0.08 MGD
0.16 MGD
0.24 MGD
0.32 MGD
max
min
Depth (in)
Velocity (ft/s)
0
0.4
0.8
1.2
1.6
2
1.6
3.2
4.8
6.4
8
10
15
20
25
ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_2721
Flow Monitor
MIL_2721
Pipe Height
8.00 in
Report Period
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
0.75
0.60
0.45
0.30
0.15
0.00
8.0
6.4
4.8
3.2
1.6
0.0
2.0
1.6
1.2
0.8
0.4
0.0
1.0
0.8
0.6
0.4
0.2
0.0
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2721, Pipe Height: 8.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 03:25 | 4.20 | 10:20 | 5.97 | 5.03 | 04:30 | 1.01 | 09:55 | 1.46 | 1.24 | 04:30 | 0.123 | 10:20 | 0.255 | 0.188 | 0.188 | |
| 11/17/2019 | 03:35 | 4.18 | 09:20 | 6.03 | 5.11 | 05:15 | 0.92 | 09:25 | 1.42 | 1.24 | 05:20 | 0.110 | 09:25 | 0.257 | 0.191 | 0.191 | |
| 11/18/2019 | 02:55 | 4.16 | 07:50 | 5.95 | 5.08 | 02:55 | 0.95 | 07:50 | 1.41 | 1.25 | 02:55 | 0.113 | 07:50 | 0.254 | 0.191 | 0.191 | |
| 11/19/2019 | 03:35 | 4.28 | 07:50 | 6.27 | 5.07 | 03:35 | 1.00 | 07:20 | 1.43 | 1.25 | 03:35 | 0.123 | 07:20 | 0.261 | 0.190 | 0.190 | |
| 11/20/2019 | 03:00 | 4.19 | 07:45 | 6.37 | 5.04 | 03:00 | 0.97 | 07:55 | 1.41 | 1.24 | 03:00 | 0.116 | 07:45 | 0.261 | 0.187 | 0.187 | |
| 11/21/2019 | 03:10 | 4.20 | 07:50 | 6.12 | 5.03 | 03:10 | 0.97 | 07:55 | 1.46 | 1.24 | 03:10 | 0.116 | 07:55 | 0.267 | 0.187 | 0.187 | |
| 11/22/2019 | 02:20 | 4.28 | 07:40 | 6.00 | 5.03 | 02:20 | 1.00 | 07:40 | 1.42 | 1.24 | 02:20 | 0.123 | 07:40 | 0.257 | 0.186 | 0.186 | |
| 11/23/2019 | 04:30 | 4.15 | 10:20 | 6.12 | 5.09 | 04:30 | 0.95 | 10:15 | 1.47 | 1.25 | 04:30 | 0.112 | 10:15 | 0.269 | 0.191 | 0.191 | |
| 11/24/2019 | 04:40 | 4.41 | 09:45 | 6.26 | 5.19 | 04:40 | 1.05 | 10:35 | 1.45 | 1.27 | 04:40 | 0.134 | 09:45 | 0.272 | 0.199 | 0.199 | |
| 11/25/2019 | 03:50 | 4.22 | 19:15 | 6.14 | 5.19 | 03:50 | 0.98 | 19:10 | 1.41 | 1.27 | 03:50 | 0.118 | 19:15 | 0.256 | 0.199 | 0.199 | |
| 11/26/2019 | 01:30 | 4.57 | 07:40 | 6.34 | 5.29 | 01:30 | 1.11 | 07:25 | 1.45 | 1.30 | 01:30 | 0.148 | 07:50 | 0.271 | 0.207 | 0.207 | 0.63 |
| 11/27/2019 | 04:20 | 4.42 | 18:30 | 6.33 | 5.34 | 04:20 | 1.05 | 21:25 | 1.47 | 1.30 | 04:20 | 0.135 | 18:25 | 0.277 | 0.210 | 0.210 | 0.77 |
| 11/28/2019 | 04:30 | 4.82 | 11:10 | 6.82 | 5.85 | 23:55 | 0.85 | 08:20 | 1.40 | 1.11 | 23:55 | 0.150 | 08:20 | 0.247 | 0.194 | 0.194 | |
| 11/29/2019 | 04:40 | 5.27 | 10:45 | 7.15 | 6.21 | 04:40 | 0.67 | 10:45 | 1.22 | 0.96 | 04:40 | 0.105 | 10:45 | 0.260 | 0.183 | 0.183 | 0.05 |
| 11/30/2019 | 04:40 | 5.23 | 13:30 | 7.09 | 6.19 | 04:40 | 0.65 | 13:30 | 1.21 | 0.96 | 04:40 | 0.102 | 13:30 | 0.256 | 0.181 | 0.181 | 0.14 |
| 12/01/2019 | 05:35 | 5.34 | 19:25 | 7.32 | 6.31 | 05:35 | 0.68 | 19:25 | 1.27 | 1.00 | 05:35 | 0.108 | 19:25 | 0.275 | 0.192 | 0.192 | 0.06 |
| 12/02/2019 | 02:45 | 5.31 | 07:50 | 7.41 | 6.35 | 02:45 | 0.67 | 07:50 | 1.29 | 1.01 | 02:45 | 0.106 | 07:50 | 0.282 | 0.196 | 0.196 | 0.36 |
| 12/03/2019 | 03:30 | 5.32 | 07:25 | 7.08 | 6.34 | 03:30 | 0.67 | 07:25 | 1.22 | 1.01 | 03:30 | 0.107 | 07:25 | 0.257 | 0.195 | 0.195 | |
| 12/04/2019 | 02:15 | 5.65 | 07:40 | 7.51 | 6.39 | 02:15 | 0.79 | 07:40 | 1.31 | 1.03 | 02:15 | 0.135 | 07:40 | 0.289 | 0.199 | 0.199 | 0.44 |
| 12/05/2019 | 02:20 | 5.63 | 19:30 | 7.37 | 6.52 | 02:20 | 0.79 | 19:30 | 1.28 | 1.06 | 02:20 | 0.133 | 19:30 | 0.279 | 0.210 | 0.210 | |
| 12/06/2019 | 03:25 | 5.77 | 07:50 | 7.16 | 6.37 | 03:25 | 0.84 | 07:55 | 1.29 | 1.03 | 03:25 | 0.146 | 07:55 | 0.274 | 0.200 | 0.200 | 0.06 |
| 12/07/2019 | 04:05 | 5.72 | 17:40 | 7.81 | 6.66 | 02:50 | 0.75 | 17:40 | 1.37 | 1.08 | 02:50 | 0.129 | 17:40 | 0.308 | 0.218 | 0.218 | 0.84 |
| 12/08/2019 | 04:55 | 5.79 | 10:50 | 7.74 | 6.68 | 04:55 | 0.84 | 10:50 | 1.36 | 1.11 | 04:55 | 0.147 | 10:50 | 0.304 | 0.223 | 0.223 | 0.10 |
| 12/09/2019 | 04:15 | 5.62 | 07:45 | 7.11 | 6.38 | 04:15 | 0.78 | 07:45 | 1.22 | 1.02 | 04:15 | 0.133 | 07:45 | 0.259 | 0.198 | 0.198 | |
| 12/10/2019 | 02:35 | 5.59 | 07:40 | 7.16 | 6.33 | 02:35 | 0.77 | 07:40 | 1.23 | 1.01 | 02:35 | 0.130 | 07:40 | 0.263 | 0.194 | 0.194 | 0.01 |
| 12/11/2019 | 02:55 | 5.51 | 07:45 | 7.40 | 6.30 | 02:55 | 0.74 | 07:45 | 1.29 | 1.02 | 02:55 | 0.123 | 07:45 | 0.281 | 0.195 | 0.195 | 0.00 |
| 12/12/2019 | 04:15 | 5.55 | 07:20 | 7.11 | 6.30 | 04:15 | 0.76 | 07:55 | 1.26 | 0.99 | 04:15 | 0.127 | 07:55 | 0.261 | 0.190 | 0.190 | |
| 12/13/2019 | 03:00 | 5.57 | 07:45 | 7.03 | 6.31 | 04:10 | 0.75 | 08:00 | 1.19 | 0.99 | 04:10 | 0.126 | 08:00 | 0.249 | 0.190 | 0.190 | |
| 12/14/2019 | 03:55 | 5.51 | 10:05 | 7.35 | 6.40 | 03:55 | 0.74 | 10:05 | 1.28 | 1.03 | 03:55 | 0.123 | 10:05 | 0.277 | 0.200 | 0.200 | 0.01 |
| 12/15/2019 | 03:45 | 5.49 | 11:00 | 7.46 | 6.39 | 03:45 | 0.73 | 11:00 | 1.30 | 1.02 | 03:45 | 0.121 | 11:00 | 0.285 | 0.199 | 0.199 | |
| 12/16/2019 | 02:50 | 5.57 | 07:45 | 7.10 | 6.33 | 02:50 | 0.76 | 07:45 | 1.22 | 1.01 | 02:50 | 0.128 | 07:45 | 0.258 | 0.194 | 0.194 | |
| 12/17/2019 | 01:25 | 5.57 | 20:35 | 7.07 | 6.39 | 01:25 | 0.76 | 20:35 | 1.21 | 1.03 | 01:25 | 0.128 | 20:35 | 0.256 | 0.199 | 0.199 | |
| 12/18/2019 | 03:15 | 5.65 | 07:25 | 7.29 | 6.46 | 03:15 | 0.79 | 07:25 | 1.26 | 1.05 | 03:15 | 0.135 | 07:25 | 0.273 | 0.206 | 0.206 | |
| 12/19/2019 | 03:15 | 5.63 | 07:40 | 7.44 | 6.42 | 03:15 | 0.79 | 07:40 | 1.30 | 1.03 | 03:15 | 0.133 | 07:40 | 0.284 | 0.202 | 0.202 | |
| 12/20/2019 | 03:05 | 5.71 | 07:30 | 7.35 | 6.50 | 03:05 | 0.82 | 07:30 | 1.28 | 1.06 | 03:05 | 0.140 | 07:30 | 0.277 | 0.208 | 0.208 | 0.02 |
| 12/21/2019 | 04:40 | 5.89 | 09:50 | 7.90 | 6.65 | 04:40 | 0.88 | 09:50 | 1.39 | 1.10 | 04:40 | 0.156 | 09:50 | 0.313 | 0.221 | 0.221 | |
| 12/22/2019 | 04:25 | 5.75 | 13:25 | 7.91 | 6.70 | 04:25 | 0.83 | 13:25 | 1.39 | 1.11 | 04:25 | 0.144 | 13:25 | 0.313 | 0.224 | 0.224 | |
| 12/23/2019 | 04:20 | 6.01 | 09:40 | 7.43 | 6.61 | 04:20 | 0.92 | 09:40 | 1.30 | 1.09 | 04:20 | 0.167 | 09:40 | 0.283 | 0.218 | 0.218 | |
| 12/24/2019 | 04:20 | 5.92 | 09:40 | 7.32 | 6.59 | 04:20 | 0.89 | 09:40 | 1.27 | 1.08 | 04:20 | 0.159 | 09:40 | 0.275 | 0.216 | 0.216 | |
| 12/25/2019 | 23:25 | 5.75 | 11:35 | 8.01 | 6.31 | 23:25 | 0.83 | 11:35 | 1.41 | 1.00 | 23:25 | 0.144 | 11:35 | 0.318 | 0.192 | 0.192 | |
| 12/26/2019 | 04:20 | 5.42 | 08:25 | 6.60 | 6.14 | 04:20 | 0.71 | 08:25 | 1.09 | 0.95 | 04:20 | 0.115 | 08:25 | 0.218 | 0.178 | 0.178 | |
| 12/27/2019 | 03:45 | 5.76 | 09:35 | 7.60 | 6.33 | 03:45 | 0.83 | 09:25 | 1.43 | 1.01 | 03:45 | 0.145 | 09:25 | 0.315 | 0.194 | 0.194 | |
| 12/28/2019 | 06:20 | 5.92 | 12:45 | 7.79 | 6.60 | 06:20 | 0.89 | 12:45 | 1.37 | 1.09 | 06:20 | 0.159 | 12:45 | 0.307 | 0.217 | 0.217 | |
| 12/29/2019 | 02:55 | 5.95 | 10:35 | 7.52 | 6.44 | 02:55 | 0.84 | 10:35 | 1.31 | 1.04 | 02:55 | 0.151 | 10:35 | 0.289 | 0.204 | 0.204 | |
| 12/30/2019 | 02:50 | 5.60 | 17:35 | 7.32 | 6.47 | 02:50 | 0.78 | 17:35 | 1.27 | 1.05 | 02:50 | 0.131 | 17:35 | 0.275 | 0.205 | 0.205 | |
| 12/31/2019 | 04:15 | 5.67 | 19:05 | 7.45 | 6.52 | 04:15 | 0.80 | 19:05 | 1.30 | 1.06 | 04:15 | 0.137 | 19:05 | 0.284 | 0.210 | 0.210 | |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 03:55 | 5.94 10:10 | 7.26 | 6.52 | 03:55 | 0.89 10:10 | 1.26 | 1.07 | 03:55 | 0.161 10:10 | 0.271 | 0.211 | 0.211 | |
| 01/02/2020 | 04:25 | 5.87 09:15 | 7.18 | 6.52 | 04:25 | 0.87 09:15 | 1.24 | 1.07 | 04:25 | 0.154 09:15 | 0.264 | 0.210 | 0.210 | |
| 01/03/2020 | 04:15 | 5.93 17:35 | 7.45 | 6.61 | 04:15 | 0.89 17:35 | 1.30 | 1.09 | 04:15 | 0.160 17:35 | 0.284 | 0.218 | 0.218 | |
| 01/04/2020 | 04:00 | 5.91 11:25 | 6.98 | 6.45 | 04:00 | 0.88 11:25 | 1.19 | 1.05 | 04:00 | 0.158 11:25 | 0.249 | 0.205 | 0.205 | |
| 01/05/2020 | 05:40 | 5.60 20:55 | 7.20 | 6.44 | 05:40 | 0.78 20:55 | 1.24 | 1.04 | 05:40 | 0.131 20:55 | 0.266 | 0.203 | 0.203 | |
| 01/06/2020 | 02:25 | 5.53 18:55 | 7.42 | 6.38 | 04:20 | 0.71 18:55 | 1.29 | 1.02 | 04:20 | 0.120 18:55 | 0.282 | 0.199 | 0.199 | |
| 01/07/2020 | 02:25 | 5.59 20:15 | 7.17 | 6.40 | 02:25 | 0.77 20:15 | 1.24 | 1.03 | 02:25 | 0.130 20:15 | 0.264 | 0.200 | 0.200 | |
| 01/08/2020 | 03:20 | 5.64 07:45 | 7.45 | 6.44 | 02:15 | 0.75 07:50 | 1.32 | 1.03 | 02:25 | 0.127 07:50 | 0.288 | 0.201 | 0.201 | |
| 01/09/2020 | 02:50 | 5.59 19:55 | 7.54 | 6.56 | 03:55 | 0.71 07:45 | 1.35 | 1.06 | 03:55 | 0.121 07:45 | 0.292 | 0.211 | 0.211 | |
| 01/10/2020 | 01:30 | 5.83 07:00 | 7.22 | 6.62 | 01:30 | 0.86 07:00 | 1.25 | 1.09 | 01:30 | 0.151 07:00 | 0.267 | 0.219 | 0.219 | |
| 01/11/2020 | 04:15 | 5.74 09:00 | 7.10 | 6.42 | 04:15 | 0.83 09:00 | 1.22 | 1.04 | 04:15 | 0.143 09:00 | 0.258 | 0.202 | 0.202 | |
| 01/12/2020 | 03:30 | 5.39 17:15 | 6.87 | 6.21 | 03:30 | 0.70 17:15 | 1.16 | 0.97 | 03:30 | 0.113 17:15 | 0.240 | 0.184 | 0.184 | |
| 01/13/2020 | 03:40 | 5.30 08:00 | 7.49 | 6.20 | 03:40 | 0.66 08:10 | 1.31 | 0.97 | 03:40 | 0.105 08:00 | 0.285 | 0.183 | 0.183 | |
| 01/14/2020 | 01:45 | 5.44 07:35 | 6.97 | 6.26 | 01:55 | 0.64 07:35 | 1.19 | 0.98 | 01:55 | 0.105 07:35 | 0.248 | 0.187 | 0.187 | |
| 01/15/2020 | 02:35 | 5.55 09:05 | 6.95 | 6.32 | 01:10 | 0.71 09:15 | 1.22 | 0.99 | 02:55 | 0.120 09:15 | 0.250 | 0.191 | 0.191 | 0.10 |
| 01/16/2020 | 02:40 | 5.58 18:50 | 7.48 | 6.57 | 02:40 | 0.71 18:50 | 1.31 | 1.06 | 02:40 | 0.119 18:50 | 0.287 | 0.211 | 0.211 | 0.66 |
| 01/17/2020 | 03:35 | 5.82 08:05 | 9.28 | 6.45 | 03:35 | 0.85 08:10 | 1.61 | 1.04 | 03:35 | 0.150 08:10 | 0.363 | 0.203 | 0.203 | |
| 01/18/2020 | 03:10 | 5.61 09:40 | 7.41 | 6.46 | 03:10 | 0.78 09:40 | 1.29 | 1.04 | 03:10 | 0.132 09:40 | 0.282 | 0.205 | 0.205 | |
| 01/19/2020 | 05:10 | 5.77 09:45 | 7.80 | 6.48 | 05:10 | 0.84 09:45 | 1.37 | 1.05 | 05:10 | 0.146 09:45 | 0.308 | 0.207 | 0.207 | |
| 01/20/2020 | 03:30 | 5.61 20:05 | 6.90 | 6.31 | 03:30 | 0.78 20:05 | 1.17 | 1.00 | 03:30 | 0.132 20:05 | 0.242 | 0.192 | 0.192 | |
| 01/21/2020 | 03:00 | 5.38 21:35 | 7.07 | 6.18 | 04:40 | 0.65 21:35 | 1.21 | 0.96 | 04:40 | 0.107 21:35 | 0.256 | 0.181 | 0.181 | 0.01 |
| 01/22/2020 | 02:35 | 5.62 08:00 | 7.17 | 6.34 | 02:35 | 0.78 08:00 | 1.24 | 1.01 | 02:35 | 0.133 08:00 | 0.264 | 0.195 | 0.195 | 0.09 |
| 01/23/2020 | 03:15 | 5.30 19:40 | 6.92 | 6.19 | 03:15 | 0.66 19:40 | 1.18 | 0.97 | 03:15 | 0.105 19:40 | 0.244 | 0.182 | 0.182 | |
| 01/24/2020 | 03:05 | 5.45 09:40 | 7.00 | 6.32 | 03:05 | 0.72 09:40 | 1.20 | 1.01 | 03:05 | 0.118 09:40 | 0.250 | 0.193 | 0.193 | |
| 01/25/2020 | 03:10 | 5.43 12:10 | 6.92 | 6.17 | 03:10 | 0.71 12:10 | 1.18 | 0.96 | 03:10 | 0.116 12:10 | 0.244 | 0.181 | 0.181 | |
| 01/26/2020 | 04:40 | 5.26 11:15 | 6.98 | 6.20 | 04:40 | 0.65 11:15 | 1.19 | 0.96 | 04:40 | 0.101 11:15 | 0.249 | 0.183 | 0.183 | 0.16 |
| 01/27/2020 | 05:55 | 5.59 05:25 | 7.24 | 6.23 | 00:05 | 0.78 05:25 | 1.25 | 0.98 | 06:00 | 0.135 05:25 | 0.269 | 0.185 | 0.185 | |
| 01/28/2020 | 02:35 | 5.33 07:40 | 6.83 | 6.08 | 02:35 | 0.67 07:40 | 1.15 | 0.93 | 02:35 | 0.107 07:40 | 0.237 | 0.173 | 0.173 | 0.02 |
| 01/29/2020 | 03:20 | 5.27 19:10 | 6.82 | 6.11 | 03:20 | 0.65 19:10 | 1.15 | 0.94 | 03:20 | 0.102 19:10 | 0.236 | 0.176 | 0.176 | |
| 01/30/2020 | 03:05 | 5.38 07:55 | 6.95 | 6.21 | 03:05 | 0.69 07:55 | 1.18 | 0.97 | 03:05 | 0.112 07:55 | 0.246 | 0.184 | 0.184 | |
| 01/31/2020 | 02:55 | 5.43 08:15 | 6.88 | 6.18 | 02:55 | 0.71 08:15 | 1.17 | 0.96 | 02:55 | 0.116 08:15 | 0.241 | 0.181 | 0.181 | 0.01 |
| 02/01/2020 | 02:55 | 5.15 08:00 | 7.09 | 6.04 | 04:30 | 0.56 08:00 | 1.19 | 0.92 | 04:30 | 0.087 08:00 | 0.251 | 0.169 | 0.169 | |
| 02/02/2020 | 06:05 | 5.08 21:20 | 7.08 | 6.15 | 05:45 | 0.53 21:20 | 1.22 | 0.94 | 05:45 | 0.080 21:20 | 0.257 | 0.178 | 0.178 | |
| 02/03/2020 | 03:35 | 5.36 07:45 | 6.92 | 6.18 | 03:35 | 0.68 07:45 | 1.18 | 0.96 | 03:35 | 0.110 07:45 | 0.244 | 0.181 | 0.181 | |
| 02/04/2020 | 02:15 | 5.36 18:45 | 6.91 | 6.19 | 02:15 | 0.68 18:45 | 1.17 | 0.97 | 02:15 | 0.110 18:45 | 0.243 | 0.182 | 0.182 | |
| 02/05/2020 | 04:05 | 5.50 07:25 | 6.89 | 6.21 | 04:05 | 0.74 07:25 | 1.17 | 0.97 | 04:05 | 0.122 07:25 | 0.242 | 0.184 | 0.184 | |
| 02/06/2020 | 02:25 | 5.50 21:05 | 7.16 | 6.25 | 02:25 | 0.74 21:05 | 1.23 | 0.99 | 02:25 | 0.122 21:05 | 0.263 | 0.187 | 0.187 | |
| 02/07/2020 | 03:10 | 5.30 18:10 | 7.26 | 6.07 | 03:10 | 0.66 18:10 | 1.26 | 0.93 | 03:10 | 0.105 18:10 | 0.271 | 0.172 | 0.172 | |
| 02/08/2020 | 04:20 | 5.16 09:35 | 6.93 | 6.12 | 04:20 | 0.60 09:35 | 1.18 | 0.94 | 04:20 | 0.093 09:35 | 0.245 | 0.176 | 0.176 | |
| 02/09/2020 | 05:00 | 5.13 12:35 | 7.04 | 6.15 | 05:00 | 0.59 12:35 | 1.21 | 0.95 | 05:00 | 0.090 12:35 | 0.254 | 0.179 | 0.179 | |
| 02/10/2020 | 03:30 | 5.38 07:45 | 7.14 | 6.21 | 03:30 | 0.69 07:45 | 1.23 | 0.97 | 03:30 | 0.112 07:45 | 0.261 | 0.184 | 0.184 | |
| 02/11/2020 | 03:45 | 5.37 07:50 | 6.94 | 6.19 | 03:45 | 0.69 07:50 | 1.18 | 0.96 | 03:45 | 0.111 07:50 | 0.246 | 0.182 | 0.182 | |
| 02/12/2020 | 02:05 | 5.41 07:45 | 7.02 | 6.23 | 02:05 | 0.70 07:45 | 1.20 | 0.98 | 02:05 | 0.114 07:45 | 0.252 | 0.186 | 0.186 | |
| 02/13/2020 | 04:05 | 5.56 07:30 | 6.96 | 6.22 | 04:05 | 0.76 07:30 | 1.19 | 0.98 | 04:05 | 0.127 07:30 | 0.247 | 0.185 | 0.185 | |
| 02/14/2020 | 03:30 | 5.50 07:45 | 6.84 | 6.22 | 03:30 | 0.74 18:40 | 1.17 | 0.99 | 03:30 | 0.122 07:45 | 0.237 | 0.187 | 0.187 | |
| 02/15/2020 | 05:10 | 5.44 15:55 | 7.03 | 6.27 | 03:05 | 0.79 15:55 | 1.24 | 1.02 | 03:10 | 0.130 15:55 | 0.261 | 0.194 | 0.194 | |
| 02/16/2020 | 02:20 | 5.66 10:15 | 7.49 | 6.44 | 04:15 | 0.79 10:00 | 1.31 | 1.05 | 04:15 | 0.135 10:15 | 0.286 | 0.205 | 0.205 | |
| 02/17/2020 | 04:20 | 5.98 10:00 | 8.34 | 6.92 | 04:20 | 0.90 10:05 | 1.51 | 1.14 | 04:20 | 0.163 10:05 | 0.341 | 0.235 | 0.235 | |
| 02/18/2020 | 03:05 | 6.06 09:30 | 7.95 | 6.85 | 03:05 | 0.93 09:30 | 1.39 | 1.12 | 03:05 | 0.170 09:30 | 0.314 | 0.230 | 0.230 | |
| 02/19/2020 | 02:45 | 6.01 08:35 | 7.78 | 6.84 | 02:45 | 0.91 08:45 | 1.37 | 1.11 | 02:45 | 0.166 08:35 | 0.304 | 0.229 | 0.229 | |
| 02/20/2020 | 04:20 | 6.05 09:00 | 7.73 | 6.77 | 04:20 | 0.92 09:05 | 1.34 | 1.10 | 04:20 | 0.169 09:05 | 0.300 | 0.223 | 0.223 | |
| 02/21/2020 | 03:40 | 6.01 18:45 | 7.58 | 6.69 | 03:40 | 0.91 18:45 | 1.32 | 1.07 | 03:40 | 0.166 18:45 | 0.292 | 0.217 | 0.217 | |
| 02/22/2020 | 05:00 | 5.89 10:20 | 8.07 | 6.77 | 05:00 | 0.87 10:20 | 1.39 | 1.10 | 05:00 | 0.156 10:20 | 0.315 | 0.224 | 0.224 | |
| 02/23/2020 | 05:15 | 5.89 11:05 | 7.88 | 6.74 | 05:15 | 0.87 11:00 | 1.39 | 1.10 | 05:15 | 0.156 11:05 | 0.310 | 0.223 | 0.223 | |
| 02/24/2020 | 03:15 | 5.87 19:50 | 8.34 | 6.69 | 03:15 | 0.87 19:50 | 1.46 | 1.08 | 03:15 | 0.154 19:50 | 0.330 | 0.217 | 0.217 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 02:30 | 5.85 | 07:40 | 7.89 | 6.64 | 02:30 | 0.79 | 07:45 | 1.43 | 1.07 | 02:30 | 0.140 | 07:45 | 0.322 | 0.215 | 0.215 | |
| 02/26/2020 | 04:10 | 6.02 | 07:40 | 7.55 | 6.65 | 04:10 | 0.91 | 07:35 | 1.38 | 1.07 | 04:10 | 0.167 | 07:35 | 0.301 | 0.214 | 0.214 | |
| 02/27/2020 | 02:50 | 5.90 | 07:10 | 7.61 | 6.59 | 02:50 | 0.88 | 07:10 | 1.40 | 1.07 | 02:50 | 0.156 | 07:10 | 0.311 | 0.213 | 0.213 | |
| 02/28/2020 | 03:10 | 5.71 | 07:35 | 7.69 | 6.49 | 02:55 | 0.74 | 07:35 | 1.35 | 1.03 | 03:00 | 0.128 | 07:35 | 0.300 | 0.203 | 0.203 | |
| 02/29/2020 | 23:50 | 4.83 | 11:05 | 7.31 | 5.91 | 03:30 | 0.79 | 14:30 | 1.43 | 1.15 | 03:30 | 0.139 | 11:05 | 0.273 | 0.204 | 0.204 | |
| 03/01/2020 | 04:35 | 4.05 | 20:55 | 6.58 | 5.30 | 04:35 | 0.99 | 12:35 | 1.42 | 1.24 | 04:35 | 0.113 | 19:40 | 0.265 | 0.199 | 0.199 | |
| 03/02/2020 | 03:05 | 3.86 | 07:35 | 6.38 | 4.60 | 03:05 | 0.92 | 07:00 | 1.41 | 1.12 | 03:05 | 0.100 | 07:30 | 0.267 | 0.153 | 0.055 | 0.01 |
| 03/03/2020 | | | | | | | | | | | | | | | | | |
| 03/04/2020 | | | | | | | | | | | | | | | | | |
| 03/05/2020 | | | | | | | | | | | | | | | | | |
| 03/06/2020 | | | | | | | | | | | | | | | | | |
| 03/07/2020 | | | | | | | | | | | | | | | | | 0.58 |
| 03/08/2020 | | | | | | | | | | | | | | | | | 0.02 |
| 03/09/2020 | | | | | | | | | | | | | | | | | 0.11 |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 21.255 | 5.26 |
| Avg | 6.23 | 1.05 | 0.198 | |

## Site Commentary

### Site Information

| MIL_2724 | |
|---|---|
| Pipe Dimensions | 39.88 |
| Silt Level | 0.00" |

### Overview

Site MIL_2724 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019 and December 7, 2019 - December 8, 2019. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 18.34 | 0.78 | 2.042 |
| Minimum | 13.49 | 0.43 | 0.744 |
| Maximum | 22.23 | 1.11 | 3.446 |
| Time of Minimum | 3/4/2020 5:30 AM | 3/4/2020 4:40 AM | 3/4/2020 4:40 AM |
| Time of Maximum | 12/7/2019 7:45 PM | 12/2/2019 10:10 AM | 12/4/2019 10:25 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_2724

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | California Cir and Cadillac Court, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | Drive | Latitude: | 37.446644° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.918485° | 39.88" x 40.50" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 2724 | Residential/Commercial |
| Access | Traffic |
| Drive | Light |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Tuesday, November 12, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 5:37:34 AM | 39.88" x 40.50" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 14.00" | 0.00" |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 0.89 | 0" |
| Silt (in) | Silt Type |
| 0" | |

Hydraulic Comments:

Ok flow, Deep and slow

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 20' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26" | 54" |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| PVC | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Manhole Pick / Vent Hole |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA19-20 |
| ADS Project Number: | 22431 |

# SCATTERGRAPH REPORT

MIL_2724

**Flow Monitor**

**MIL_2724**

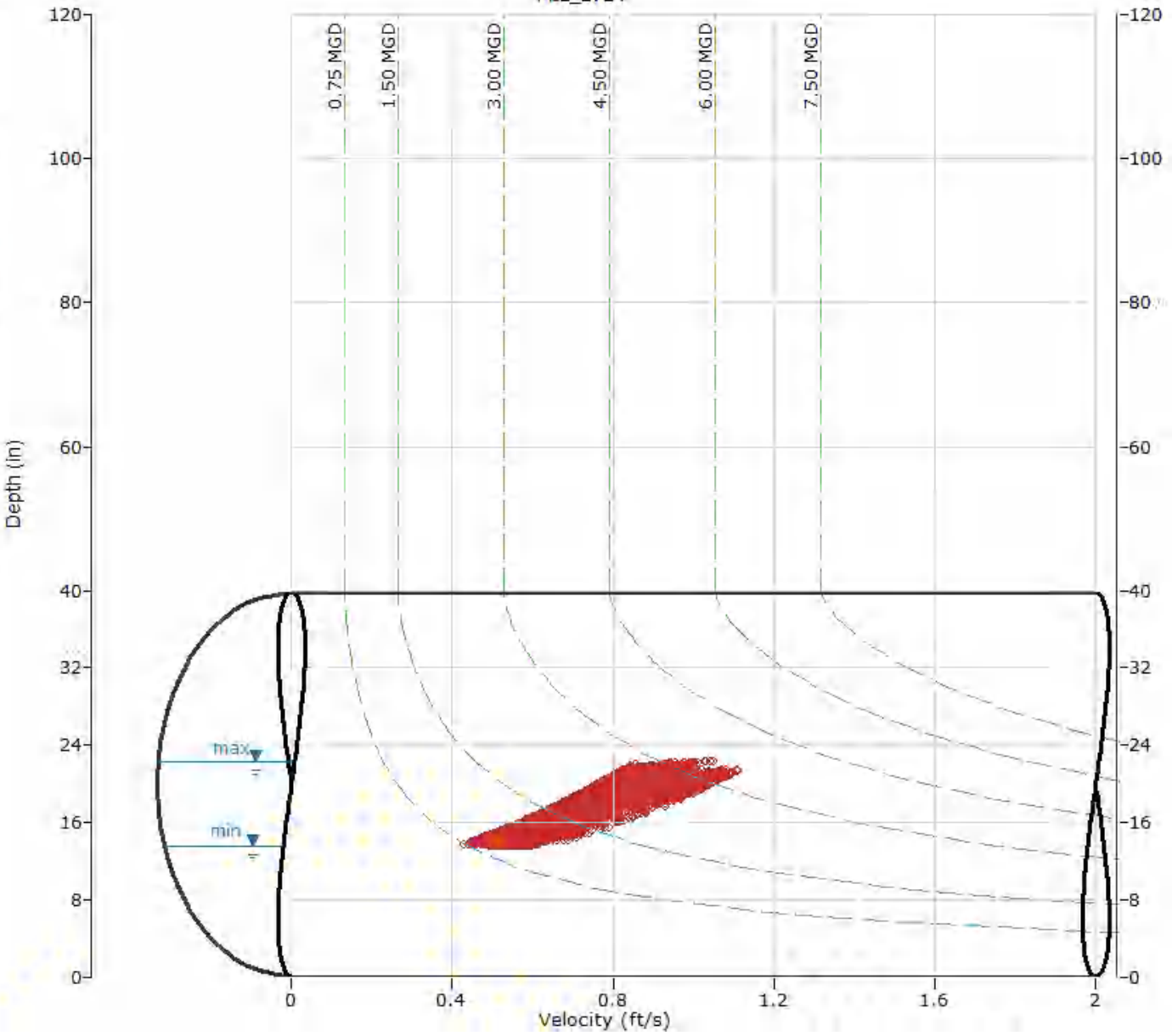
Pipe Height
39.88 in

**Report Period**

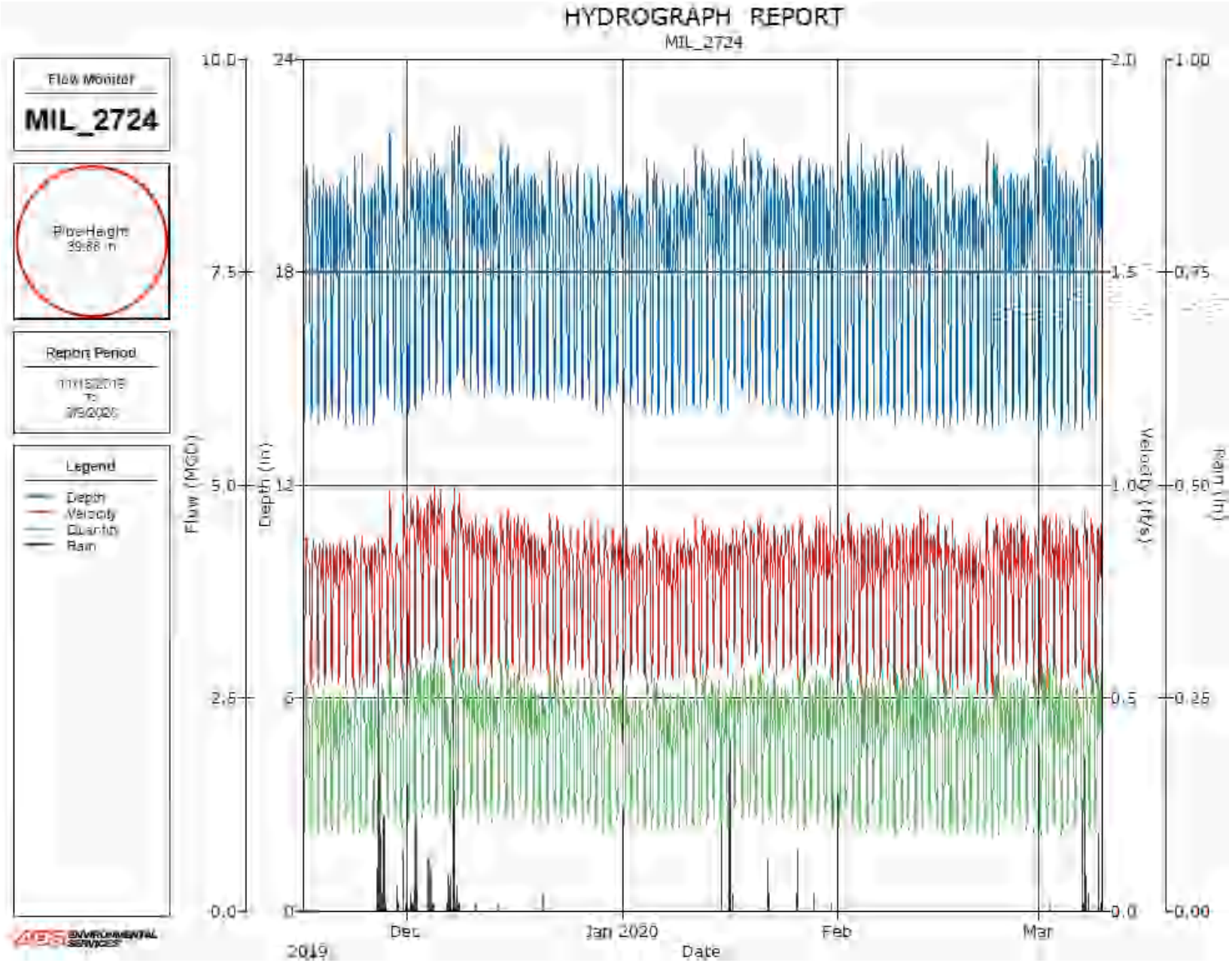
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_2724
Flow Monitor
MIL_2724
Pipe Height
39.88 in
Report Period
11/15/2019
to
3/9/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
10.0
7.5
5.0
2.5
0.0
24
18
12
6
0
2.0
1.5
1.0
0.5
0.0
1.00
0.75
0.50
0.25
0.00
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2724, Pipe Height: 39.88 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 06:05 | 13.74 | 12:15 | 21.05 | 18.02 | 06:05 | 0.53 | 12:15 | 0.88 | 0.75 | 06:05 | 0.917 | 12:15 | 2.670 | 1.935 | 1.935 | |
| 11/17/2019 | 06:05 | 13.78 | 12:45 | 20.99 | 18.15 | 06:05 | 0.53 | 12:45 | 0.87 | 0.76 | 06:05 | 0.925 | 12:45 | 2.656 | 1.968 | 1.968 | |
| 11/18/2019 | 05:30 | 13.71 | 22:10 | 20.69 | 18.05 | 05:30 | 0.53 | 22:10 | 0.87 | 0.76 | 05:30 | 0.910 | 22:10 | 2.587 | 1.942 | 1.942 | |
| 11/19/2019 | 05:35 | 13.80 | 09:50 | 20.54 | 18.07 | 05:35 | 0.53 | 09:50 | 0.86 | 0.76 | 05:35 | 0.931 | 09:50 | 2.551 | 1.949 | 1.949 | |
| 11/20/2019 | 05:25 | 13.88 | 09:50 | 20.59 | 18.03 | 05:25 | 0.54 | 09:50 | 0.86 | 0.76 | 05:25 | 0.946 | 09:50 | 2.564 | 1.938 | 1.938 | |
| 11/21/2019 | 05:40 | 13.81 | 10:10 | 20.70 | 18.02 | 05:40 | 0.53 | 10:10 | 0.87 | 0.76 | 05:40 | 0.932 | 10:10 | 2.589 | 1.937 | 1.937 | |
| 11/22/2019 | 05:30 | 13.71 | 10:05 | 20.76 | 18.09 | 05:30 | 0.53 | 10:05 | 0.87 | 0.76 | 05:30 | 0.912 | 10:05 | 2.603 | 1.953 | 1.953 | |
| 11/23/2019 | 06:05 | 13.69 | 12:45 | 21.31 | 18.08 | 06:05 | 0.52 | 12:45 | 0.88 | 0.76 | 06:05 | 0.906 | 12:45 | 2.729 | 1.951 | 1.951 | |
| 11/24/2019 | 06:25 | 13.67 | 12:30 | 21.38 | 18.19 | 06:25 | 0.52 | 12:30 | 0.88 | 0.76 | 06:25 | 0.902 | 12:30 | 2.746 | 1.977 | 1.977 | |
| 11/25/2019 | 05:35 | 13.64 | 09:55 | 20.41 | 17.97 | 05:35 | 0.52 | 09:55 | 0.86 | 0.75 | 05:35 | 0.897 | 09:55 | 2.520 | 1.925 | 1.925 | |
| 11/26/2019 | 05:35 | 13.71 | 22:15 | 21.05 | 18.15 | 05:35 | 0.53 | 22:15 | 0.88 | 0.76 | 05:35 | 0.911 | 22:15 | 2.671 | 1.968 | 1.968 | 0.63 |
| 11/27/2019 | 04:50 | 14.44 | 11:30 | 21.02 | 18.67 | 04:50 | 0.57 | 11:30 | 0.88 | 0.78 | 04:50 | 1.065 | 11:30 | 2.664 | 2.093 | 2.093 | 0.77 |
| 11/28/2019 | 06:40 | 14.33 | 13:45 | 21.91 | 18.41 | 06:40 | 0.57 | 13:45 | 1.00 | 0.77 | 06:40 | 1.043 | 13:45 | 3.198 | 2.040 | 2.040 | |
| 11/29/2019 | 06:20 | 14.05 | 12:50 | 20.54 | 17.82 | 06:20 | 0.55 | 12:50 | 0.86 | 0.75 | 06:20 | 0.981 | 12:50 | 2.552 | 1.884 | 1.884 | 0.05 |
| 11/30/2019 | 06:00 | 13.99 | 13:50 | 21.00 | 17.98 | 05:40 | 0.51 | 11:55 | 1.06 | 0.79 | 05:40 | 0.914 | 13:35 | 3.216 | 2.021 | 2.021 | 0.14 |
| 12/01/2019 | 06:35 | 14.06 | 13:45 | 21.12 | 18.38 | 05:15 | 0.53 | 12:35 | 1.09 | 0.83 | 06:35 | 0.950 | 13:15 | 3.333 | 2.196 | 2.196 | 0.06 |
| 12/02/2019 | 05:35 | 14.07 | 10:05 | 21.27 | 18.67 | 05:45 | 0.51 | 10:10 | 1.11 | 0.84 | 05:45 | 0.916 | 10:10 | 3.427 | 2.251 | 2.251 | 0.36 |
| 12/03/2019 | 05:35 | 14.37 | 22:15 | 20.89 | 18.45 | 05:25 | 0.57 | 21:35 | 1.08 | 0.84 | 05:25 | 1.051 | 23:10 | 3.240 | 2.193 | 2.193 | |
| 12/04/2019 | 04:55 | 14.58 | 22:25 | 21.36 | 18.87 | 04:50 | 0.58 | 22:25 | 1.11 | 0.87 | 04:50 | 1.091 | 22:25 | 3.446 | 2.348 | 2.348 | 0.44 |
| 12/05/2019 | 05:30 | 14.58 | 10:05 | 21.01 | 18.69 | 05:45 | 0.55 | 10:30 | 1.07 | 0.86 | 05:45 | 1.039 | 10:30 | 3.235 | 2.303 | 2.303 | |
| 12/06/2019 | 05:30 | 14.54 | 10:15 | 20.84 | 18.47 | 05:00 | 0.55 | 09:10 | 1.06 | 0.80 | 05:15 | 1.034 | 09:10 | 3.106 | 2.087 | 2.087 | 0.06 |
| 12/07/2019 | 06:10 | 14.37 | 19:45 | 22.23 | 18.99 | 06:40 | 0.51 | 19:45 | 1.05 | 0.81 | 06:40 | 0.953 | 19:45 | 3.419 | 2.231 | 2.231 | 0.84 |
| 12/08/2019 | 06:30 | 15.07 | 12:25 | 22.18 | 19.31 | 04:35 | 0.58 | 12:25 | 1.00 | 0.84 | 06:00 | 1.140 | 12:25 | 3.264 | 2.341 | 2.341 | 0.10 |
| 12/09/2019 | 05:35 | 14.80 | 09:50 | 21.02 | 18.87 | 05:05 | 0.51 | 21:20 | 0.97 | 0.82 | 05:05 | 0.991 | 22:45 | 2.940 | 2.204 | 2.204 | |
| 12/10/2019 | 05:35 | 14.64 | 22:50 | 21.07 | 18.60 | 06:00 | 0.52 | 22:30 | 0.98 | 0.81 | 06:00 | 0.993 | 22:30 | 2.988 | 2.153 | 2.153 | 0.01 |
| 12/11/2019 | 05:25 | 14.61 | 22:55 | 20.85 | 18.60 | 05:05 | 0.50 | 10:25 | 0.96 | 0.80 | 05:20 | 0.935 | 23:15 | 2.887 | 2.115 | 2.115 | 0.00 |
| 12/12/2019 | 05:35 | 14.43 | 10:00 | 20.73 | 18.44 | 04:45 | 0.50 | 09:20 | 0.96 | 0.80 | 04:45 | 0.932 | 10:20 | 2.871 | 2.097 | 2.097 | |
| 12/13/2019 | 05:45 | 14.57 | 09:50 | 20.80 | 18.46 | 04:50 | 0.50 | 10:50 | 0.94 | 0.79 | 05:45 | 0.932 | 10:50 | 2.815 | 2.078 | 2.078 | |
| 12/14/2019 | 06:20 | 14.81 | 12:30 | 21.71 | 18.85 | 06:35 | 0.52 | 13:20 | 1.01 | 0.80 | 06:35 | 1.006 | 13:20 | 3.176 | 2.176 | 2.176 | 0.01 |
| 12/15/2019 | 06:35 | 14.51 | 12:30 | 21.60 | 18.72 | 05:20 | 0.51 | 12:00 | 1.00 | 0.79 | 06:25 | 0.978 | 12:40 | 3.116 | 2.141 | 2.141 | |
| 12/16/2019 | 05:35 | 14.52 | 22:40 | 21.09 | 18.64 | 05:35 | 0.58 | 10:15 | 0.98 | 0.81 | 05:35 | 1.078 | 23:05 | 2.982 | 2.152 | 2.152 | |
| 12/17/2019 | 05:40 | 14.60 | 22:55 | 20.78 | 18.58 | 05:35 | 0.50 | 09:40 | 0.96 | 0.80 | 05:35 | 0.935 | 23:20 | 2.876 | 2.127 | 2.127 | |
| 12/18/2019 | 05:25 | 14.46 | 22:30 | 20.69 | 18.58 | 04:55 | 0.50 | 10:25 | 0.96 | 0.79 | 04:55 | 0.947 | 10:25 | 2.836 | 2.100 | 2.100 | |
| 12/19/2019 | 05:35 | 14.39 | 10:00 | 20.84 | 18.55 | 05:55 | 0.50 | 09:40 | 0.94 | 0.78 | 05:55 | 0.935 | 09:40 | 2.804 | 2.051 | 2.051 | |
| 12/20/2019 | 05:40 | 14.38 | 10:10 | 20.54 | 18.50 | 05:50 | 0.49 | 10:30 | 0.93 | 0.78 | 05:50 | 0.899 | 10:30 | 2.739 | 2.039 | 2.039 | 0.02 |
| 12/21/2019 | 06:15 | 14.41 | 12:50 | 21.47 | 18.43 | 06:40 | 0.49 | 11:30 | 0.99 | 0.79 | 06:40 | 0.906 | 13:20 | 3.084 | 2.093 | 2.093 | |
| 12/22/2019 | 06:25 | 14.30 | 13:20 | 21.12 | 18.49 | 06:05 | 0.48 | 13:40 | 0.99 | 0.79 | 06:15 | 0.876 | 13:40 | 3.029 | 2.093 | 2.093 | |
| 12/23/2019 | 06:00 | 14.63 | 12:50 | 20.84 | 18.53 | 05:35 | 0.50 | 11:25 | 0.96 | 0.78 | 05:40 | 0.939 | 12:35 | 2.866 | 2.071 | 2.071 | |
| 12/24/2019 | 06:00 | 14.53 | 13:20 | 20.76 | 18.30 | 07:00 | 0.50 | 12:25 | 0.95 | 0.77 | 07:00 | 0.941 | 14:05 | 2.826 | 2.004 | 2.004 | |
| 12/25/2019 | 07:05 | 14.40 | 13:15 | 21.12 | 18.00 | 07:05 | 0.57 | 13:10 | 0.95 | 0.76 | 07:05 | 1.051 | 13:10 | 2.921 | 1.927 | 1.927 | |
| 12/26/2019 | 05:55 | 14.29 | 13:00 | 20.76 | 18.16 | 05:55 | 0.56 | 12:25 | 0.97 | 0.77 | 05:55 | 1.029 | 13:05 | 2.912 | 1.998 | 1.998 | |
| 12/27/2019 | 05:55 | 14.31 | 12:15 | 20.62 | 18.16 | 04:50 | 0.49 | 12:15 | 0.96 | 0.77 | 05:55 | 0.893 | 12:15 | 2.860 | 1.998 | 1.998 | |
| 12/28/2019 | 06:35 | 14.09 | 13:35 | 20.99 | 18.06 | 07:10 | 0.49 | 12:20 | 0.96 | 0.75 | 07:10 | 0.880 | 12:35 | 2.881 | 1.928 | 1.928 | |
| 12/29/2019 | 06:30 | 14.06 | 13:20 | 20.82 | 18.02 | 06:25 | 0.46 | 13:40 | 0.96 | 0.75 | 06:25 | 0.823 | 13:40 | 2.890 | 1.933 | 1.933 | |
| 12/30/2019 | 05:55 | 14.35 | 12:55 | 20.33 | 18.20 | 05:15 | 0.50 | 12:10 | 0.95 | 0.77 | 05:55 | 0.913 | 12:10 | 2.767 | 1.991 | 1.991 | |
| 12/31/2019 | 06:05 | 14.53 | 13:00 | 20.30 | 18.28 | 04:55 | 0.50 | 19:40 | 0.94 | 0.76 | 06:40 | 0.951 | 19:40 | 2.733 | 1.974 | 1.974 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 01/01/2020 | 07:20 | 14.33 | 13:45 | 20.53 | 17.98 | 06:05 | 0.50 | 12:50 | 0.96 | 0.75 | 06:25 | 0.922 | 13:55 | 2.842 | 1.912 | 1.912 | |
| 01/02/2020 | 05:50 | 14.22 | 11:50 | 20.44 | 18.11 | 05:40 | 0.50 | 11:45 | 0.94 | 0.76 | 05:40 | 0.919 | 11:50 | 2.750 | 1.948 | 1.948 | |
| 01/03/2020 | 05:50 | 14.26 | 12:35 | 20.09 | 18.12 | 05:50 | 0.56 | 12:35 | 0.86 | 0.76 | 05:50 | 1.023 | 12:35 | 2.472 | 1.960 | 1.960 | |
| 01/04/2020 | 06:30 | 14.06 | 13:30 | 21.19 | 18.21 | 06:30 | 0.55 | 13:30 | 0.91 | 0.77 | 06:30 | 0.980 | 13:30 | 2.786 | 1.993 | 1.993 | |
| 01/05/2020 | 06:45 | 13.97 | 13:15 | 21.14 | 18.39 | 06:20 | 0.46 | 12:45 | 0.91 | 0.77 | 06:20 | 0.819 | 12:45 | 2.775 | 2.038 | 2.038 | |
| 01/06/2020 | 05:35 | 13.96 | 22:20 | 20.57 | 18.05 | 05:35 | 0.54 | 22:20 | 0.88 | 0.76 | 05:35 | 0.960 | 22:20 | 2.607 | 1.945 | 1.945 | |
| 01/07/2020 | 05:35 | 13.98 | 22:10 | 20.49 | 17.96 | 05:35 | 0.54 | 22:10 | 0.88 | 0.75 | 05:35 | 0.965 | 22:10 | 2.585 | 1.914 | 1.914 | |
| 01/08/2020 | 05:50 | 13.98 | 22:20 | 20.50 | 17.98 | 05:50 | 0.54 | 21:55 | 0.92 | 0.75 | 05:50 | 0.965 | 21:55 | 2.703 | 1.908 | 1.908 | |
| 01/09/2020 | 05:35 | 14.03 | 22:00 | 20.97 | 18.39 | 05:35 | 0.54 | 21:10 | 0.94 | 0.77 | 05:35 | 0.974 | 21:20 | 2.859 | 2.032 | 2.032 | |
| 01/10/2020 | 05:40 | 14.23 | 10:00 | 20.40 | 18.44 | 05:40 | 0.56 | 23:05 | 0.88 | 0.78 | 05:40 | 1.016 | 10:00 | 2.560 | 2.042 | 2.042 | |
| 01/11/2020 | 06:20 | 14.26 | 13:30 | 21.59 | 18.52 | 06:30 | 0.49 | 13:30 | 0.92 | 0.78 | 06:30 | 0.890 | 13:30 | 2.902 | 2.069 | 2.069 | |
| 01/12/2020 | 06:20 | 14.18 | 12:55 | 21.48 | 18.67 | 06:20 | 0.55 | 13:10 | 0.92 | 0.78 | 06:20 | 1.006 | 13:10 | 2.869 | 2.111 | 2.111 | |
| 01/13/2020 | 05:25 | 14.19 | 22:50 | 20.89 | 18.48 | 05:25 | 0.56 | 22:50 | 0.89 | 0.78 | 05:25 | 1.008 | 22:50 | 2.698 | 2.057 | 2.057 | |
| 01/14/2020 | 05:45 | 14.42 | 22:20 | 20.92 | 18.42 | 05:45 | 0.57 | 22:20 | 0.89 | 0.78 | 05:45 | 1.057 | 22:20 | 2.707 | 2.042 | 2.042 | |
| 01/15/2020 | 05:30 | 13.93 | 22:00 | 20.77 | 18.28 | 05:30 | 0.54 | 19:55 | 0.95 | 0.77 | 05:30 | 0.956 | 19:55 | 2.723 | 1.998 | 1.998 | 0.10 |
| 01/16/2020 | 05:30 | 14.07 | 22:10 | 21.46 | 18.85 | 03:40 | 0.51 | 20:30 | 0.98 | 0.79 | 05:35 | 0.934 | 20:30 | 2.975 | 2.130 | 2.130 | 0.66 |
| 01/17/2020 | 05:30 | 14.90 | 10:00 | 21.03 | 18.91 | 03:40 | 0.55 | 10:05 | 0.95 | 0.79 | 04:50 | 1.115 | 10:05 | 2.890 | 2.145 | 2.145 | |
| 01/18/2020 | 06:15 | 14.62 | 13:40 | 21.78 | 18.71 | 06:35 | 0.51 | 11:10 | 0.98 | 0.79 | 06:35 | 0.963 | 11:20 | 2.982 | 2.116 | 2.116 | |
| 01/19/2020 | 06:30 | 14.32 | 13:00 | 21.43 | 18.49 | 05:25 | 0.49 | 14:20 | 0.98 | 0.78 | 05:25 | 0.918 | 14:20 | 2.980 | 2.074 | 2.074 | |
| 01/20/2020 | 06:00 | 14.37 | 13:45 | 21.42 | 18.85 | 04:05 | 0.52 | 22:00 | 0.99 | 0.80 | 04:10 | 1.017 | 22:00 | 3.042 | 2.167 | 2.167 | |
| 01/21/2020 | 05:35 | 14.26 | 22:45 | 20.98 | 18.47 | 05:30 | 0.47 | 09:35 | 0.96 | 0.78 | 05:30 | 0.863 | 21:50 | 2.846 | 2.050 | 2.050 | 0.01 |
| 01/22/2020 | 05:45 | 14.24 | 22:30 | 21.20 | 18.58 | 04:55 | 0.49 | 21:20 | 0.97 | 0.78 | 06:00 | 0.905 | 21:20 | 2.956 | 2.071 | 2.071 | 0.09 |
| 01/23/2020 | 05:40 | 14.23 | 10:00 | 21.02 | 18.50 | 05:45 | 0.48 | 22:45 | 0.97 | 0.78 | 05:45 | 0.879 | 22:45 | 2.893 | 2.049 | 2.049 | |
| 01/24/2020 | 05:50 | 14.12 | 12:00 | 20.91 | 18.63 | 05:10 | 0.49 | 10:45 | 0.96 | 0.80 | 05:10 | 0.884 | 10:45 | 2.847 | 2.122 | 2.122 | |
| 01/25/2020 | 06:15 | 14.09 | 13:15 | 21.03 | 18.17 | 07:20 | 0.52 | 12:55 | 0.97 | 0.78 | 07:20 | 0.970 | 12:55 | 2.935 | 2.003 | 2.003 | |
| 01/26/2020 | 06:15 | 13.91 | 13:30 | 21.20 | 18.32 | 05:15 | 0.47 | 13:45 | 0.99 | 0.79 | 05:15 | 0.846 | 13:45 | 3.036 | 2.075 | 2.075 | 0.16 |
| 01/27/2020 | 05:40 | 13.88 | 21:55 | 21.17 | 18.27 | 05:40 | 0.54 | 22:45 | 0.97 | 0.77 | 05:40 | 0.946 | 22:45 | 2.982 | 1.996 | 1.996 | |
| 01/28/2020 | 05:20 | 14.11 | 21:50 | 21.09 | 18.40 | 04:15 | 0.52 | 22:15 | 0.98 | 0.79 | 05:20 | 0.952 | 22:15 | 2.987 | 2.061 | 2.061 | 0.02 |
| 01/29/2020 | 05:30 | 14.06 | 22:20 | 21.11 | 18.38 | 05:15 | 0.57 | 21:35 | 0.98 | 0.79 | 05:15 | 1.015 | 21:35 | 2.975 | 2.074 | 2.074 | |
| 01/30/2020 | 05:35 | 14.00 | 22:15 | 21.00 | 18.27 | 05:20 | 0.54 | 23:00 | 0.98 | 0.79 | 05:20 | 0.968 | 23:00 | 2.946 | 2.050 | 2.050 | |
| 01/31/2020 | 05:35 | 13.96 | 10:05 | 20.42 | 18.29 | 04:35 | 0.49 | 09:40 | 0.95 | 0.78 | 05:30 | 0.885 | 09:40 | 2.757 | 2.035 | 2.035 | 0.01 |
| 02/01/2020 | 06:15 | 14.11 | 12:05 | 21.13 | 18.31 | 05:40 | 0.50 | 14:35 | 0.98 | 0.78 | 05:40 | 0.903 | 12:30 | 2.973 | 2.051 | 2.051 | |
| 02/02/2020 | 06:30 | 13.83 | 13:30 | 21.92 | 18.34 | 05:50 | 0.48 | 15:05 | 0.99 | 0.78 | 05:50 | 0.845 | 14:10 | 3.084 | 2.068 | 2.068 | |
| 02/03/2020 | 05:30 | 13.88 | 22:25 | 20.98 | 18.34 | 04:45 | 0.48 | 09:50 | 0.95 | 0.78 | 04:45 | 0.852 | 22:35 | 2.819 | 2.031 | 2.031 | |
| 02/04/2020 | 05:45 | 13.83 | 10:10 | 21.72 | 18.50 | 04:10 | 0.47 | 10:35 | 0.99 | 0.78 | 05:40 | 0.839 | 10:05 | 3.098 | 2.061 | 2.061 | |
| 02/05/2020 | 05:30 | 13.84 | 22:15 | 20.86 | 18.19 | 05:50 | 0.45 | 09:45 | 0.96 | 0.77 | 05:50 | 0.797 | 09:45 | 2.820 | 1.988 | 1.988 | |
| 02/06/2020 | 05:35 | 13.79 | 10:25 | 21.37 | 18.51 | 06:05 | 0.50 | 10:00 | 0.96 | 0.78 | 06:05 | 0.880 | 10:00 | 2.988 | 2.075 | 2.075 | |
| 02/07/2020 | 05:35 | 13.97 | 12:10 | 21.45 | 18.56 | 04:25 | 0.48 | 11:25 | 0.98 | 0.79 | 04:25 | 0.873 | 11:25 | 3.000 | 2.101 | 2.101 | |
| 02/08/2020 | 06:05 | 13.98 | 12:50 | 21.28 | 18.29 | 05:20 | 0.48 | 12:20 | 0.97 | 0.77 | 05:20 | 0.862 | 12:50 | 3.008 | 2.003 | 2.003 | |
| 02/09/2020 | 06:30 | 13.68 | 12:50 | 21.39 | 18.35 | 05:30 | 0.48 | 12:55 | 0.97 | 0.77 | 05:30 | 0.849 | 12:55 | 3.015 | 2.027 | 2.027 | |
| 02/10/2020 | 05:45 | 13.91 | 10:35 | 21.64 | 18.34 | 04:50 | 0.47 | 09:30 | 0.98 | 0.77 | 04:50 | 0.846 | 10:55 | 3.022 | 2.024 | 2.024 | |
| 02/11/2020 | 05:40 | 13.93 | 22:20 | 20.89 | 18.30 | 05:45 | 0.46 | 22:45 | 0.96 | 0.78 | 05:45 | 0.815 | 22:45 | 2.874 | 2.030 | 2.030 | |
| 02/12/2020 | 05:20 | 13.87 | 22:25 | 20.89 | 18.28 | 04:10 | 0.48 | 22:45 | 0.98 | 0.78 | 04:10 | 0.875 | 22:45 | 2.948 | 2.044 | 2.044 | |
| 02/13/2020 | 05:45 | 13.77 | 10:00 | 20.68 | 18.17 | 05:10 | 0.44 | 10:15 | 0.97 | 0.79 | 05:10 | 0.777 | 10:15 | 2.874 | 2.048 | 2.048 | |
| 02/14/2020 | 05:40 | 13.90 | 10:15 | 20.40 | 18.17 | 04:55 | 0.56 | 09:55 | 0.95 | 0.80 | 04:55 | 0.994 | 09:55 | 2.789 | 2.052 | 2.052 | |
| 02/15/2020 | 06:20 | 13.69 | 12:55 | 21.28 | 17.98 | 05:20 | 0.48 | 12:20 | 0.98 | 0.77 | 05:20 | 0.842 | 13:05 | 3.009 | 1.979 | 1.979 | |
| 02/16/2020 | 06:50 | 13.59 | 13:00 | 21.00 | 17.91 | 05:55 | 0.46 | 12:10 | 0.96 | 0.76 | 05:55 | 0.799 | 13:10 | 2.910 | 1.933 | 1.933 | |
| 02/17/2020 | 05:50 | 13.62 | 13:05 | 20.97 | 17.99 | 06:10 | 0.47 | 13:30 | 0.95 | 0.75 | 06:10 | 0.812 | 13:30 | 2.883 | 1.931 | 1.931 | |
| 02/18/2020 | 05:35 | 13.73 | 22:05 | 20.32 | 18.02 | 05:30 | 0.46 | 11:05 | 0.92 | 0.75 | 05:30 | 0.803 | 11:05 | 2.610 | 1.915 | 1.915 | |
| 02/19/2020 | 05:45 | 13.82 | 23:05 | 20.49 | 18.19 | 06:10 | 0.47 | 22:50 | 0.94 | 0.75 | 06:10 | 0.842 | 22:50 | 2.761 | 1.954 | 1.954 | |
| 02/20/2020 | 05:35 | 13.96 | 11:40 | 20.35 | 18.22 | 04:55 | 0.46 | 09:55 | 0.93 | 0.76 | 04:55 | 0.831 | 21:00 | 2.643 | 1.960 | 1.960 | |
| 02/21/2020 | 05:25 | 13.73 | 11:25 | 20.49 | 18.03 | 04:50 | 0.45 | 19:35 | 0.90 | 0.74 | 05:45 | 0.790 | 12:15 | 2.604 | 1.900 | 1.900 | |
| 02/22/2020 | 06:25 | 13.70 | 12:30 | 21.74 | 18.19 | 05:35 | 0.46 | 12:10 | 1.00 | 0.75 | 05:35 | 0.807 | 12:10 | 3.175 | 1.960 | 1.960 | |
| 02/23/2020 | 06:45 | 13.60 | 12:35 | 21.39 | 18.40 | 07:10 | 0.44 | 22:35 | 0.97 | 0.77 | 07:10 | 0.761 | 22:35 | 2.966 | 2.056 | 2.056 | |
| 02/24/2020 | 05:40 | 13.65 | 22:10 | 20.68 | 18.25 | 05:15 | 0.45 | 22:20 | 0.97 | 0.77 | 05:15 | 0.772 | 22:20 | 2.887 | 2.006 | 2.006 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 05:25 | 13.72 | 22:30 | 20.76 | 18.16 | 06:10 | 0.53 | 22:20 | 0.98 | 0.78 | 06:10 | 0.935 | 22:20 | 2.919 | 2.022 | 2.022 | |
| 02/26/2020 | 05:45 | 13.85 | 09:50 | 20.90 | 18.24 | 05:55 | 0.54 | 23:15 | 0.97 | 0.79 | 05:55 | 0.944 | 23:15 | 2.918 | 2.059 | 2.059 | |
| 02/27/2020 | 06:05 | 13.77 | 09:45 | 20.68 | 18.24 | 06:35 | 0.55 | 09:50 | 0.97 | 0.80 | 06:35 | 0.986 | 09:50 | 2.898 | 2.065 | 2.065 | |
| 02/28/2020 | 05:25 | 13.79 | 10:05 | 20.86 | 18.29 | 04:10 | 0.48 | 20:20 | 0.93 | 0.76 | 04:10 | 0.857 | 09:25 | 2.706 | 1.985 | 1.985 | |
| 02/29/2020 | 06:40 | 13.81 | 12:30 | 21.47 | 18.32 | 06:45 | 0.45 | 11:55 | 0.99 | 0.76 | 06:45 | 0.781 | 11:55 | 3.083 | 2.008 | 2.008 | |
| 03/01/2020 | 06:35 | 13.50 | 13:05 | 21.27 | 18.34 | 05:40 | 0.46 | 13:05 | 0.99 | 0.78 | 05:40 | 0.787 | 13:05 | 3.052 | 2.064 | 2.064 | |
| 03/02/2020 | 05:35 | 13.63 | 11:30 | 21.72 | 18.55 | 05:05 | 0.45 | 23:10 | 0.98 | 0.78 | 05:05 | 0.772 | 11:05 | 3.028 | 2.081 | 2.081 | 0.01 |
| 03/03/2020 | 05:40 | 13.94 | 10:10 | 21.48 | 18.22 | 05:05 | 0.51 | 09:45 | 1.00 | 0.78 | 05:05 | 0.906 | 10:05 | 3.126 | 2.016 | 2.016 | |
| 03/04/2020 | 05:30 | 13.49 | 22:20 | 20.92 | 18.10 | 04:40 | 0.43 | 10:05 | 0.97 | 0.77 | 04:40 | 0.744 | 10:05 | 2.906 | 1.981 | 1.981 | |
| 03/05/2020 | 05:50 | 13.72 | 09:45 | 20.67 | 18.04 | 06:10 | 0.46 | 09:50 | 0.97 | 0.78 | 06:10 | 0.799 | 09:50 | 2.897 | 2.003 | 2.003 | |
| 03/06/2020 | 05:40 | 13.56 | 14:05 | 20.51 | 18.19 | 06:30 | 0.53 | 14:15 | 0.96 | 0.78 | 06:30 | 0.939 | 14:15 | 2.840 | 2.017 | 2.017 | |
| 03/07/2020 | 05:45 | 13.50 | 13:10 | 21.42 | 18.27 | 03:50 | 0.48 | 13:20 | 1.00 | 0.77 | 05:45 | 0.868 | 13:20 | 3.120 | 2.037 | 2.037 | 0.58 |
| 03/08/2020 | 06:05 | 13.77 | 13:20 | 21.37 | 18.58 | 07:00 | 0.51 | 14:45 | 0.98 | 0.79 | 07:00 | 0.913 | 13:40 | 3.000 | 2.113 | 2.113 | 0.02 |
| 03/09/2020 | 04:10 | 13.82 | 10:55 | 21.69 | 18.65 | 04:10 | 0.53 | 20:45 | 0.98 | 0.78 | 04:10 | 0.934 | 20:45 | 2.985 | 2.091 | 2.090 | 0.11 |

## Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 234.802 | 5.26 |
| Avg | 18.34 | 0.78 | 2.042 | |

## Site Commentary

### Site Information

| MIL_2808 | |
|---|---|
| Pipe Dimensions | 36 |
| Silt Level | 0.00" |

### Overview

Site MIL_2808 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that free flow conditions were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed downstream of sites MIL_0229 and MIL_0715. A review of balancing shows a net flow of 0.938 MGD between the sites.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 8.74 | 2.26 | 2.009 |
| Minimum | 5.84 | 1.16 | 0.567 |
| Maximum | 11.20 | 3.09 | 3.591 |
| Time of Minimum | 1/5/2020 6:30 AM | 1/4/2020 6:30 AM | 1/4/2020 6:30 AM |
| Time of Maximum | 12/23/2019 2:10 PM | 1/23/2020 9:45 AM | 3/4/2020 9:55 AM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

## *Flow Monitoring Site Report*

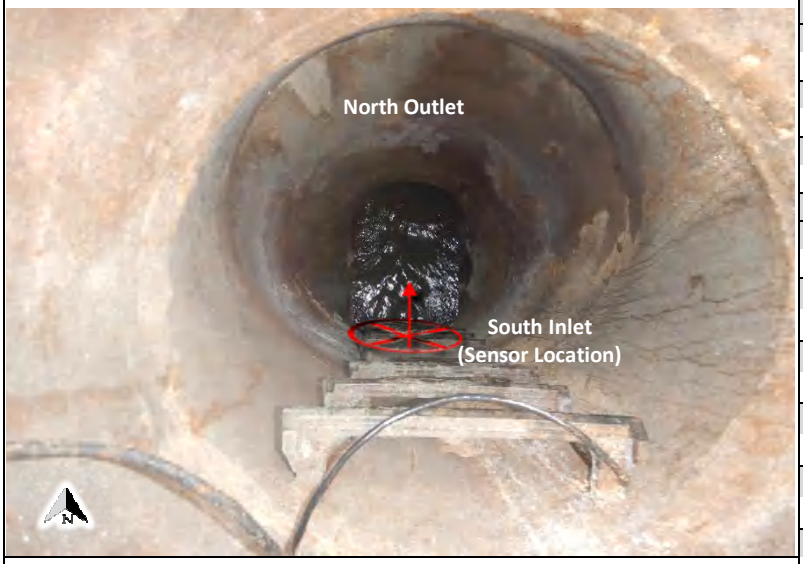
ADS ENVIRONMENTAL SERVICES®

# Site Name

# MIL_2808

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | N McCarthy Blvd and Ranch Dr, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.433534° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.922138° | 36.00"x36.00" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 2808 | Residential/Commercial |
| Access | Traffic |
| Drive | Heavy |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Wednesday, November 13, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 12:08:00 AM | 36.00"x36.00" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 11.25" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 2.45' | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

Smooth flow with deep depth and moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 12' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Drilled Pavement / Concrete |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |

# SCATTERGRAPH REPORT

MIL_2808

**Flow Monitor**

**MIL_2808**

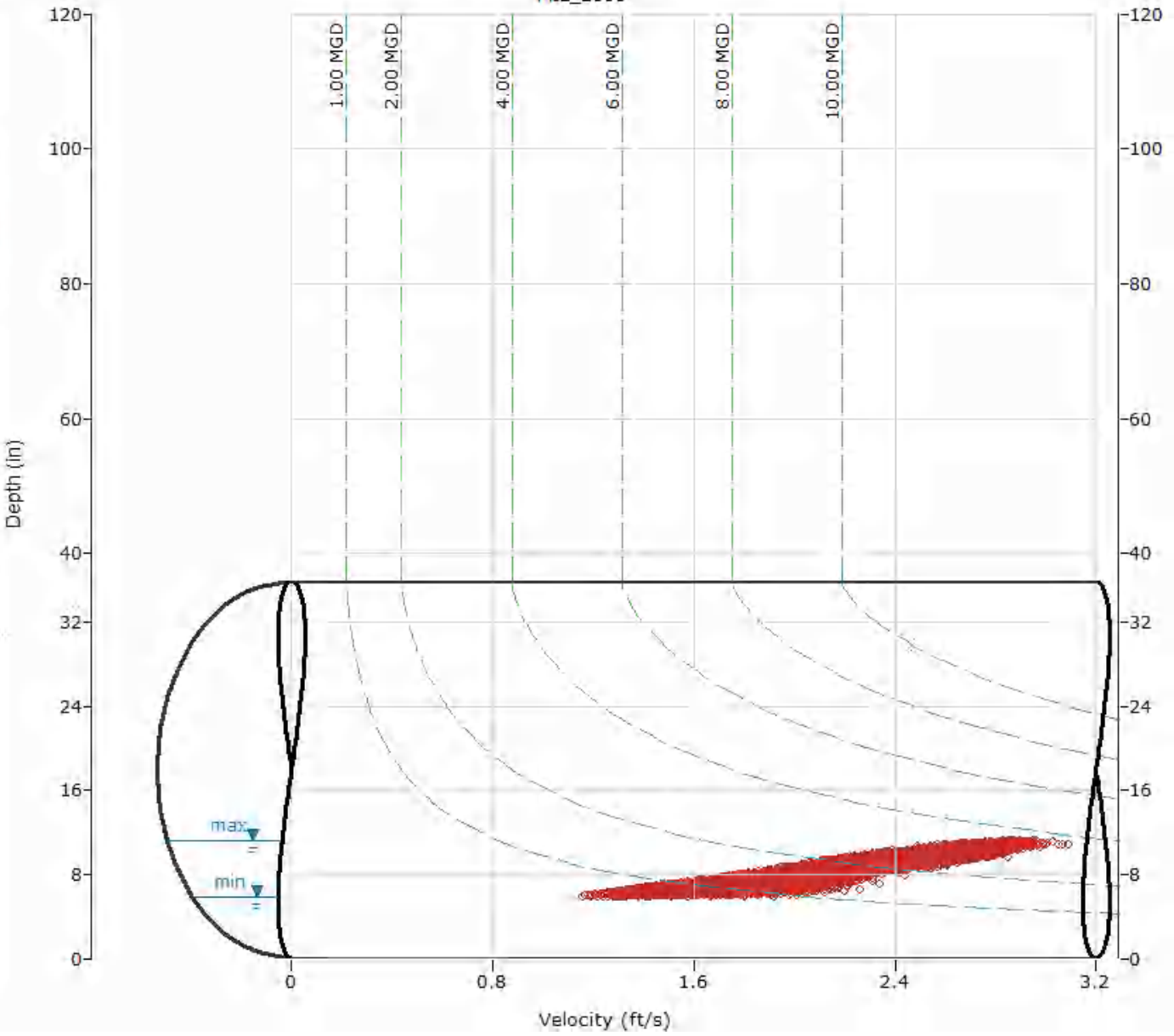
Pipe Height
36.00 in

**Report Period**

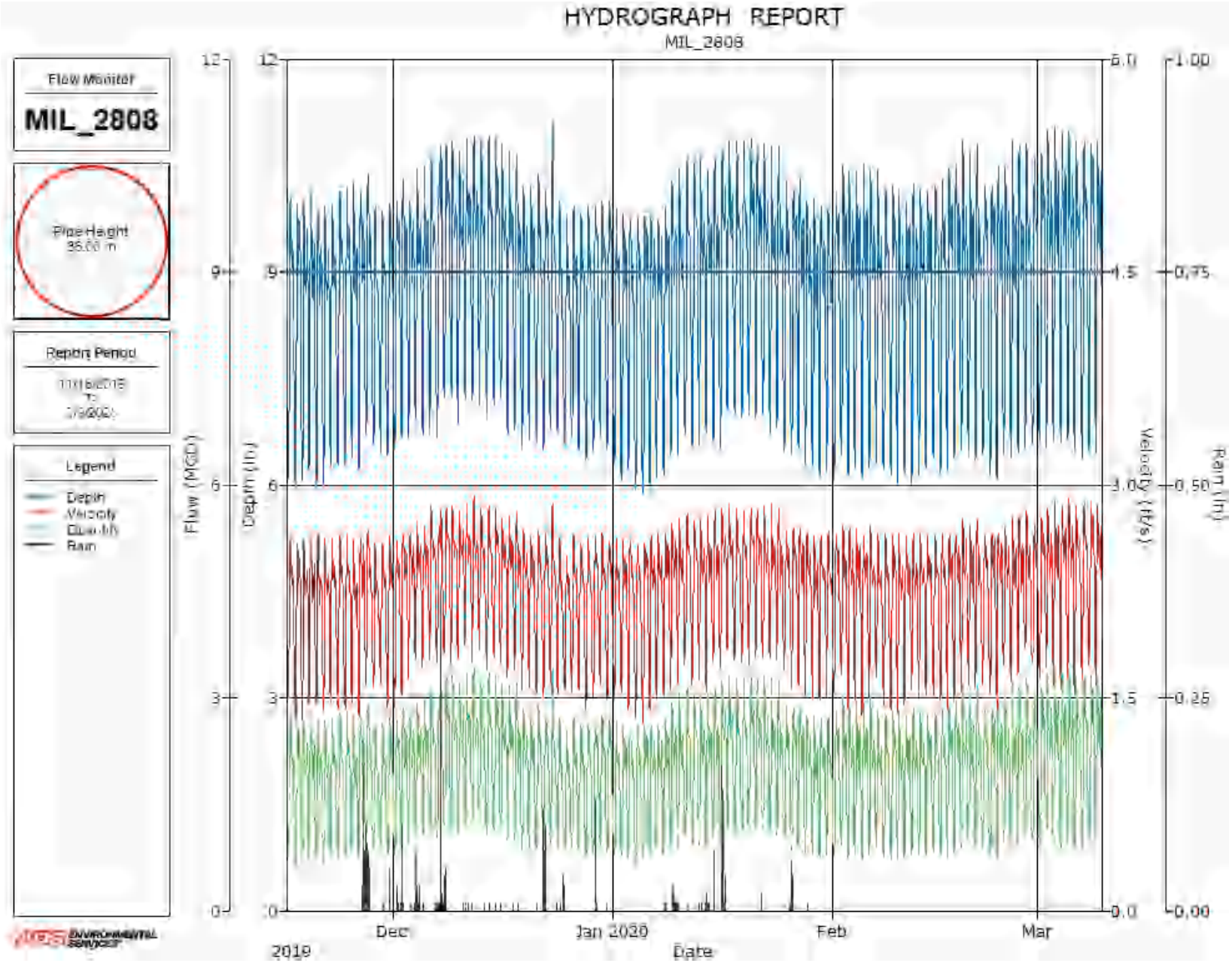
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_2808
Flow Monitor
MIL_2808
Pipe Height
36.00 in
Report Period
Legend
Depth
Velocity
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
12
9
6
3
0
6.0
4.5
3.0
1.5
0.0
1.00
0.75
0.50
0.25
0.00
Dec
2019
Jan 2020
Feb
Mar
Date

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2808, Pipe Height: 36.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 06:00 | 6.05 | 13:00 | 10.14 | 8.37 | 05:20 | 1.25 | 13:30 | 2.73 | 2.15 | 06:00 | 0.638 | 13:30 | 2.852 | 1.816 | 1.816 | |
| 11/17/2019 | 06:25 | 5.94 | 12:50 | 10.15 | 8.39 | 06:10 | 1.19 | 20:00 | 2.70 | 2.12 | 06:10 | 0.593 | 12:55 | 2.766 | 1.812 | 1.812 | |
| 11/18/2019 | 05:25 | 6.04 | 10:05 | 10.08 | 8.43 | 04:45 | 1.23 | 09:20 | 2.74 | 2.14 | 04:45 | 0.632 | 09:55 | 2.810 | 1.819 | 1.819 | |
| 11/19/2019 | 04:40 | 6.18 | 09:55 | 10.21 | 8.48 | 04:35 | 1.31 | 10:55 | 2.84 | 2.17 | 04:35 | 0.686 | 10:55 | 2.954 | 1.848 | 1.848 | |
| 11/20/2019 | 06:00 | 5.93 | 10:10 | 9.95 | 8.35 | 06:10 | 1.27 | 11:00 | 2.75 | 2.15 | 06:10 | 0.625 | 11:00 | 2.777 | 1.794 | 1.794 | |
| 11/21/2019 | 06:05 | 5.93 | 10:25 | 10.00 | 8.40 | 05:50 | 1.17 | 09:25 | 2.67 | 2.15 | 05:55 | 0.580 | 10:25 | 2.715 | 1.814 | 1.814 | |
| 11/22/2019 | 05:35 | 6.19 | 12:05 | 10.05 | 8.47 | 05:30 | 1.26 | 10:10 | 2.76 | 2.17 | 05:30 | 0.660 | 10:10 | 2.863 | 1.845 | 1.845 | |
| 11/23/2019 | 06:05 | 6.26 | 13:10 | 10.24 | 8.52 | 07:20 | 1.31 | 12:35 | 2.75 | 2.14 | 07:20 | 0.705 | 12:35 | 2.910 | 1.846 | 1.846 | |
| 11/24/2019 | 07:00 | 6.23 | 13:10 | 10.38 | 8.54 | 07:05 | 1.31 | 11:45 | 2.78 | 2.12 | 07:05 | 0.694 | 13:00 | 2.939 | 1.843 | 1.843 | |
| 11/25/2019 | 06:40 | 6.37 | 10:45 | 10.35 | 8.57 | 05:35 | 1.33 | 10:45 | 2.69 | 2.10 | 05:35 | 0.738 | 10:45 | 2.921 | 1.818 | 1.818 | |
| 11/26/2019 | 05:50 | 6.17 | 11:05 | 10.22 | 8.58 | 06:25 | 1.26 | 21:50 | 2.71 | 2.14 | 06:25 | 0.664 | 10:55 | 2.869 | 1.870 | 1.870 | 0.36 |
| 11/27/2019 | 05:40 | 6.69 | 11:15 | 10.47 | 8.78 | 05:00 | 1.45 | 12:10 | 2.76 | 2.25 | 05:10 | 0.855 | 11:15 | 2.981 | 2.001 | 2.001 | 0.63 |
| 11/28/2019 | 07:25 | 6.55 | 13:50 | 9.99 | 8.33 | 07:00 | 1.43 | 12:55 | 2.66 | 2.12 | 07:00 | 0.818 | 13:00 | 2.723 | 1.745 | 1.745 | |
| 11/29/2019 | 07:00 | 6.39 | 12:30 | 9.90 | 8.35 | 05:45 | 1.35 | 12:35 | 2.72 | 2.17 | 05:45 | 0.763 | 12:35 | 2.746 | 1.795 | 1.795 | 0.02 |
| 11/30/2019 | 06:35 | 6.39 | 13:55 | 10.16 | 8.43 | 07:30 | 1.34 | 14:30 | 2.74 | 2.14 | 07:30 | 0.747 | 13:50 | 2.859 | 1.811 | 1.811 | 0.10 |
| 12/01/2019 | 07:50 | 6.47 | 13:55 | 10.08 | 8.53 | 07:25 | 1.34 | 15:25 | 2.75 | 2.14 | 07:25 | 0.754 | 15:25 | 2.854 | 1.843 | 1.843 | 0.06 |
| 12/02/2019 | 06:25 | 6.62 | 10:35 | 10.40 | 8.73 | 06:10 | 1.40 | 11:25 | 2.72 | 2.23 | 06:10 | 0.814 | 10:35 | 2.955 | 1.973 | 1.973 | 0.30 |
| 12/03/2019 | 05:30 | 6.66 | 10:50 | 10.05 | 8.77 | 05:15 | 1.42 | 22:20 | 2.80 | 2.29 | 05:15 | 0.827 | 11:55 | 2.782 | 2.031 | 2.031 | 0.01 |
| 12/04/2019 | 05:00 | 6.81 | 10:25 | 10.54 | 8.95 | 05:00 | 1.54 | 09:55 | 2.83 | 2.35 | 05:00 | 0.926 | 10:25 | 3.108 | 2.137 | 2.137 | 0.39 |
| 12/05/2019 | 05:20 | 6.68 | 10:35 | 10.54 | 8.92 | 04:45 | 1.53 | 09:40 | 2.89 | 2.35 | 04:45 | 0.901 | 09:40 | 3.117 | 2.130 | 2.130 | 0.01 |
| 12/06/2019 | 05:30 | 6.65 | 10:40 | 10.64 | 8.98 | 05:25 | 1.45 | 10:20 | 2.98 | 2.39 | 05:25 | 0.844 | 10:20 | 3.330 | 2.188 | 2.188 | 0.01 |
| 12/07/2019 | 05:55 | 6.66 | 20:00 | 10.89 | 9.09 | 06:10 | 1.48 | 19:15 | 2.94 | 2.38 | 06:10 | 0.863 | 20:10 | 3.399 | 2.241 | 2.241 | 0.67 |
| 12/08/2019 | 06:45 | 7.19 | 12:10 | 10.89 | 9.28 | 06:55 | 1.61 | 14:25 | 3.00 | 2.39 | 06:55 | 1.049 | 14:25 | 3.449 | 2.299 | 2.299 | 0.20 |
| 12/09/2019 | 06:20 | 7.20 | 10:20 | 10.91 | 9.23 | 04:40 | 1.58 | 10:15 | 2.95 | 2.40 | 04:50 | 1.040 | 10:15 | 3.444 | 2.274 | 2.274 | |
| 12/10/2019 | 05:25 | 6.83 | 11:00 | 10.76 | 9.18 | 04:35 | 1.47 | 10:40 | 2.92 | 2.43 | 04:35 | 0.907 | 10:40 | 3.336 | 2.287 | 2.287 | |
| 12/11/2019 | 06:10 | 7.14 | 09:55 | 10.95 | 9.28 | 04:35 | 1.68 | 10:30 | 2.99 | 2.44 | 05:10 | 1.106 | 10:30 | 3.491 | 2.323 | 2.323 | 0.03 |
| 12/12/2019 | 04:55 | 7.14 | 09:50 | 10.96 | 9.32 | 04:00 | 1.63 | 09:25 | 3.07 | 2.44 | 04:55 | 1.093 | 09:25 | 3.534 | 2.341 | 2.341 | 0.01 |
| 12/13/2019 | 05:50 | 7.09 | 10:20 | 10.97 | 9.25 | 05:05 | 1.65 | 10:10 | 2.93 | 2.42 | 05:05 | 1.073 | 10:10 | 3.421 | 2.297 | 2.297 | 0.01 |
| 12/14/2019 | 06:40 | 6.86 | 13:35 | 10.99 | 9.18 | 05:55 | 1.49 | 13:20 | 2.98 | 2.36 | 05:55 | 0.923 | 13:20 | 3.493 | 2.240 | 2.240 | 0.01 |
| 12/15/2019 | 07:05 | 7.08 | 13:05 | 11.02 | 9.25 | 07:20 | 1.55 | 13:25 | 2.96 | 2.37 | 07:20 | 0.990 | 13:25 | 3.491 | 2.269 | 2.269 | 0.01 |
| 12/16/2019 | 06:00 | 7.11 | 10:50 | 10.97 | 9.20 | 05:55 | 1.57 | 10:10 | 2.90 | 2.36 | 05:55 | 1.005 | 10:10 | 3.321 | 2.228 | 2.228 | 0.01 |
| 12/17/2019 | 04:55 | 6.71 | 10:45 | 10.78 | 9.08 | 04:50 | 1.49 | 10:15 | 2.93 | 2.35 | 04:50 | 0.880 | 10:15 | 3.330 | 2.192 | 2.192 | 0.01 |
| 12/18/2019 | 05:30 | 6.76 | 10:30 | 10.78 | 9.00 | 04:50 | 1.44 | 10:45 | 2.91 | 2.33 | 04:50 | 0.870 | 09:55 | 3.303 | 2.141 | 2.141 | 0.01 |
| 12/19/2019 | 05:00 | 6.48 | 10:20 | 10.41 | 8.76 | 05:45 | 1.35 | 10:10 | 2.80 | 2.27 | 05:45 | 0.762 | 10:25 | 3.041 | 2.015 | 2.015 | |
| 12/20/2019 | 06:25 | 6.60 | 11:00 | 10.32 | 8.75 | 06:50 | 1.39 | 10:05 | 2.79 | 2.23 | 06:50 | 0.802 | 10:05 | 2.873 | 1.980 | 1.980 | |
| 12/21/2019 | 07:05 | 6.57 | 13:30 | 10.48 | 8.66 | 05:30 | 1.42 | 13:25 | 2.72 | 2.23 | 05:30 | 0.815 | 13:30 | 3.007 | 1.954 | 1.954 | 0.01 |
| 12/22/2019 | 06:30 | 6.47 | 14:50 | 10.27 | 8.67 | 07:15 | 1.39 | 14:45 | 2.78 | 2.22 | 07:15 | 0.803 | 14:45 | 2.968 | 1.955 | 1.955 | 0.41 |
| 12/23/2019 | 06:25 | 6.74 | 14:10 | 11.20 | 8.83 | 06:00 | 1.43 | 12:55 | 2.97 | 2.25 | 06:15 | 0.850 | 14:15 | 3.580 | 2.042 | 2.042 | |
| 12/24/2019 | 06:45 | 6.73 | 12:50 | 10.04 | 8.48 | 06:00 | 1.45 | 13:40 | 2.70 | 2.16 | 06:00 | 0.858 | 14:00 | 2.787 | 1.825 | 1.825 | 0.02 |
| 12/25/2019 | 06:35 | 6.58 | 13:35 | 9.84 | 8.22 | 05:25 | 1.39 | 13:15 | 2.65 | 2.07 | 06:25 | 0.798 | 13:20 | 2.665 | 1.674 | 1.674 | 0.08 |
| 12/26/2019 | 06:10 | 6.67 | 13:40 | 9.99 | 8.46 | 05:50 | 1.47 | 13:00 | 2.71 | 2.17 | 05:50 | 0.866 | 13:50 | 2.773 | 1.834 | 1.834 | |
| 12/27/2019 | 05:40 | 6.46 | 13:30 | 9.86 | 8.40 | 04:50 | 1.38 | 12:45 | 2.79 | 2.16 | 06:20 | 0.772 | 12:45 | 2.809 | 1.814 | 1.814 | |
| 12/28/2019 | 06:45 | 6.31 | 13:00 | 9.98 | 8.35 | 06:20 | 1.30 | 14:10 | 2.73 | 2.13 | 06:20 | 0.706 | 14:10 | 2.800 | 1.786 | 1.786 | |
| 12/29/2019 | 06:15 | 6.44 | 13:55 | 10.02 | 8.48 | 06:05 | 1.33 | 13:05 | 2.72 | 2.16 | 06:05 | 0.744 | 12:50 | 2.775 | 1.849 | 1.849 | 0.22 |
| 12/30/2019 | 06:20 | 6.66 | 12:55 | 10.11 | 8.63 | 06:20 | 1.41 | 13:15 | 2.77 | 2.21 | 06:20 | 0.820 | 13:15 | 2.897 | 1.916 | 1.916 | |
| 12/31/2019 | 06:25 | 6.46 | 13:30 | 10.04 | 8.59 | 06:35 | 1.35 | 14:20 | 2.76 | 2.18 | 06:35 | 0.753 | 14:20 | 2.838 | 1.892 | 1.892 | 0.01 |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 01/01/2020 | 07:55 | 6.27 | 14:00 | 9.92 | 8.26 | 07:10 | 1.33 | 14:50 | 2.71 | 2.12 | 07:10 | 0.722 | 14:50 | 2.744 | 1.741 | 1.741 | |
| 01/02/2020 | 05:30 | 6.04 | 11:50 | 9.90 | 8.35 | 05:35 | 1.35 | 11:55 | 2.77 | 2.17 | 05:35 | 0.686 | 11:55 | 2.825 | 1.812 | 1.812 | |
| 01/03/2020 | 06:20 | 6.20 | 11:50 | 9.83 | 8.36 | 07:10 | 1.31 | 11:10 | 2.69 | 2.16 | 06:25 | 0.700 | 13:20 | 2.681 | 1.806 | 1.806 | |
| 01/04/2020 | 06:30 | 5.90 | 13:35 | 9.84 | 8.18 | 06:30 | 1.16 | 13:50 | 2.71 | 2.10 | 06:30 | 0.567 | 13:50 | 2.720 | 1.722 | 1.722 | |
| 01/05/2020 | 06:30 | 5.84 | 14:30 | 9.84 | 8.22 | 07:30 | 1.19 | 13:30 | 2.70 | 2.12 | 07:30 | 0.578 | 13:30 | 2.699 | 1.753 | 1.753 | |
| 01/06/2020 | 06:05 | 5.92 | 11:00 | 9.83 | 8.32 | 06:05 | 1.18 | 11:00 | 2.73 | 2.17 | 06:05 | 0.579 | 11:00 | 2.760 | 1.810 | 1.810 | |
| 01/07/2020 | 06:05 | 6.01 | 09:45 | 9.79 | 8.40 | 05:15 | 1.29 | 10:25 | 2.73 | 2.22 | 06:20 | 0.673 | 10:25 | 2.713 | 1.863 | 1.863 | |
| 01/08/2020 | 06:00 | 6.04 | 10:20 | 9.98 | 8.48 | 06:05 | 1.24 | 10:20 | 2.78 | 2.25 | 06:05 | 0.628 | 10:20 | 2.871 | 1.923 | 1.923 | 0.02 |
| 01/09/2020 | 06:10 | 6.39 | 09:50 | 10.41 | 8.71 | 04:10 | 1.40 | 09:50 | 2.87 | 2.30 | 04:10 | 0.795 | 09:50 | 3.143 | 2.028 | 2.028 | 0.18 |
| 01/10/2020 | 05:25 | 6.39 | 10:45 | 10.55 | 8.74 | 04:25 | 1.37 | 10:20 | 2.84 | 2.32 | 04:25 | 0.785 | 11:15 | 3.111 | 2.049 | 2.049 | 0.02 |
| 01/11/2020 | 05:55 | 6.70 | 13:45 | 10.74 | 8.83 | 04:35 | 1.55 | 13:05 | 2.86 | 2.34 | 05:05 | 0.911 | 13:25 | 3.222 | 2.096 | 2.096 | 0.01 |
| 01/12/2020 | 06:05 | 6.47 | 14:15 | 10.64 | 8.83 | 05:05 | 1.38 | 12:10 | 2.86 | 2.29 | 05:05 | 0.794 | 12:10 | 3.162 | 2.077 | 2.077 | |
| 01/13/2020 | 06:00 | 6.48 | 10:25 | 10.69 | 8.85 | 05:00 | 1.46 | 14:25 | 2.85 | 2.29 | 06:00 | 0.820 | 10:35 | 3.182 | 2.065 | 2.065 | 0.02 |
| 01/14/2020 | 04:55 | 6.71 | 10:45 | 10.56 | 8.87 | 05:05 | 1.41 | 10:30 | 2.87 | 2.31 | 05:05 | 0.831 | 10:45 | 3.173 | 2.086 | 2.086 | 0.11 |
| 01/15/2020 | 06:00 | 6.55 | 10:05 | 10.68 | 8.91 | 03:20 | 1.57 | 10:20 | 2.85 | 2.35 | 06:25 | 0.919 | 10:20 | 3.222 | 2.129 | 2.129 | 0.07 |
| 01/16/2020 | 05:25 | 6.46 | 13:55 | 10.84 | 9.17 | 05:00 | 1.47 | 10:15 | 2.94 | 2.40 | 05:00 | 0.823 | 10:15 | 3.346 | 2.279 | 2.279 | 0.66 |
| 01/17/2020 | 04:50 | 7.02 | 10:50 | 10.91 | 9.27 | 04:00 | 1.55 | 10:15 | 2.93 | 2.42 | 04:00 | 1.004 | 10:15 | 3.391 | 2.314 | 2.314 | |
| 01/18/2020 | 07:10 | 6.95 | 12:55 | 10.94 | 9.08 | 07:15 | 1.62 | 12:30 | 2.95 | 2.35 | 07:15 | 1.002 | 12:30 | 3.418 | 2.189 | 2.189 | |
| 01/19/2020 | 06:00 | 6.94 | 12:55 | 10.92 | 9.09 | 06:30 | 1.48 | 12:05 | 2.91 | 2.35 | 06:30 | 0.913 | 12:05 | 3.380 | 2.194 | 2.194 | |
| 01/20/2020 | 05:55 | 6.97 | 14:25 | 10.97 | 9.18 | 05:30 | 1.55 | 13:45 | 2.94 | 2.37 | 05:30 | 0.972 | 14:30 | 3.450 | 2.254 | 2.254 | |
| 01/21/2020 | 05:55 | 6.94 | 10:30 | 10.83 | 9.19 | 04:30 | 1.61 | 10:55 | 2.90 | 2.39 | 04:30 | 1.008 | 10:55 | 3.309 | 2.261 | 2.261 | |
| 01/22/2020 | 05:20 | 6.98 | 10:20 | 10.89 | 9.16 | 04:45 | 1.58 | 10:35 | 2.92 | 2.38 | 04:45 | 1.012 | 10:30 | 3.389 | 2.236 | 2.236 | 0.03 |
| 01/23/2020 | 05:15 | 6.70 | 09:55 | 10.95 | 9.03 | 04:45 | 1.58 | 09:45 | 3.09 | 2.38 | 05:00 | 0.931 | 09:45 | 3.580 | 2.200 | 2.200 | |
| 01/24/2020 | 05:30 | 6.80 | 10:15 | 10.80 | 9.00 | 05:35 | 1.62 | 10:35 | 2.90 | 2.36 | 05:35 | 0.971 | 11:10 | 3.323 | 2.161 | 2.161 | |
| 01/25/2020 | 06:15 | 6.45 | 13:15 | 10.43 | 8.62 | 08:20 | 1.39 | 13:05 | 2.74 | 2.26 | 08:20 | 0.810 | 13:05 | 2.977 | 1.964 | 1.964 | |
| 01/26/2020 | 06:25 | 6.39 | 13:50 | 10.24 | 8.66 | 05:30 | 1.34 | 13:10 | 2.77 | 2.27 | 05:30 | 0.751 | 13:40 | 2.918 | 1.994 | 1.994 | 0.16 |
| 01/27/2020 | 05:55 | 6.44 | 10:25 | 10.42 | 8.69 | 04:20 | 1.39 | 10:10 | 2.80 | 2.25 | 04:20 | 0.796 | 10:10 | 3.026 | 1.982 | 1.982 | |
| 01/28/2020 | 05:35 | 6.24 | 10:15 | 10.11 | 8.57 | 05:45 | 1.27 | 09:45 | 2.80 | 2.25 | 05:45 | 0.676 | 09:45 | 2.847 | 1.934 | 1.934 | 0.01 |
| 01/29/2020 | 05:45 | 6.22 | 10:35 | 10.17 | 8.44 | 05:10 | 1.39 | 09:30 | 2.70 | 2.21 | 05:50 | 0.737 | 10:35 | 2.863 | 1.864 | 1.864 | |
| 01/30/2020 | 05:25 | 6.09 | 10:20 | 9.98 | 8.41 | 05:50 | 1.28 | 10:35 | 2.79 | 2.22 | 05:50 | 0.662 | 10:35 | 2.861 | 1.861 | 1.861 | |
| 01/31/2020 | 05:00 | 6.13 | 10:55 | 9.91 | 8.35 | 05:25 | 1.31 | 11:15 | 2.77 | 2.20 | 05:25 | 0.684 | 11:15 | 2.810 | 1.826 | 1.826 | |
| 02/01/2020 | 06:55 | 6.04 | 14:10 | 10.26 | 8.43 | 04:35 | 1.31 | 15:15 | 2.74 | 2.20 | 07:20 | 0.673 | 14:20 | 2.869 | 1.875 | 1.875 | |
| 02/02/2020 | 06:30 | 6.39 | 13:20 | 10.57 | 8.62 | 06:00 | 1.36 | 13:15 | 2.80 | 2.23 | 06:00 | 0.756 | 13:15 | 3.126 | 1.946 | 1.946 | |
| 02/03/2020 | 06:20 | 6.09 | 10:25 | 10.47 | 8.62 | 05:35 | 1.25 | 11:30 | 2.85 | 2.21 | 05:35 | 0.645 | 10:35 | 3.072 | 1.938 | 1.938 | |
| 02/04/2020 | 05:55 | 6.19 | 10:10 | 10.51 | 8.66 | 05:05 | 1.28 | 10:05 | 2.81 | 2.24 | 05:05 | 0.678 | 10:05 | 3.114 | 1.967 | 1.967 | |
| 02/05/2020 | 05:30 | 6.09 | 10:00 | 10.69 | 8.67 | 05:50 | 1.23 | 09:45 | 2.80 | 2.22 | 05:50 | 0.632 | 09:45 | 3.131 | 1.961 | 1.961 | |
| 02/06/2020 | 05:20 | 6.20 | 09:55 | 10.69 | 8.68 | 05:20 | 1.29 | 10:00 | 2.75 | 2.23 | 05:20 | 0.677 | 10:00 | 3.113 | 1.958 | 1.958 | |
| 02/07/2020 | 06:00 | 6.30 | 10:05 | 10.53 | 8.65 | 04:10 | 1.42 | 09:45 | 2.81 | 2.22 | 05:50 | 0.769 | 09:45 | 3.103 | 1.941 | 1.941 | |
| 02/08/2020 | 06:10 | 6.18 | 12:55 | 10.32 | 8.48 | 06:05 | 1.26 | 12:00 | 2.72 | 2.17 | 06:05 | 0.659 | 13:30 | 2.864 | 1.862 | 1.862 | |
| 02/09/2020 | 06:40 | 6.11 | 13:45 | 10.28 | 8.56 | 06:15 | 1.26 | 13:00 | 2.85 | 2.17 | 06:15 | 0.656 | 13:00 | 3.012 | 1.893 | 1.893 | |
| 02/10/2020 | 05:40 | 5.97 | 10:35 | 10.20 | 8.44 | 05:40 | 1.17 | 10:30 | 2.76 | 2.15 | 05:40 | 0.582 | 10:30 | 2.935 | 1.828 | 1.828 | |
| 02/11/2020 | 06:30 | 6.14 | 11:50 | 10.05 | 8.50 | 04:05 | 1.23 | 12:15 | 2.80 | 2.19 | 04:05 | 0.639 | 12:15 | 2.900 | 1.872 | 1.872 | |
| 02/12/2020 | 05:40 | 5.97 | 10:00 | 10.47 | 8.49 | 04:15 | 1.34 | 10:10 | 2.71 | 2.21 | 06:05 | 0.682 | 10:05 | 2.943 | 1.882 | 1.882 | |
| 02/13/2020 | 05:40 | 6.13 | 10:00 | 10.25 | 8.61 | 04:10 | 1.30 | 11:25 | 2.74 | 2.22 | 04:55 | 0.707 | 11:25 | 2.852 | 1.931 | 1.931 | |
| 02/14/2020 | 05:05 | 6.21 | 11:15 | 10.22 | 8.66 | 06:10 | 1.33 | 09:45 | 2.73 | 2.22 | 06:10 | 0.704 | 09:45 | 2.844 | 1.946 | 1.946 | |
| 02/15/2020 | 06:50 | 6.32 | 13:30 | 10.28 | 8.63 | 07:35 | 1.36 | 12:10 | 2.72 | 2.20 | 07:35 | 0.740 | 13:30 | 2.897 | 1.924 | 1.924 | |
| 02/16/2020 | 06:50 | 6.15 | 13:25 | 10.36 | 8.63 | 06:25 | 1.26 | 11:50 | 2.71 | 2.18 | 06:25 | 0.661 | 13:25 | 2.950 | 1.921 | 1.921 | |
| 02/17/2020 | 06:15 | 6.17 | 12:05 | 10.60 | 8.78 | 06:50 | 1.35 | 11:30 | 2.77 | 2.20 | 06:50 | 0.713 | 11:30 | 3.075 | 1.987 | 1.987 | |
| 02/18/2020 | 05:40 | 6.35 | 10:50 | 10.68 | 8.82 | 05:00 | 1.35 | 10:55 | 2.74 | 2.22 | 05:00 | 0.753 | 10:55 | 3.093 | 2.006 | 2.006 | |
| 02/19/2020 | 05:25 | 6.47 | 10:20 | 10.94 | 8.89 | 04:15 | 1.43 | 10:15 | 2.89 | 2.28 | 04:45 | 0.822 | 10:15 | 3.388 | 2.074 | 2.074 | |
| 02/20/2020 | 05:20 | 6.33 | 10:25 | 10.89 | 8.88 | 06:20 | 1.36 | 10:15 | 2.85 | 2.28 | 06:20 | 0.760 | 10:15 | 3.269 | 2.072 | 2.072 | |
| 02/21/2020 | 05:45 | 6.30 | 11:00 | 10.91 | 8.81 | 05:45 | 1.41 | 10:30 | 2.85 | 2.26 | 05:45 | 0.759 | 10:30 | 3.320 | 2.031 | 2.031 | |
| 02/22/2020 | 06:15 | 6.39 | 13:00 | 10.32 | 8.68 | 04:55 | 1.38 | 12:15 | 2.73 | 2.23 | 04:55 | 0.800 | 12:55 | 2.945 | 1.966 | 1.966 | |
| 02/23/2020 | 06:20 | 6.10 | 12:55 | 10.29 | 8.63 | 06:20 | 1.36 | 22:00 | 2.75 | 2.21 | 06:20 | 0.695 | 13:00 | 2.876 | 1.949 | 1.949 | |
| 02/24/2020 | 04:40 | 6.06 | 10:45 | 10.59 | 8.66 | 04:40 | 1.23 | 10:10 | 2.73 | 2.23 | 04:40 | 0.624 | 10:45 | 3.004 | 1.972 | 1.972 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 06:10 | 6.34 | 10:05 | 10.55 | 8.70 | 04:35 | 1.36 | 10:05 | 2.84 | 2.29 | 04:35 | 0.772 | 10:05 | 3.169 | 2.015 | 2.015 | |
| 02/26/2020 | 05:45 | 6.34 | 10:15 | 10.98 | 8.81 | 04:30 | 1.44 | 10:05 | 2.89 | 2.28 | 06:05 | 0.800 | 10:05 | 3.371 | 2.048 | 2.048 | |
| 02/27/2020 | 05:30 | 6.44 | 09:55 | 10.95 | 8.88 | 03:45 | 1.43 | 10:00 | 2.88 | 2.31 | 04:50 | 0.818 | 10:00 | 3.378 | 2.096 | 2.096 | |
| 02/28/2020 | 05:45 | 6.42 | 10:50 | 10.96 | 8.90 | 06:25 | 1.34 | 10:30 | 2.91 | 2.33 | 06:25 | 0.755 | 10:50 | 3.376 | 2.111 | 2.111 | |
| 02/29/2020 | 06:25 | 6.53 | 14:30 | 10.69 | 8.81 | 05:10 | 1.52 | 13:50 | 2.88 | 2.29 | 05:10 | 0.888 | 13:05 | 3.203 | 2.055 | 2.055 | |
| 03/01/2020 | 05:45 | 6.54 | 14:10 | 10.78 | 8.92 | 05:25 | 1.44 | 14:25 | 2.88 | 2.30 | 06:15 | 0.837 | 14:25 | 3.261 | 2.118 | 2.118 | |
| 03/02/2020 | 06:00 | 6.42 | 10:40 | 11.12 | 9.05 | 04:45 | 1.39 | 10:30 | 2.92 | 2.35 | 04:45 | 0.804 | 10:30 | 3.472 | 2.194 | 2.194 | |
| 03/03/2020 | 06:05 | 6.53 | 10:35 | 11.07 | 9.14 | 06:25 | 1.45 | 10:55 | 2.97 | 2.36 | 06:05 | 0.836 | 10:55 | 3.540 | 2.240 | 2.240 | |
| 03/04/2020 | 06:15 | 6.54 | 10:00 | 11.02 | 9.20 | 06:10 | 1.38 | 09:55 | 3.03 | 2.38 | 06:10 | 0.784 | 09:55 | 3.591 | 2.275 | 2.275 | |
| 03/05/2020 | 06:00 | 6.61 | 10:05 | 11.06 | 9.23 | 05:00 | 1.40 | 10:45 | 3.01 | 2.38 | 05:00 | 0.823 | 10:45 | 3.549 | 2.277 | 2.277 | |
| 03/06/2020 | 06:05 | 6.45 | 10:05 | 10.89 | 9.05 | 06:05 | 1.37 | 10:20 | 2.99 | 2.36 | 06:05 | 0.760 | 10:20 | 3.482 | 2.209 | 2.209 | |
| 03/07/2020 | 06:55 | 6.28 | 13:30 | 10.89 | 9.02 | 06:50 | 1.41 | 12:45 | 2.98 | 2.37 | 06:50 | 0.759 | 14:45 | 3.390 | 2.223 | 2.223 | |
| 03/08/2020 | 05:55 | 6.43 | 13:55 | 10.86 | 9.12 | 05:30 | 1.38 | 12:45 | 3.05 | 2.41 | 05:35 | 0.771 | 12:45 | 3.522 | 2.287 | 2.287 | |
| 03/09/2020 | 05:00 | 6.42 | 10:35 | 10.91 | 9.08 | 04:45 | 1.38 | 10:30 | 2.93 | 2.38 | 04:45 | 0.766 | 10:30 | 3.412 | 2.239 | 2.238 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 231.008 | 4.90 |
| Avg | 8.74 | 2.26 | 2.009 | |

## Site Commentary

### Site Information

| MIL_2840 | |
|---|---|
| Pipe Dimensions | 15 |
| Silt Level | 0.00" |

### Overview

Site MIL_2840 functioned under normal conditions during the period Saturday, November 16, 2019 to Monday, March 9, 2020 . This site exhibited an observable response to the wet weather events of November 26, 2019 - November 27, 2019, December 7, 2019 - December 8, 2019, and January 16, 2020 - January 17, 2020. Review of the scattergraph shows that both free flow and backwater flows were recorded during the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This location was installed upstream of sites MIL_0649 and MIL_2491, and downstream of MIL_1193. A review of balancing of combined flows MIL_1043 and MIL_2840 shows a net flow of 0.663 MGD.

### Observations

Average flow depth, velocity, and quantity data observed during Saturday, November 16, 2019 to Monday, March 9, 2020 , along with observed minimum and maximum data, are provided in the following table.

| Observed Flow Conditions | | | |
|---|---|---|---|
| Item | Depth (in) | Velocity (ft/s) | Quantity (MGD) |
| Average | 1.99 | 1.38 | 0.087 |
| Minimum | 1.80 | 0.99 | 0.055 |
| Maximum | 2.26 | 1.82 | 0.131 |
| Time of Minimum | 11/21/2019 3:35 PM | 11/24/2019 7:15 AM | 11/24/2019 7:15 AM |
| Time of Maximum | 12/8/2019 6:00 PM | 12/10/2019 5:35 PM | 12/9/2019 5:25 PM |

### Data Quality

Data uptime observed during the Saturday, November 16, 2019 to the Monday, March 9, 2020 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

| Percent Uptime | |
|---|---|
| Depth (in) | 100 |
| Velocity (ft/s) | 100 |
| Quantity (MGD) | 100 |

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_2840

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | S Abel St and Curtis Ave, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | TRITON+ | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.433982° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.891547° | 15.00"x15.00" | Circular |

| Manhole # | System Characteristics |
|---|---|
| 2840 | Residential/Commercial |
| Access | Traffic |
| Drive | Heavy |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Wednesday, November 13, 2019 | Doppler Standard Ring and Crank |
| Monitoring Location (Sensors): | Monitor Location: |
| Upstream 0-5 FT | Manhole |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Peak Combo (CS4) | 0 - 5 psi |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 11:04:00 AM | 15.00"x15.00" |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| 2.00" | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | 0.25" |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| 1.28' | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

Smooth flow with shallow depth and moderate velocity

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| 10' | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| Unbolted | Normal |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | Good |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | Drilled Pavement / Concrete |

## Additional Site Info. / Comments:

| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |

# SCATTERGRAPH REPORT

MIL_2840

**Flow Monitor**

**MIL_2840**

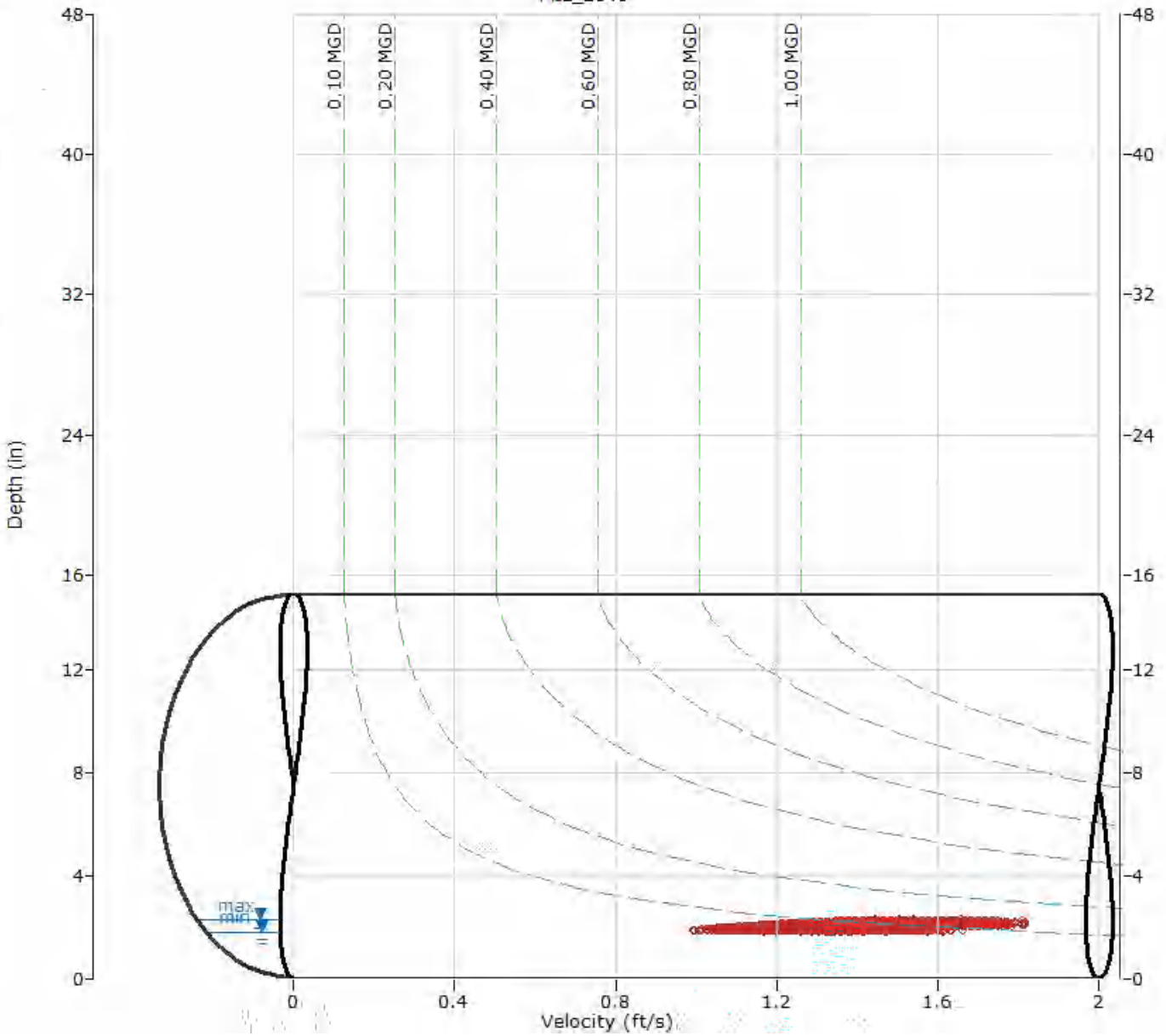
Pipe Height
15.00 in

**Report Period**

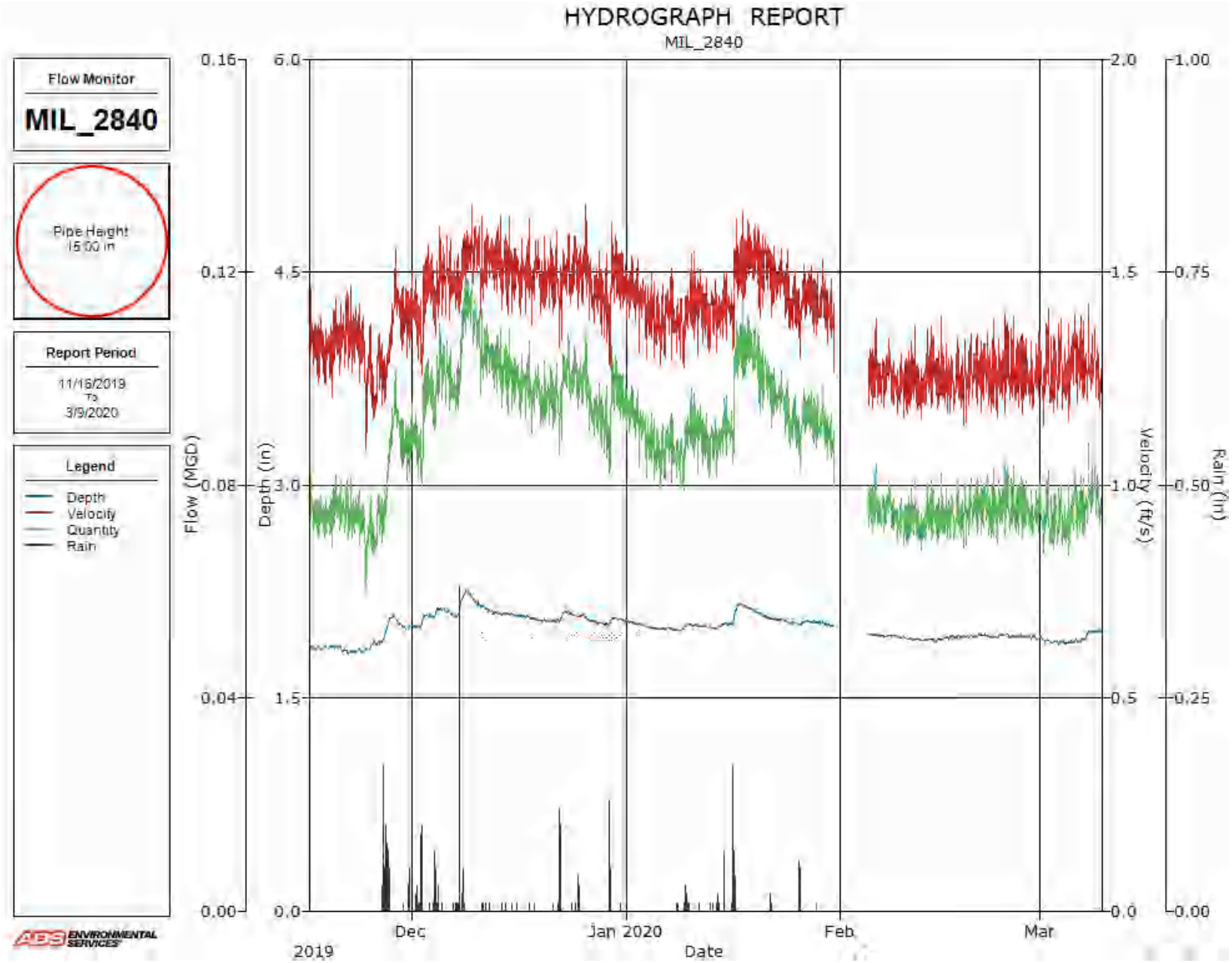
11/16/2019
To
3/9/2020

**Legend**

- Depth - Velocity
- Iso-Q™
- Silt
- Min-Max Depth




ADS ENVIRONMENTAL SERVICES


HYDROGRAPH REPORT
MIL_2840
Flow Monitor
MIL_2840
Pipe Height
15.00 in
Report Period
11/15/2019
To
3/9/2020
Legend
Depth
Velocity
Quantity
Rain
Flow (MGD)
Depth (in)
Velocity (ft/s)
Rain (in)
0.16
0.12
0.08
0.04
0.00
6.0
4.5
3.0
1.5
0.0
2.0
1.5
1.0
0.5
0.0
1.00
0.75
0.50
0.25
0.00
Dec
Jan 2020
Feb
Mar
2019
Date
ADS ENVIRONMENTAL SERVICES

**Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

**MIL_2840, Pipe Height: 15.00 in, Silt: 0.00 in**

## Daily Tabular Report

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | 21:25 | 1.83 | 13:55 | 1.86 | 1.85 | 23:15 | 1.11 | 02:50 | 1.63 | 1.35 | 23:15 | 0.062 | 02:50 | 0.091 | 0.076 | 0.076 | |
| 11/17/2019 | 16:55 | 1.83 | 07:55 | 1.86 | 1.85 | 16:35 | 1.05 | 15:05 | 1.56 | 1.32 | 16:35 | 0.059 | 15:05 | 0.087 | 0.074 | 0.074 | |
| 11/18/2019 | 19:25 | 1.84 | 09:30 | 1.87 | 1.85 | 12:05 | 1.06 | 19:50 | 1.66 | 1.31 | 00:30 | 0.060 | 19:50 | 0.093 | 0.074 | 0.074 | |
| 11/19/2019 | 16:25 | 1.84 | 22:40 | 1.88 | 1.86 | 08:20 | 1.07 | 21:30 | 1.57 | 1.33 | 08:20 | 0.060 | 22:25 | 0.090 | 0.075 | 0.075 | |
| 11/20/2019 | 23:05 | 1.83 | 10:10 | 1.88 | 1.85 | 17:45 | 1.04 | 08:45 | 1.61 | 1.34 | 17:45 | 0.058 | 08:45 | 0.092 | 0.076 | 0.076 | |
| 11/21/2019 | 15:35 | 1.80 | 06:00 | 1.85 | 1.83 | 06:35 | 1.10 | 11:30 | 1.62 | 1.35 | 06:35 | 0.061 | 11:30 | 0.090 | 0.074 | 0.074 | |
| 11/22/2019 | 00:05 | 1.81 | 06:35 | 1.84 | 1.83 | 19:10 | 1.13 | 10:35 | 1.58 | 1.35 | 19:10 | 0.062 | 10:35 | 0.087 | 0.074 | 0.074 | |
| 11/23/2019 | 21:05 | 1.81 | 08:20 | 1.85 | 1.83 | 14:30 | 1.10 | 01:10 | 1.58 | 1.34 | 14:30 | 0.061 | 01:10 | 0.087 | 0.074 | 0.074 | |
| 11/24/2019 | 00:05 | 1.82 | 23:50 | 1.87 | 1.84 | 07:15 | 0.99 | 01:00 | 1.55 | 1.25 | 07:15 | 0.055 | 23:50 | 0.086 | 0.070 | 0.070 | |
| 11/25/2019 | 00:45 | 1.85 | 14:00 | 1.90 | 1.88 | 18:05 | 1.02 | 00:55 | 1.54 | 1.23 | 18:05 | 0.058 | 00:55 | 0.087 | 0.071 | 0.071 | |
| 11/26/2019 | 05:00 | 1.87 | 23:50 | 1.94 | 1.90 | 16:50 | 1.04 | 15:50 | 1.58 | 1.28 | 16:50 | 0.061 | 15:50 | 0.091 | 0.075 | 0.075 | 0.36 |
| 11/27/2019 | 00:30 | 1.94 | 22:45 | 2.07 | 2.02 | 06:00 | 1.09 | 22:00 | 1.52 | 1.30 | 06:00 | 0.067 | 22:00 | 0.100 | 0.083 | 0.083 | 0.63 |
| 11/28/2019 | 22:20 | 2.03 | 01:15 | 2.08 | 2.06 | 15:00 | 1.19 | 09:40 | 1.69 | 1.43 | 15:00 | 0.078 | 09:40 | 0.111 | 0.094 | 0.094 | |
| 11/29/2019 | 18:55 | 1.99 | 00:50 | 2.04 | 2.01 | 10:50 | 1.14 | 00:40 | 1.72 | 1.40 | 10:50 | 0.072 | 00:40 | 0.111 | 0.089 | 0.089 | 0.02 |
| 11/30/2019 | 08:10 | 1.98 | 22:15 | 2.02 | 2.00 | 05:15 | 1.12 | 04:15 | 1.63 | 1.40 | 05:15 | 0.070 | 04:15 | 0.102 | 0.088 | 0.088 | 0.10 |
| 12/01/2019 | 11:05 | 1.98 | 06:50 | 2.02 | 2.00 | 22:35 | 1.13 | 00:05 | 1.62 | 1.41 | 22:35 | 0.071 | 00:05 | 0.103 | 0.089 | 0.089 | 0.06 |
| 12/02/2019 | 05:20 | 1.99 | 20:10 | 2.10 | 2.04 | 08:45 | 1.14 | 22:35 | 1.70 | 1.39 | 08:45 | 0.072 | 22:35 | 0.113 | 0.090 | 0.090 | 0.30 |
| 12/03/2019 | 22:30 | 2.06 | 03:40 | 2.10 | 2.08 | 05:15 | 1.20 | 09:50 | 1.76 | 1.49 | 05:15 | 0.080 | 09:50 | 0.116 | 0.099 | 0.099 | 0.01 |
| 12/04/2019 | 02:35 | 2.05 | 18:15 | 2.14 | 2.10 | 09:00 | 1.22 | 23:35 | 1.73 | 1.44 | 04:15 | 0.081 | 23:35 | 0.119 | 0.097 | 0.097 | 0.39 |
| 12/05/2019 | 22:45 | 2.10 | 03:30 | 2.14 | 2.12 | 19:50 | 1.23 | 03:00 | 1.71 | 1.49 | 19:50 | 0.083 | 03:00 | 0.118 | 0.102 | 0.102 | 0.01 |
| 12/06/2019 | 22:15 | 2.06 | 05:40 | 2.12 | 2.09 | 08:05 | 1.24 | 01:00 | 1.72 | 1.49 | 19:55 | 0.083 | 01:00 | 0.116 | 0.100 | 0.100 | 0.01 |
| 12/07/2019 | 03:45 | 2.06 | 22:45 | 2.17 | 2.09 | 16:10 | 1.20 | 08:55 | 1.70 | 1.46 | 16:10 | 0.080 | 08:55 | 0.113 | 0.098 | 0.098 | 0.67 |
| 12/08/2019 | 00:00 | 2.17 | 18:00 | 2.26 | 2.22 | 00:50 | 1.31 | 03:05 | 1.73 | 1.52 | 00:50 | 0.094 | 17:45 | 0.126 | 0.112 | 0.112 | 0.20 |
| 12/09/2019 | 23:30 | 2.17 | 00:15 | 2.25 | 2.22 | 19:10 | 1.35 | 17:25 | 1.81 | 1.55 | 18:35 | 0.097 | 17:25 | 0.131 | 0.113 | 0.113 | |
| 12/10/2019 | 23:00 | 2.13 | 00:10 | 2.20 | 2.16 | 21:00 | 1.29 | 17:35 | 1.82 | 1.55 | 23:15 | 0.089 | 02:05 | 0.128 | 0.109 | 0.109 | |
| 12/11/2019 | 16:20 | 2.11 | 04:55 | 2.16 | 2.14 | 18:15 | 1.27 | 01:50 | 1.77 | 1.53 | 18:15 | 0.088 | 01:50 | 0.123 | 0.106 | 0.106 | 0.03 |
| 12/12/2019 | 16:15 | 2.08 | 00:00 | 2.12 | 2.11 | 16:50 | 1.24 | 08:10 | 1.79 | 1.53 | 16:50 | 0.085 | 08:10 | 0.122 | 0.104 | 0.104 | 0.01 |
| 12/13/2019 | 22:00 | 2.07 | 03:15 | 2.12 | 2.10 | 21:15 | 1.24 | 18:25 | 1.75 | 1.53 | 21:15 | 0.083 | 20:20 | 0.118 | 0.103 | 0.103 | 0.01 |
| 12/14/2019 | 00:00 | 2.08 | 07:35 | 2.11 | 2.09 | 00:30 | 1.21 | 10:55 | 1.73 | 1.51 | 00:30 | 0.081 | 10:55 | 0.116 | 0.101 | 0.101 | 0.01 |
| 12/15/2019 | 03:30 | 2.07 | 00:00 | 2.10 | 2.09 | 12:30 | 1.26 | 02:10 | 1.74 | 1.51 | 12:30 | 0.084 | 02:10 | 0.117 | 0.101 | 0.101 | 0.01 |
| 12/16/2019 | 00:10 | 2.06 | 01:00 | 2.10 | 2.08 | 12:05 | 1.24 | 01:00 | 1.81 | 1.50 | 12:00 | 0.083 | 01:00 | 0.122 | 0.100 | 0.100 | 0.01 |
| 12/17/2019 | 00:05 | 2.06 | 06:15 | 2.09 | 2.07 | 08:35 | 1.26 | 23:55 | 1.82 | 1.50 | 08:35 | 0.083 | 23:55 | 0.120 | 0.099 | 0.099 | 0.01 |
| 12/18/2019 | 17:05 | 2.04 | 00:05 | 2.07 | 2.06 | 08:20 | 1.21 | 00:05 | 1.81 | 1.49 | 08:20 | 0.079 | 00:05 | 0.120 | 0.098 | 0.098 | 0.01 |
| 12/19/2019 | 20:10 | 2.02 | 03:50 | 2.06 | 2.05 | 23:20 | 1.16 | 07:55 | 1.72 | 1.49 | 23:20 | 0.075 | 03:50 | 0.113 | 0.097 | 0.097 | |
| 12/20/2019 | 02:05 | 2.03 | 03:10 | 2.06 | 2.04 | 20:20 | 1.22 | 23:35 | 1.72 | 1.48 | 20:20 | 0.079 | 23:35 | 0.111 | 0.096 | 0.096 | |
| 12/21/2019 | 17:25 | 2.02 | 06:15 | 2.07 | 2.04 | 14:05 | 1.18 | 21:55 | 1.75 | 1.49 | 14:05 | 0.077 | 21:55 | 0.113 | 0.097 | 0.097 | 0.01 |
| 12/22/2019 | 06:20 | 2.03 | 22:45 | 2.11 | 2.06 | 07:35 | 1.17 | 23:00 | 1.70 | 1.46 | 07:35 | 0.075 | 23:00 | 0.115 | 0.096 | 0.096 | 0.41 |
| 12/23/2019 | 19:00 | 2.08 | 13:00 | 2.13 | 2.10 | 08:40 | 1.29 | 13:50 | 1.82 | 1.51 | 08:40 | 0.087 | 13:50 | 0.124 | 0.102 | 0.102 | |
| 12/24/2019 | 14:50 | 2.07 | 00:55 | 2.10 | 2.08 | 02:35 | 1.28 | 18:10 | 1.74 | 1.51 | 02:35 | 0.086 | 15:30 | 0.115 | 0.101 | 0.101 | 0.02 |
| 12/25/2019 | 03:25 | 2.06 | 07:50 | 2.09 | 2.08 | 15:50 | 1.21 | 14:20 | 1.72 | 1.49 | 15:50 | 0.081 | 14:20 | 0.115 | 0.099 | 0.099 | 0.08 |
| 12/26/2019 | 19:20 | 2.03 | 01:35 | 2.08 | 2.05 | 17:45 | 1.24 | 04:25 | 1.74 | 1.50 | 17:45 | 0.081 | 04:25 | 0.115 | 0.098 | 0.098 | |
| 12/27/2019 | 20:55 | 2.01 | 01:45 | 2.05 | 2.03 | 08:00 | 1.19 | 14:25 | 1.67 | 1.44 | 08:00 | 0.077 | 14:25 | 0.108 | 0.093 | 0.093 | |
| 12/28/2019 | 23:30 | 2.00 | 01:55 | 2.04 | 2.02 | 20:45 | 1.19 | 03:00 | 1.68 | 1.43 | 20:45 | 0.076 | 03:50 | 0.108 | 0.092 | 0.092 | |
| 12/29/2019 | 01:10 | 2.01 | 23:40 | 2.07 | 2.03 | 06:10 | 1.17 | 20:25 | 1.72 | 1.41 | 06:10 | 0.074 | 20:25 | 0.111 | 0.091 | 0.091 | 0.22 |
| 12/30/2019 | 03:45 | 2.04 | 00:15 | 2.07 | 2.06 | 21:55 | 1.22 | 02:30 | 1.74 | 1.51 | 21:55 | 0.079 | 02:30 | 0.114 | 0.099 | 0.099 | |
| 12/31/2019 | 14:35 | 2.03 | 01:30 | 2.07 | 2.05 | 06:55 | 1.17 | 03:45 | 1.71 | 1.49 | 06:55 | 0.077 | 03:45 | 0.111 | 0.097 | 0.097 | 0.01 |

| Date | Depth (in) | | | | Velocity (ft/s) | | | | Quantity (MGD - Total MG) | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Time | Min Time | Max | Avg | Total | Total |
| 01/01/2020 | 11:50 | 2.02 00:05 | 2.06 | 2.04 | 03:15 | 1.19 13:25 | 1.77 | 1.45 | 03:15 | 0.077 13:25 | 0.114 | 0.094 | 0.094 | |
| 01/02/2020 | 03:15 | 2.01 00:45 | 2.04 | 2.03 | 22:15 | 1.16 18:20 | 1.68 | 1.44 | 22:15 | 0.074 18:20 | 0.107 | 0.092 | 0.092 | |
| 01/03/2020 | 21:15 | 1.99 00:20 | 2.03 | 2.01 | 22:50 | 1.19 21:50 | 1.78 | 1.43 | 22:50 | 0.075 21:50 | 0.113 | 0.091 | 0.091 | |
| 01/04/2020 | 10:10 | 1.98 00:00 | 2.01 | 2.00 | 00:15 | 1.20 02:30 | 1.75 | 1.41 | 17:05 | 0.075 02:30 | 0.109 | 0.088 | 0.088 | |
| 01/05/2020 | 10:00 | 1.97 01:05 | 2.00 | 1.99 | 15:55 | 1.13 00:25 | 1.67 | 1.37 | 15:55 | 0.071 00:25 | 0.104 | 0.085 | 0.085 | |
| 01/06/2020 | 19:40 | 1.97 01:20 | 2.00 | 1.99 | 00:30 | 1.13 07:45 | 1.60 | 1.38 | 00:30 | 0.071 07:45 | 0.100 | 0.086 | 0.086 | |
| 01/07/2020 | 16:30 | 1.97 04:15 | 2.01 | 1.99 | 18:45 | 1.18 16:15 | 1.70 | 1.41 | 18:45 | 0.073 16:15 | 0.106 | 0.088 | 0.088 | |
| 01/08/2020 | 07:20 | 1.96 00:30 | 1.99 | 1.98 | 07:55 | 1.10 00:15 | 1.60 | 1.37 | 07:55 | 0.067 00:15 | 0.099 | 0.085 | 0.085 | 0.02 |
| 01/09/2020 | 00:00 | 1.97 13:45 | 2.02 | 2.00 | 09:40 | 1.12 23:10 | 1.70 | 1.38 | 09:40 | 0.070 23:10 | 0.107 | 0.087 | 0.087 | 0.18 |
| 01/10/2020 | 21:00 | 1.99 09:25 | 2.03 | 2.01 | 18:25 | 1.14 11:30 | 1.71 | 1.43 | 18:25 | 0.073 11:30 | 0.109 | 0.091 | 0.091 | 0.02 |
| 01/11/2020 | 17:30 | 1.99 04:35 | 2.03 | 2.01 | 10:45 | 1.13 01:45 | 1.64 | 1.42 | 10:45 | 0.072 01:45 | 0.104 | 0.090 | 0.090 | 0.01 |
| 01/12/2020 | 21:35 | 1.98 01:10 | 2.02 | 2.00 | 20:25 | 1.16 18:15 | 1.70 | 1.40 | 20:25 | 0.072 18:15 | 0.106 | 0.088 | 0.088 | |
| 01/13/2020 | 00:45 | 1.98 05:25 | 2.01 | 1.99 | 02:45 | 1.12 23:30 | 1.64 | 1.40 | 02:45 | 0.070 23:30 | 0.101 | 0.088 | 0.088 | 0.02 |
| 01/14/2020 | 02:50 | 1.97 13:25 | 2.02 | 2.00 | 02:40 | 1.16 11:05 | 1.64 | 1.40 | 02:40 | 0.072 11:05 | 0.103 | 0.088 | 0.088 | 0.11 |
| 01/15/2020 | 01:10 | 2.01 12:05 | 2.04 | 2.02 | 15:45 | 1.18 06:45 | 1.69 | 1.43 | 15:45 | 0.075 06:45 | 0.107 | 0.091 | 0.091 | 0.07 |
| 01/16/2020 | 10:15 | 2.00 23:40 | 2.13 | 2.05 | 11:40 | 1.15 23:10 | 1.77 | 1.43 | 11:40 | 0.073 23:40 | 0.120 | 0.093 | 0.093 | 0.66 |
| 01/17/2020 | 00:00 | 2.12 11:55 | 2.17 | 2.15 | 03:15 | 1.30 17:05 | 1.77 | 1.52 | 03:15 | 0.090 17:05 | 0.124 | 0.106 | 0.106 | |
| 01/18/2020 | 20:00 | 2.11 00:30 | 2.16 | 2.14 | 02:50 | 1.28 21:40 | 1.78 | 1.54 | 04:30 | 0.089 01:20 | 0.123 | 0.107 | 0.107 | |
| 01/19/2020 | 11:20 | 2.10 03:20 | 2.14 | 2.12 | 07:20 | 1.30 17:55 | 1.78 | 1.54 | 07:20 | 0.088 18:25 | 0.121 | 0.105 | 0.105 | |
| 01/20/2020 | 17:55 | 2.07 00:00 | 2.11 | 2.09 | 13:45 | 1.21 10:40 | 1.77 | 1.50 | 13:45 | 0.081 10:40 | 0.118 | 0.101 | 0.101 | |
| 01/21/2020 | 16:20 | 2.04 00:00 | 2.09 | 2.07 | 18:25 | 1.24 03:40 | 1.76 | 1.52 | 18:25 | 0.082 03:40 | 0.116 | 0.100 | 0.100 | |
| 01/22/2020 | 01:50 | 2.04 03:55 | 2.07 | 2.05 | 01:10 | 1.21 13:00 | 1.71 | 1.48 | 01:10 | 0.079 13:00 | 0.113 | 0.097 | 0.097 | 0.03 |
| 01/23/2020 | 22:35 | 2.03 02:40 | 2.06 | 2.05 | 00:00 | 1.25 12:15 | 1.70 | 1.48 | 00:00 | 0.081 12:15 | 0.111 | 0.097 | 0.097 | |
| 01/24/2020 | 04:00 | 2.02 06:55 | 2.06 | 2.03 | 18:15 | 1.14 09:35 | 1.67 | 1.45 | 18:15 | 0.073 09:35 | 0.108 | 0.093 | 0.093 | |
| 01/25/2020 | 02:05 | 2.01 02:45 | 2.05 | 2.03 | 19:25 | 1.15 21:55 | 1.69 | 1.43 | 19:25 | 0.073 21:55 | 0.108 | 0.092 | 0.092 | |
| 01/26/2020 | 03:50 | 2.00 14:40 | 2.05 | 2.03 | 02:10 | 1.17 13:40 | 1.70 | 1.42 | 02:10 | 0.074 13:40 | 0.110 | 0.091 | 0.091 | 0.16 |
| 01/27/2020 | 10:35 | 2.02 03:55 | 2.05 | 2.04 | 09:00 | 1.22 20:25 | 1.68 | 1.45 | 09:00 | 0.078 20:25 | 0.109 | 0.094 | 0.094 | |
| 01/28/2020 | 03:15 | 2.02 00:45 | 2.05 | 2.03 | 04:05 | 1.16 06:15 | 1.69 | 1.43 | 04:05 | 0.075 06:15 | 0.108 | 0.092 | 0.092 | 0.01 |
| 01/29/2020 | 21:55 | 2.00 00:10 | 2.04 | 2.02 | 10:55 | 1.17 01:15 | 1.64 | 1.43 | 10:55 | 0.075 01:15 | 0.106 | 0.092 | 0.092 | |
| 01/30/2020 | 06:15 | 1.99 03:30 | 2.03 | 2.01 | 16:05 | 1.15 00:50 | 1.66 | 1.42 | 16:05 | 0.072 00:50 | 0.105 | 0.090 | 0.090 | |
| 01/31/2020 | 01:00 | 1.99 00:35 | 2.02 | 2.01 | 00:05 | 1.21 00:20 | 1.58 | 1.38 | 00:05 | 0.076 00:20 | 0.100 | 0.087 | 0.015 | |
| 02/01/2020 | | | | | | | | | | | | | | |
| 02/02/2020 | | | | | | | | | | | | | | |
| 02/03/2020 | | | | | | | | | | | | | | |
| 02/04/2020 | | | | | | | | | | | | | | |
| 02/05/2020 | 15:55 | 1.93 17:25 | 1.96 | 1.94 | 05:30 | 1.08 17:40 | 1.57 | 1.26 | 14:45 | 0.065 17:40 | 0.095 | 0.076 | 0.063 | |
| 02/06/2020 | 22:45 | 1.93 04:30 | 1.96 | 1.94 | 15:00 | 1.07 06:10 | 1.52 | 1.26 | 15:00 | 0.064 06:10 | 0.092 | 0.076 | 0.076 | |
| 02/07/2020 | 18:30 | 1.92 03:10 | 1.95 | 1.94 | 19:45 | 1.06 17:45 | 1.48 | 1.25 | 19:45 | 0.063 17:45 | 0.088 | 0.075 | 0.075 | |
| 02/08/2020 | 23:05 | 1.93 06:35 | 1.95 | 1.94 | 20:05 | 1.06 04:55 | 1.52 | 1.26 | 20:05 | 0.063 04:55 | 0.092 | 0.076 | 0.076 | |
| 02/09/2020 | 23:25 | 1.91 04:05 | 1.95 | 1.93 | 16:50 | 1.06 19:40 | 1.51 | 1.24 | 20:30 | 0.062 19:40 | 0.090 | 0.074 | 0.074 | |
| 02/10/2020 | 14:00 | 1.91 06:25 | 1.94 | 1.92 | 22:40 | 1.06 00:10 | 1.50 | 1.24 | 22:40 | 0.062 00:10 | 0.089 | 0.074 | 0.074 | |
| 02/11/2020 | 14:25 | 1.90 05:05 | 1.93 | 1.91 | 01:20 | 1.05 11:05 | 1.63 | 1.26 | 15:30 | 0.062 11:05 | 0.096 | 0.074 | 0.074 | |
| 02/12/2020 | 21:00 | 1.90 07:35 | 1.93 | 1.91 | 21:50 | 1.04 08:40 | 1.61 | 1.23 | 21:50 | 0.061 08:40 | 0.095 | 0.072 | 0.072 | |
| 02/13/2020 | 00:10 | 1.89 13:30 | 1.92 | 1.91 | 06:15 | 1.04 02:00 | 1.49 | 1.25 | 06:15 | 0.061 02:00 | 0.087 | 0.073 | 0.073 | |
| 02/14/2020 | 17:50 | 1.89 01:40 | 1.92 | 1.91 | 12:05 | 1.04 05:10 | 1.50 | 1.27 | 12:05 | 0.061 05:10 | 0.089 | 0.074 | 0.074 | |
| 02/15/2020 | 01:30 | 1.89 05:15 | 1.93 | 1.91 | 06:35 | 1.05 19:50 | 1.54 | 1.26 | 11:00 | 0.062 19:55 | 0.091 | 0.074 | 0.074 | |
| 02/16/2020 | 00:45 | 1.90 04:25 | 1.93 | 1.92 | 00:50 | 1.05 00:40 | 1.51 | 1.24 | 00:50 | 0.061 11:25 | 0.089 | 0.074 | 0.074 | |
| 02/17/2020 | 21:50 | 1.92 06:05 | 1.95 | 1.93 | 19:25 | 1.06 11:00 | 1.54 | 1.24 | 19:25 | 0.063 11:00 | 0.092 | 0.074 | 0.074 | |
| 02/18/2020 | 23:45 | 1.92 04:35 | 1.95 | 1.93 | 23:50 | 1.05 20:40 | 1.49 | 1.24 | 23:50 | 0.062 20:40 | 0.089 | 0.074 | 0.074 | |
| 02/19/2020 | 00:00 | 1.92 06:50 | 1.94 | 1.93 | 19:30 | 1.05 05:00 | 1.55 | 1.24 | 19:30 | 0.063 05:00 | 0.093 | 0.074 | 0.074 | |
| 02/20/2020 | 17:45 | 1.92 04:35 | 1.95 | 1.94 | 19:05 | 1.06 01:05 | 1.52 | 1.26 | 19:05 | 0.064 01:05 | 0.091 | 0.076 | 0.076 | |
| 02/21/2020 | 00:00 | 1.93 14:25 | 1.96 | 1.94 | 16:15 | 1.07 04:40 | 1.58 | 1.25 | 21:05 | 0.064 04:40 | 0.096 | 0.076 | 0.076 | |
| 02/22/2020 | 21:35 | 1.91 03:45 | 1.96 | 1.93 | 17:50 | 1.05 10:00 | 1.52 | 1.26 | 17:50 | 0.062 10:00 | 0.091 | 0.076 | 0.076 | |
| 02/23/2020 | 00:10 | 1.92 03:25 | 1.94 | 1.93 | 15:55 | 1.05 13:10 | 1.54 | 1.24 | 15:55 | 0.062 13:10 | 0.092 | 0.074 | 0.074 | |
| 02/24/2020 | 01:05 | 1.93 12:10 | 1.95 | 1.94 | 21:45 | 1.06 09:25 | 1.54 | 1.25 | 21:45 | 0.064 09:25 | 0.093 | 0.075 | 0.075 | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | 22:10 | 1.92 | 05:15 | 1.96 | 1.94 | 20:20 | 1.06 | 01:50 | 1.52 | 1.29 | 20:05 | 0.063 | 03:05 | 0.092 | 0.077 | 0.077 | |
| 02/26/2020 | 14:25 | 1.92 | 00:55 | 1.95 | 1.93 | 10:00 | 1.06 | 15:15 | 1.53 | 1.26 | 10:00 | 0.064 | 15:15 | 0.091 | 0.075 | 0.075 | |
| 02/27/2020 | 18:45 | 1.92 | 05:50 | 1.96 | 1.93 | 19:40 | 1.06 | 17:20 | 1.48 | 1.27 | 19:40 | 0.063 | 08:50 | 0.089 | 0.076 | 0.076 | |
| 02/28/2020 | 20:55 | 1.91 | 02:40 | 1.95 | 1.93 | 17:55 | 1.06 | 03:20 | 1.49 | 1.25 | 16:55 | 0.063 | 03:20 | 0.090 | 0.074 | 0.074 | |
| 02/29/2020 | 22:10 | 1.90 | 07:20 | 1.94 | 1.92 | 01:05 | 1.06 | 23:40 | 1.51 | 1.26 | 22:05 | 0.063 | 23:45 | 0.089 | 0.075 | 0.075 | |
| 03/01/2020 | 20:20 | 1.89 | 04:15 | 1.93 | 1.92 | 15:10 | 1.05 | 02:55 | 1.51 | 1.25 | 15:10 | 0.062 | 02:55 | 0.090 | 0.074 | 0.074 | |
| 03/02/2020 | 18:30 | 1.88 | 05:00 | 1.92 | 1.90 | 12:45 | 1.04 | 08:25 | 1.58 | 1.29 | 12:45 | 0.061 | 08:25 | 0.093 | 0.075 | 0.075 | |
| 03/03/2020 | 20:15 | 1.87 | 04:45 | 1.91 | 1.89 | 14:35 | 1.08 | 18:20 | 1.50 | 1.28 | 14:35 | 0.062 | 01:10 | 0.087 | 0.074 | 0.074 | |
| 03/04/2020 | 22:00 | 1.87 | 06:15 | 1.90 | 1.89 | 18:45 | 1.03 | 01:50 | 1.52 | 1.26 | 18:45 | 0.059 | 01:50 | 0.088 | 0.073 | 0.073 | |
| 03/05/2020 | 11:00 | 1.88 | 14:50 | 1.90 | 1.89 | 07:05 | 1.05 | 02:35 | 1.55 | 1.28 | 07:05 | 0.061 | 02:35 | 0.090 | 0.074 | 0.074 | |
| 03/06/2020 | 18:05 | 1.88 | 05:20 | 1.91 | 1.90 | 05:10 | 1.06 | 05:05 | 1.59 | 1.31 | 05:10 | 0.062 | 05:05 | 0.093 | 0.076 | 0.076 | |
| 03/07/2020 | 00:35 | 1.88 | 23:25 | 1.96 | 1.92 | 11:00 | 1.05 | 08:05 | 1.53 | 1.29 | 11:00 | 0.062 | 08:05 | 0.090 | 0.076 | 0.076 | |
| 03/08/2020 | 01:15 | 1.95 | 15:25 | 1.98 | 1.97 | 01:10 | 1.08 | 16:40 | 1.54 | 1.28 | 01:10 | 0.065 | 16:40 | 0.094 | 0.079 | 0.079 | |
| 03/09/2020 | 21:35 | 1.95 | 08:20 | 1.98 | 1.97 | 09:45 | 1.09 | 12:40 | 1.60 | 1.26 | 09:45 | 0.067 | 12:40 | 0.099 | 0.077 | 0.077 | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Depth (in) | Velocity (ft/s) | Quantity (MGD - Total MG) | Rain (in) |
|---|---|---|---|---|
| Total | | | 9.571 | 4.90 |
| Avg | 1.99 | 1.38 | 0.087 | |

## Rainfall data

| MIL_RG01 | |
|---|---|
| Rain Collector Dimensions | 8" |

The rainfall measured at MIL_RG01 from November 16, 2019 to March 09, 2020 is 4.90 inches.

# Milpitas Temp Study 2019-20

***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

## Site Name

# MIL_RG01

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | 641 Gibraltar Court, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | Rain Alert III | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.423469° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.898106° | | |

| Manhole # | System Characteristics |
|---|---|
| | Commercial |
| Access | Traffic |
| Drive | Light |

## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Friday, November 15, 2019 | Rain Gauge |
| Monitoring Location (Sensors): | Monitor Location: |
| Field | Building |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Rain Gauge Tipping Bucket | |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| | |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| | |
| Active Drop Connections | Air Quality: |
| | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | |

## Additional Site Info. / Comments:

Need key to access.

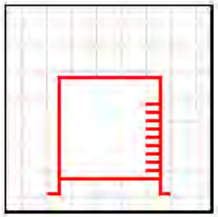
| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |

# HYDROGRAPH REPORT

MIL_RG01

**Rain Gauge**

**MIL_RG01**

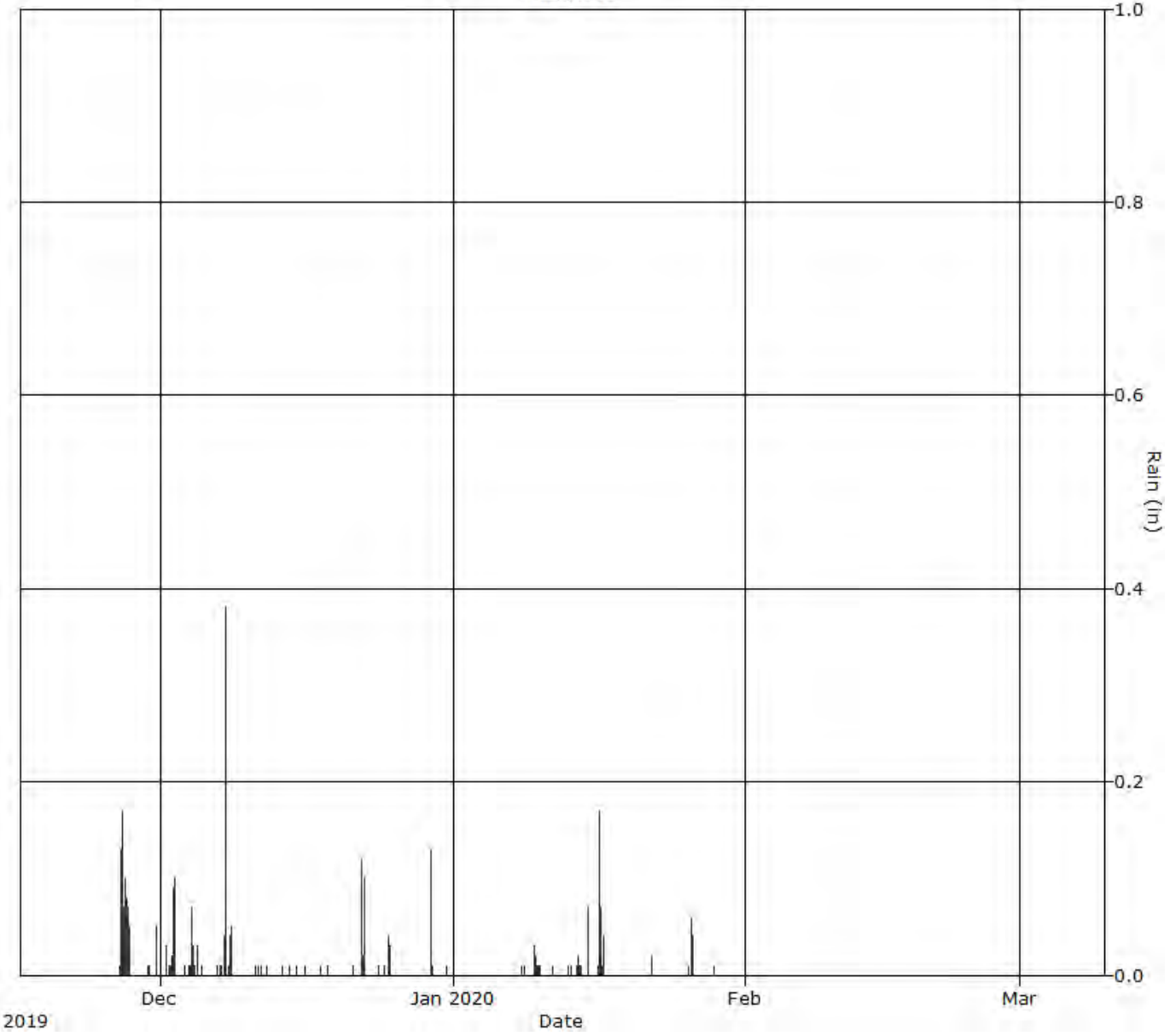


**Report Period**

11/16/2019
To
3/9/2020

**Legend**

Rain




ADS ENVIRONMENTAL SERVICES

## Daily Tabular Report

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | | | | | | | | | | | | | | | | | |
| 11/17/2019 | | | | | | | | | | | | | | | | | |
| 11/18/2019 | | | | | | | | | | | | | | | | | |
| 11/19/2019 | | | | | | | | | | | | | | | | | |
| 11/20/2019 | | | | | | | | | | | | | | | | | |
| 11/21/2019 | | | | | | | | | | | | | | | | | |
| 11/22/2019 | | | | | | | | | | | | | | | | | |
| 11/23/2019 | | | | | | | | | | | | | | | | | |
| 11/24/2019 | | | | | | | | | | | | | | | | | |
| 11/25/2019 | | | | | | | | | | | | | | | | | |
| 11/26/2019 | | | | | | | | | | | | | | | | | 0.36 |
| 11/27/2019 | | | | | | | | | | | | | | | | | 0.63 |
| 11/28/2019 | | | | | | | | | | | | | | | | | |
| 11/29/2019 | | | | | | | | | | | | | | | | | 0.02 |
| 11/30/2019 | | | | | | | | | | | | | | | | | 0.10 |
| 12/01/2019 | | | | | | | | | | | | | | | | | 0.06 |
| 12/02/2019 | | | | | | | | | | | | | | | | | 0.30 |
| 12/03/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/04/2019 | | | | | | | | | | | | | | | | | 0.39 |
| 12/05/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/06/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/07/2019 | | | | | | | | | | | | | | | | | 0.67 |
| 12/08/2019 | | | | | | | | | | | | | | | | | 0.20 |
| 12/09/2019 | | | | | | | | | | | | | | | | | |
| 12/10/2019 | | | | | | | | | | | | | | | | | |
| 12/11/2019 | | | | | | | | | | | | | | | | | 0.03 |
| 12/12/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/13/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/14/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/15/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/16/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/17/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/18/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/19/2019 | | | | | | | | | | | | | | | | | |
| 12/20/2019 | | | | | | | | | | | | | | | | | |
| 12/21/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/22/2019 | | | | | | | | | | | | | | | | | 0.41 |
| 12/23/2019 | | | | | | | | | | | | | | | | | |
| 12/24/2019 | | | | | | | | | | | | | | | | | 0.02 |
| 12/25/2019 | | | | | | | | | | | | | | | | | 0.08 |
| 12/26/2019 | | | | | | | | | | | | | | | | | |
| 12/27/2019 | | | | | | | | | | | | | | | | | |
| 12/28/2019 | | | | | | | | | | | | | | | | | |
| 12/29/2019 | | | | | | | | | | | | | | | | | 0.22 |
| 12/30/2019 | | | | | | | | | | | | | | | | | |
| 12/31/2019 | | | | | | | | | | | | | | | | | 0.01 |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 01/01/2020 | | | | | | | | | | | | | | | | | |
| 01/02/2020 | | | | | | | | | | | | | | | | | |
| 01/03/2020 | | | | | | | | | | | | | | | | | |
| 01/04/2020 | | | | | | | | | | | | | | | | | |
| 01/05/2020 | | | | | | | | | | | | | | | | | |
| 01/06/2020 | | | | | | | | | | | | | | | | | |
| 01/07/2020 | | | | | | | | | | | | | | | | | |
| 01/08/2020 | | | | | | | | | | | | | | | | | 0.02 |
| 01/09/2020 | | | | | | | | | | | | | | | | | 0.18 |
| 01/10/2020 | | | | | | | | | | | | | | | | | 0.02 |
| 01/11/2020 | | | | | | | | | | | | | | | | | 0.01 |
| 01/12/2020 | | | | | | | | | | | | | | | | | |
| 01/13/2020 | | | | | | | | | | | | | | | | | 0.02 |
| 01/14/2020 | | | | | | | | | | | | | | | | | 0.11 |
| 01/15/2020 | | | | | | | | | | | | | | | | | 0.07 |
| 01/16/2020 | | | | | | | | | | | | | | | | | 0.66 |
| 01/17/2020 | | | | | | | | | | | | | | | | | |
| 01/18/2020 | | | | | | | | | | | | | | | | | |
| 01/19/2020 | | | | | | | | | | | | | | | | | |
| 01/20/2020 | | | | | | | | | | | | | | | | | |
| 01/21/2020 | | | | | | | | | | | | | | | | | |
| 01/22/2020 | | | | | | | | | | | | | | | | | 0.03 |
| 01/23/2020 | | | | | | | | | | | | | | | | | |
| 01/24/2020 | | | | | | | | | | | | | | | | | |
| 01/25/2020 | | | | | | | | | | | | | | | | | |
| 01/26/2020 | | | | | | | | | | | | | | | | | 0.16 |
| 01/27/2020 | | | | | | | | | | | | | | | | | |
| 01/28/2020 | | | | | | | | | | | | | | | | | 0.01 |
| 01/29/2020 | | | | | | | | | | | | | | | | | |
| 01/30/2020 | | | | | | | | | | | | | | | | | |
| 01/31/2020 | | | | | | | | | | | | | | | | | |
| 02/01/2020 | | | | | | | | | | | | | | | | | |
| 02/02/2020 | | | | | | | | | | | | | | | | | |
| 02/03/2020 | | | | | | | | | | | | | | | | | |
| 02/04/2020 | | | | | | | | | | | | | | | | | |
| 02/05/2020 | | | | | | | | | | | | | | | | | |
| 02/06/2020 | | | | | | | | | | | | | | | | | |
| 02/07/2020 | | | | | | | | | | | | | | | | | |
| 02/08/2020 | | | | | | | | | | | | | | | | | |
| 02/09/2020 | | | | | | | | | | | | | | | | | |
| 02/10/2020 | | | | | | | | | | | | | | | | | |
| 02/11/2020 | | | | | | | | | | | | | | | | | |
| 02/12/2020 | | | | | | | | | | | | | | | | | |
| 02/13/2020 | | | | | | | | | | | | | | | | | |
| 02/14/2020 | | | | | | | | | | | | | | | | | |
| 02/15/2020 | | | | | | | | | | | | | | | | | |
| 02/16/2020 | | | | | | | | | | | | | | | | | |
| 02/17/2020 | | | | | | | | | | | | | | | | | |
| 02/18/2020 | | | | | | | | | | | | | | | | | |
| 02/19/2020 | | | | | | | | | | | | | | | | | |
| 02/20/2020 | | | | | | | | | | | | | | | | | |
| 02/21/2020 | | | | | | | | | | | | | | | | | |
| 02/22/2020 | | | | | | | | | | | | | | | | | |
| 02/23/2020 | | | | | | | | | | | | | | | | | |
| 02/24/2020 | | | | | | | | | | | | | | | | | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | | | | | | | | | | | | | | | | | |
| 02/26/2020 | | | | | | | | | | | | | | | | | |
| 02/27/2020 | | | | | | | | | | | | | | | | | |
| 02/28/2020 | | | | | | | | | | | | | | | | | |
| 02/29/2020 | | | | | | | | | | | | | | | | | |
| 03/01/2020 | | | | | | | | | | | | | | | | | |
| 03/02/2020 | | | | | | | | | | | | | | | | | |
| 03/03/2020 | | | | | | | | | | | | | | | | | |
| 03/04/2020 | | | | | | | | | | | | | | | | | |
| 03/05/2020 | | | | | | | | | | | | | | | | | |
| 03/06/2020 | | | | | | | | | | | | | | | | | |
| 03/07/2020 | | | | | | | | | | | | | | | | | |
| 03/08/2020 | | | | | | | | | | | | | | | | | |
| 03/09/2020 | | | | | | | | | | | | | | | | | |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Rain (in) |
|---|---|
| Total | 4.90 |
| Avg | |

## Rainfall data

| MIL_RG02 | |
|---|---|
| Rain Collector Dimensions | 8" |

The rainfall measured at MIL_RG02 from November 16, 2019 to March 09, 2020 is 5.26 inches.

# Milpitas Temp Study 2019-20

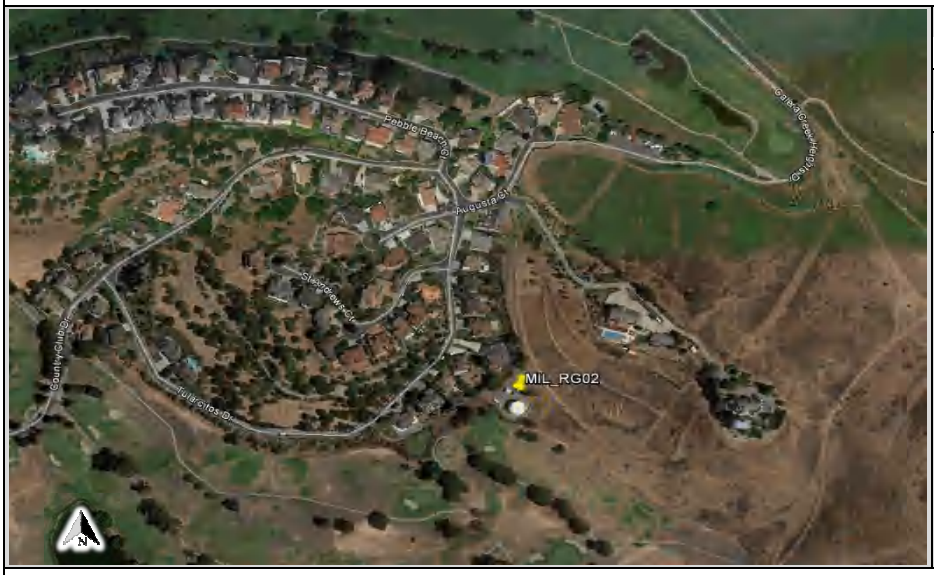
***Flow Monitoring Site Report***

ADS ENVIRONMENTAL SERVICES®

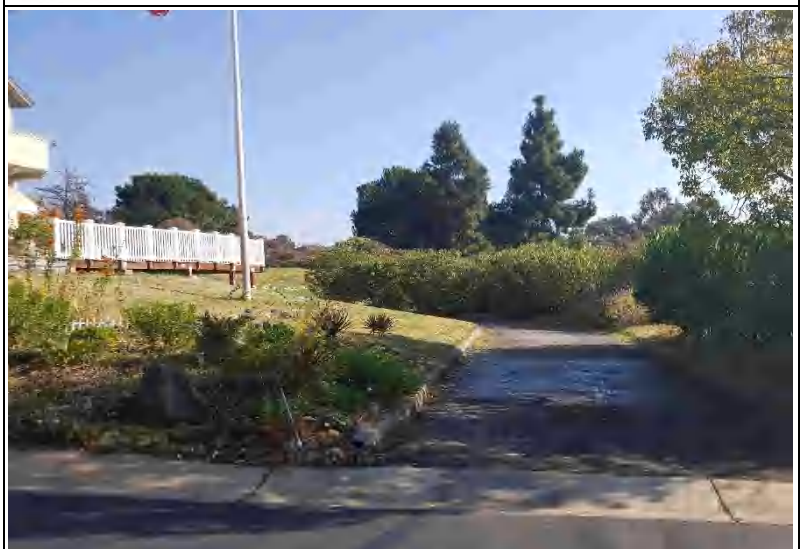
## Site Name

# MIL_RG02

| | | | | | |
|---|---|---|---|---|---|
| Site Address /Location: | 1328 Tularcitos Drive, Milpitas, CA | | | Monitor Series | Location Type |
| | | | | Rain Alert III | Temporary |
| Site Access Details: | DRIVE. | Latitude: | 37.455939° | Pipe Size (H x W) | Pipe Shape |
| | | Longitude: | -121.875253° | | |




| Manhole # | System Characteristics |
|---|---|
| | Commercial |
| Access | Traffic |
| Drive | Light |



## Installation Information

| Installation Date: | Installation Type: |
|---|---|
| Friday, November 15, 2019 | Rain Gauge |
| Monitoring Location (Sensors): | Monitor Location: |
| Field | Building |
| Sensors / Devices: | Pressure Sensor Range (psi) |
| Rain Gauge Tipping Bucket | |

## Installation Confirmation:

| Confirmation Time: | Pipe Size (HxW) |
|---|---|
| 1:30:00 AM | |
| Depth of Flow (Wet DOF) (in) | Range (Air DOF) (in) |
| | |
| Downlooker Physical Offset (in) | Measurement Confidence (in) |
| NA | |
| Peak Velocity (fps) | Velocity Sensor Offset (in) |
| | 0'' |
| Silt (in) | Silt Type |
| 0.0" | |

Hydraulic Comments:

## Manhole / Pipe Information:

| Manhole Depth (Approx. FT): | Manhole Configuration |
|---|---|
| | Single |
| Manhole Material: | Manhole Condition: |
| Concrete | Good |
| Manhole Opening Diameter (in) | Manhole Diameter (Approx.): |
| 26'' | 54'' |
| Manhole Cover | Manhole Frame |
| | |
| Active Drop Connections | Air Quality: |
| No | Normal |
| Pipe Material | Pipe Condition: |
| Concrete | |

## Communication Information:

| Communication Type | Antenna Location |
|---|---|
| Wireless | |

## Additional Site Info. / Comments:

Tularcitos Pump Station. Needs passcode and key.

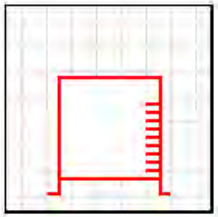
| | |
|---|---|
| ADS Project Name: | Milpitas.WWTFM.CA2019-2020 |
| ADS Project Number: | 22431.11.325 |

# HYDROGRAPH REPORT

MIL_RG02

**Rain Gauge**

**MIL_RG02**

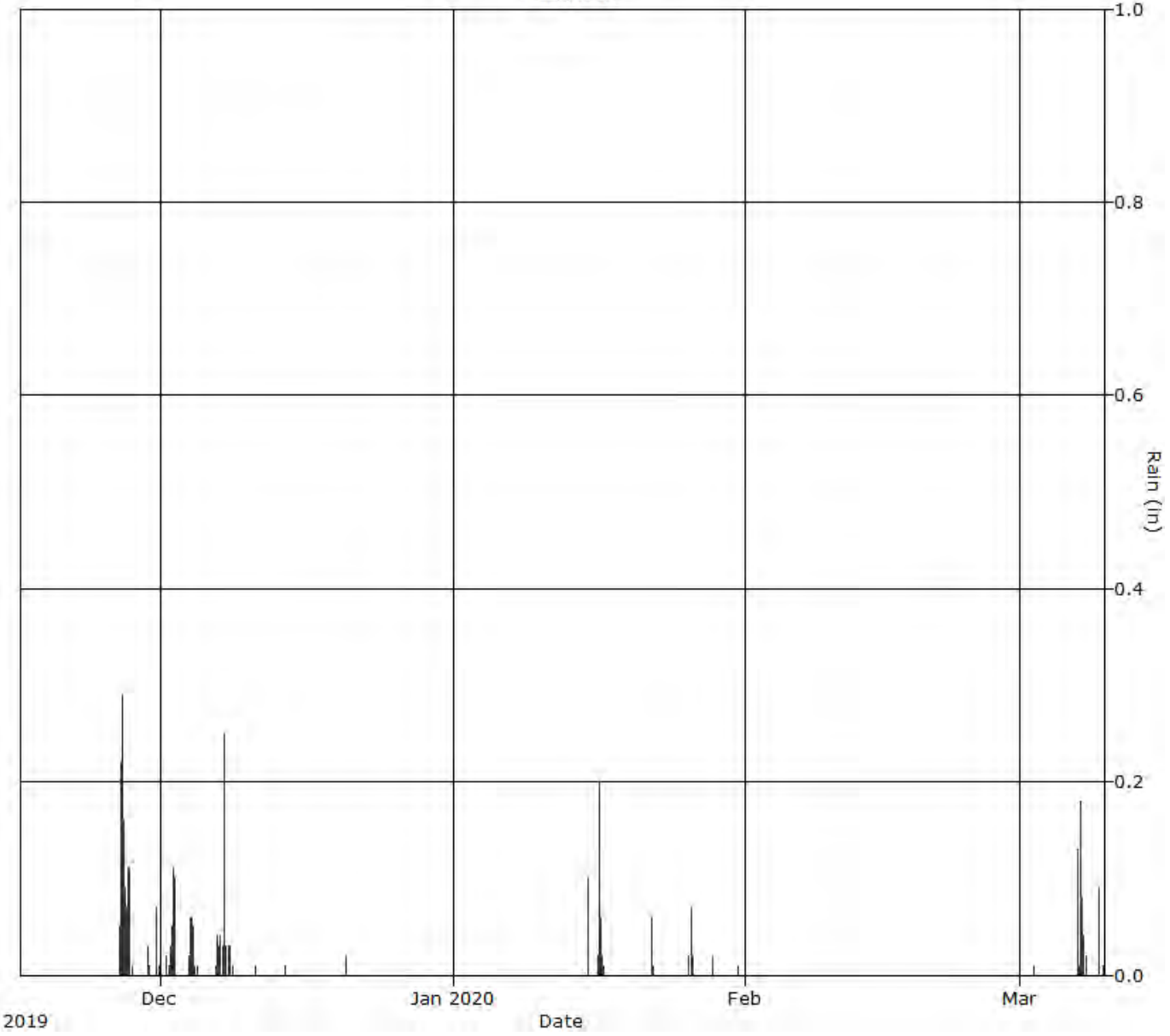


**Report Period**

11/16/2019
To
3/9/2020

**Legend**

Rain




ADS ENVIRONMENTAL SERVICES

## Daily Tabular Report

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 11/16/2019 | | | | | | | | | | | | | | | | | |
| 11/17/2019 | | | | | | | | | | | | | | | | | |
| 11/18/2019 | | | | | | | | | | | | | | | | | |
| 11/19/2019 | | | | | | | | | | | | | | | | | |
| 11/20/2019 | | | | | | | | | | | | | | | | | |
| 11/21/2019 | | | | | | | | | | | | | | | | | |
| 11/22/2019 | | | | | | | | | | | | | | | | | |
| 11/23/2019 | | | | | | | | | | | | | | | | | |
| 11/24/2019 | | | | | | | | | | | | | | | | | |
| 11/25/2019 | | | | | | | | | | | | | | | | | |
| 11/26/2019 | | | | | | | | | | | | | | | | | 0.63 |
| 11/27/2019 | | | | | | | | | | | | | | | | | 0.77 |
| 11/28/2019 | | | | | | | | | | | | | | | | | |
| 11/29/2019 | | | | | | | | | | | | | | | | | 0.05 |
| 11/30/2019 | | | | | | | | | | | | | | | | | 0.14 |
| 12/01/2019 | | | | | | | | | | | | | | | | | 0.06 |
| 12/02/2019 | | | | | | | | | | | | | | | | | 0.36 |
| 12/03/2019 | | | | | | | | | | | | | | | | | |
| 12/04/2019 | | | | | | | | | | | | | | | | | 0.44 |
| 12/05/2019 | | | | | | | | | | | | | | | | | |
| 12/06/2019 | | | | | | | | | | | | | | | | | 0.06 |
| 12/07/2019 | | | | | | | | | | | | | | | | | 0.84 |
| 12/08/2019 | | | | | | | | | | | | | | | | | 0.10 |
| 12/09/2019 | | | | | | | | | | | | | | | | | |
| 12/10/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/11/2019 | | | | | | | | | | | | | | | | | 0.00 |
| 12/12/2019 | | | | | | | | | | | | | | | | | |
| 12/13/2019 | | | | | | | | | | | | | | | | | |
| 12/14/2019 | | | | | | | | | | | | | | | | | 0.01 |
| 12/15/2019 | | | | | | | | | | | | | | | | | |
| 12/16/2019 | | | | | | | | | | | | | | | | | |
| 12/17/2019 | | | | | | | | | | | | | | | | | |
| 12/18/2019 | | | | | | | | | | | | | | | | | |
| 12/19/2019 | | | | | | | | | | | | | | | | | |
| 12/20/2019 | | | | | | | | | | | | | | | | | 0.02 |
| 12/21/2019 | | | | | | | | | | | | | | | | | |
| 12/22/2019 | | | | | | | | | | | | | | | | | |
| 12/23/2019 | | | | | | | | | | | | | | | | | |
| 12/24/2019 | | | | | | | | | | | | | | | | | |
| 12/25/2019 | | | | | | | | | | | | | | | | | |
| 12/26/2019 | | | | | | | | | | | | | | | | | |
| 12/27/2019 | | | | | | | | | | | | | | | | | |
| 12/28/2019 | | | | | | | | | | | | | | | | | |
| 12/29/2019 | | | | | | | | | | | | | | | | | |
| 12/30/2019 | | | | | | | | | | | | | | | | | |
| 12/31/2019 | | | | | | | | | | | | | | | | | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 01/01/2020 | | | | | | | | | | | | | | | | | |
| 01/02/2020 | | | | | | | | | | | | | | | | | |
| 01/03/2020 | | | | | | | | | | | | | | | | | |
| 01/04/2020 | | | | | | | | | | | | | | | | | |
| 01/05/2020 | | | | | | | | | | | | | | | | | |
| 01/06/2020 | | | | | | | | | | | | | | | | | |
| 01/07/2020 | | | | | | | | | | | | | | | | | |
| 01/08/2020 | | | | | | | | | | | | | | | | | |
| 01/09/2020 | | | | | | | | | | | | | | | | | |
| 01/10/2020 | | | | | | | | | | | | | | | | | |
| 01/11/2020 | | | | | | | | | | | | | | | | | |
| 01/12/2020 | | | | | | | | | | | | | | | | | |
| 01/13/2020 | | | | | | | | | | | | | | | | | |
| 01/14/2020 | | | | | | | | | | | | | | | | | |
| 01/15/2020 | | | | | | | | | | | | | | | | | 0.10 |
| 01/16/2020 | | | | | | | | | | | | | | | | | 0.66 |
| 01/17/2020 | | | | | | | | | | | | | | | | | |
| 01/18/2020 | | | | | | | | | | | | | | | | | |
| 01/19/2020 | | | | | | | | | | | | | | | | | |
| 01/20/2020 | | | | | | | | | | | | | | | | | |
| 01/21/2020 | | | | | | | | | | | | | | | | | 0.01 |
| 01/22/2020 | | | | | | | | | | | | | | | | | 0.09 |
| 01/23/2020 | | | | | | | | | | | | | | | | | |
| 01/24/2020 | | | | | | | | | | | | | | | | | |
| 01/25/2020 | | | | | | | | | | | | | | | | | |
| 01/26/2020 | | | | | | | | | | | | | | | | | 0.16 |
| 01/27/2020 | | | | | | | | | | | | | | | | | |
| 01/28/2020 | | | | | | | | | | | | | | | | | 0.02 |
| 01/29/2020 | | | | | | | | | | | | | | | | | |
| 01/30/2020 | | | | | | | | | | | | | | | | | |
| 01/31/2020 | | | | | | | | | | | | | | | | | 0.01 |
| 02/01/2020 | | | | | | | | | | | | | | | | | |
| 02/02/2020 | | | | | | | | | | | | | | | | | |
| 02/03/2020 | | | | | | | | | | | | | | | | | |
| 02/04/2020 | | | | | | | | | | | | | | | | | |
| 02/05/2020 | | | | | | | | | | | | | | | | | |
| 02/06/2020 | | | | | | | | | | | | | | | | | |
| 02/07/2020 | | | | | | | | | | | | | | | | | |
| 02/08/2020 | | | | | | | | | | | | | | | | | |
| 02/09/2020 | | | | | | | | | | | | | | | | | |
| 02/10/2020 | | | | | | | | | | | | | | | | | |
| 02/11/2020 | | | | | | | | | | | | | | | | | |
| 02/12/2020 | | | | | | | | | | | | | | | | | |
| 02/13/2020 | | | | | | | | | | | | | | | | | |
| 02/14/2020 | | | | | | | | | | | | | | | | | |
| 02/15/2020 | | | | | | | | | | | | | | | | | |
| 02/16/2020 | | | | | | | | | | | | | | | | | |
| 02/17/2020 | | | | | | | | | | | | | | | | | |
| 02/18/2020 | | | | | | | | | | | | | | | | | |
| 02/19/2020 | | | | | | | | | | | | | | | | | |
| 02/20/2020 | | | | | | | | | | | | | | | | | |
| 02/21/2020 | | | | | | | | | | | | | | | | | |
| 02/22/2020 | | | | | | | | | | | | | | | | | |
| 02/23/2020 | | | | | | | | | | | | | | | | | |
| 02/24/2020 | | | | | | | | | | | | | | | | | |

| Date | Depth (in) | | | | | Velocity (ft/s) | | | | | Quantity (MGD - Total MG) | | | | | | Rain (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Time | Min | Time | Max | Avg | Total | Total |
| 02/25/2020 | | | | | | | | | | | | | | | | | |
| 02/26/2020 | | | | | | | | | | | | | | | | | |
| 02/27/2020 | | | | | | | | | | | | | | | | | |
| 02/28/2020 | | | | | | | | | | | | | | | | | |
| 02/29/2020 | | | | | | | | | | | | | | | | | |
| 03/01/2020 | | | | | | | | | | | | | | | | | |
| 03/02/2020 | | | | | | | | | | | | | | | | | 0.01 |
| 03/03/2020 | | | | | | | | | | | | | | | | | |
| 03/04/2020 | | | | | | | | | | | | | | | | | |
| 03/05/2020 | | | | | | | | | | | | | | | | | |
| 03/06/2020 | | | | | | | | | | | | | | | | | |
| 03/07/2020 | | | | | | | | | | | | | | | | | 0.58 |
| 03/08/2020 | | | | | | | | | | | | | | | | | 0.02 |
| 03/09/2020 | | | | | | | | | | | | | | | | | 0.11 |

**Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59**

| | Rain (in) |
|---|---|
| Total | 5.26 |
| Avg | |

# APPENDIX C

City of Milpitas
Sewer Master Plan Study
Summary of GIS Updates

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**GIS Updates**

The City provided their most up-to-date records of the wastewater collection system as an ArcGIS geodatabase (GIS) as well as a hard-drive containing most of the record drawings on file. The GIS had not been updated with any recent CIP projects implemented since the last model update in 2009. The City also provided a spreadsheet listing all of the record drawings and designating them as one of the following seven categories:

1. Category 1: Pre-2002, DWG # is not referenced on GIS, plat sheet # has been identified;
2. Category 2: Pre-2002, DWG # is referenced on GIS, plat sheet # has not been identified;
3. Category 3: Pre-2002, DWG # is not referenced on GIS, plat sheet # has not been identified;
4. Category 4: Post-2002, DWG # is referenced on GIS, plat sheet # has not been identified;
5. Category 5: Post-2002, DWG # is referenced on GIS, plat sheet # has been identified;
6. Category 6: Post-2002, DWG # is not referenced on GIS, plat sheet # has been identified, alignment not drawn in GIS; and
7. Category 7: Post-2002, No utility improvements but existing utilities shown on plan for reference.

Based on these categories, the following drawing reviews were completed to update the GIS:

1. All category 1, 4, and 5 record drawings, along with many category 2 record drawings, were reviewed and updates were made where there was missing information;
2. All available category 3 record drawings were reviewed, but none of the available drawings had any sanitary sewer pipe information;
3. All category 6 record drawings were reviewed and new alignments were added;
4. Benchmark and/or datum information found on each reviewed drawing was recorded or it was noted if there was no information.

Based on the review of the abovementioned record drawings, the following information was added to or updated in the GIS:

1. Pipe GIS updates:
    - Material, diameter, upstream and downstream invert elevations, measured length, slope, year built, and drawing number were updated where information was found in the set of available record drawings;
    - The actual length was also calculated using one dimensional horizontal distance calculator in ArcGIS once all updates were complete;
    - Where siphons are located throughout the system, “siphon” was listed in the “slope” field;
    - All existing pipe segments with the material “High Density Polyurethane” were changed to “HDPE” for consistency with the rest of the system;
    - In cases where the pipe material was not specified on the drawing, but it was listed in the notes that all sanitary sewer pipes on this drawing should be, for example, “VCP or ABS or other approved material,” the material was listed as “VCP/ABS”;
    - Where the material was listed as “SS” or “SSP” and no material was listed in the record drawings, these were left as “SS” or “SSP.” When referring to pipe material, these

acronyms often represent stainless steel pipe; however, for a gravity collection system, it is assumed that these are simply to indicate that the pipelines are “sanitary sewer” and are not a representation of the pipe material;

- An attribute column titled “HSE_NOTES” was added for tracking notes and edits made to the pipeline GIS file. Notes were standardized to the extent possible for streamlined sorting. Notes indicated in that column include the following:
  - If a drawing indicated that a liner was added to an existing pipe or the pipe was rehabilitated, the year built was updated to indicate the year the liner was added or the rehab was completed, and “UPDT_YR(NEWLINER)” or “UPDT_YR(REHAB)” was added;
  - Abandoned pipes were labeled “ABANDONED”;
  - New pipes were labeled “ADDED_SEGMENT”;
  - Pipes that were already in GIS but were indicated as private on record drawings were labeled “PRIVATE”;

2. Manhole GIS updates:
   - Rim elevation, year of installation, and drawing number were updated where available;
   - Manhole invert elevations were not typically available on record drawings and were not prioritized;
   - An attribute column titled “HSE_NOTES” was also added for tracking notes and edits made to the manhole GIS file. Notes indicated in that column include the following:
     - Abandoned and floating manholes were labeled “ABANDONED” or “DISCONNECTED,” respectively;
     - New manholes were labeled “ADDED_MH”;
3. Two of the fields included in the attributes table for both the pipeline and manhole GIS files are DRAWINGNO (drawing number) and UPDTSRC (update source). The DRAWINGNO was reserved for the original utility construction drawing. The UPDTSRC field indicated the drawing number for updates made during our review and generally referred to record drawings of new facilities that might show the facility as “existing.”

During the GIS update process, the update of model information for areas containing either flow splits or where critical information, such as pipe diameter, material, invert elevations, and year built, was missing was prioritized.

# APPENDIX D

City of Milpitas
Sewer Master Plan Study
Dry Weather Calibration Charts

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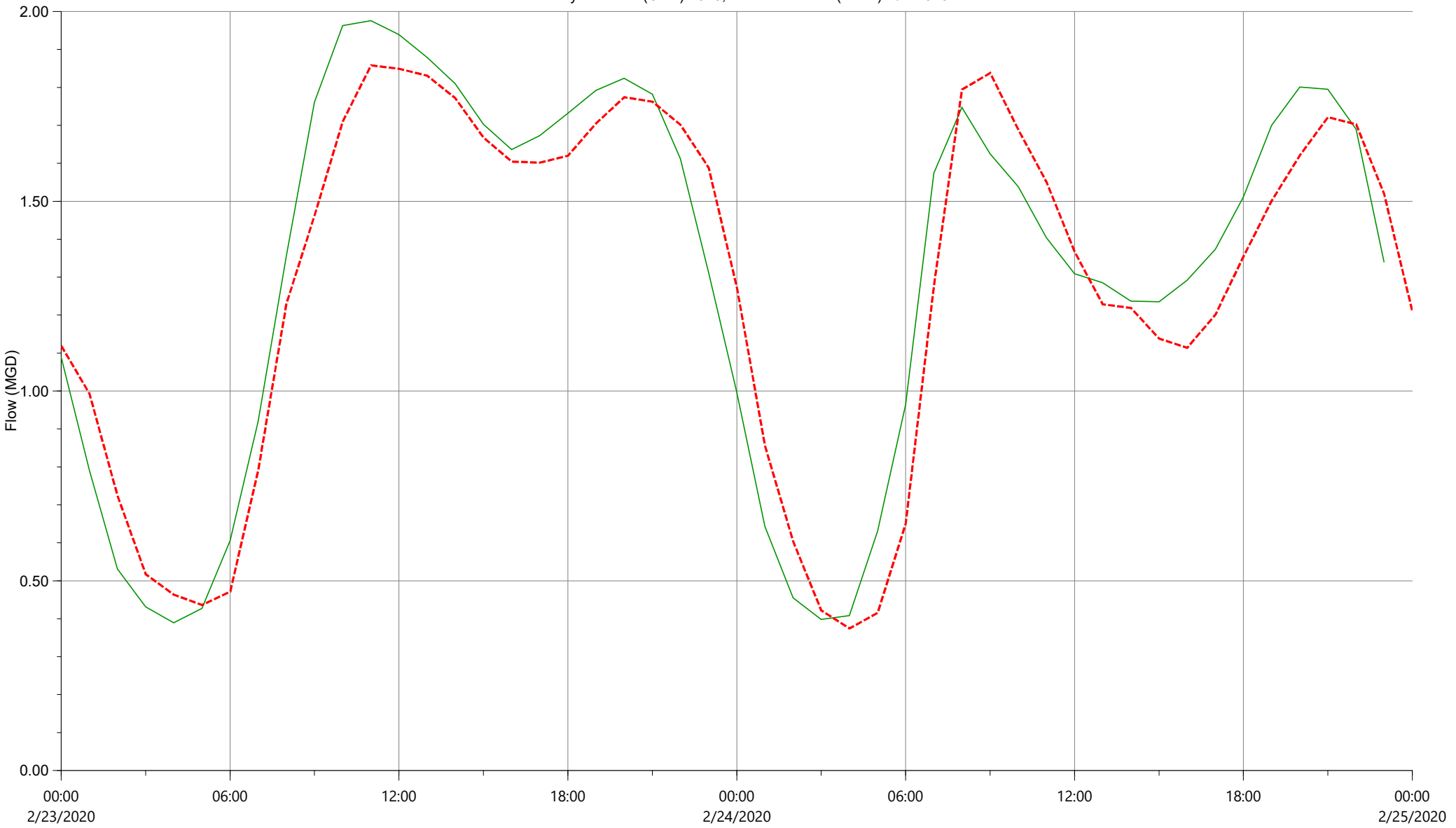
Flow Survey Location (Obs.) 1043, Model Location (Pred.) D/S 1043.1

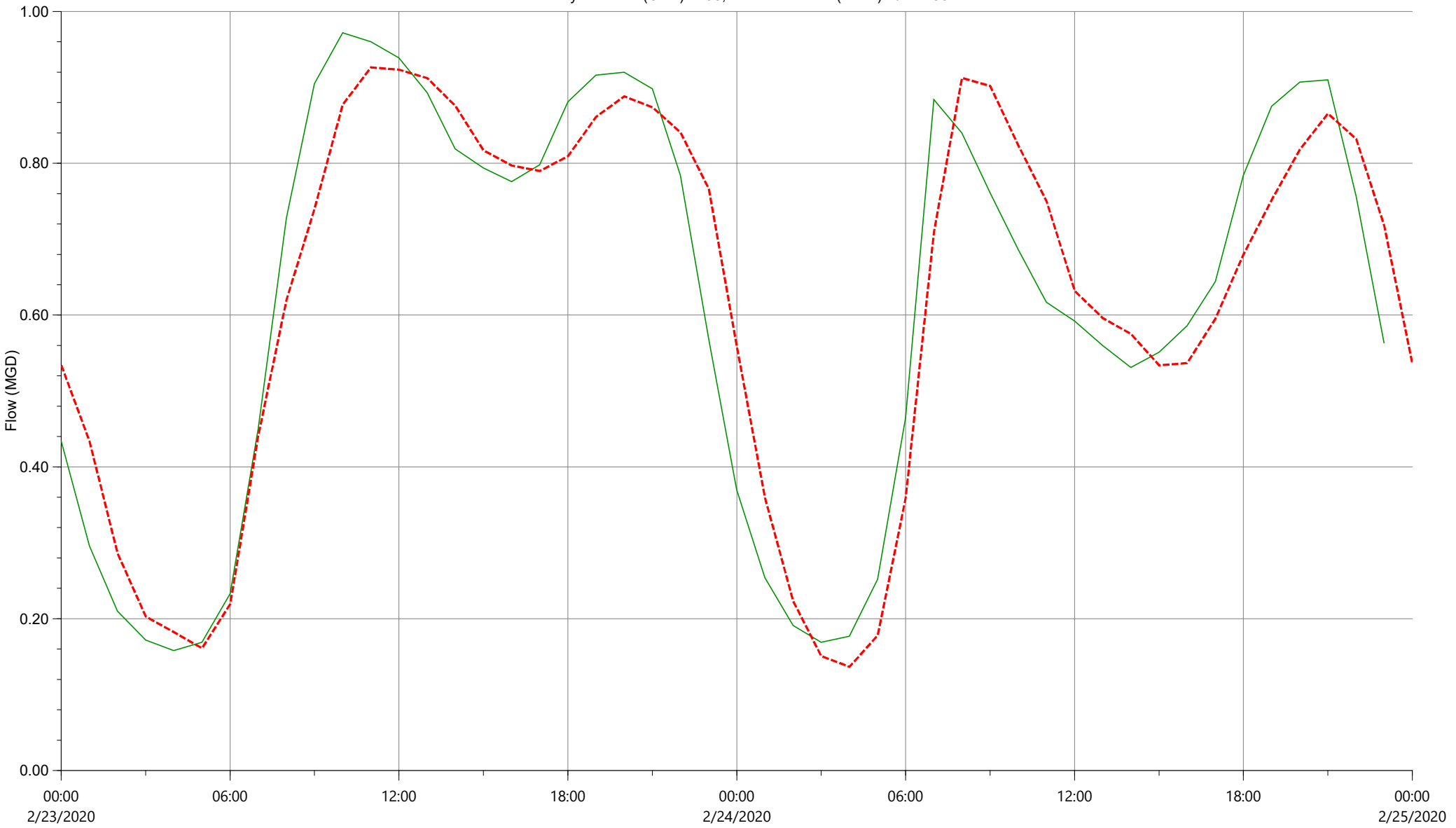



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.389 | 1.976 | 2.570 |
| Model | 0.374 | 1.858 | 2.572 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 1193, Model Location (Pred.) D/S 1193.1

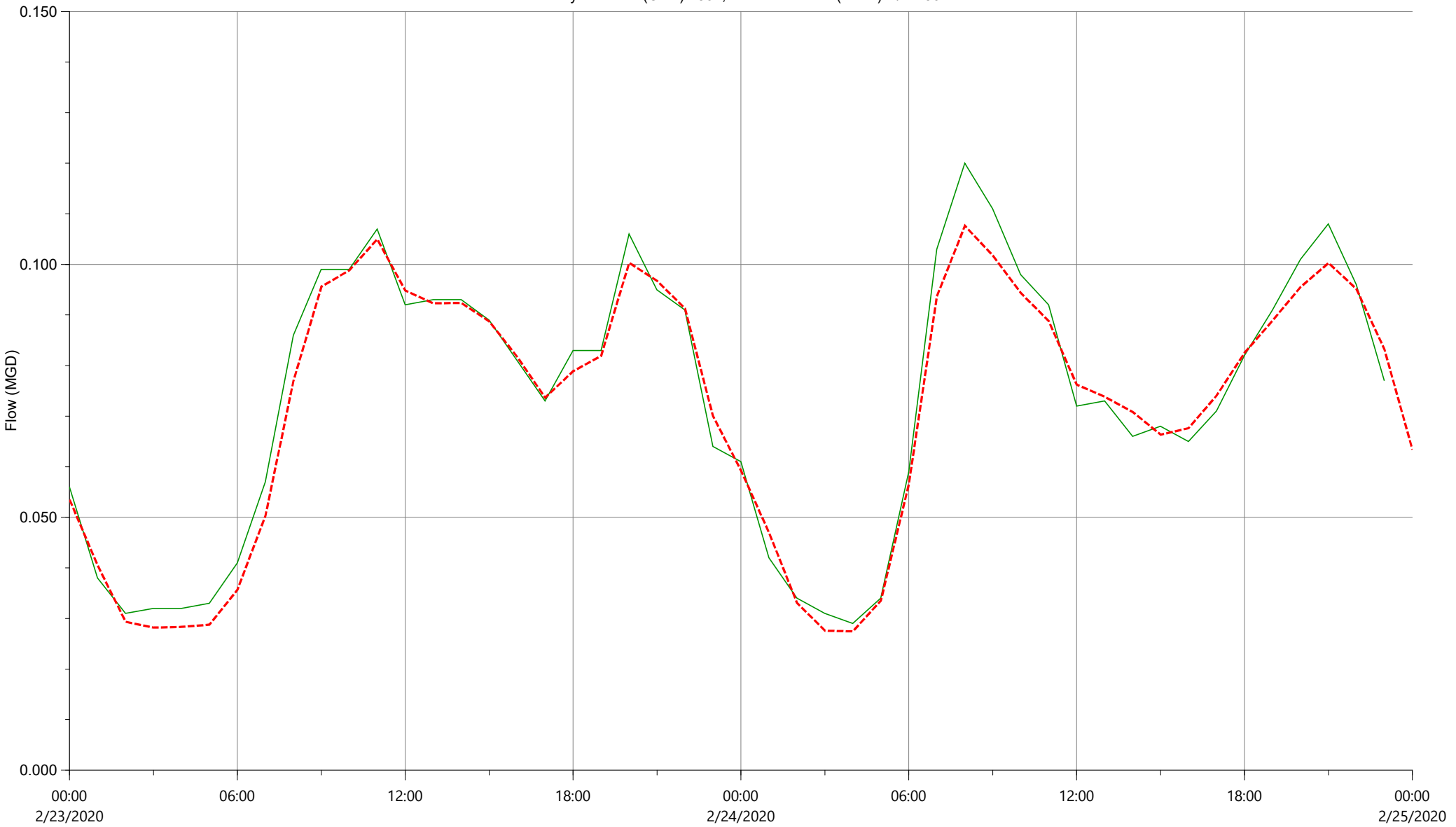



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.158 | 0.972 | 1.213 |
| Model | 0.137 | 0.926 | 1.249 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 1564, Model Location (Pred.) D/S 1564.1

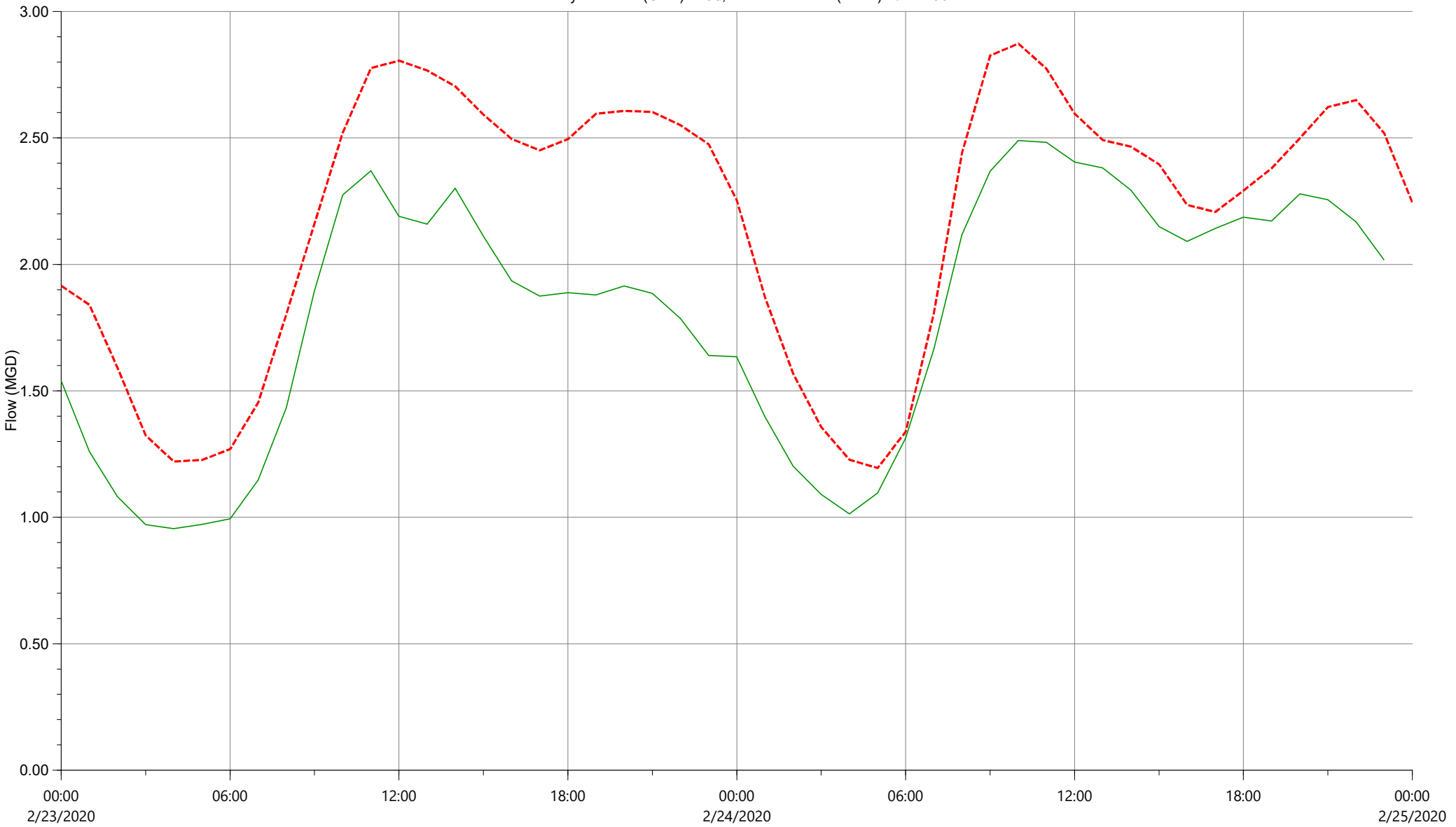



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.029 | 0.120 | 0.145 |
| Model | 0.027 | 0.108 | 0.144 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 1790, Model Location (Pred.) D/S 1790.1

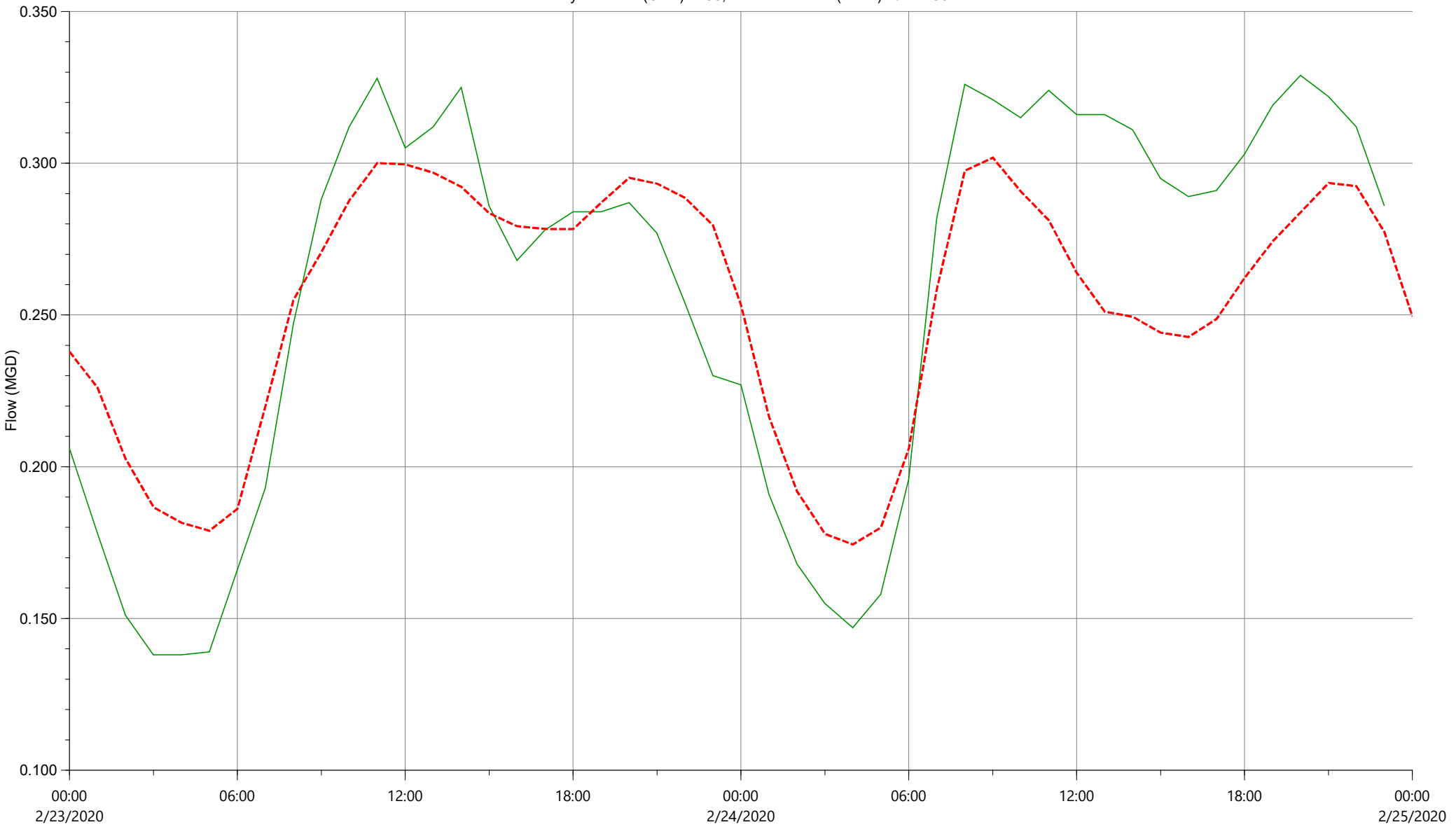



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.955 | 2.490 | 3.546 |
| Model | 1.196 | 2.874 | 4.388 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 1795, Model Location (Pred.) D/S 1795.1

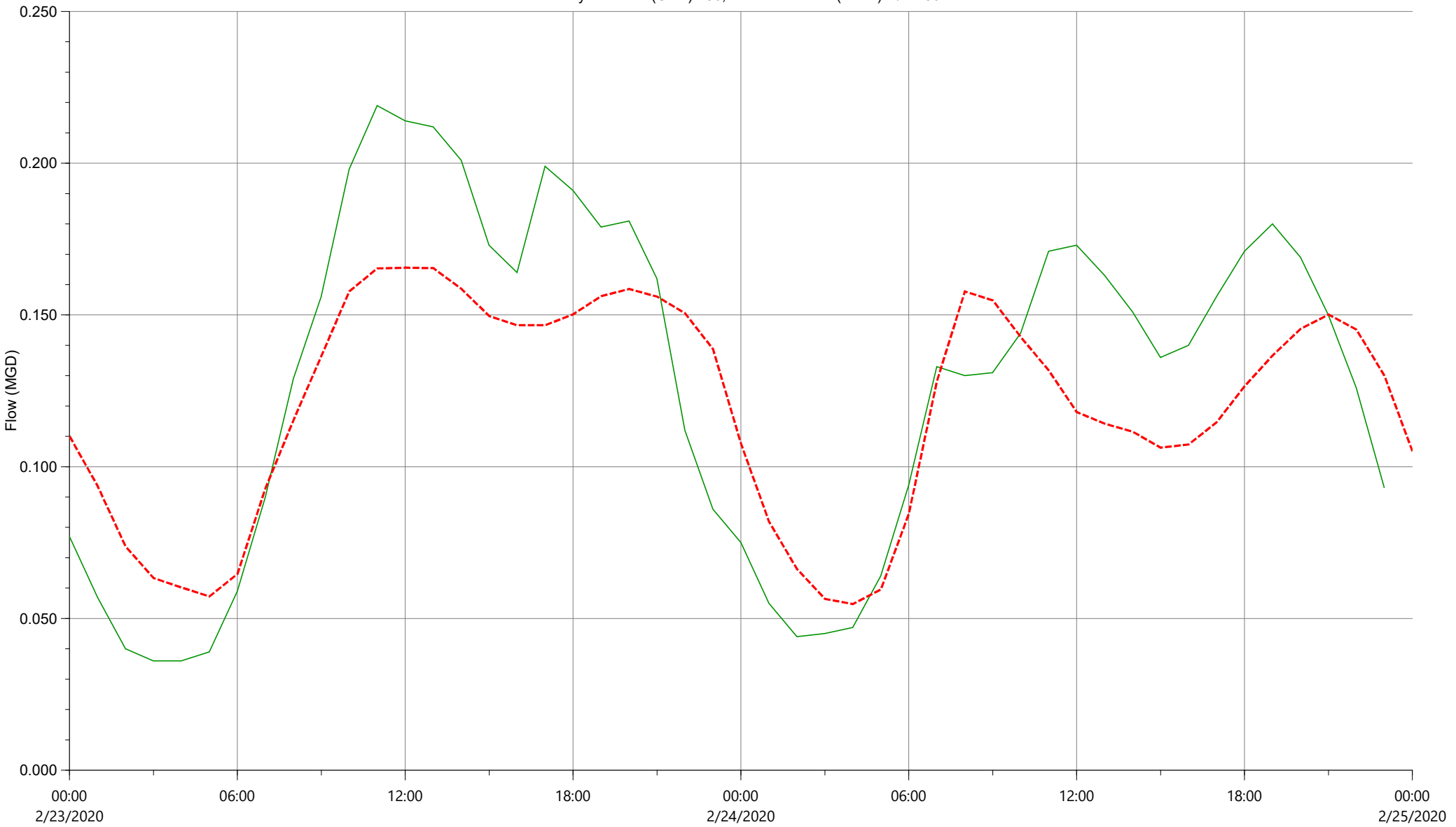



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.138 | 0.329 | 0.505 |
| Model | 0.174 | 0.302 | 0.509 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 186, Model Location (Pred.) D/S 186.1

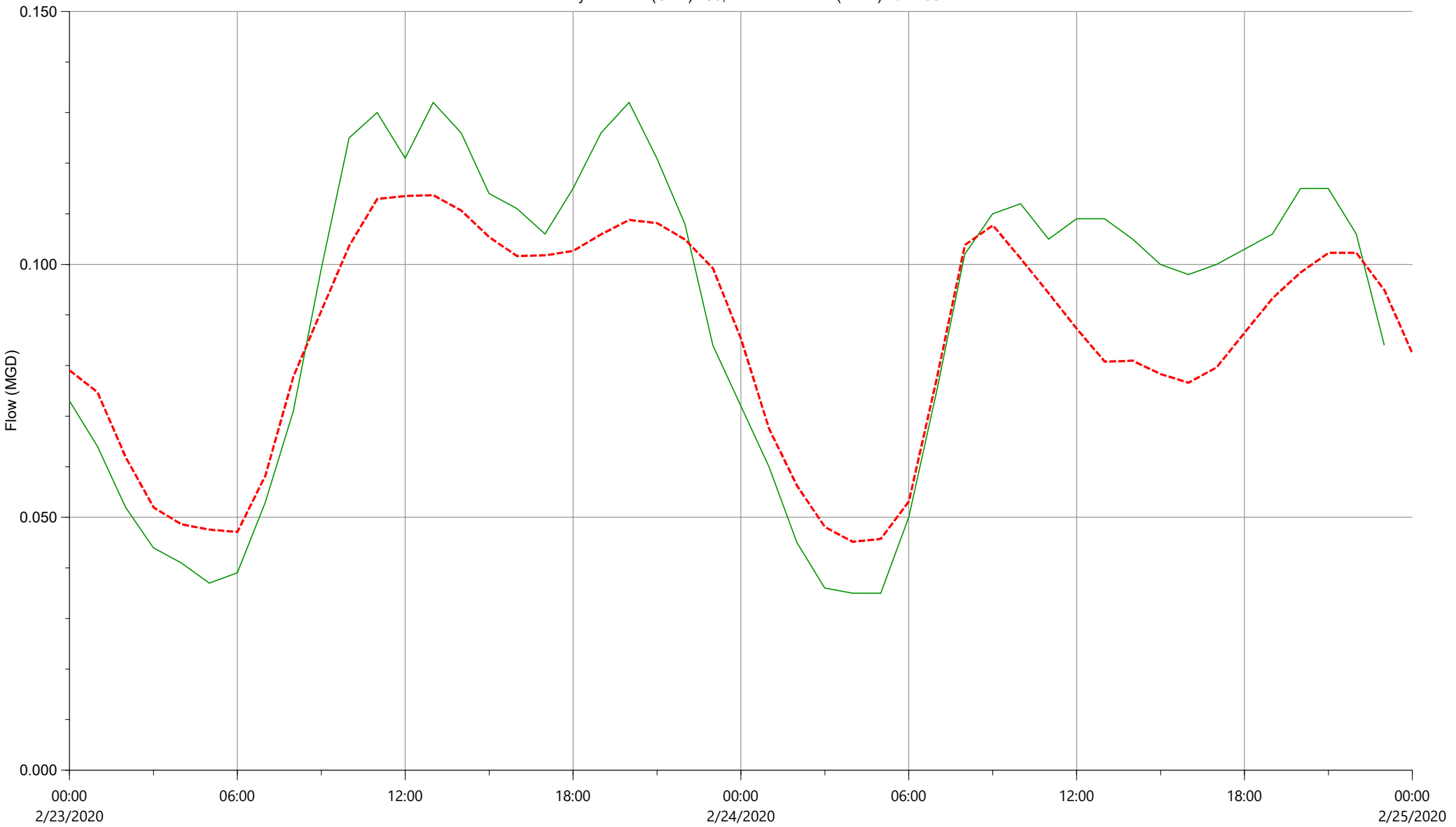



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.036 | 0.219 | 0.253 |
| Model | 0.055 | 0.166 | 0.240 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 190, Model Location (Pred.) D/S 190.1

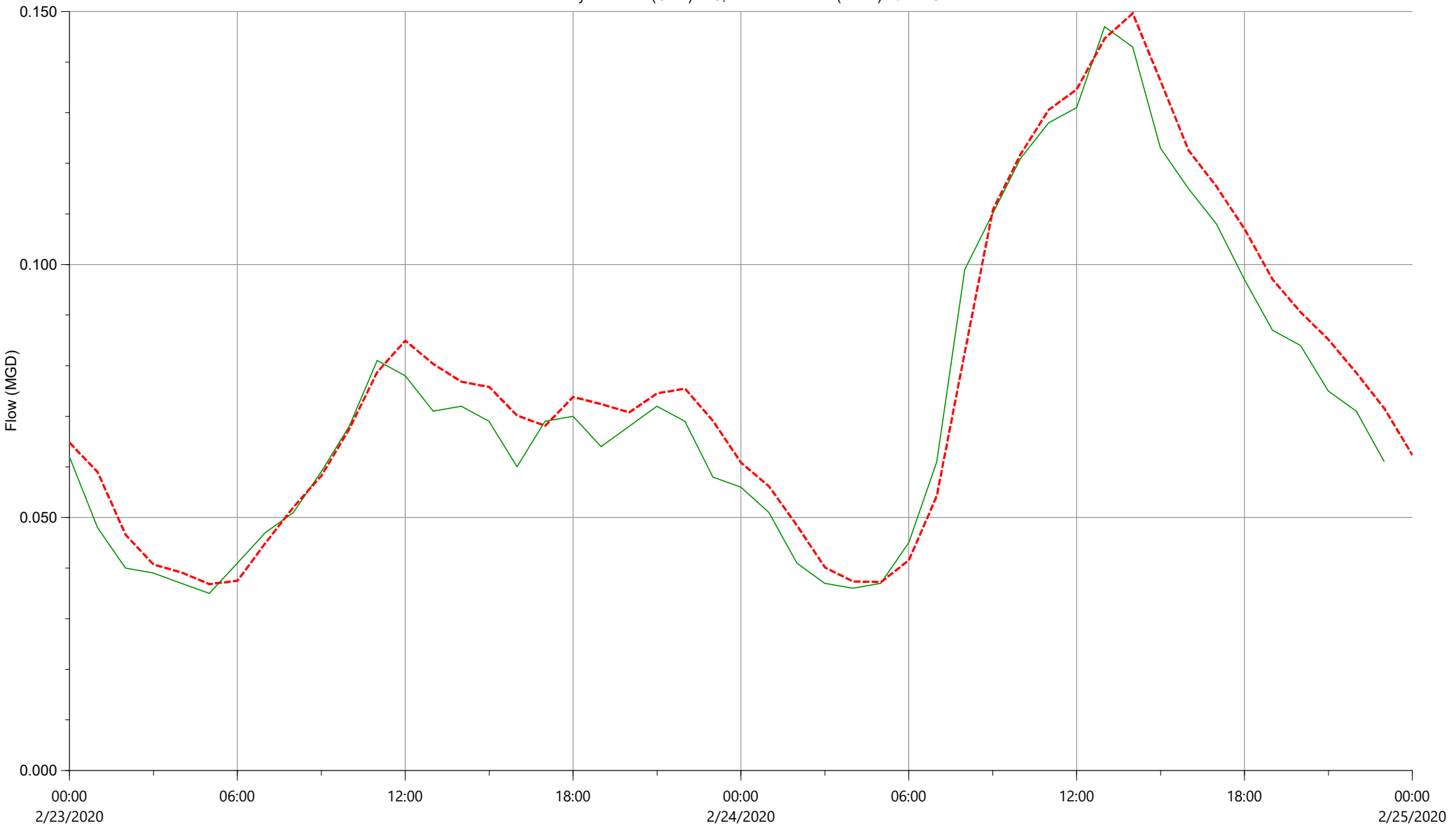



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.035 | 0.132 | 0.176 |
| Model | 0.045 | 0.114 | 0.170 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 229, Model Location (Pred.) D/S 229.1

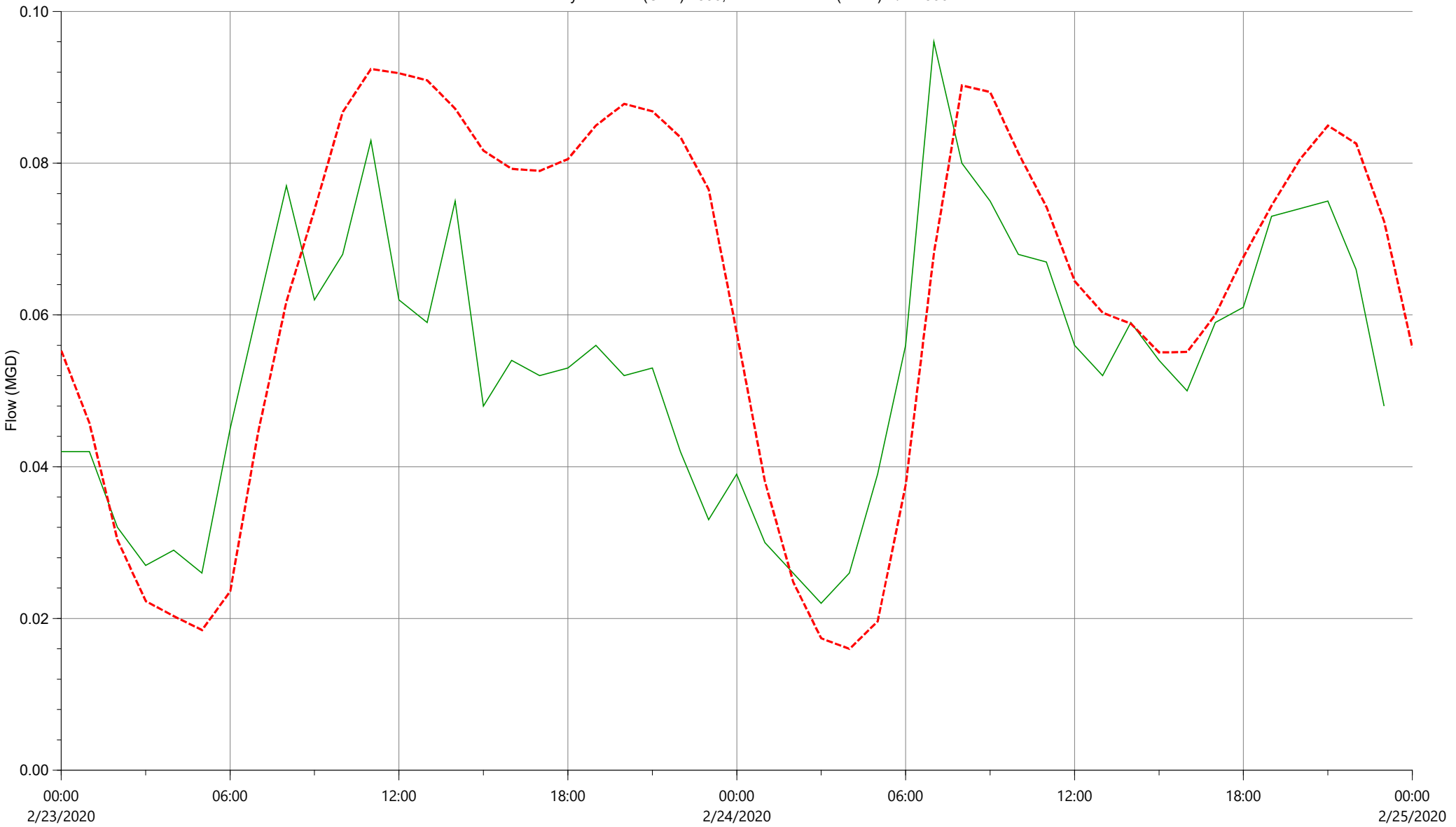



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.035 | 0.147 | 0.143 |
| Model | 0.037 | 0.150 | 0.153 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 2300, Model Location (Pred.) D/S 2300.1

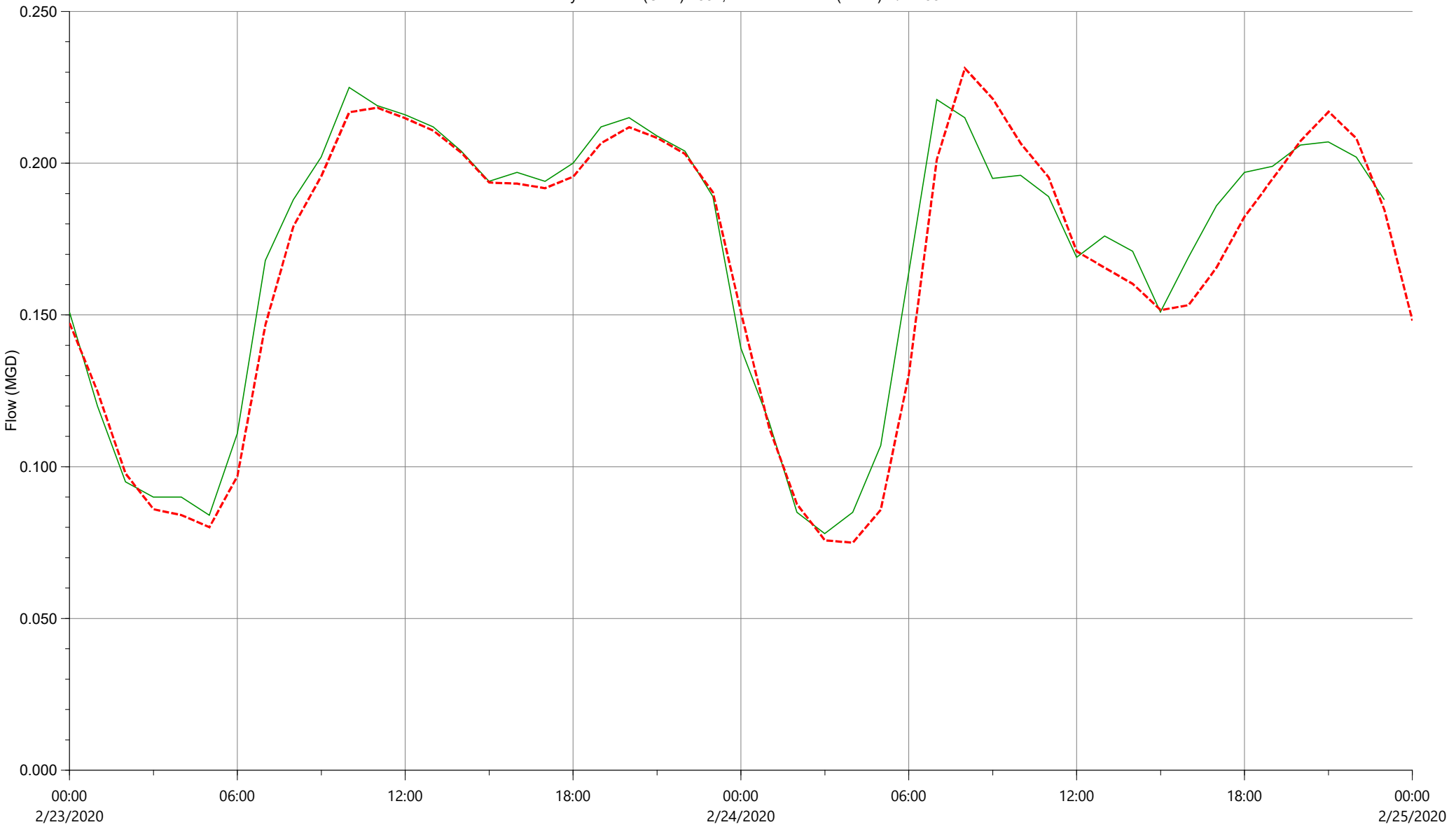



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.022 | 0.096 | 0.106 |
| Model | 0.016 | 0.092 | 0.126 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 2334, Model Location (Pred.) D/S 2334.1




| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.078 | 0.225 | 0.335 |
| Model | 0.075 | 0.231 | 0.335 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

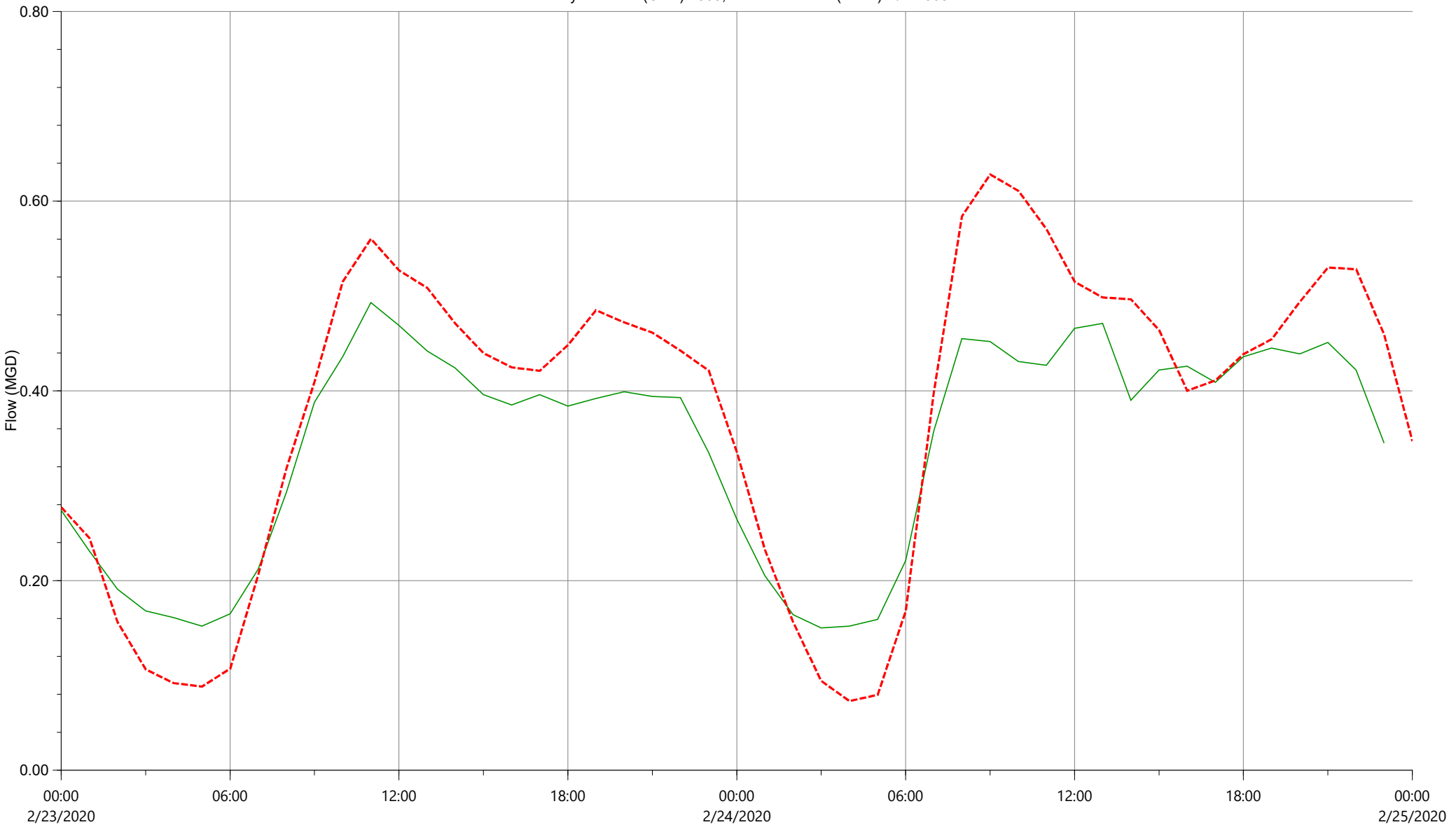
Flow Survey Location (Obs.) 2491, Model Location (Pred.) D/S 2491.1

| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.031 | 0.298 | 0.194 |
| Model | 0.002 | 0.214 | 0.169 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 2569, Model Location (Pred.) D/S 2569.1

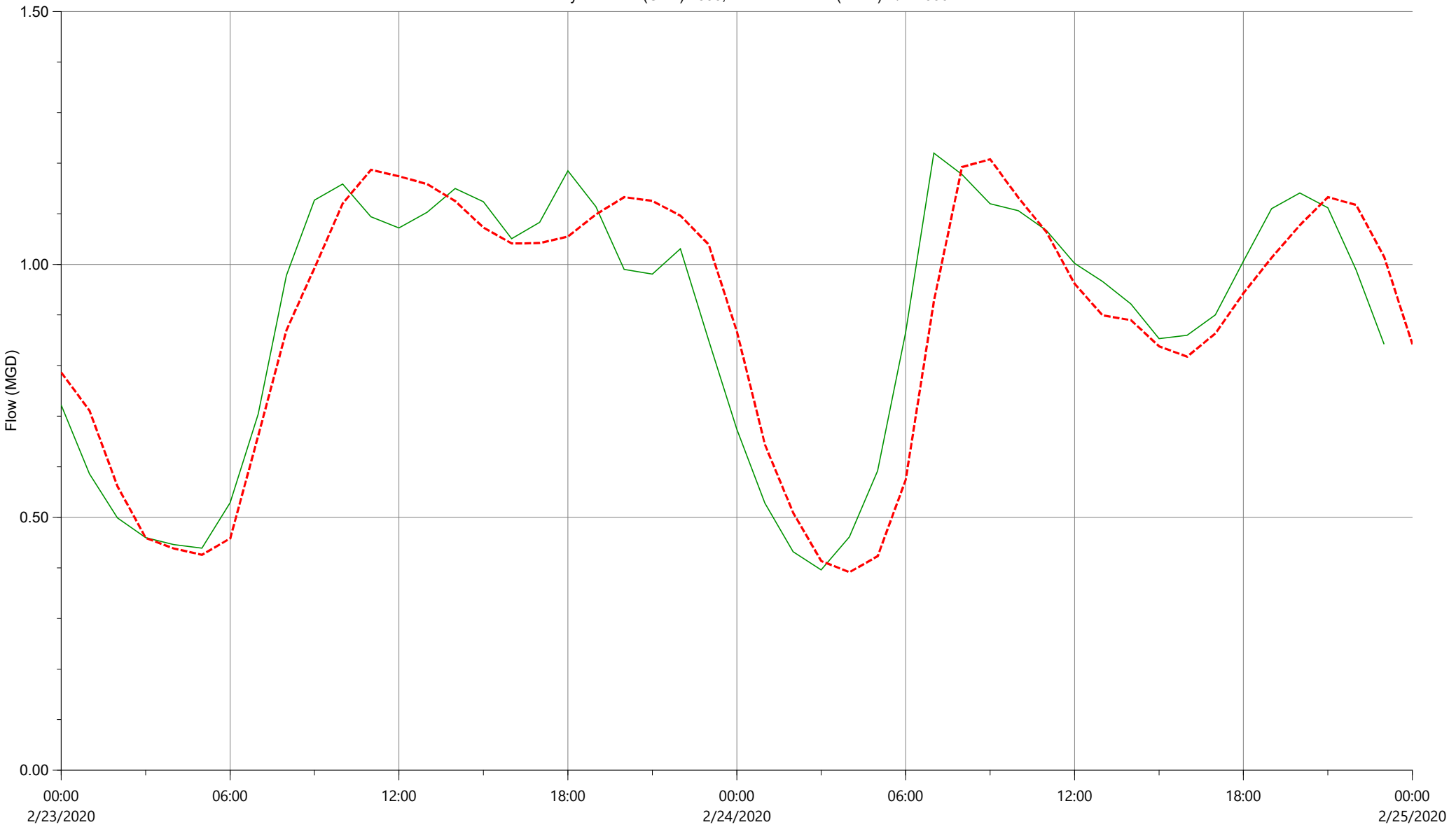



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.150 | 0.493 | 0.676 |
| Model | 0.073 | 0.628 | 0.761 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 2666, Model Location (Pred.) D/S 2666.1

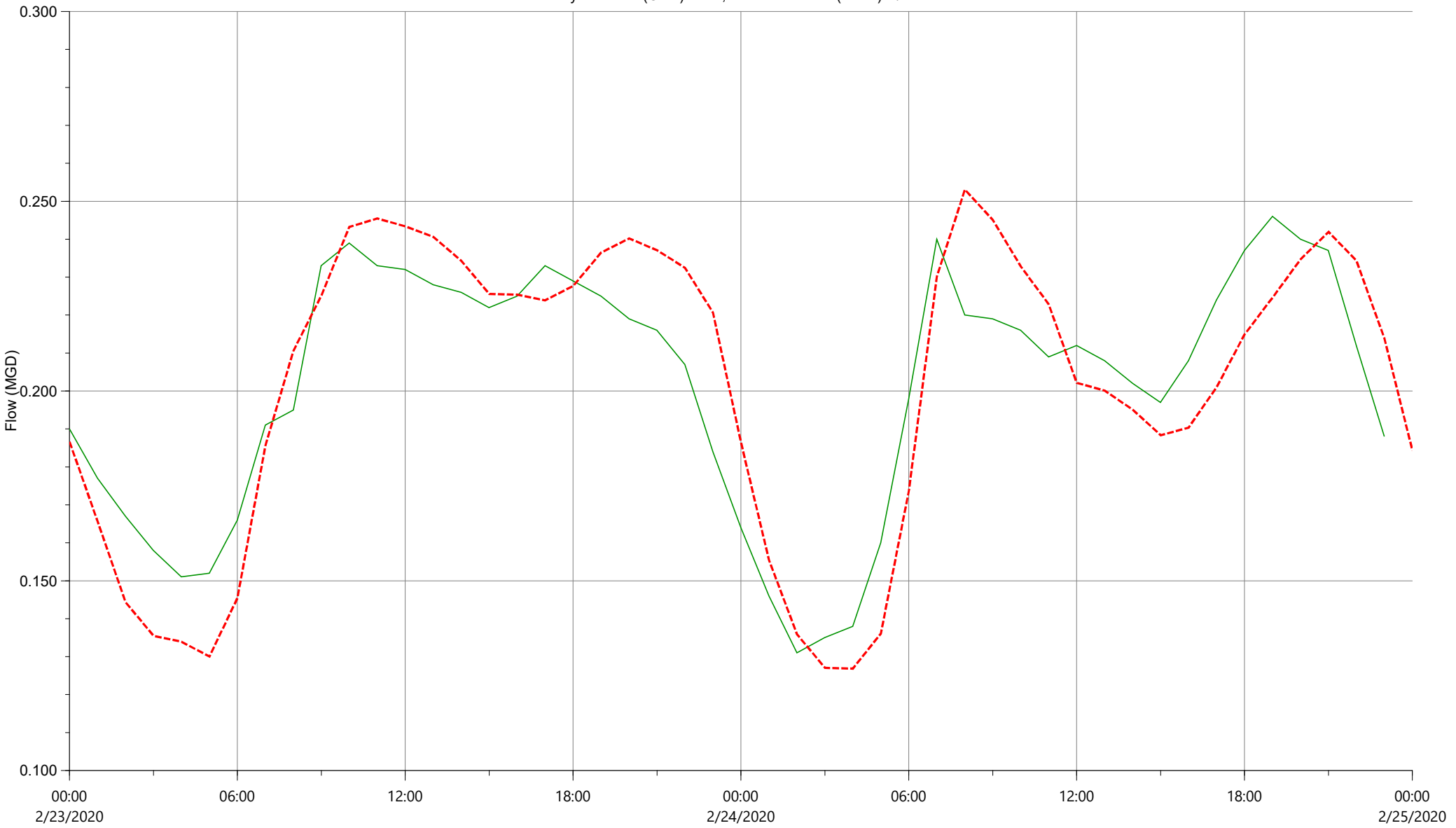



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.396 | 1.220 | 1.752 |
| Model | 0.392 | 1.208 | 1.783 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 2721, Model Location (Pred.) D/S 2721.1

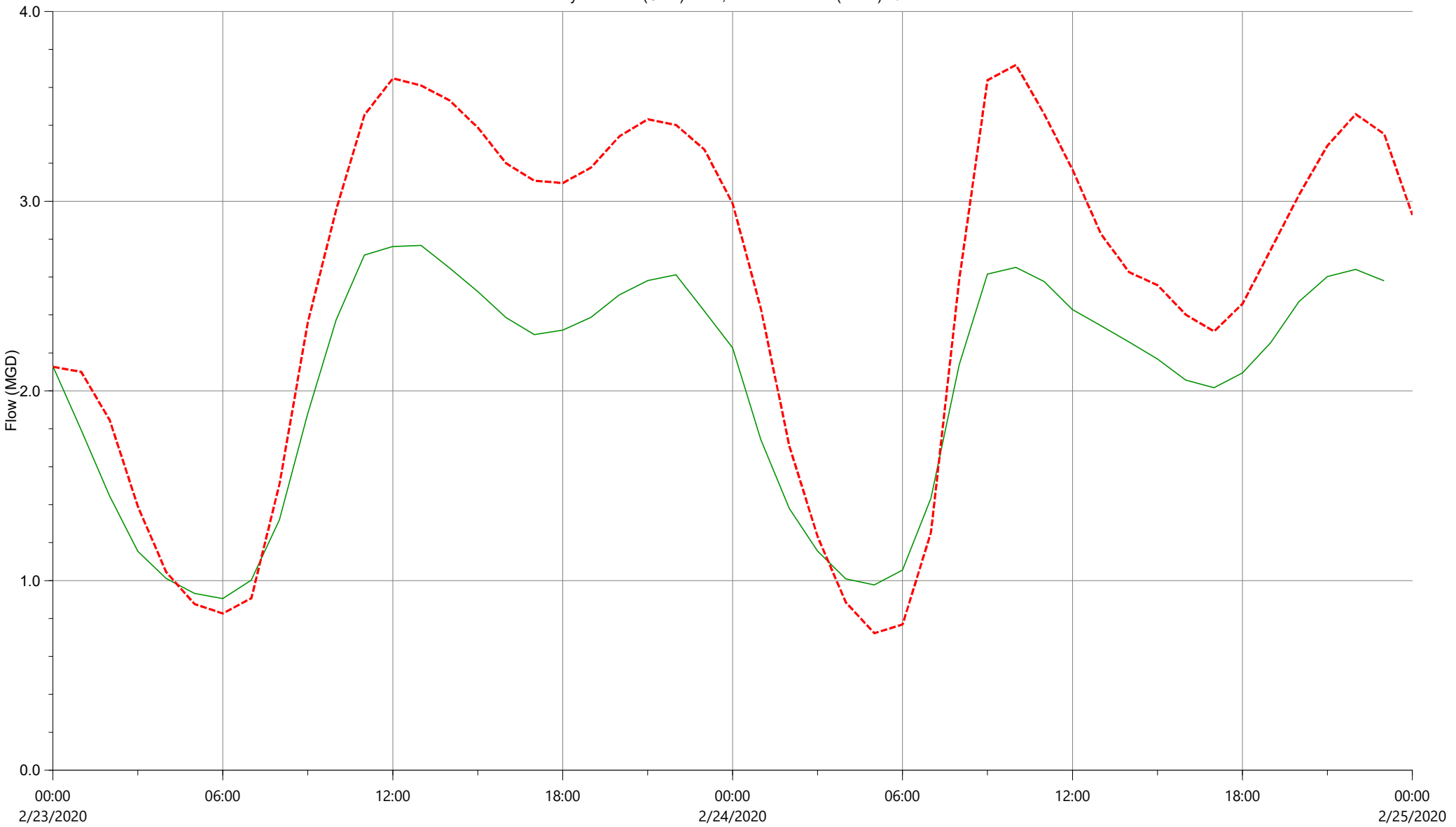



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.131 | 0.246 | 0.396 |
| Model | 0.127 | 0.253 | 0.404 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 2724, Model Location (Pred.) D/S 2724.1

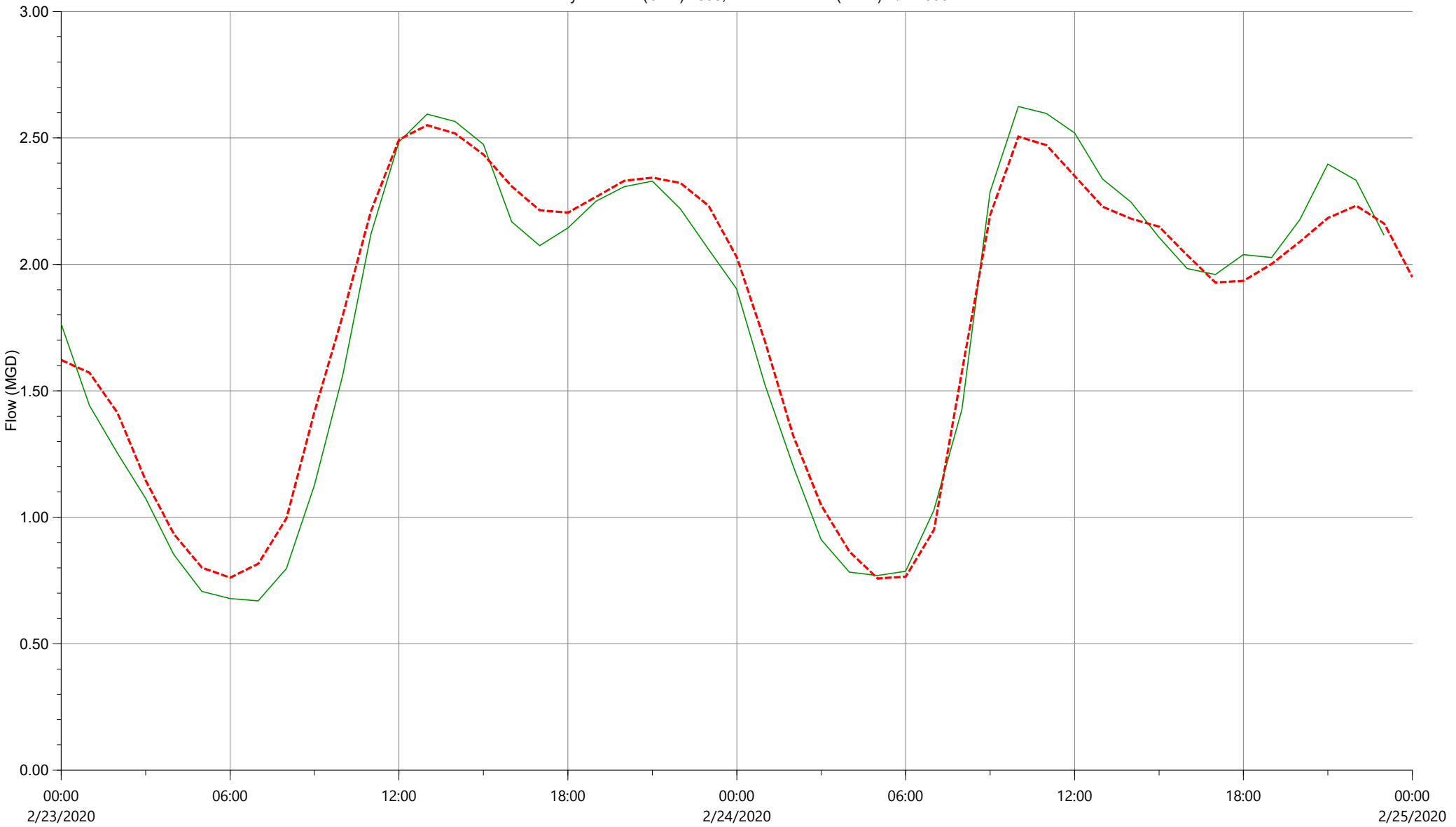



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.905 | 2.767 | 3.975 |
| Model | 0.723 | 3.719 | 5.069 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 2808, Model Location (Pred.) D/S 2808.1

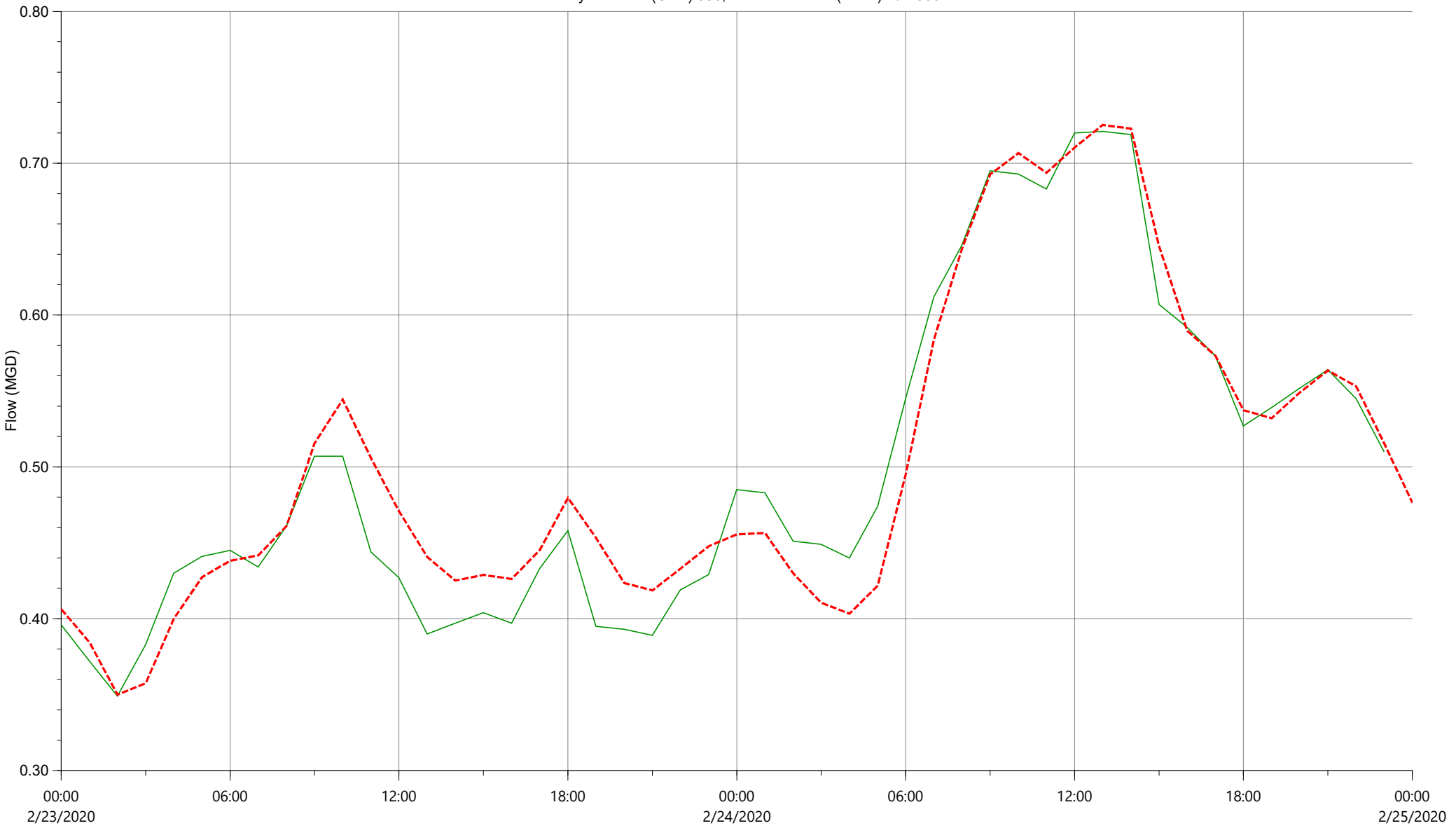



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.670 | 2.624 | 3.494 |
| Model | 0.758 | 2.551 | 3.648 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 386, Model Location (Pred.) D/S 386.1

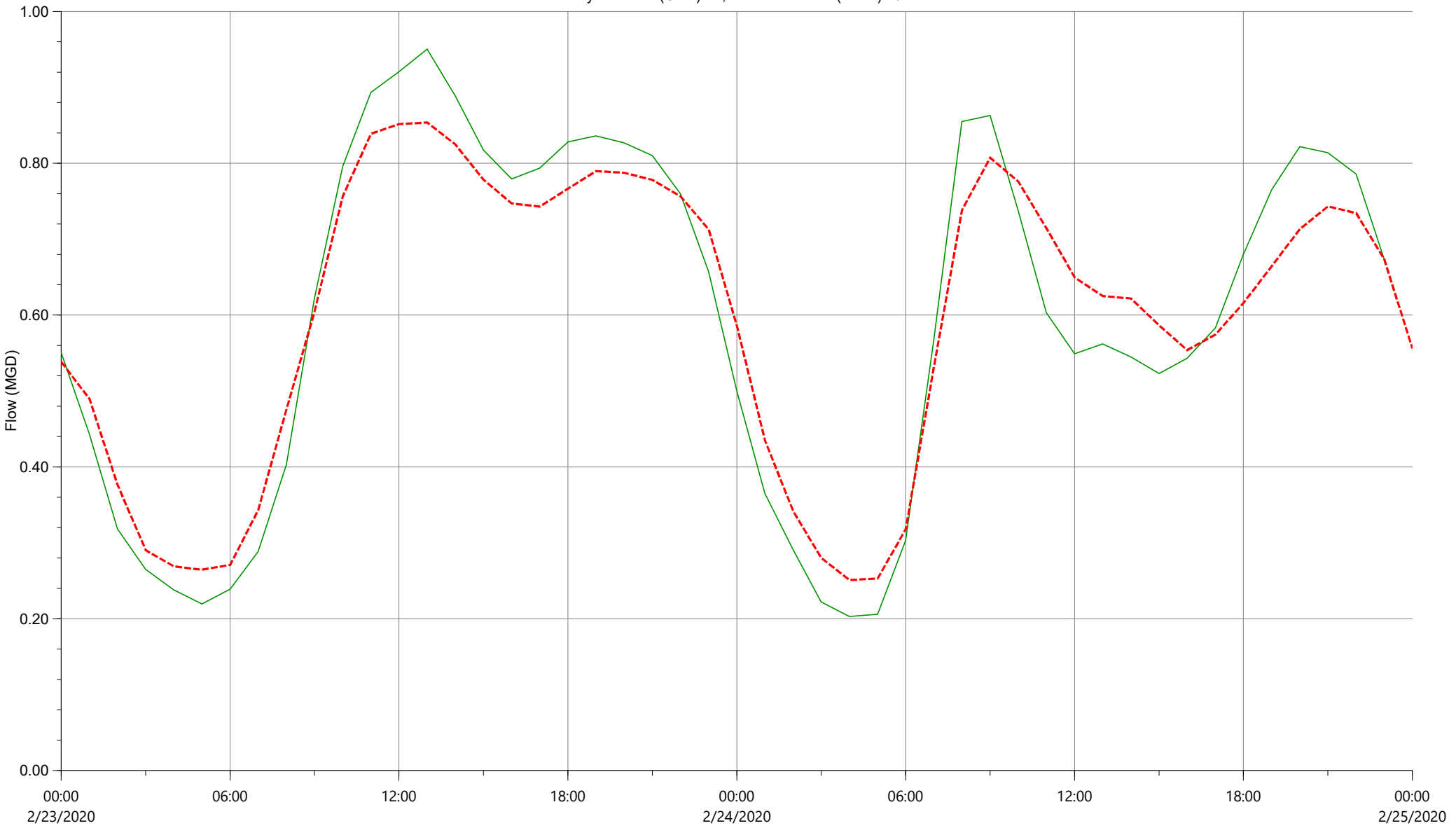



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.349 | 0.721 | 0.978 |
| Model | 0.350 | 0.725 | 1.007 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 41, Model Location (Pred.) D/S 41.1

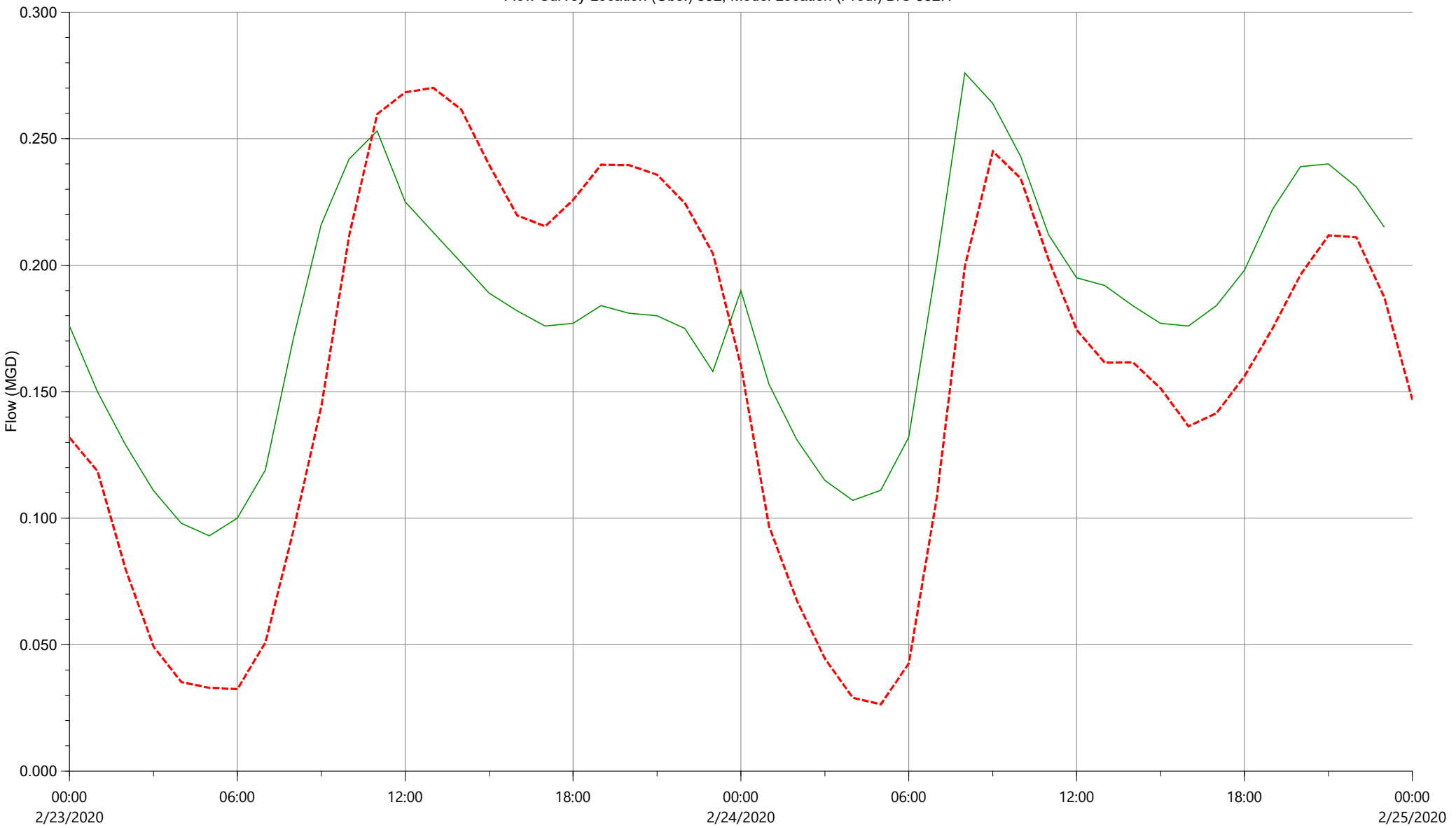



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.203 | 0.951 | 1.171 |
| Model | 0.251 | 0.854 | 1.196 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 592, Model Location (Pred.) D/S 592.1

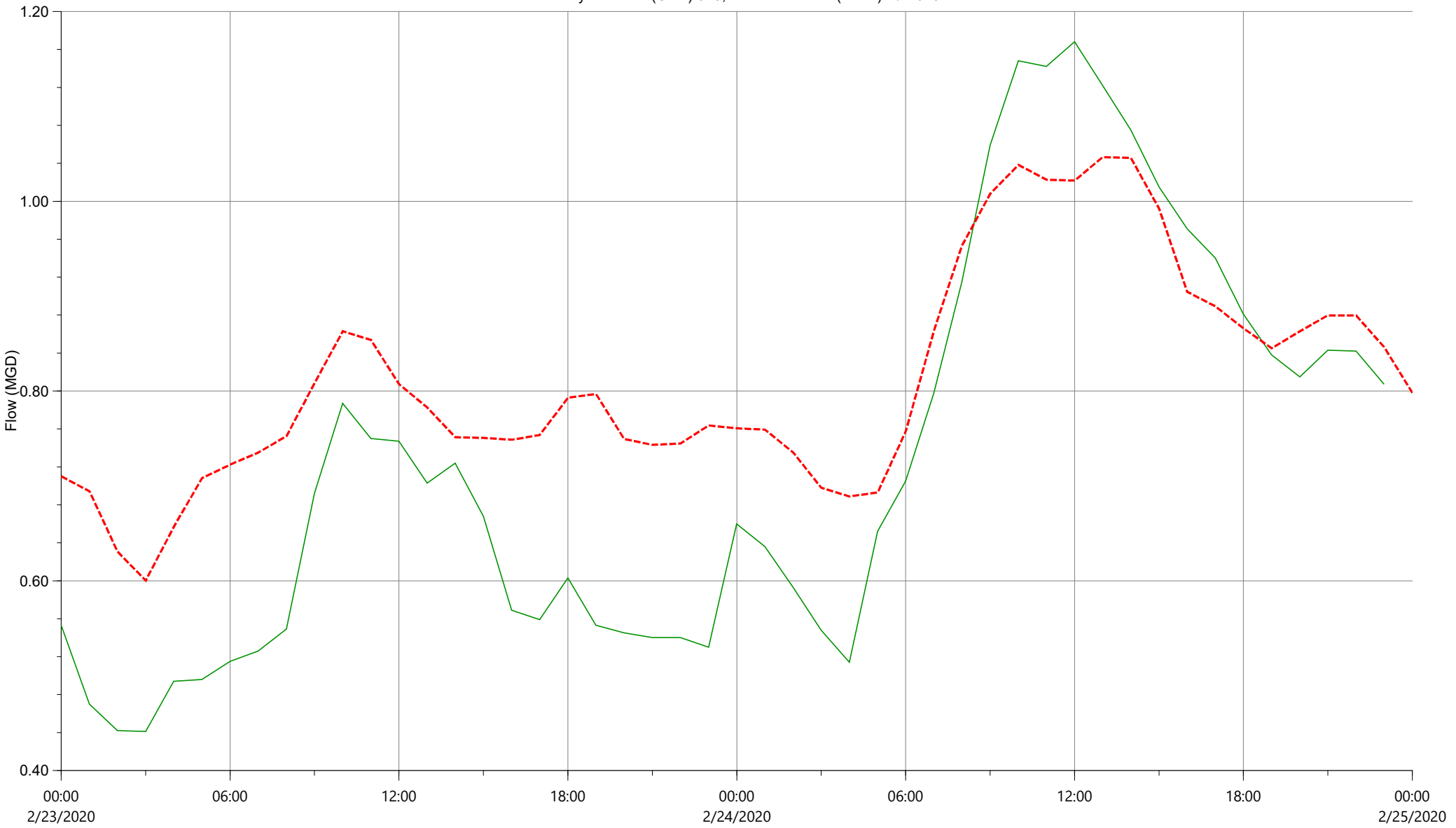



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.093 | 0.276 | 0.354 |
| Model | 0.027 | 0.270 | 0.317 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 649, Model Location (Pred.) D/S 649.1

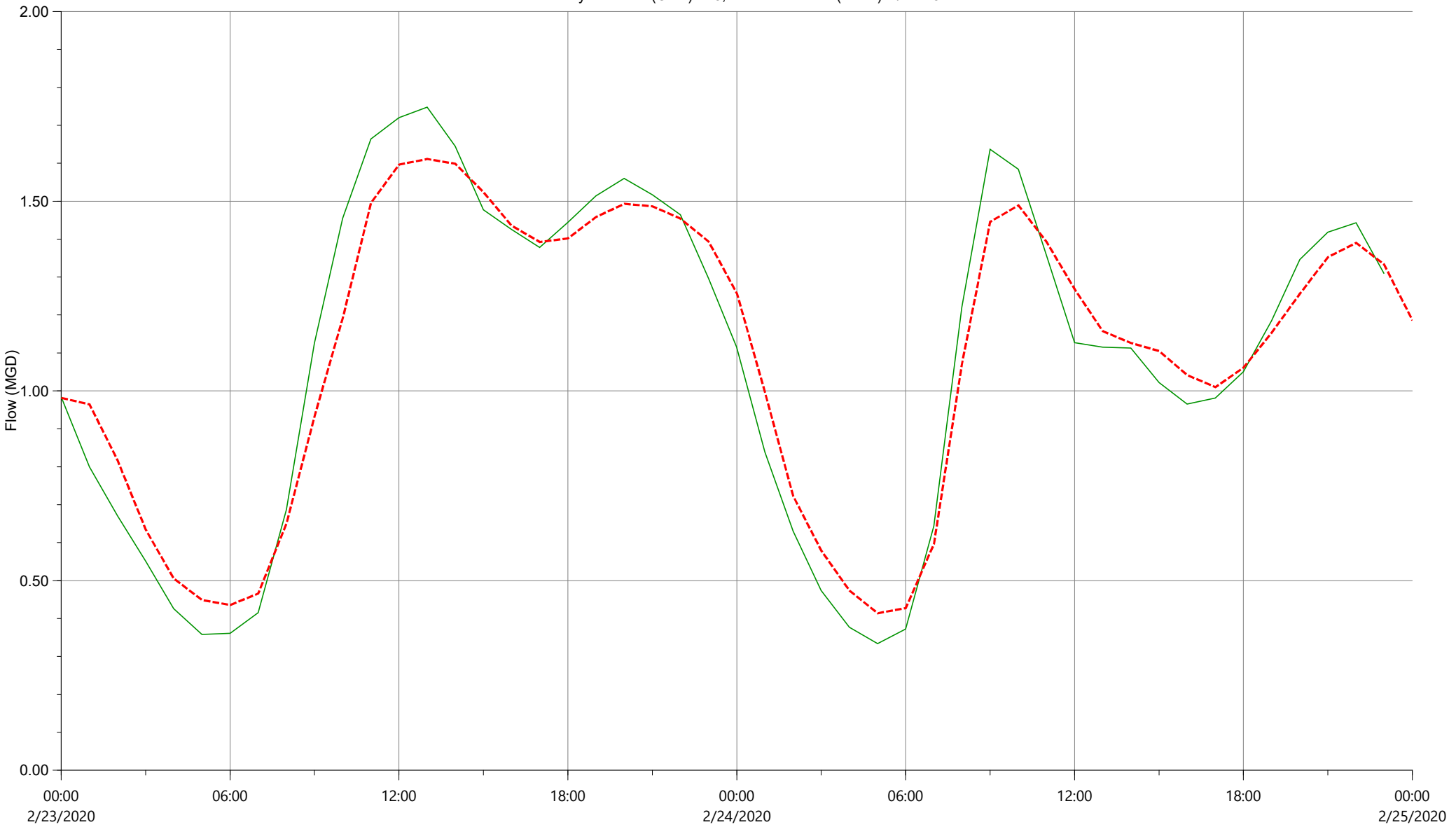



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.441 | 1.168 | 1.417 |
| Model | 0.600 | 1.047 | 1.626 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 715, Model Location (Pred.) D/S 715.1

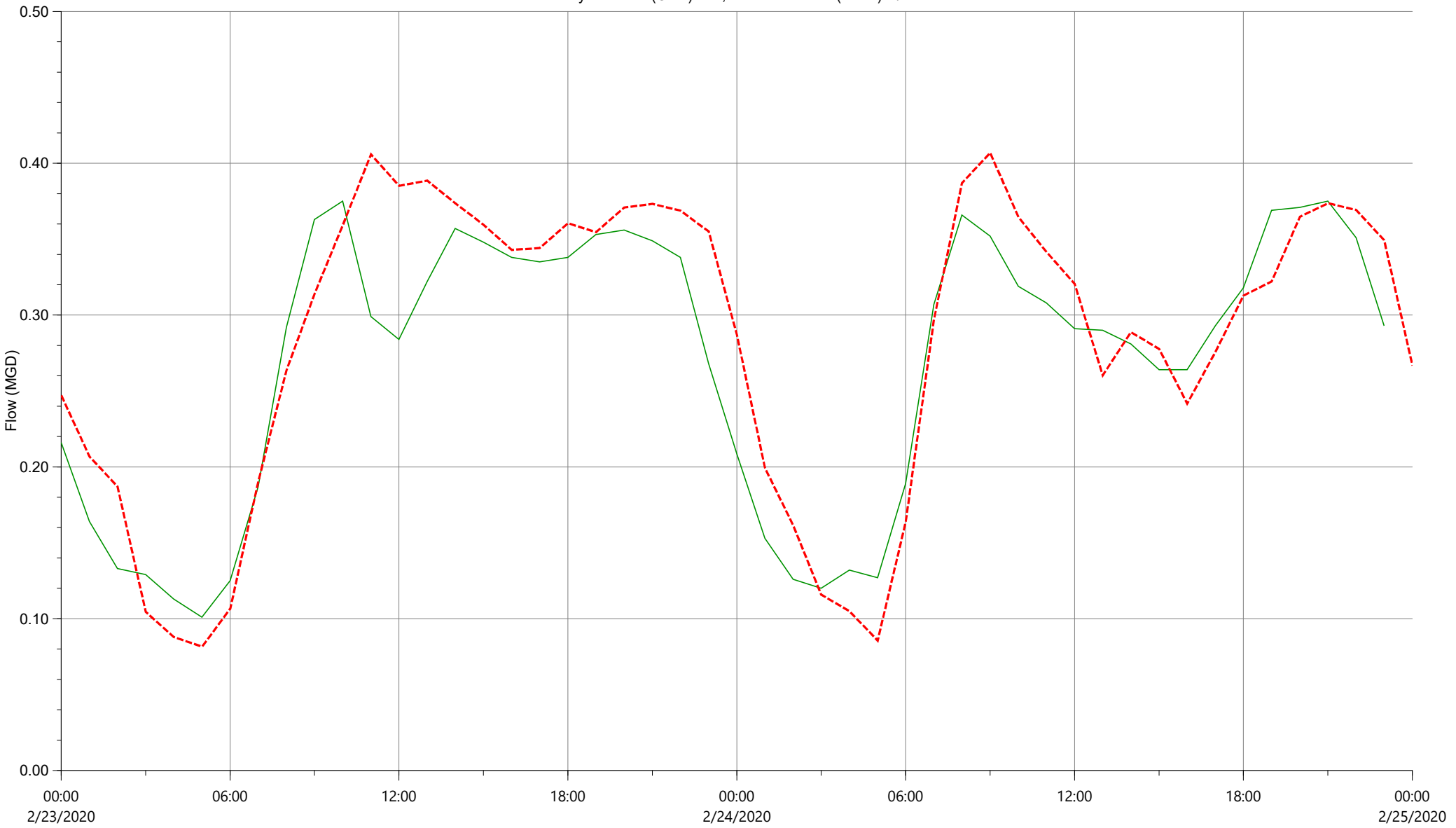



| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.334 | 1.748 | 2.133 |
| Model | 0.414 | 1.611 | 2.192 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 744, Model Location (Pred.) D/S 744.1




| | Flow | | |
|---|---|---|---|
| | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Observed | 0.101 | 0.375 | 0.529 |
| Model | 0.082 | 0.407 | 0.567 |

# Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

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# APPENDIX E

City of Milpitas
Sewer Master Plan Study
Wet Weather Calibration Charts

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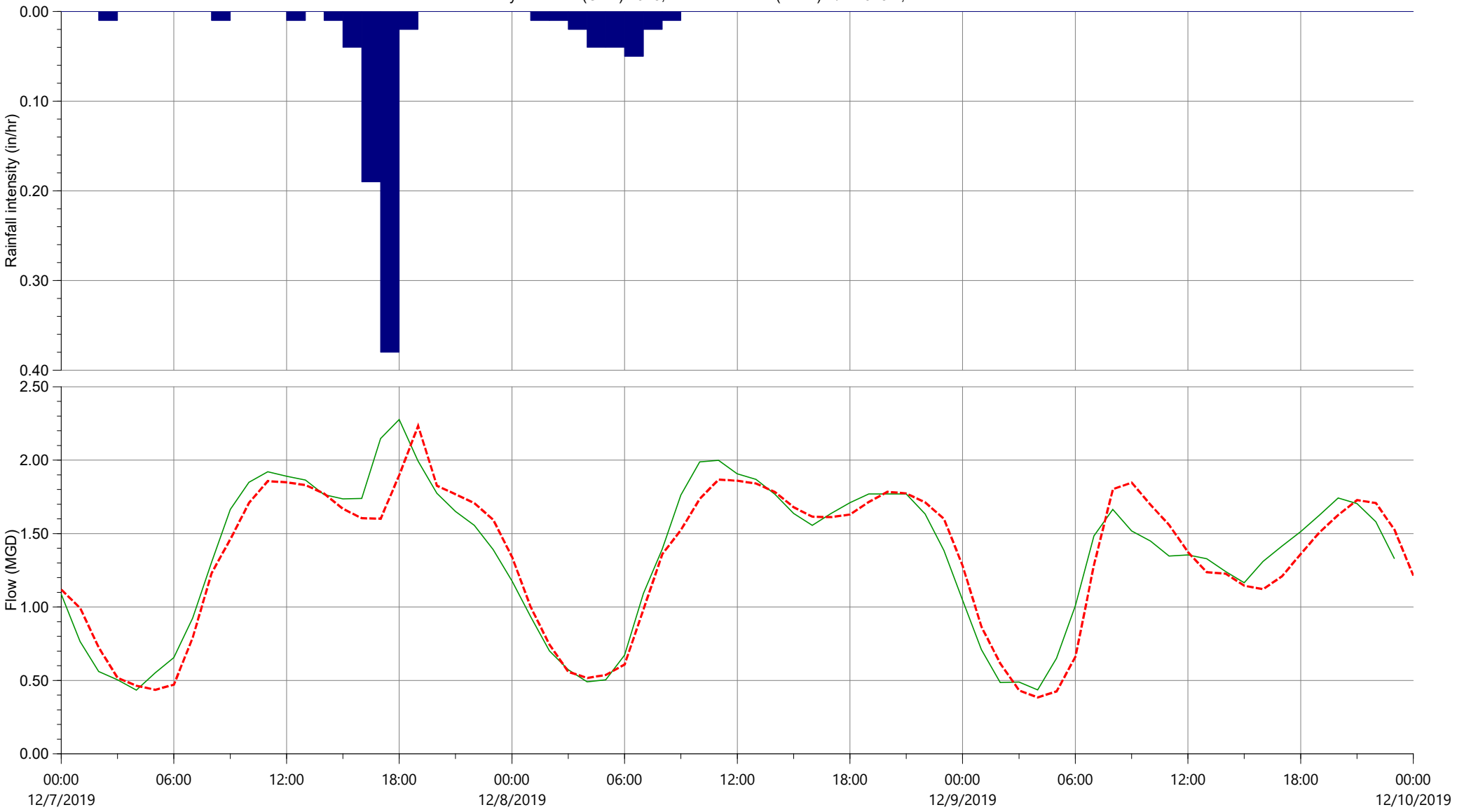
Flow Survey Location (Obs.) 1043, Model Location (Pred.) D/S 1043.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.433 | 2.277 | 4.004 |
| Model | | | | 0.384 | 2.235 | 4.010 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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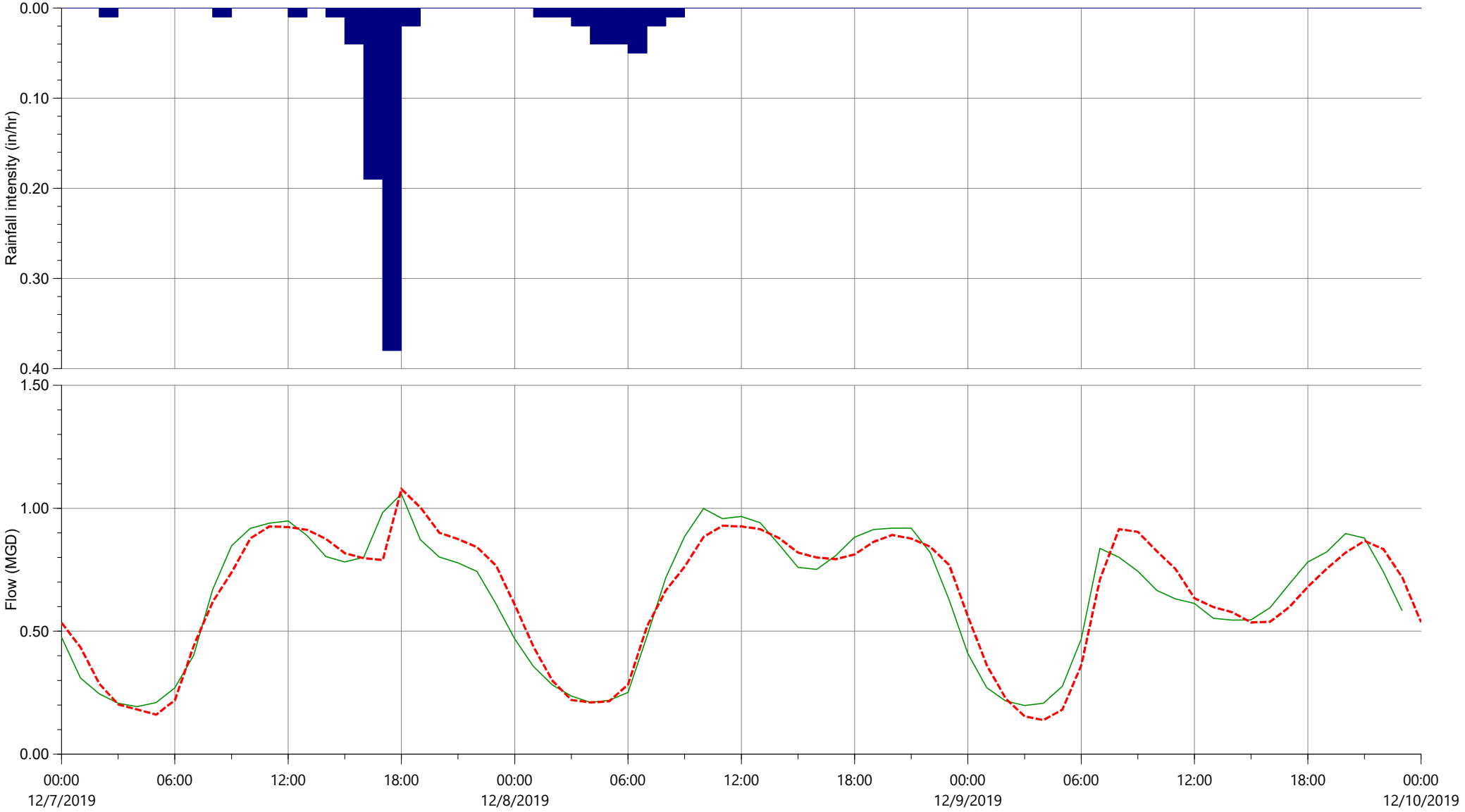
Flow Survey Location (Obs.) 1193, Model Location (Pred.) D/S 1193.1, Rainfall Profile: 1

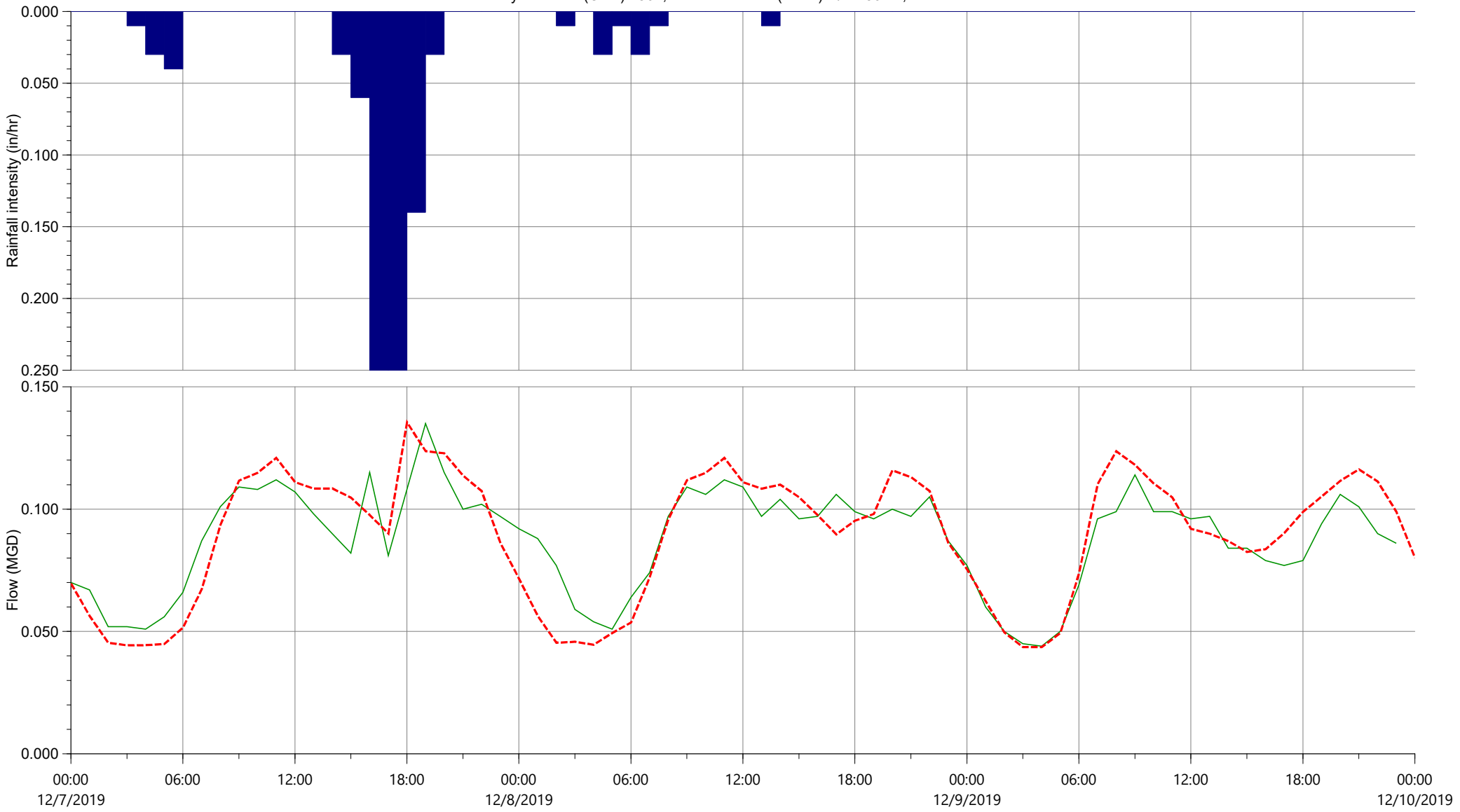



| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.193 | 1.058 | 1.892 |
| Model | | | | 0.139 | 1.079 | 1.946 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 1564, Model Location (Pred.) D/S 1564.1, Rainfall Profile: 2

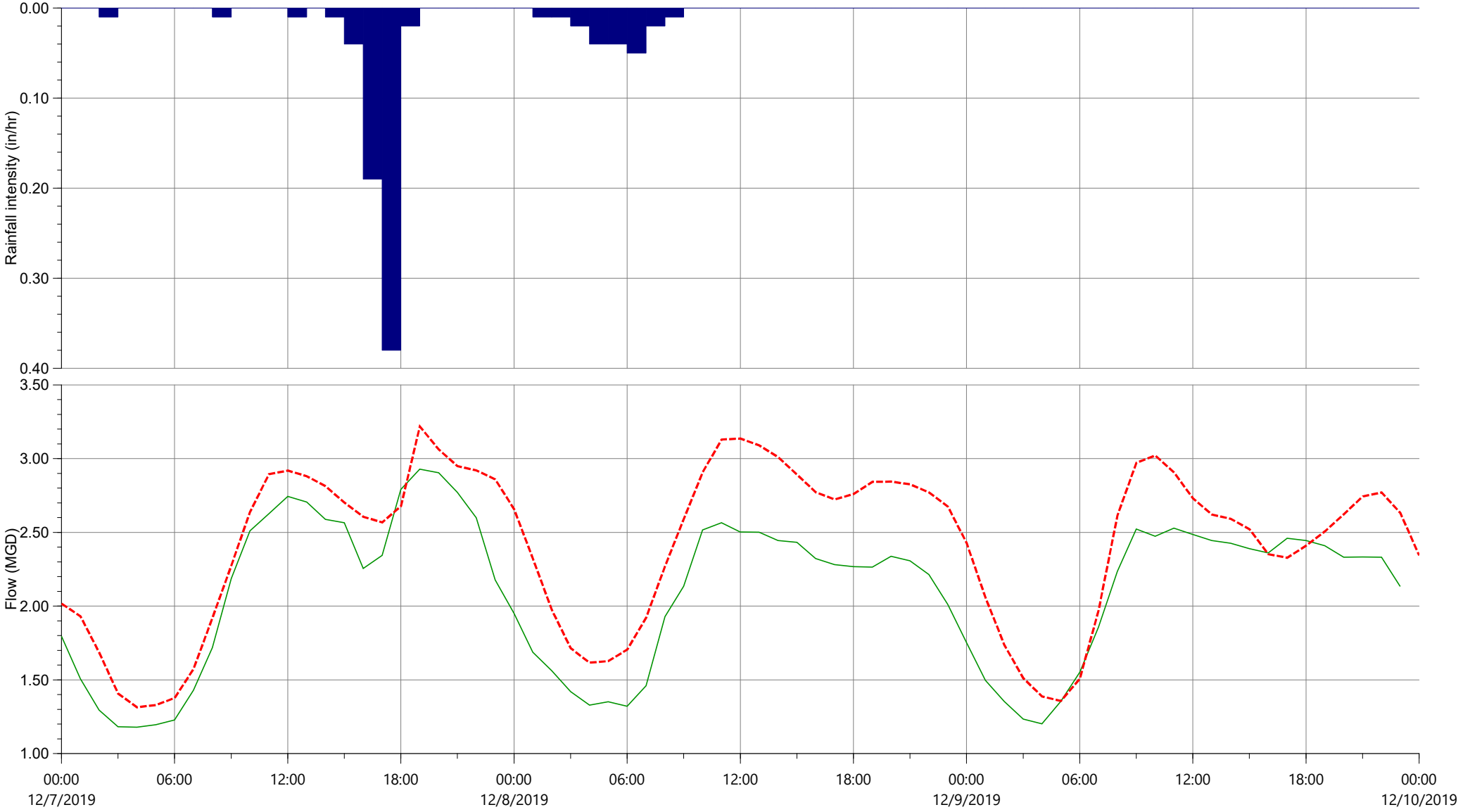



| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.940 | 0.250 | 0.013 | | | |
| Observed | | | | 0.044 | 0.135 | 0.260 |
| Model | | | | 0.044 | 0.135 | 0.268 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 1790, Model Location (Pred.) D/S 1790.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 1.179 | 2.929 | 6.187 |
| Model | | | | 1.314 | 3.219 | 7.243 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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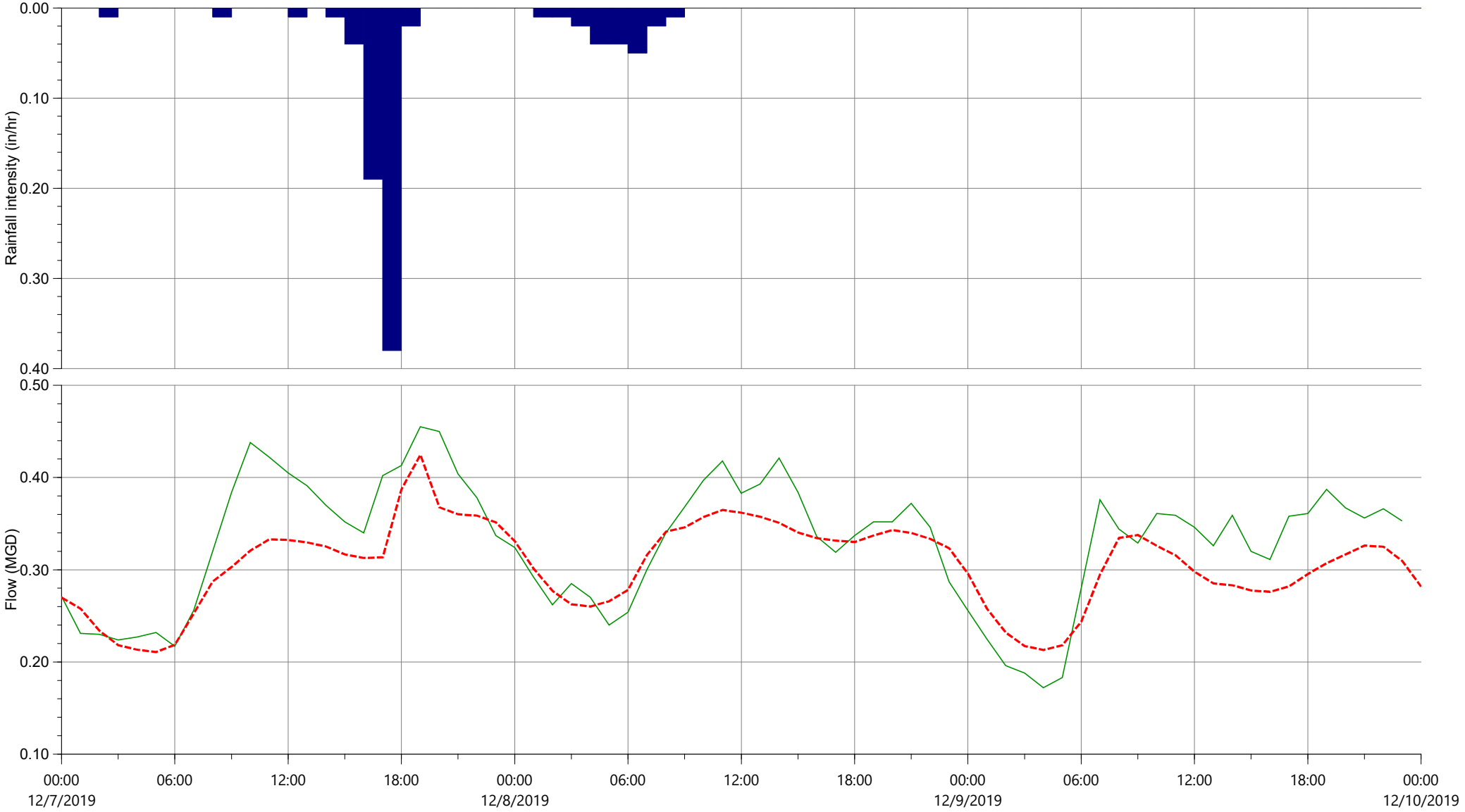
Flow Survey Location (Obs.) 1795, Model Location (Pred.) D/S 1795.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.172 | 0.455 | 0.973 |
| Model | | | | 0.211 | 0.425 | 0.915 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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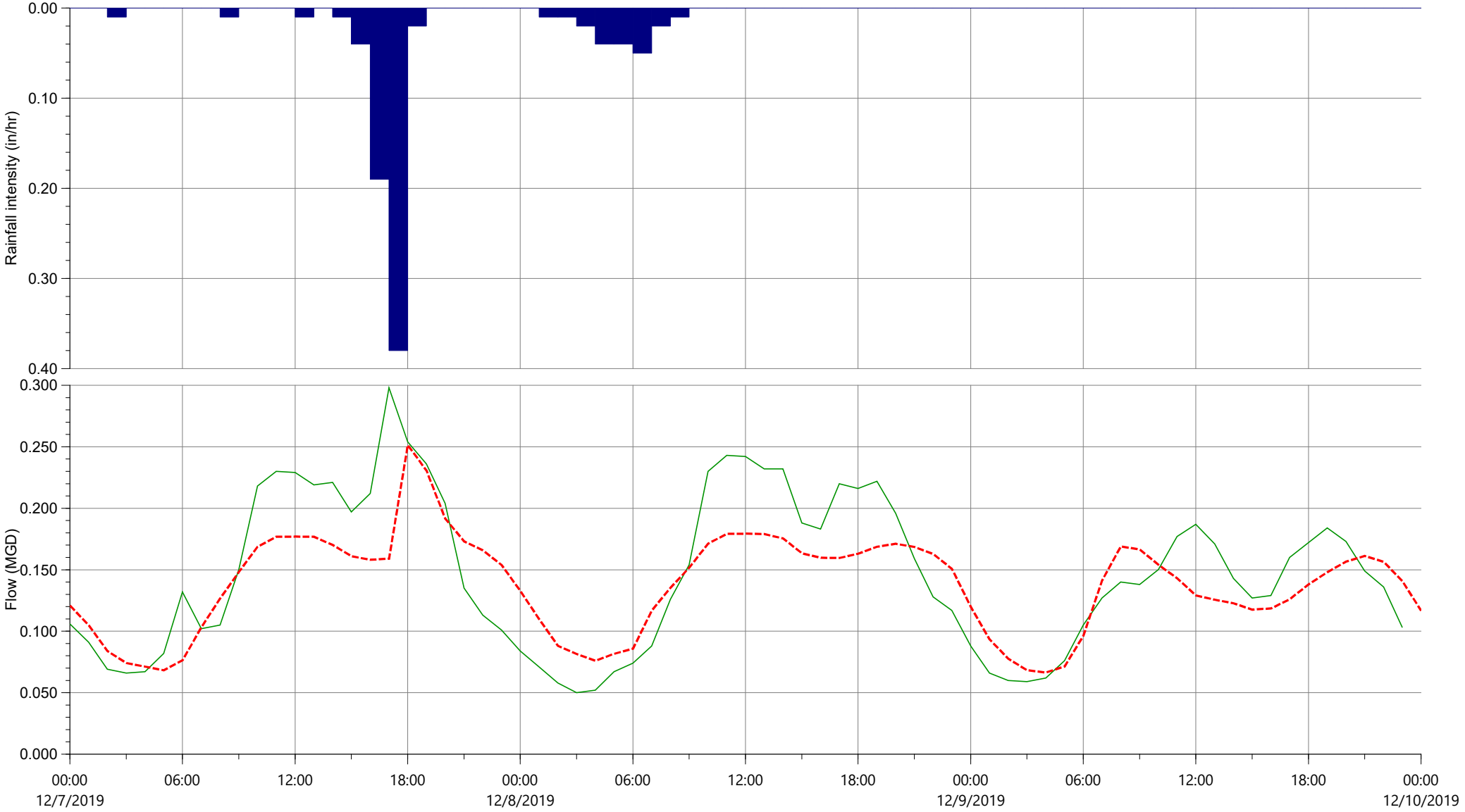
Flow Survey Location (Obs.) 186, Model Location (Pred.) D/S 186.1, Rainfall Profile: 1

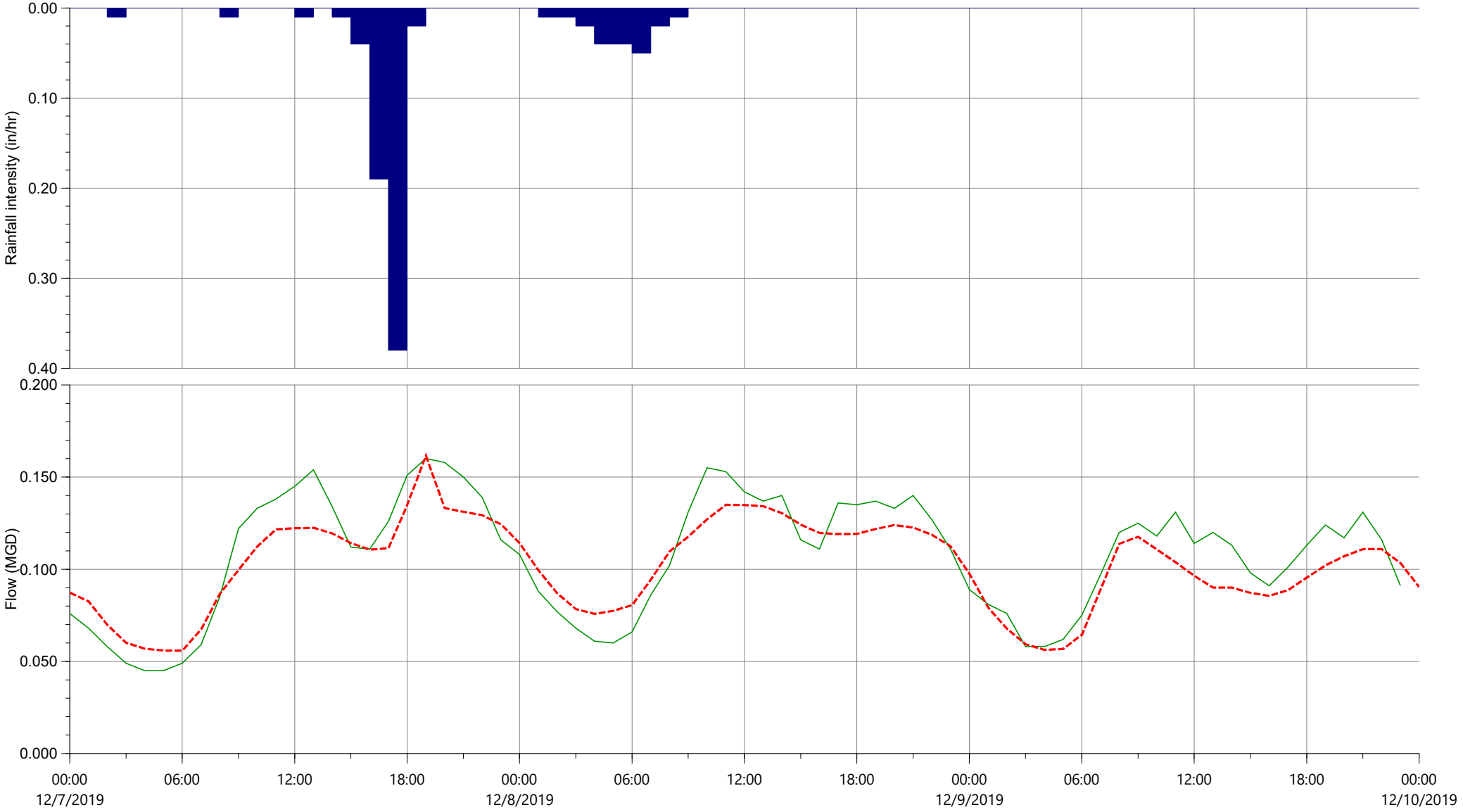



| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.050 | 0.298 | 0.435 |
| Model | | | | 0.067 | 0.251 | 0.413 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 190, Model Location (Pred.) D/S 190.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| **Rain** | 0.870 | 0.380 | 0.012 | | | |
| **Observed** | | | | 0.045 | 0.160 | 0.318 |
| **Model** | | | | 0.056 | 0.162 | 0.306 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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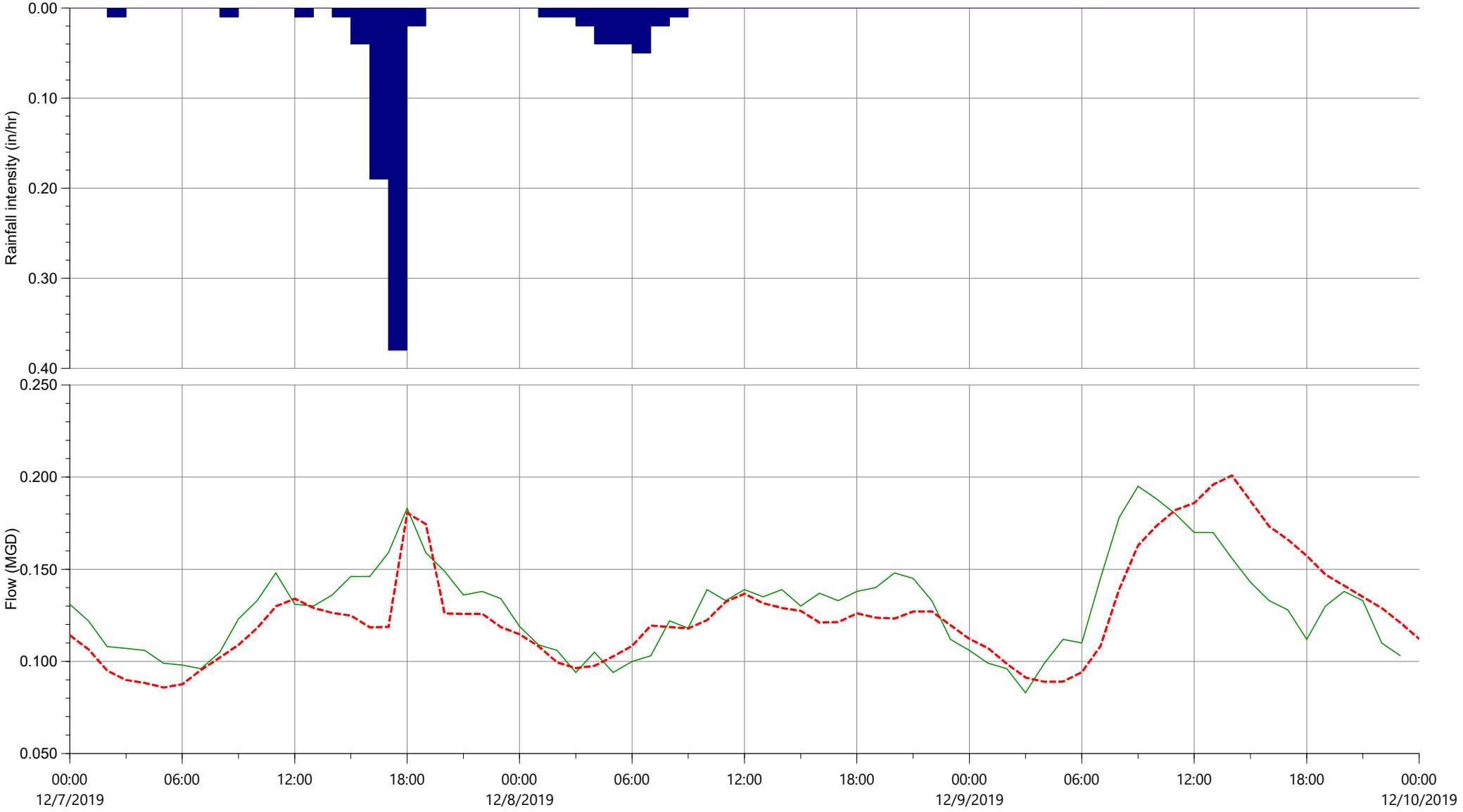
Flow Survey Location (Obs.) 229, Model Location (Pred.) D/S 229.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.083 | 0.195 | 0.383 |
| Model | | | | 0.086 | 0.201 | 0.378 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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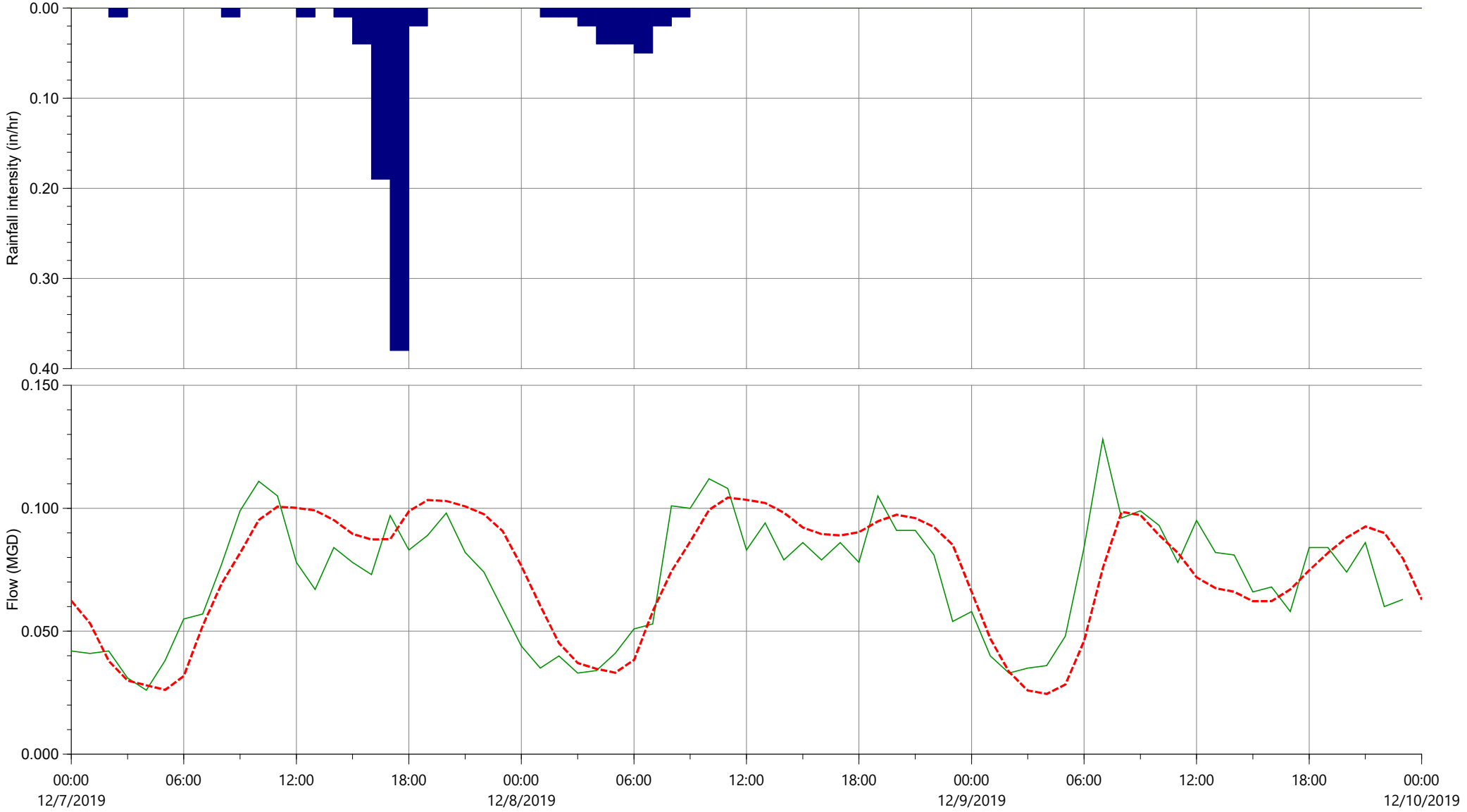
Flow Survey Location (Obs.) 2300, Model Location (Pred.) D/S 2300.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.026 | 0.128 | 0.213 |
| Model | | | | 0.025 | 0.104 | 0.222 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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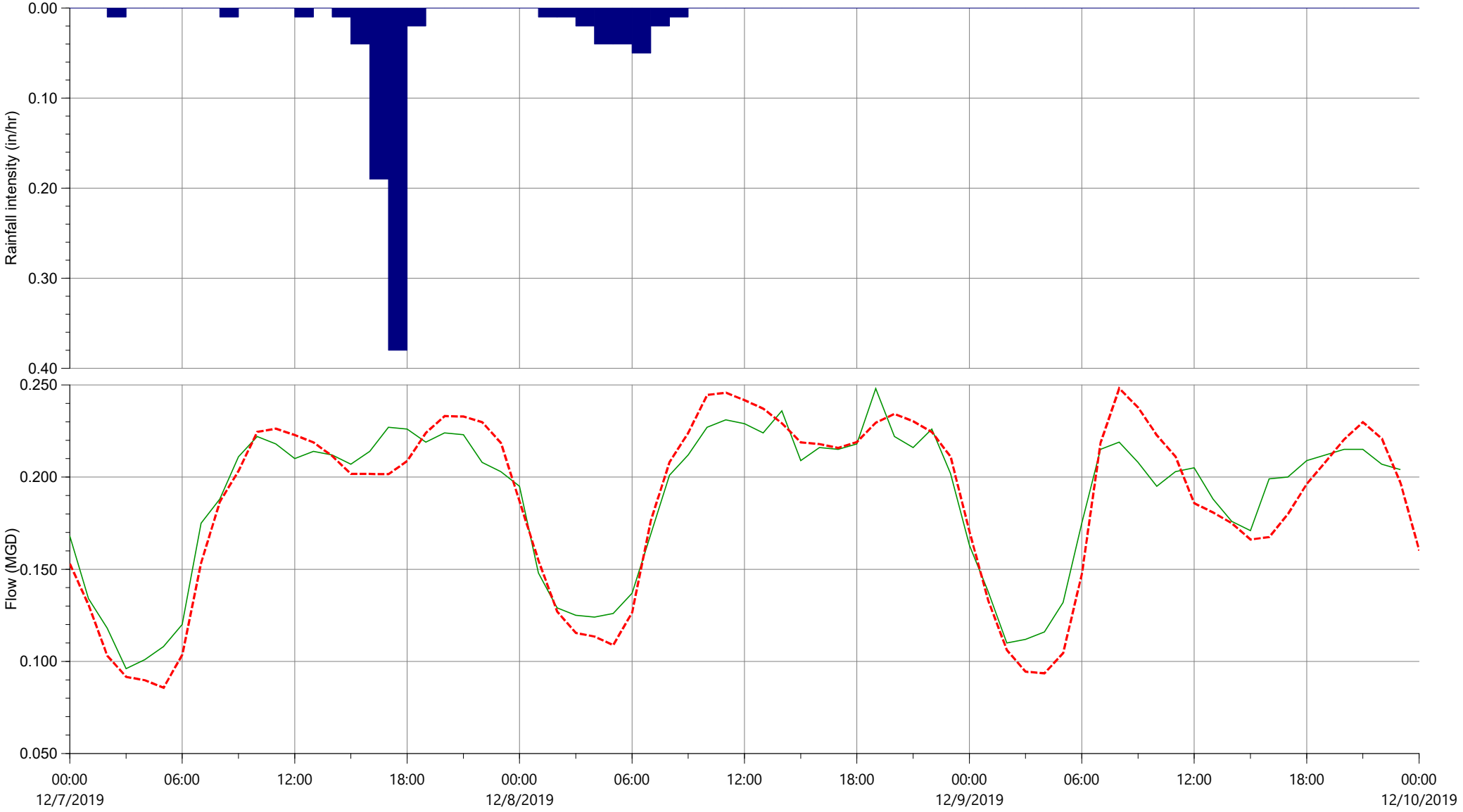
Flow Survey Location (Obs.) 2334, Model Location (Pred.) D/S 2334.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.096 | 0.248 | 0.555 |
| Model | | | | 0.086 | 0.248 | 0.559 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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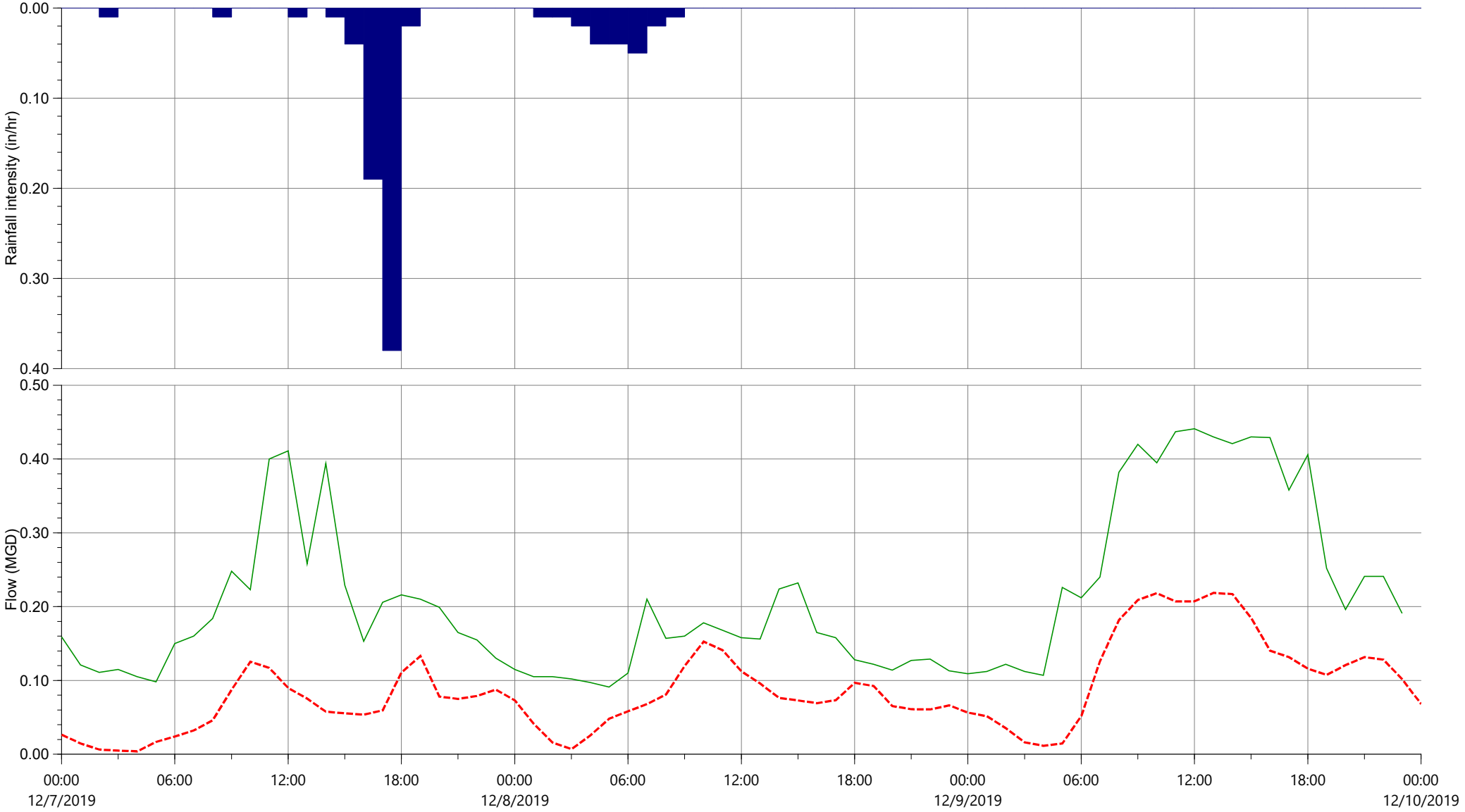
Flow Survey Location (Obs.) 2491, Model Location (Pred.) D/S 2491.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.091 | 0.441 | 0.623 |
| Model | | | | 0.004 | 0.219 | 0.260 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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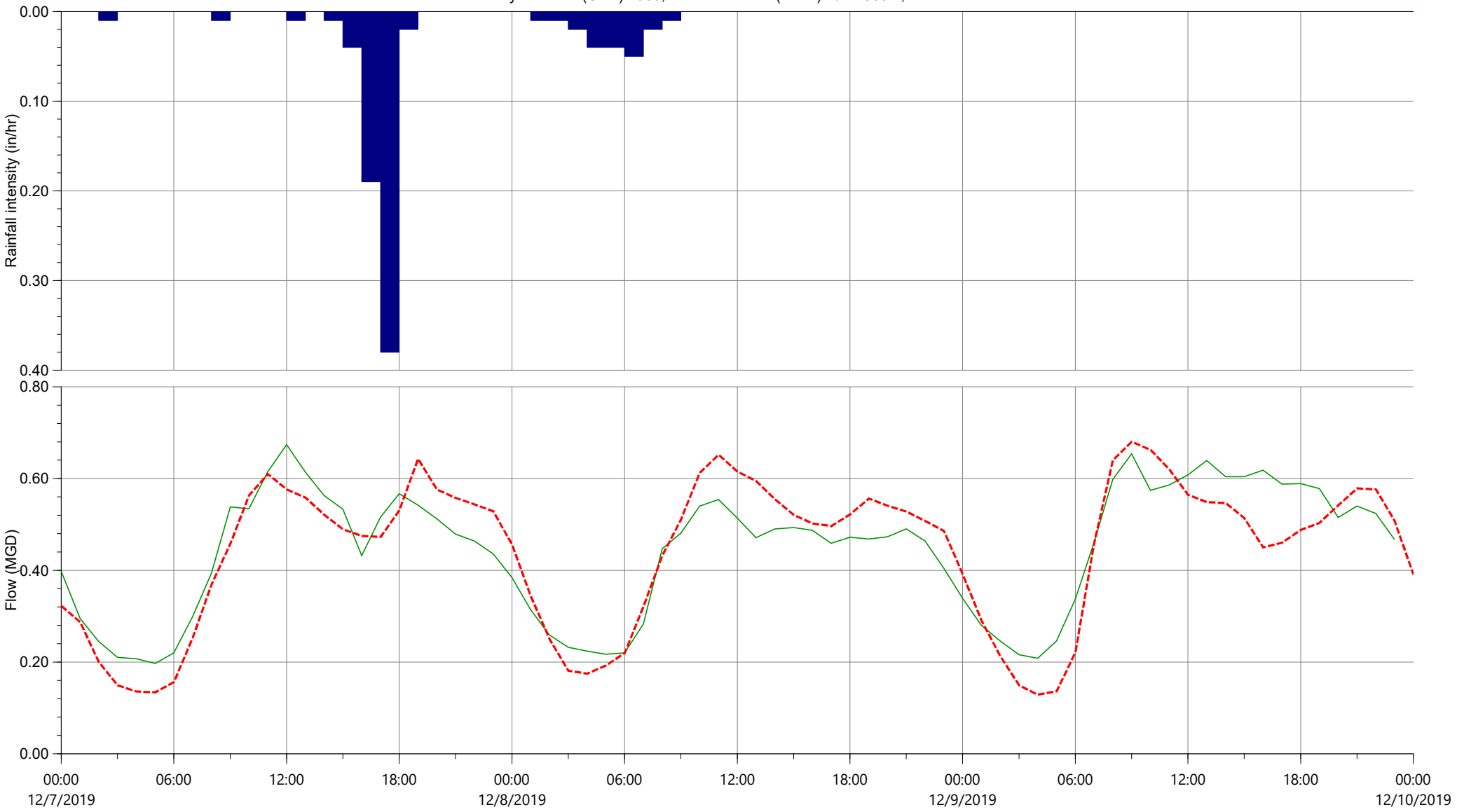
Flow Survey Location (Obs.) 2569, Model Location (Pred.) D/S 2569.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.197 | 0.674 | 1.313 |
| Model | | | | 0.129 | 0.680 | 1.325 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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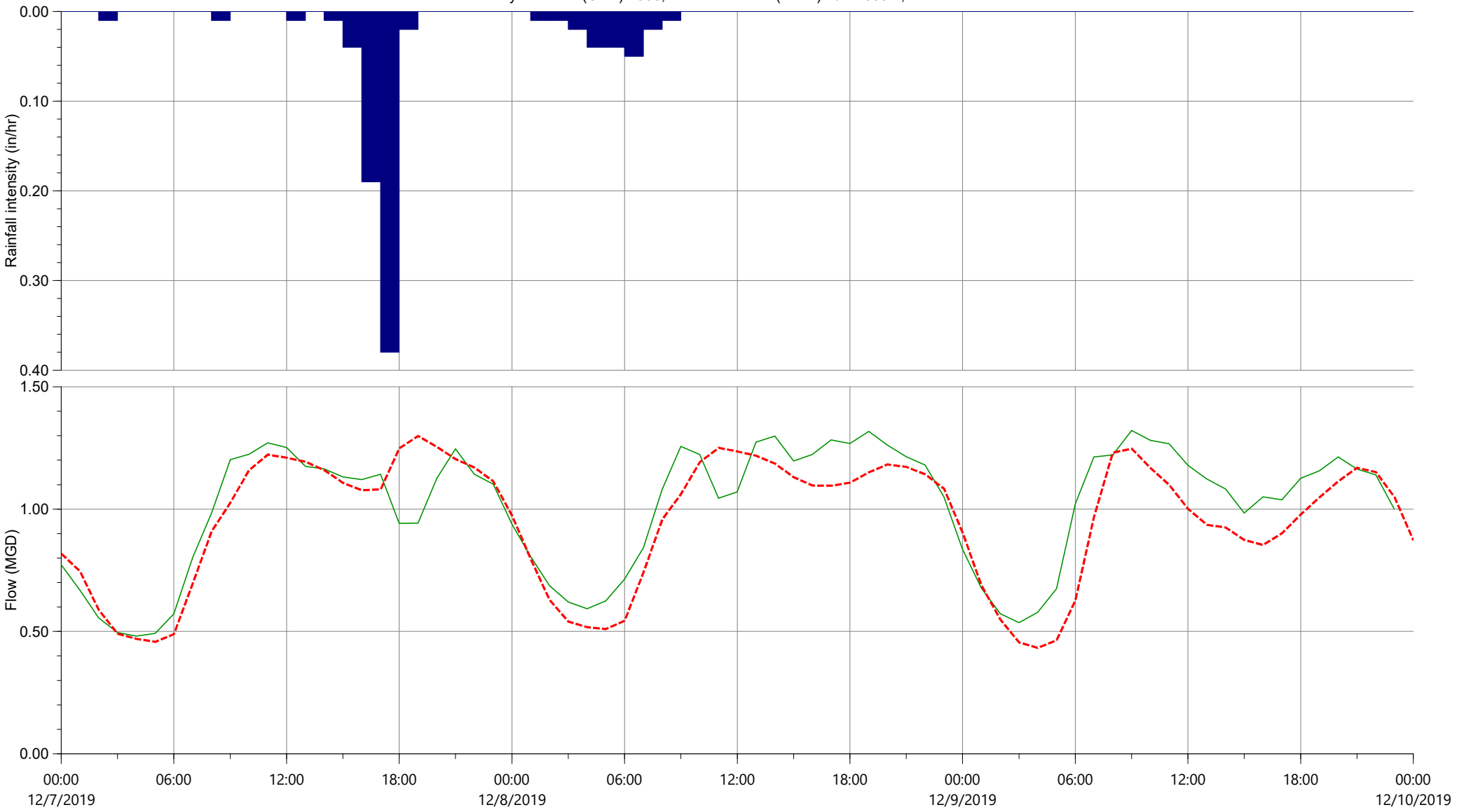
Flow Survey Location (Obs.) 2666, Model Location (Pred.) D/S 2666.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.481 | 1.321 | 2.985 |
| Model | | | | 0.433 | 1.299 | 2.858 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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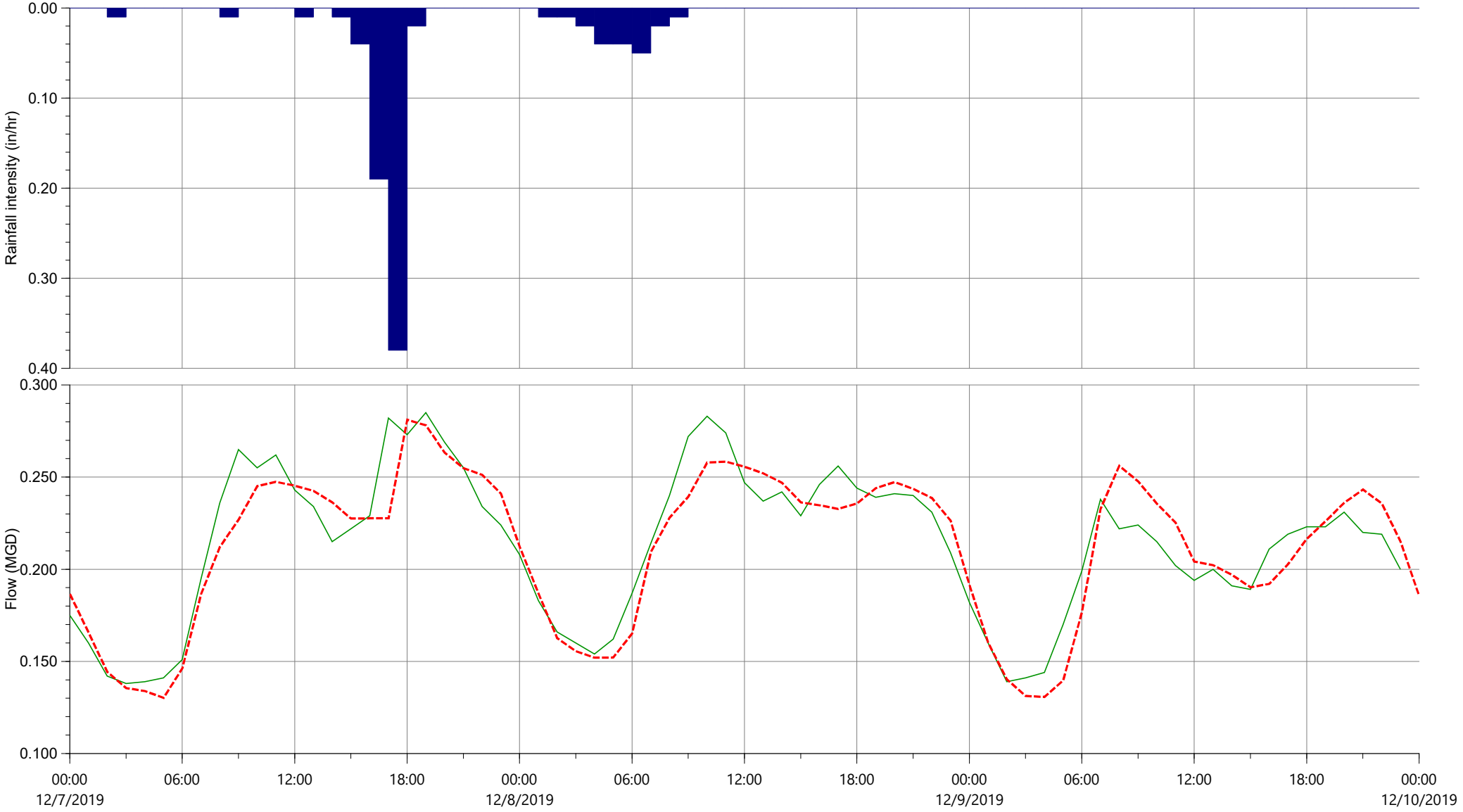
Flow Survey Location (Obs.) 2721, Model Location (Pred.) D/S 2721.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.138 | 0.285 | 0.632 |
| Model | | | | 0.130 | 0.281 | 0.635 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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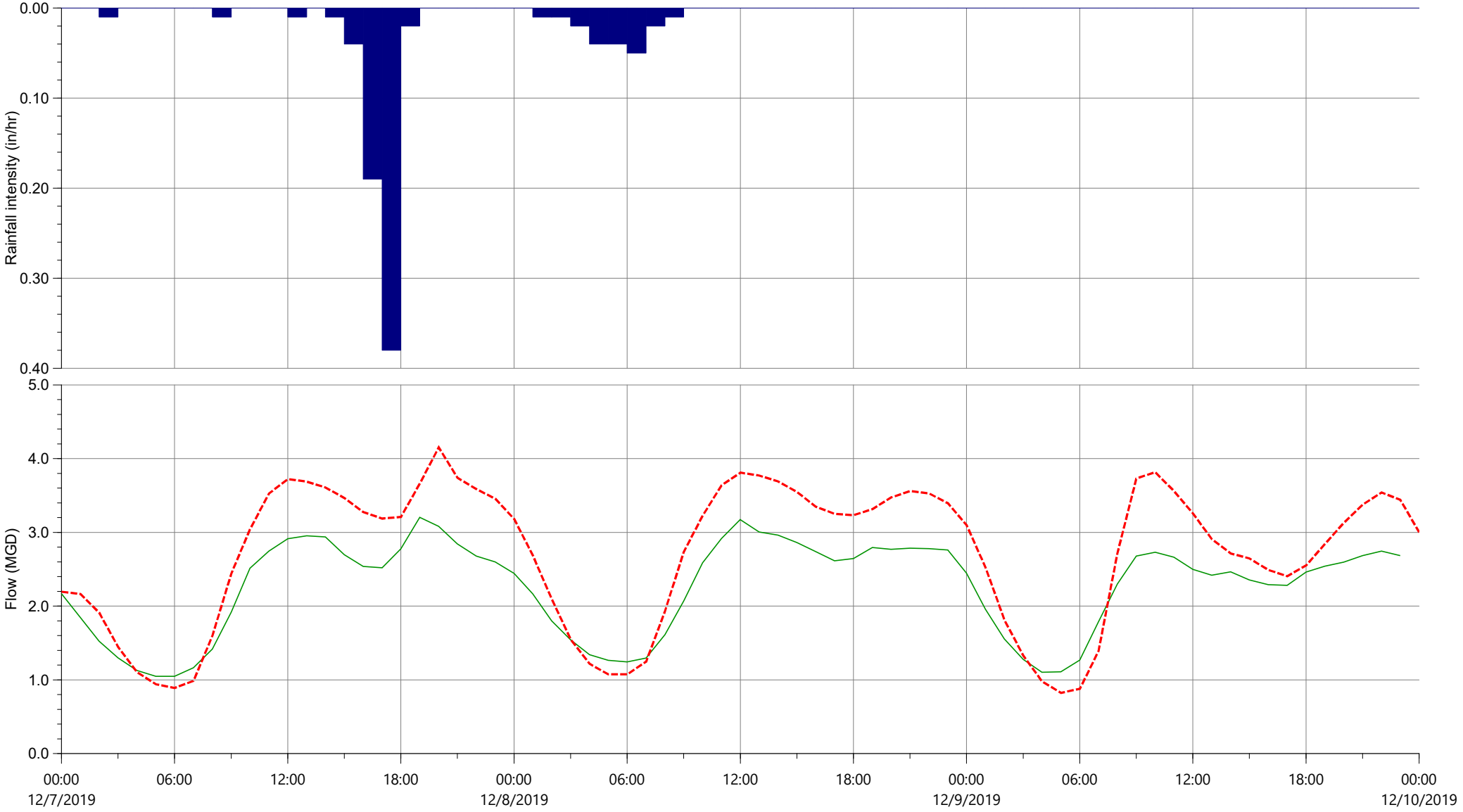
Flow Survey Location (Obs.) 2724, Model Location (Pred.) D/S 2724.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 1.047 | 3.205 | 6.675 |
| Model | | | | 0.824 | 4.153 | 8.127 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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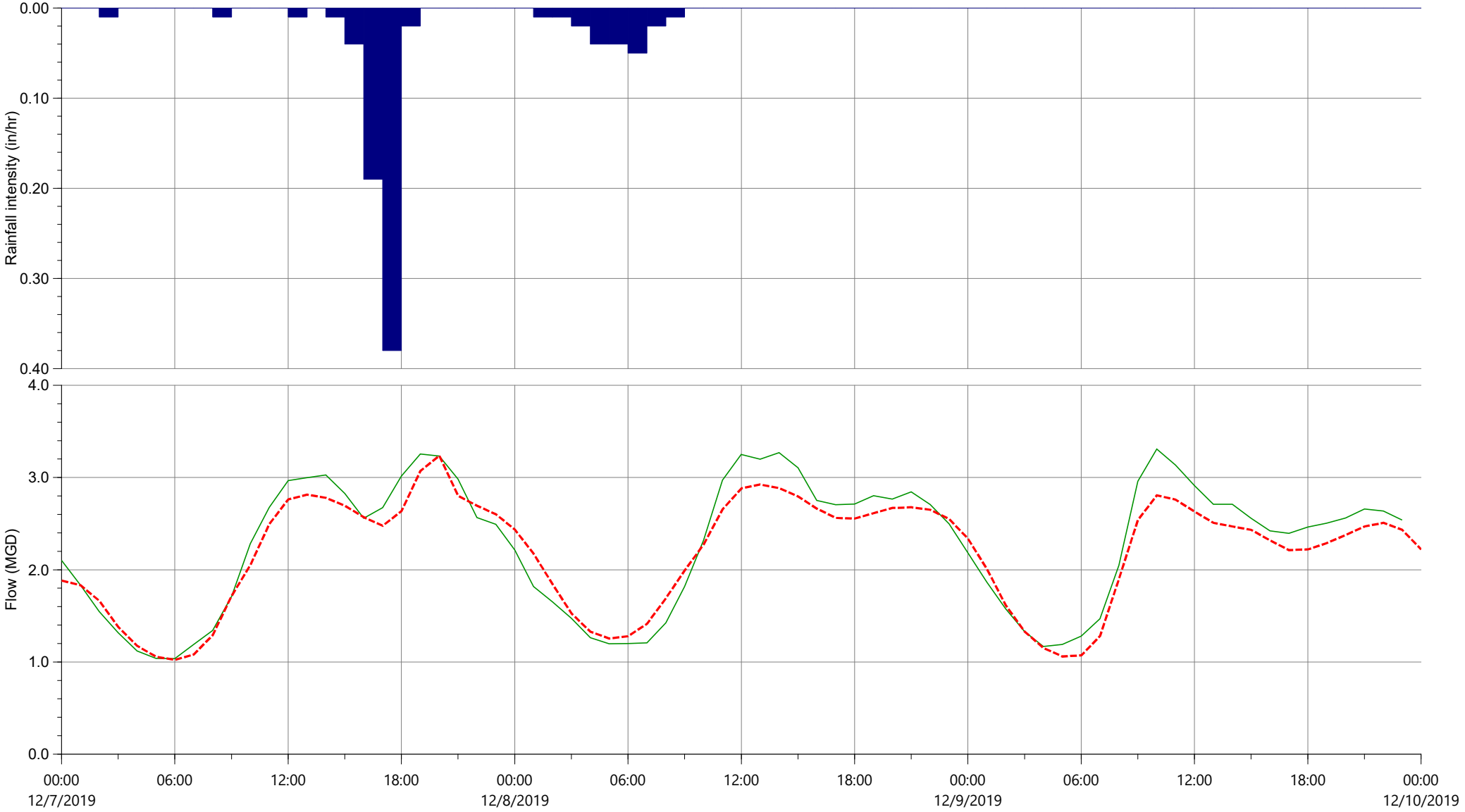
Flow Survey Location (Obs.) 2808, Model Location (Pred.) D/S 2808.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 1.036 | 3.308 | 6.717 |
| Model | | | | 1.023 | 3.238 | 6.544 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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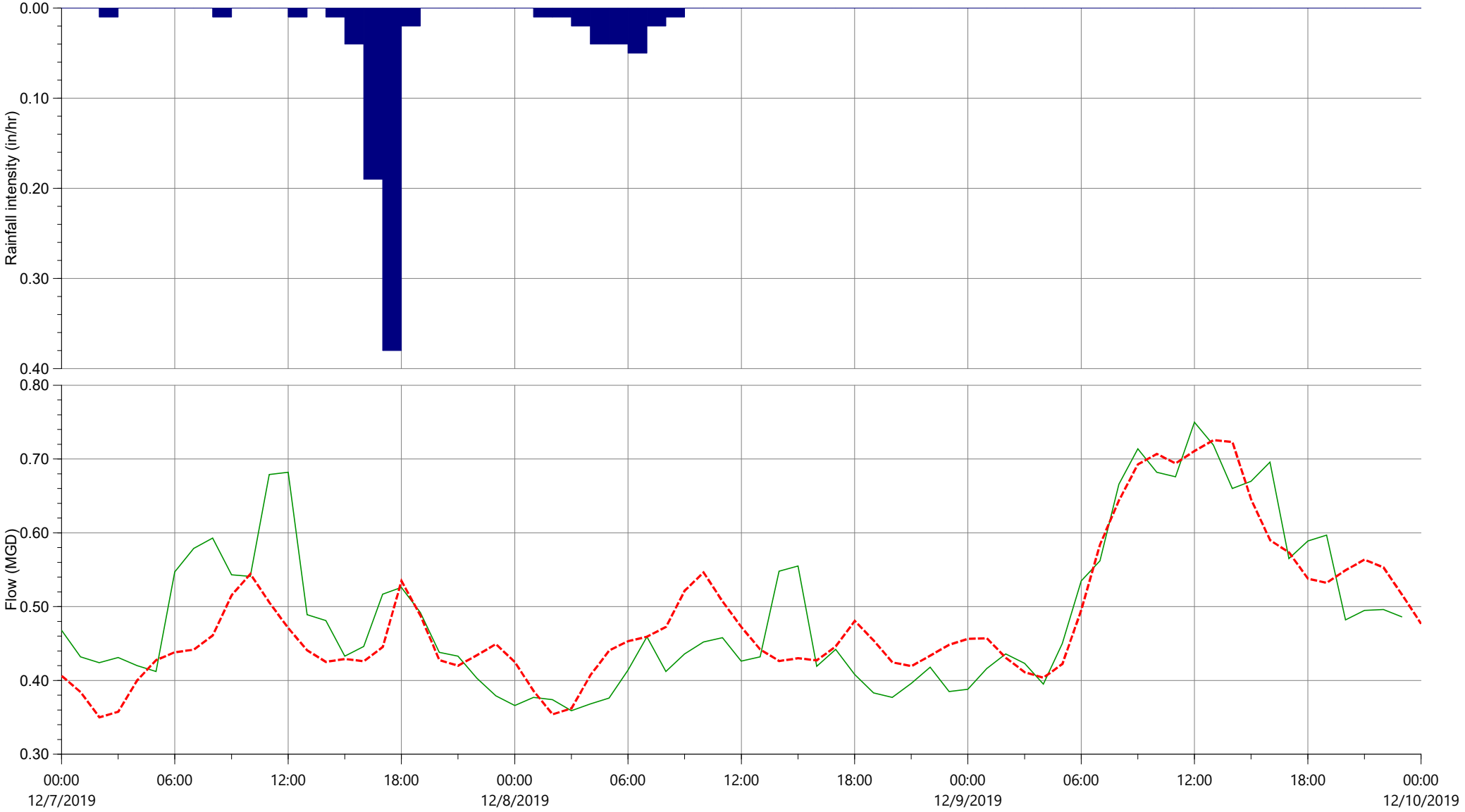
Flow Survey Location (Obs.) 386, Model Location (Pred.) D/S 386.1, Rainfall Profile: 1

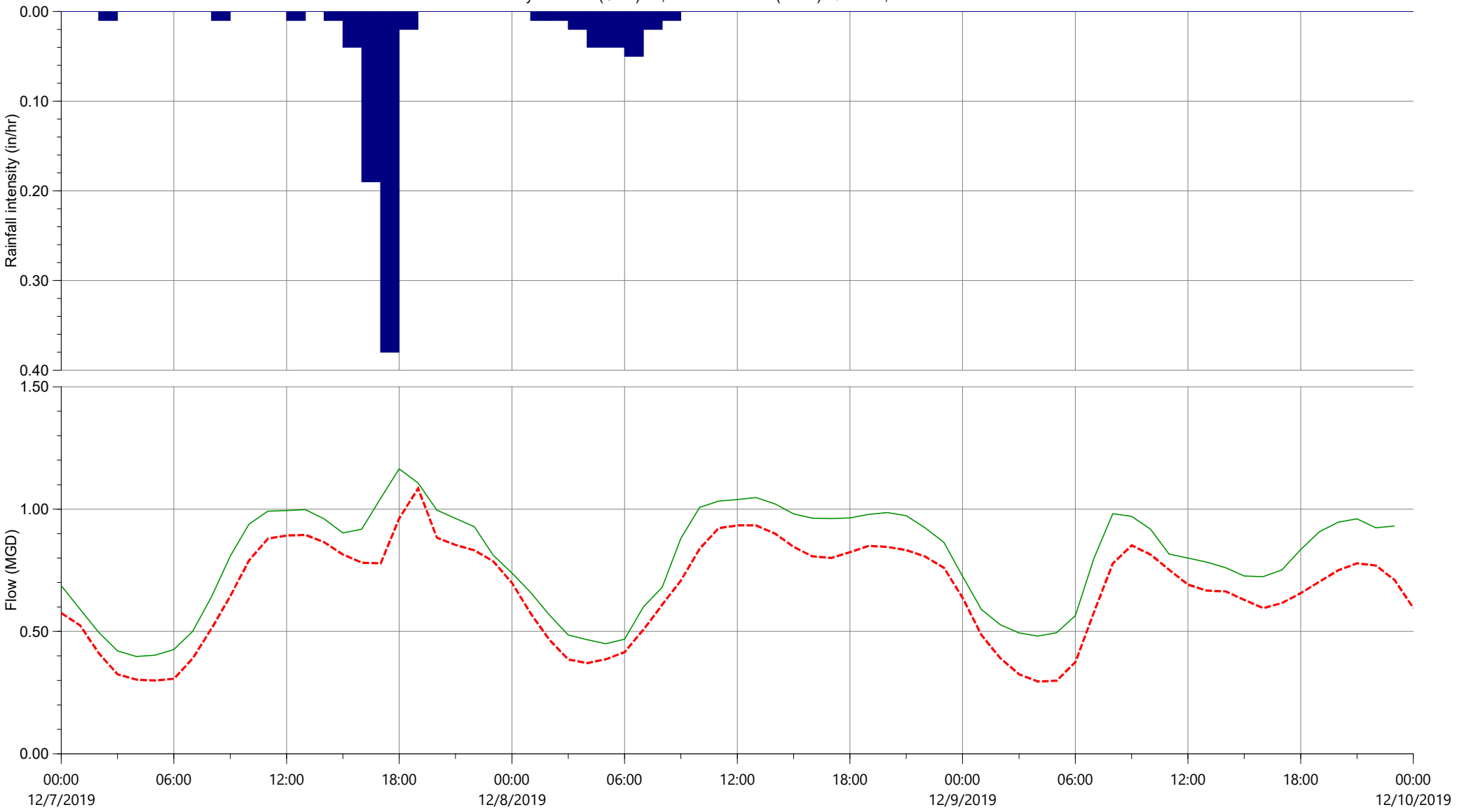



| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.359 | 0.750 | 1.454 |
| Model | | | | 0.350 | 0.726 | 1.455 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 41, Model Location (Pred.) D/S 41.1, Rainfall Profile: 1

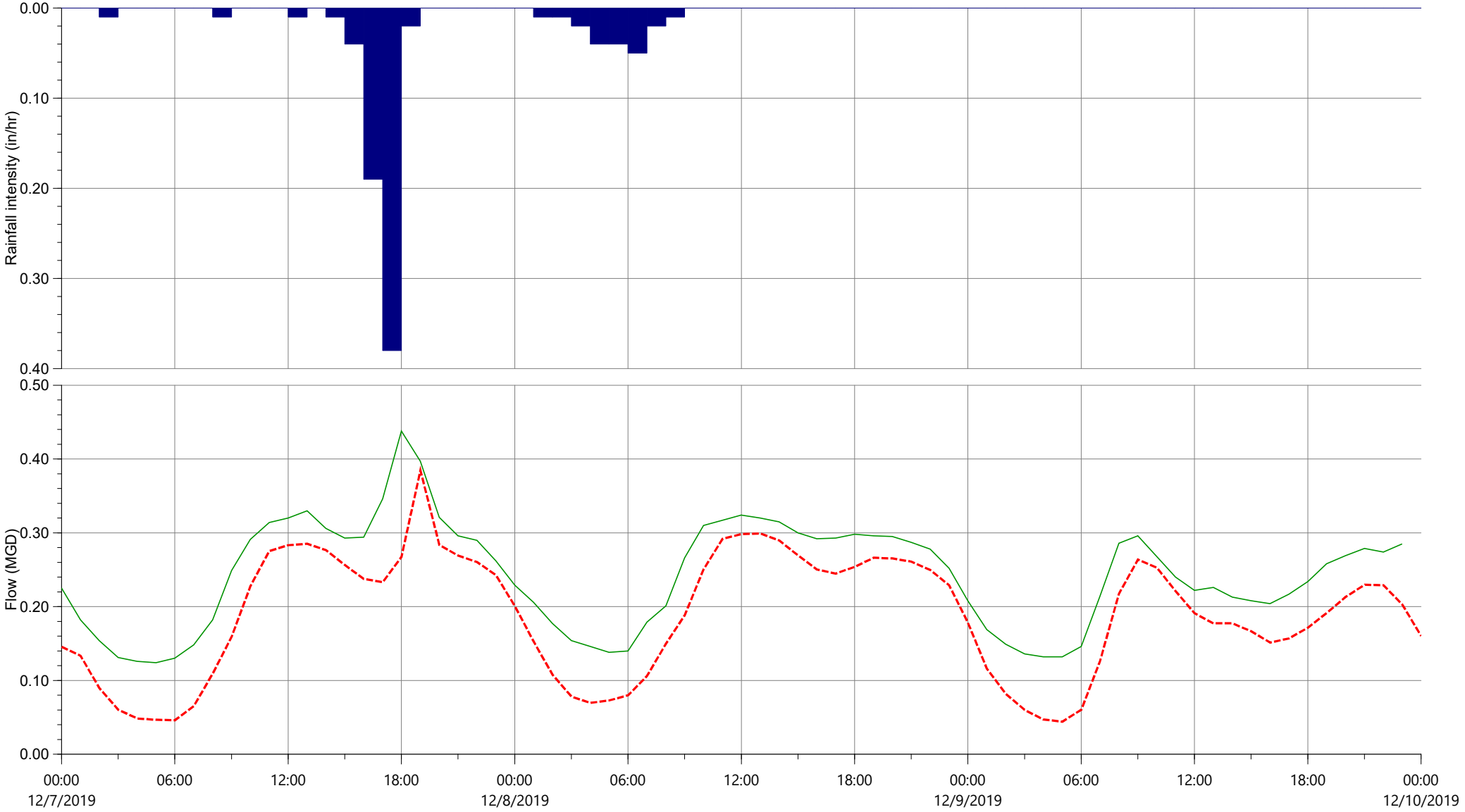



| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.398 | 1.165 | 2.351 |
| Model | | | | 0.296 | 1.085 | 2.011 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 592, Model Location (Pred.) D/S 592.1, Rainfall Profile: 1

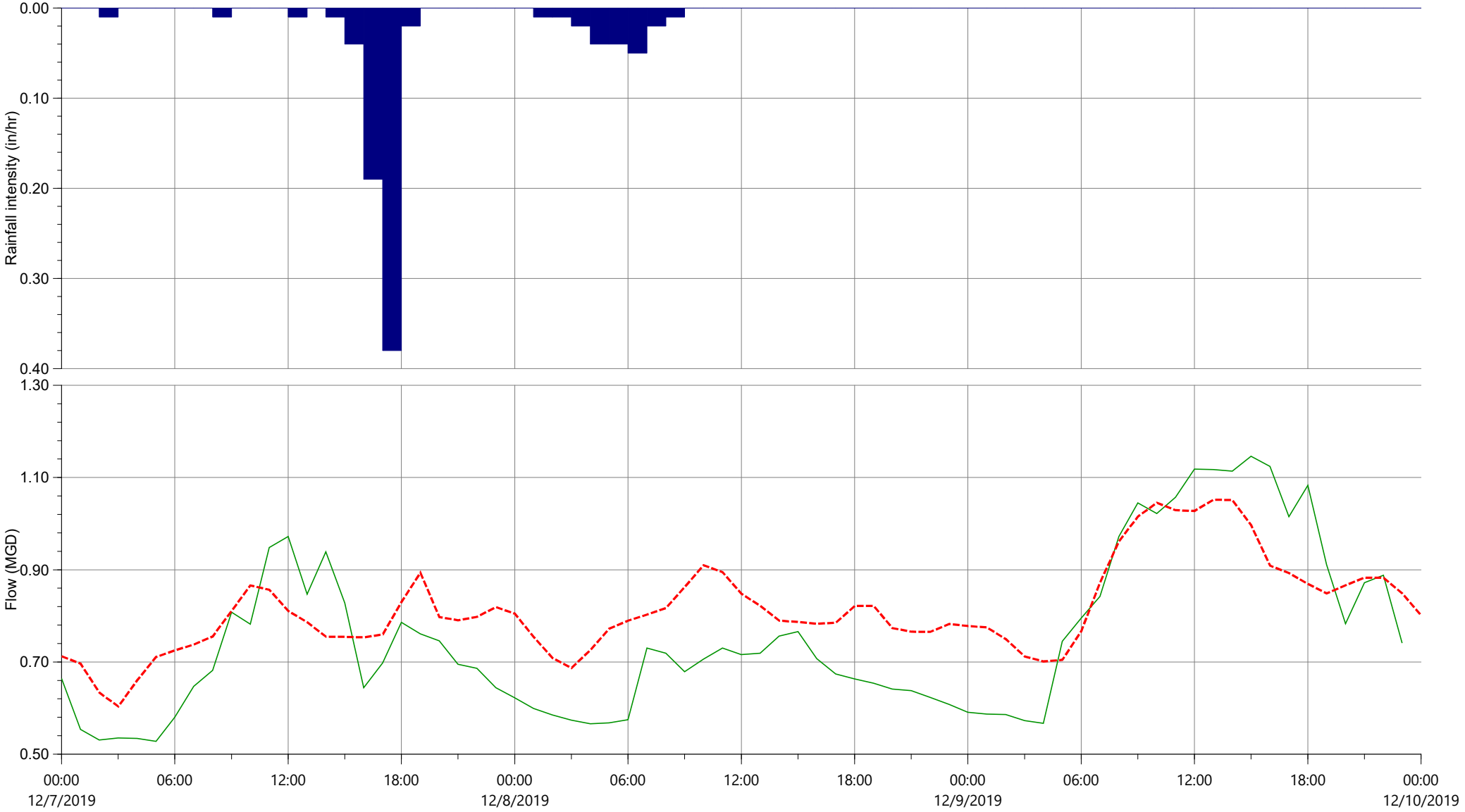



| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.124 | 0.438 | 0.715 |
| Model | | | | 0.044 | 0.385 | 0.565 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 649, Model Location (Pred.) D/S 649.1, Rainfall Profile: 1

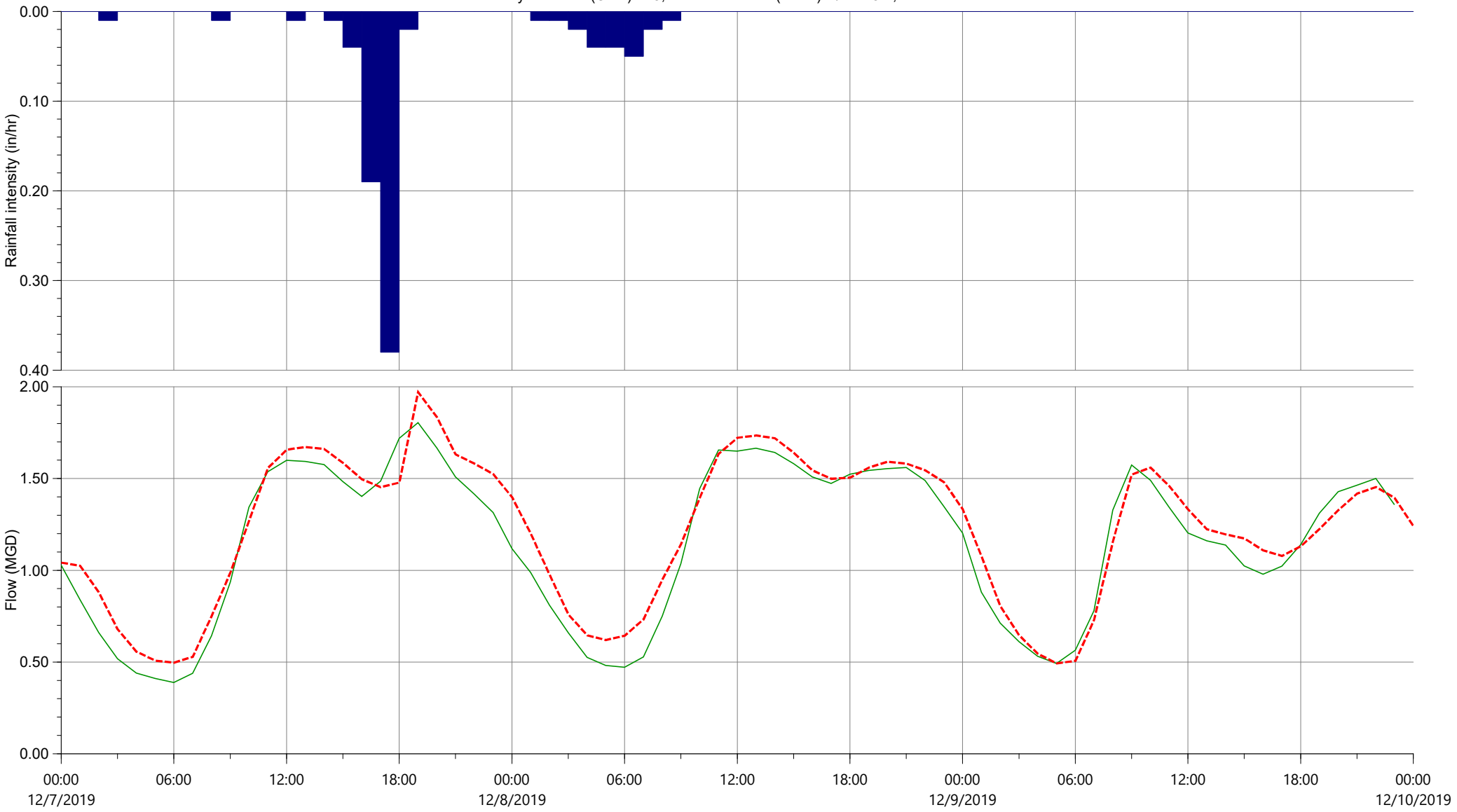



| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.528 | 1.146 | 2.227 |
| Model | | | | 0.603 | 1.052 | 2.445 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 715, Model Location (Pred.) D/S 715.1, Rainfall Profile: 1

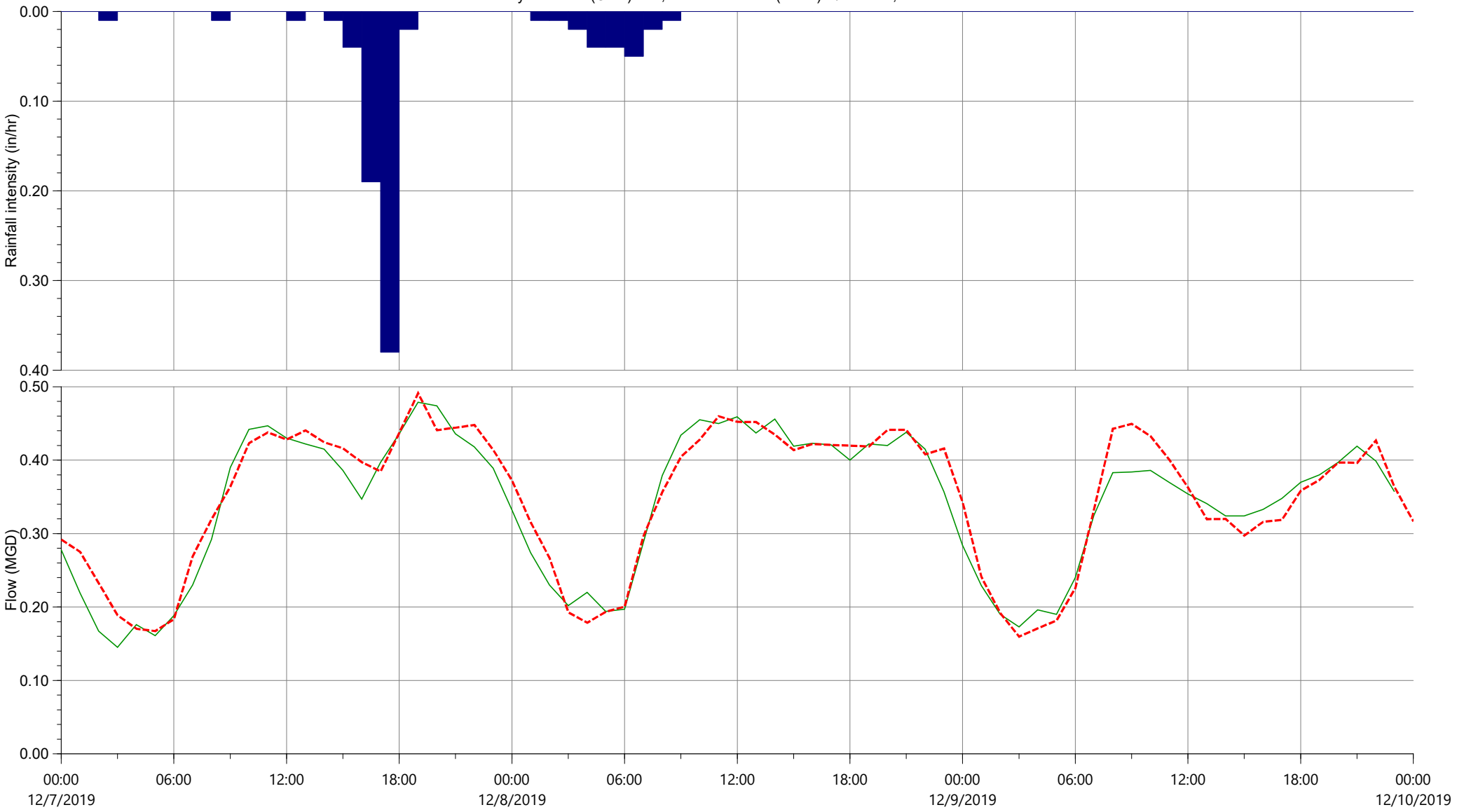



| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.388 | 1.804 | 3.408 |
| Model | | | | 0.494 | 1.971 | 3.670 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Powered by InfoWorks®

Flow Survey Location (Obs.) 744, Model Location (Pred.) D/S 744.1, Rainfall Profile: 1




| | Rainfall | | | Flow | | |
|---|---|---|---|---|---|---|
| | Depth (in) | Peak (in/hr) | Average (in/hr) | Min (MGD) | Max (MGD) | Volume (US Mgal) |
| Rain | 0.870 | 0.380 | 0.012 | | | |
| Observed | | | | 0.145 | 0.479 | 1.011 |
| Model | | | | 0.160 | 0.492 | 1.047 |

# Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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# APPENDIX F

City of Milpitas
Sewer Master Plan Study
Los Esteros Ranch Agreement

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DOCUMENT: 490116

Pages: 41

Fees.... * No Fees
Taxes...
Copies..
AMT PAID

BRENDA DAVIS
SANTA CLARA COUNTY RECORDER
Recorded at the request of
City

RDE # 003
11/25/2003
9:18 AM

**Control No. 2003-008**

Recording requested by:
**City of Milpitas**
When recorded mail to:
**City of Milpitas**
**City Engineer's Offiee**
**455 E. Calaveras Blvd.**
**Milpitas, Ca 95035**

Record without fee under Section 6103-Government Code, State of California

# AGREEMENT BETWEEN THE CITY OF MILPITAS AND LOS ESTEROS RANCH PARTNERSHIP FOR USE OF CERTAIN CITY OF MILPITAS SANITARY SEWER AND WATER FACILITIES BY THE CITY OF SAN JOSE

This agreement ("Agreement"), is made and entered into this 6th day of August, 2003 ("Effective Date"), by and between the City of Milpitas, California, a general law city of the State of California ("Milpitas") and Los Esteros Ranch Partnership ("Property Owner"). Milpitas and Property Owner may be referred to herein individually as a "Party" or collectively as the "Parties" or the "Parties to this Agreement".

## RECITALS

The purpose for which this Agreement is made, and all pertinent recitals, is described below:

A. Property Owner owns or leases certain real property located in the city of San Jose as shown on Exhibit A. The properties subject to this Agreement are Parcel 1, hereinafter referred to as the "East of McCarthy Boulevard Parcel", Parcel 2, hereinafter referred to as the "West of McCarthy Boulevard Parcel" and Parcel 3, hereinafter referred to as the "BFI Recyclery Parcel" ("Subject Properties"). Parcel 1 and Parcel 2 are jointly subject to the terms and conditions of San Jose PDC No. 99-09-078

and PD 01-084. Parcel 3 is subject to the terms and conditions of San Jose Planned Development Zoning PDC93-044, Planned Development Permit PD95-068, and Planned Development Permit Adjustments AD01-637 and AD02-679.

B. Property Owner wishes to be allowed to discharge sewage into the Milpitas-Owned Sewer System as shown on Exhibit B; and receive potable water from the Milpitas-Owned Water System.

C The City of Jose and Milpitas are preparing to enter into sewer and water agreements to enable the Subject Properties to receive sewage discharge and receive water services from the City of Milpitas without cost or expense to Milpitas ("City Agreements") attached hereto and incorporated herein as Exhibit C.

D. Property Owner, in consideration for Milpitas entering into the City Agreements, provides the commitments herein.

Therefore, in consideration of their mutual covenants, promises and undertakings, Property Owner and Milpitas agree as follows:

## 1. EFFECTIVE DATE

This Agreement will become effective immediately upon the execution of both the City Agreements by San Jose and Milpitas and this Agreement.

## 2. DEFINITIONS

For the purpose of this Agreement, the following words or terms shall have the following meanings, unless othorwise stated in this Agreement:

A. Milpitas-Owned Sewer System - "Milpitas-Owned Sewer Lines" means those sewer lines and related facilities including pump stations within the legal boundaries of Milpitas, or outside Milpitas where rights are defined by ownership of property, easements, public right of way or other agreements.

B. Milpitas-Owned Water System – "Milpitas-Owned Water Lines" means those water lines and related facilities within the legal boundaries of Milpitas, or outside Milpitas where rights are defined by ownership of property, easements, public right of way or other agreements.

## 3. LAND USE CONSENT

A. Property Owner acknowledges that the subject Property is located adjacent to the McCarthy Business Park and is in an area that serves as a gateway entrance to Milpitas. Milpitas, therefore, has a significant interest in ensuring that any new development or redevelopment on the subject Property is consistent and/or compatible with the McCarthy Business Park and with the City's goals for this gateway area. Property Owner hereby agrees that there shall be no new change in use, or other development, redevelopment, or change in design of the subject Property, or improvement thereon, without the prior consent of the Milpitas Planning Manager or employee with equivalent responsibilities.

B. Milpitas has reviewed and approved the terms and conditions of San Jose PDC99-09-078 and the plans for the development of the West of McCarthy Boulevard Parcel. Milpitas consents to this development receiving sewer and water service. All connections to Milpitas facilities will be performed at no cost to Milpitas.

C. No development has been initiated for the East of McCarthy Boulevard Parcel. Prior to any future development on this parcel receiving water and sewer service pursuant to the City Agreements, the Property Owner shall comply with Section 3.A of this Agreement.

D. The BFI Recyclery Parcel contains an existing use and improvements. This Agreement shall serve as Milpitas' consent to this parcel receiving sewer and water service from San Jose to serve this existing use.

## 4. INDEMNIFICATION

A. The City of San Jose has agreed to defend, hold harmless, and indemnify Milpitas, its elective and appointive boards and commissions; and its officers, agents, and employees for loss or damage to any person or entity, and to defend, indemnify, hold harmless and release Milpitas, its agents and employees, from and against any and all actions, regulatory proceedings, claims, damages, liabilities, fines, penalties, or expenses that may be asserted by any person or entity, including San Jose arising out of or in connection with the performance of the Agreement hereunder, whether or not there is concurrent negligence on the part of the Milpitas, but excluding liability due to the sole active negligence or sole willful misconduct of the Milpitas.

B. Property Owner has agreed to provide an indemnification to the City of San Jose which indemnifies that city to the full extent of its indemnification of Milpitas.

## 5. WAIVERS

Waiver by any party to this Agreement of any breach, default, or violation of any term or condition of this Agreement shall not be deemed to be a waiver of any other term or condition of this Agreement, or a waiver of any subsequent breach or violation of the same, or any other term or condition.

## 6. NOTICES

All notices and other communications required or permitted to be given under this Agreement shall be in writing and shall be personally served or mailed, postage prepaid and return-receipt requested, addressed to the respective Parties, or by facsimile, as follows:

To Property Owner: Los Esteros Ranch
c/o Mr. Will Oswald
1125 North Amphlett Blvd.
San Mateo, CA 94401

Copy To: Realty Law, LLP
c/o Joan Gallo
125 S. Market St. Suite 500
San Jose, CA 95112

To Milpitas: City Engineer
City of Milpitas
455 E. Calavaras Blvd.
Milpitas, CA 95035
Or by facsimile at (408) 586-3305

Notice shall be deemed effective on the date personally delivered or, if mailed, three (3) days after deposit in the mail.

## 7. NO TITLE OR PROPERTY RIGHTS CONFERRED

This Agreement is not intended to and shall not confer title or any other property right to Property Owner in any part of Milpitas Owned Sewer or Water Lines.

## 8. RECORDATION

This Agreement is intended to and shall run with the land. Property Owner shall cause this Agreement to be recorded within thirty (30) days after the effective date and shall provide a copy of the recorded document to Milpitas.

## 9. TERMINATION AND NONRENEWAL

The City Agreements give rights of termination to both cities. Milpitas shall immediately give notice to Property Owner of any violation under the City Agreements Termination clause. In addition, the City Agreements are subject to a limited term of twenty years with a provision that allows for an extension of not more than ten (10) years. Milpitas shall endeavor to provide property owners with one year advance notice should it determine for any reason that it will not extend either of the City Agreements. This Agreement shall terminate if such termination or refusal to extend by either City shall ever become effective. If in the future, for any reason, services to a property subject to this Agreement are provided by the City of San Jose, this Agreement shall terminate with respect to that property. In addition, each Property Owner may terminate this Agreement on ninety (90) days advance written notice to the City, at which time this Agreement will be of no further force or effect.

## 10. GOVERNING LAW

The law governing this Agreement shall be that of the State of California.

## 11. COMPLIANCE WITH LAWS

Parties agree to comply with all applicable laws, ordinances, codes and regulations of the federal, state and local governments.

## 12. VENUE

In the event that suit shall be brought by either Party to this Agreement, the Parties agree that venue shall be exclusively vested in the State Courts of the County of Santa Clara, or where otherwise appropriate, exclusively in the United States District Court, Northern District of California, San Jose, California.

## 13. PRIOR AGREEMENTS AND AMENDMENTS

This Agreement, including all Exhibits attached hereto, represents the entire understanding of the Parties as to those matters contained herein. No prior or written understanding shall be of any force or effect with respect to those matters covered hereunder.

## 14. INTERPRETATION OF AGREEMENT

The Parties to this Agreement acknowledge that each Party and their respective counsel have participated in the drafting and revision of this Agreement. Accordingly, the Parties agree that any rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not apply in the interpretation of this Agreement or any Exhibit hereto.

## 15. THIRD PARTY BENEFICIARY

This Agreement shall be binding on and inure to the benefit of the Parties any owner, tenant or other person with an interest in the subject Properties.

## 16. AMENDMENT

This Agreement may be modified only by a written amendment duly executed by the Parties to this Agreement.

The Parties acknowledge and accept the terms and conditions of this Agreement as evidenced by the following signatures of their duly authorized representatives. It is the intent of the Parties that this Agreement shall become operative on the Effective Date.

**PROPERTY OWNER**

Will Oswald, Partner
Los Esteros Ranch Partnership

**MILPITAS**

**Approved as to Form:**

for Steven T. Mattas, City Attorney

By: Thomas J. Wilson
THOMAS WILSON
City Manager

ATTEST:

Gail Blalock, City Clerk

Attach Notary Certificate

# CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of CALIFORNIA

County of SAN MATEO

On AUGUST 6, 2003 (Date) before me, LORI L. HORN, NOTARY PUBLIC (Name and Title of Officer (e.g., "Jane Doe, Notary Public"))

personally appeared WILL OSWALD (Name(s) of Signer(s))

☐ personally known to me – OR – ☒ proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

LORI L. HORN
COMM. # 1284833
NOTARY PUBLIC • CALIFORNIA
SAN MATEO COUNTY
Comm. Exp. DEC. 17, 2004

WITNESS my hand and official seal.

Signature of Notary Public

## OPTIONAL

*Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.*

### Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

### Capacity(ies) Claimed by Signer(s)

Signer's Name: _____

☐ Individual
☐ Corporate Officer
Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Attorney-in-Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

Signer Is Representing:

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer's Name: _____

☐ Individual
☐ Corporate Officer
Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Attorney-in-Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

Signer Is Representing:

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

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Prod. No. 5907 Reorder: Call Toll-Free 1-800-876-6827

# CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California

County of Santa Clara } ss.

On 11-20-2003 (Date), before me, Gail A. Blalock Notary Public (Name and Title of Officer (e.g., "Jane Doe, Notary Public")),

personally appeared Thomas J. Wilson (Name(s) of Signer(s)),

☒ personally known to me
☐ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/~~are~~ subscribed to the within instrument and acknowledged to me ~~that~~ he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Gail A. Blalock
Signature of Notary Public

GAIL A. BLALOCK
Commission # 1283395
Notary Public - California
Santa Clara County
My Comm. Expires Dec 6, 2004

Place Notary Seal Above

## OPTIONAL

*Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.*

**Description of Attached Document**

Title or Type of Document: Agreement for Sanitary Sewer & Water

Document Date: August 6, 2003 Number of Pages: 6 + exhibits

Signer(s) Other Than Named Above: Will Oswald

**Capacity(ies) Claimed by Signer**

Signer's Name: Thomas J. Wilson

☐ Individual
☒ Corporate Officer — Title(s): City Manager
☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

Signer Is Representing: City of Milpitas

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

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Gilroy
(408) 846-0707
www.hmh-engineers.com

William J. Wagner
Thomas A. Armstrong
Michael L. Morsilli
David M. Wilson
James E. Thompson

July 9, 2003
HMH 2734-01-099


EXHIBIT "A"

All that certain real property situate in the City of San Jose, County of Santa Clara, State of California, described as follows:

PARCEL A

A portion of that certain parcel of land described in the deed from J. E. Fifer and Ellie E. Fifer, His Wife, to A. M. Standish dated September 23, 1946 and recorded in Book 1534 Official Records at page 499, Santa Clara County Records, said portion being bounded and described as follows:

COMMENCING at a 3/4 inch iron pipe found in the Northerly line of said parcel conveyed from J. E. Fifer, et ux, to A. M. Standish at the Westerly line of a 60 foot strip of land conveyed by William Boots, et al., to the County of Santa Clara, by deed dated April 26, 1876 and recorded July 11, 1876 in Book 41 of Deeds, page 469, Santa Clara County Records, said 3/4 inch iron pipe being N. 34° 39' 00" E., 3209.7 feet from a one (1) inch bar found at the section corner common to Sections 1 and 2, Township 6 South, Range 1 West, M.D.B. & M. and Sections 35 and 36, Township 5 South, Range 1 West, M.D.B. & M. as surveyed by Mission Engineers, Inc., in April 1963.

THENCE, along said Westerly line of a 60 foot strip of land conveyed by William Boots, et al, to the County of Santa Clara, the following courses and distances:

S. 69° 34' 00" E., 473.39 feet; S. 9° 09' 00" E., 111.36 feet; S. 48° 59' 00" W., 99.64 feet; S. 77° 15' 00" W., 478.87 feet; N. 85° 56' 00" W., 250.14 feet;

Thence S. 53° 33' 00" W. a distance of 11.67 feet, more or less, to the point of intersection with the Easterly prolongation of the common boundary lines of Parcels 1 and 2 above described (the course of said common boundary being N. 89° 58' 00" W.); thence N. 89° 58' 00" W. along said Easterly prolongation of said common boundary line a distance of 122.09 feet, more or less, to the Southeasterly corner of said Parcel 1 above described; thence along the Easterly boundary line of said Parcel 1 N. 43° 02' 00" E. a distance of 595.61 feet to a one (1) inch iron pipe in the said Northerly line of the said parcel conveyed to A. M. Standish; thence along said Northerly line S. 89° 58' 00" E., a distanoe of 55.46 feet to the point of commencement.

Being a portion of the Swamp and Overflow Survey No. 59 in Section 36, Township 5 South, Range 1 West, M.D.B. & M.



1570 Oakland Road, Suite 200 • P.O. Box 611510 • San Jose, CA 95161-1510 • Tel: (408) 487-2200 • Fax: (408) 487-2222
4456 Black Avenue, Suite 100 • Pleasanton, CA 94566-6147 • Tel: (925) 600-7335 • Fax: (925) 600-8895
7951 Wren Avenue, Suite D • Gilroy, CA 95020-4903 • Tel: (408) 846-0707 • Fax: (408) 846-0676

PARCEL B

BEGINNING at a point on the general Southerly line of that certain parcel of land described in the Deed from J. E. Fifer et ux to A. M. Standish, recorded December 1, 1947 in Book 1534, Official Records, at page 499, Santa Clara County Records distant thereof North 77° 15' 00" East 175.16 feet from the Southwesterly terminus of that certain course designated as North 77° 15' 00" East, 478.87 feet; thence leaving said point of beginning along said general Southerly line North 77°15' 00" East 279.04 feet to a point hereinafter referred to as Point "A"; thence leaving said general Southerly line from a tangent bearing of South 42° 14' 45" West along a curve to the right with a radius of 190.00 feet through a central angle of 48° 03' 04" for an arc length of 159.34 feet and North 89° 42' 11" West, 130.53 feet to the point of beginning.

PARCEL THREE

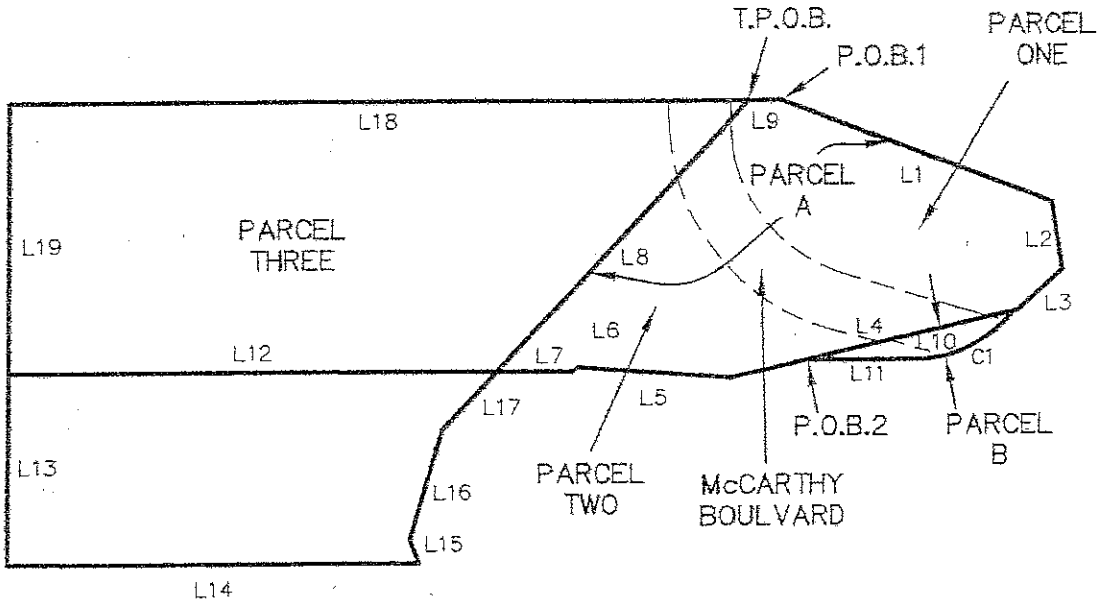
A portion of that certain parcel of land described in the deed from J. E. Filer and Ellie E. Filer, his wife, to A. M. Standish dated September 23, 1946 and recorded in Book 1534 Official Records at page 499, Santa Clara County Records, said portion being bounded and described as follows:

COMENCING at a 3/4 inch iron pipe found in the northerly line of said parcel conveyed from J. E. Filer, et ux tc A. M. Standish at the westerly line of a 60 foot strip of land conveyed by William Boots, et al., to the County of Santa Clara, by deed dated April 26 1876 and recorded July 11, 1876 in Book 41 of Deeds, page 469, Santa Clara County Records; said 3/4 inch iron pipe being N. 34° 39' 00" E.,3209.7 feet from a one (1) inch bar found at the section corner common to Sections 1 and 2, Township 6 South, Range 1 West, M.D.B.& M. and Sections 35 and 36; Township 5 South, Range 1 West, M.D.B.& M. as surveyed by Mission Engineers, Inc. in April, 1963.

THENCE, on and along the said northerly line of said parcel conveyed tc A. M. Standish N. 89° 58' 00" W., 55.46 feet to a one (1) inch iron pipe and the TRUE POINT OF COMMENCMENT.

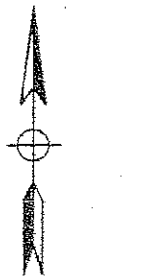
THENCE, along said northerly line N. 89° 58' 00" W., 1203.10 feet to a one (1) inch iron pipe; thence, S. 0° 02' 00" W., 435.60 feet to a one (1) inch iron pine; thence, S. 89° 58' 00" E., 796.90 feet to a one (1) inch iron pipe; thence, N. 43° 02' 00" E., 595.61 feet to the true point of commencement.

And being a portion of the Swamp and Overflow Survey No. 59 in Section 36, Township 5 South, Range 1 West, M.D.B.& M.




| LINE | BEARING | DISTANCE |
|---|---|---|
| L1 | S69°34'00"E | 473.39' |
| L2 | S09°09'00"E | 111.36' |
| L3 | S48°59'00"W | 99.64' |
| L4 | S77°15'00"W | 478.87' |
| L5 | N85°56'00"W | 250.14' |
| L6 | S53°33'00"W | 11.67' |
| L7 | N89°58'00"W | 122.09' |
| L8 | N43°02'00"E | 595.61' |
| L9 | S89°58'00"E | 55.46' |
| L10 | N77°15'00"E | 279.04' |
| L11 | N89°42'11"W | 130.53' |
| L12 | S89°58'00"E | 796.90' |
| L13 | S00°02'00"W | 310.52' |
| L14 | S89°58'00"E | 671.84' |
| L15 | N22°54'00"W | 41.59' |
| L16 | S16°40'00"W | 185.40' |
| L17 | N43°02'00"E | 129.32' |
| L18 | N89°58'00"W | 1203.10' |
| L19 | S00°02'00"W | 435.60' |

| CURVE | RADIUS | DELTA | LENGTH |
|---|---|---|---|
| C1 | 190.00' | 48°03'04" | 159.34' |



0 150 300

GRAPHIC SCALE

1 INCH = 300 FT.

SHEET 1 OF 1

| | |
|---|---|
| Date: | 7-09-03 |
| Scale: | 1"=300' |
| Designed: | – |
| Drawn: | dt |
| Checked: | DT |
| Proj. Engr.: | – |
| Dwg Name: | 2734PL11 |

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PLAT TO ACCOMPANY
EXHIBIT "A"
LOS ESTEROS RANCH PROPERTIES"

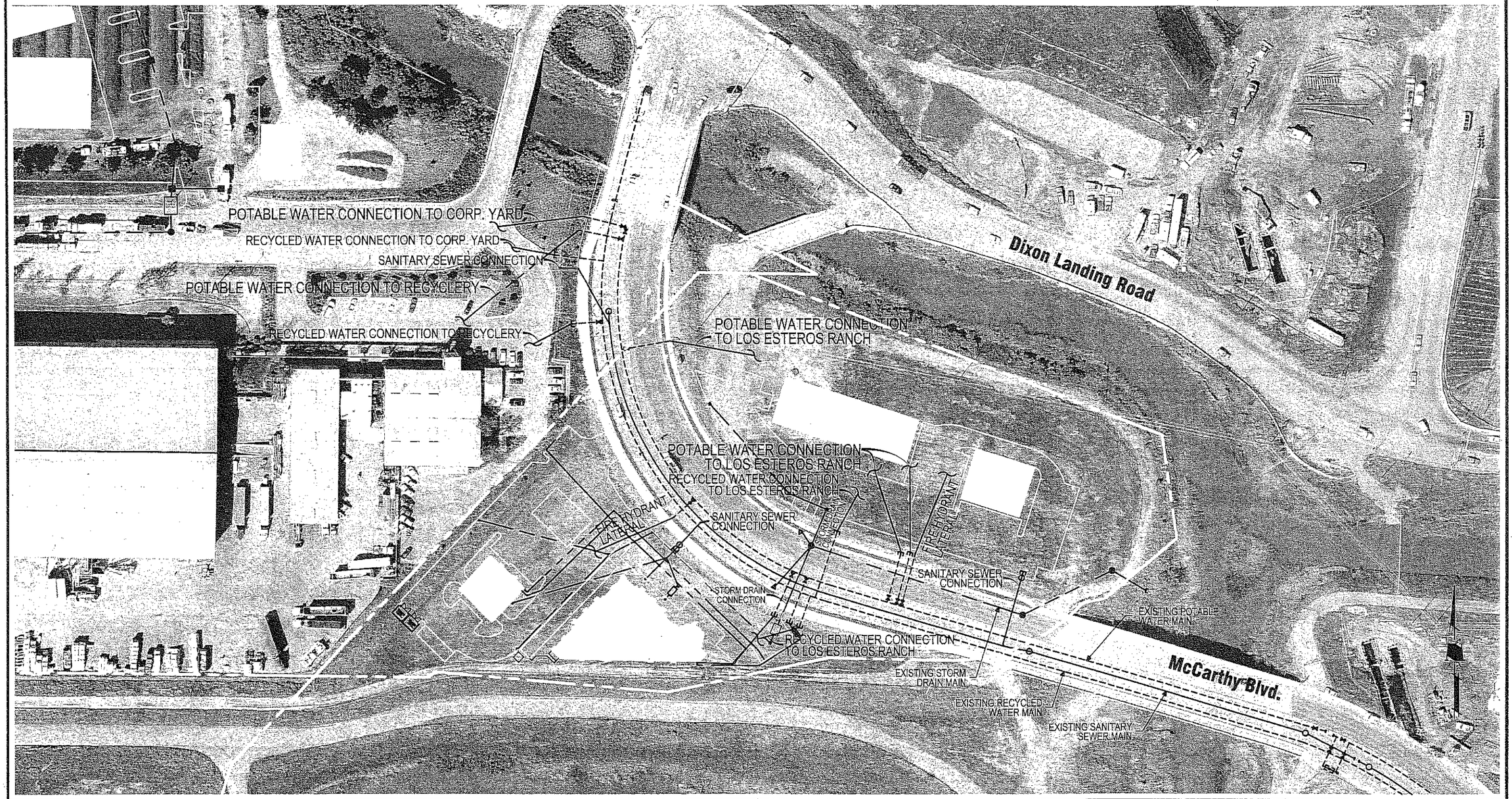
SAN JOSE CALIFORNIA

20030709.1113

EXHIBIT B

## LEGEND

| | | | |
|---|---|---|---|
| POTABLE WATER LINE — EXISTING | POTABLE WATER LINE — PROPOSED | SANITARY SEWER — EXISTING | SANITARY SEWER — PROPOSED |
| RECYCLED WATER LINE — EXISTING | RECYCLED WATER LINE — PROPOSED | STORM DRAIN — EXISTING | STORM DRAIN — PROPOSED |

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The Los Esteros Ranch
1125 N. Amphlett
San Mateo, CA 94401

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| Date: | 7.29.03 |
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| Designed: | DRR |
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| Proj. Engr: | DRR |
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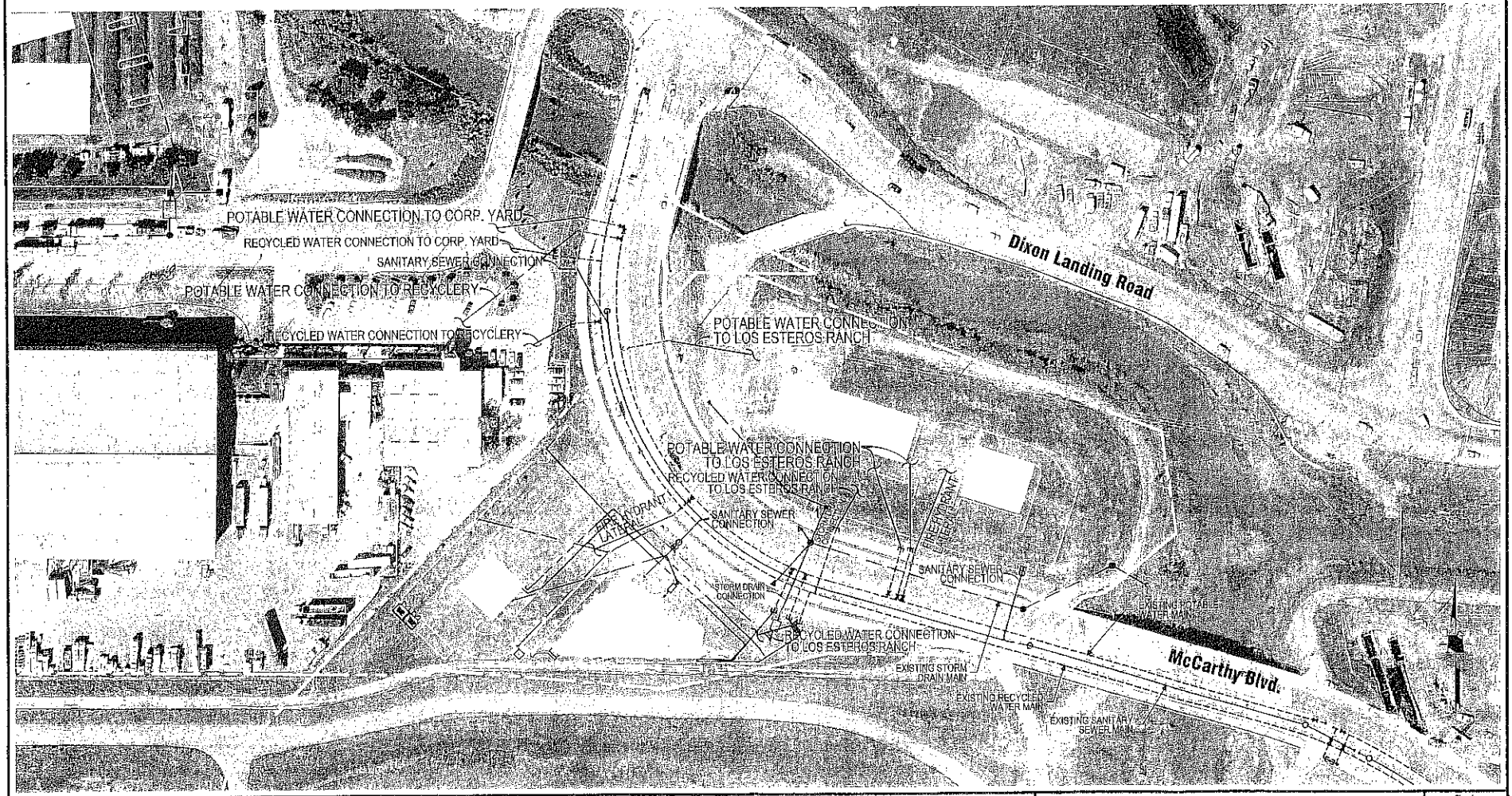
The Los Esteros Ranch - Site One & Two
BFI Proposed Corporation Yard
Utility Connections

Sheet 1 of 1 Sheets
JOB NUMBER 2734-01

LEGEND

| | | | | | |
|---|---|---|---|---|---|
| EXISTING | POTABLE WATER LINE | PROPOSED | EXISTING | SANITARY SEWER | PROPOSED |
| EXISTING | RECYCLED WATER LINE | PROPOSED | EXISTING | STORM DRAIN | PROPOSED |

**EXHIBIT B**

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The Los Esteros Ranch
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Sheet 1 of 1 Sheets
JOB NUMBER 2734-01

# EXHIBIT C

City Agreements

# APPENDIX G

City of Milpitas
Sewer Master Plan Study
Sanitary Sewer Force Main Cleaning and CCTV Inspection
Project Report

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# PROJECT REPORT

## SANITARY SEWER FORCE MAIN CLEANING AND CCTV INSPECTION

CITY OF MILPITAS
ENGINEERING DEPARTMENT
PREPARED BY: LYHAK EAM, P.E.
REVIEWED BY: MICHAEL SILVEIRA, P.E.
DATE: FEBRUARY 22, 2021

## EXECUTIVE SUMMARY

The City of Milpitas sanitary sewer system consists of two force mains that carries the City's wastewater from the City of Milpitas Main Lift Sewer Pump Station at North McCarthy Boulevard to the San Jose-Santa Clara Regional Wastewater Treatment Plants. Force Main A and B were constructed in 1974 and 2000, respectively. The objective of this project was to perform an internal assessment of Force Main A ("FM-A"), but it was not possible to complete within budget due to unforeseen conditions and challenges. Engineering Department reported the findings to Public Works and recommends FM-A be either rehabilitated or replaced due to the its condition and age.

## PROJECT BACKGROUND

Cathodic Protection Improvement Project No. 6131 ("Project") is in the approved Capital Improvement Program 2020-2025. The Project provides for the replacement of two existing mag meters at the Milpitas Main Lift Station, installation of cathodic protection system along the FM-A, removal or abandonment of the existing diverter valve vault near the Coyote Creek, evaluation and renovation of existing pinch valve vaults, and an assessment of FM-A. Per the "Water Pollution Control Facilities Project" record drawing dated April 1972 (**Attachment A),** FM-A is approximate 12,000 feet including 12 access manholes spaced approximately 1,000 feet apart. The force main extends from the Main Lift Pump Station, crossing under the Coyote Creek as a siphon, going underneath San Jose Residual Sludge Management (RSM) drying beds (Lagoons) and Zander Road, and connecting to the San Jose-Santa Clara Regional Wastewater Treatment Plants. (***Figure 01)***.

JDH Corrosion Consultant, Inc. was retained to perform an indirect pipe assessment by using a Close Interval Survey (CIS) to measure the soil corrosivity surrounding the FM-A. The survey concluded the soils are inherently very corrosive and can potentially corrode and damage the steel force main (**Attachment B**). Based on the survey and the age of the system, Pipe and Plant Solutions Inc (PPSI) was retained to perform the cleaning and CCTV inspection to assess the internal condition of the force main. The work included site investigation of all sewer manholes, replacement of any corroded bolts and gaskets as needed, clearing and grubbing surrounding areas for safe and secure access, removal and disposal of any debris from the sanitary sewer force main, and performing CCTV inspection.

***Figure 1**- Ariel Map of City Force Mains*

**SITE INVESTIGATION FINDINGS/CHALLANGES**

The following is a summary of findings/challenges that Engineering staff encountered during the site investigation.

1. RIGHT-OF-WAY/PERMITTING PROCESS

The entire FM-A (**Figure 02**) is located within the Santa Clara-San Jose Wastewater Treatment Plant property, and the City of Milpitas has an easement to maintain and operate the facility at any time (**Attachment B**). Without any additional provisions or requirements mentioned in the easement, the City of San Jose requires the City of Milpitas to enter into Right of Entry agreement (**Attachment C**) to access the City right-of-way for any work. The City attorney reviewed the languages in the easement and re-affirmed that the City of Milpitas has the right to access and perform work necessary without any further restriction by San Jose. Due to the schedule and need to investigate the FM-A, Engineering applied for a Right of Entry permit and tabled the discussion of the City of Milpitas rights to their Right of way. The permit process took approximately 3 months.

***Figure 2**- Force Main A Alignment*

In addition, the City is required to obtain an encroachment permit from Santa Clara Valley Water District (Valley Water) to access manhole #1 because of its close proximity to Coyote Creek that falls under their jurisdiction (**Figure 3**). At the time, Valley Water issued a permit for pedestrian access for site investigation search of the manhole with no excavation allowed. To obtain a vehicle access permit, the Valley Water will require an environmental assessment of invasive plants in the area. The assessment shall include the impacts of the work and any mitigation measures to preserve the surrounding area.

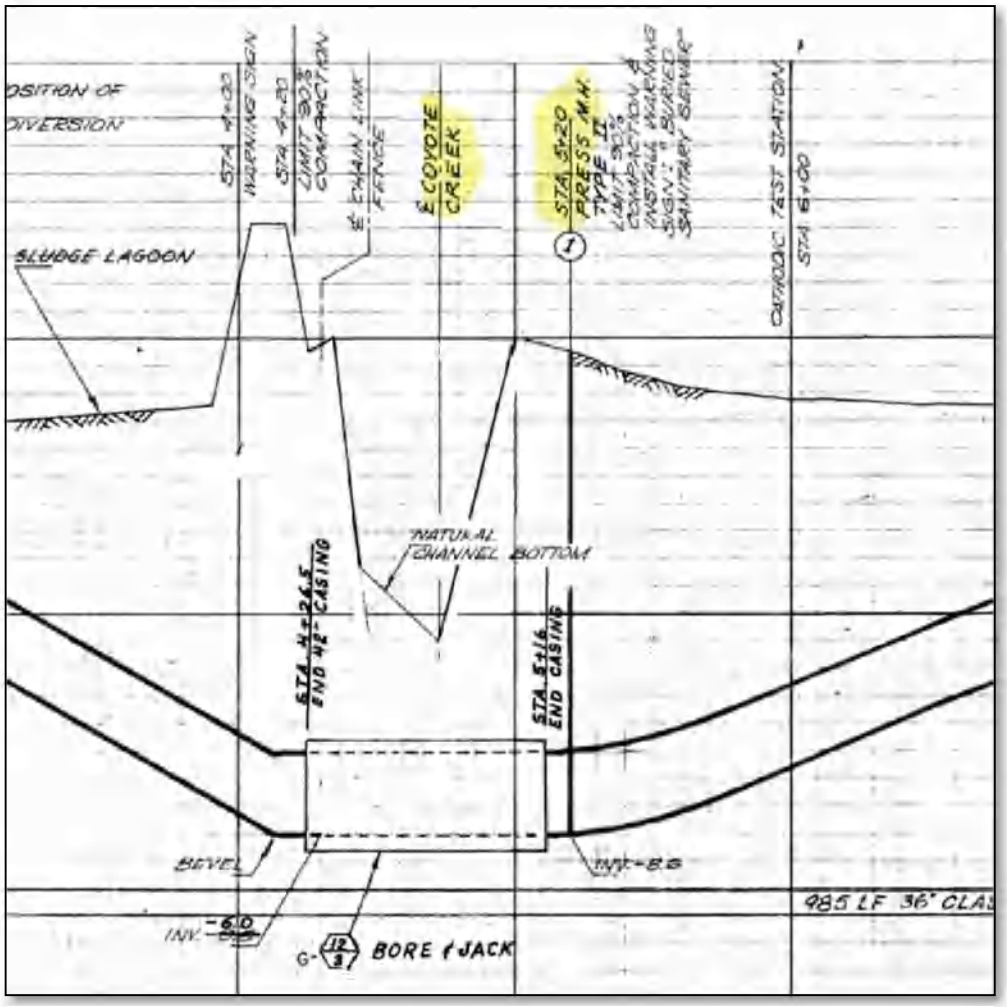


***Figure 3**- Manhole #1 Location Per As built*

2. MISSING MANHOLES

After securing necessary permits, the contractor began to locate and assess all the manholes to access FM-A for cleaning and CCTV inspection. The contractor was able to locate manhole #2-6, 9-12, but unable to locate manhole #1, 7, and 8.

Manhole #1: Per Record Drawings, the manhole is located adjacent to Coyote Creek (**Figure 04**) under District jurisdiction. The manhole was not found because the permit issued by Valley Water is limited to pedestrian access and no excavation or removal of vegetation allowed. In order to locate the manhole, heavy equipment will have to be used to excavate and remove the vegetation around the area.

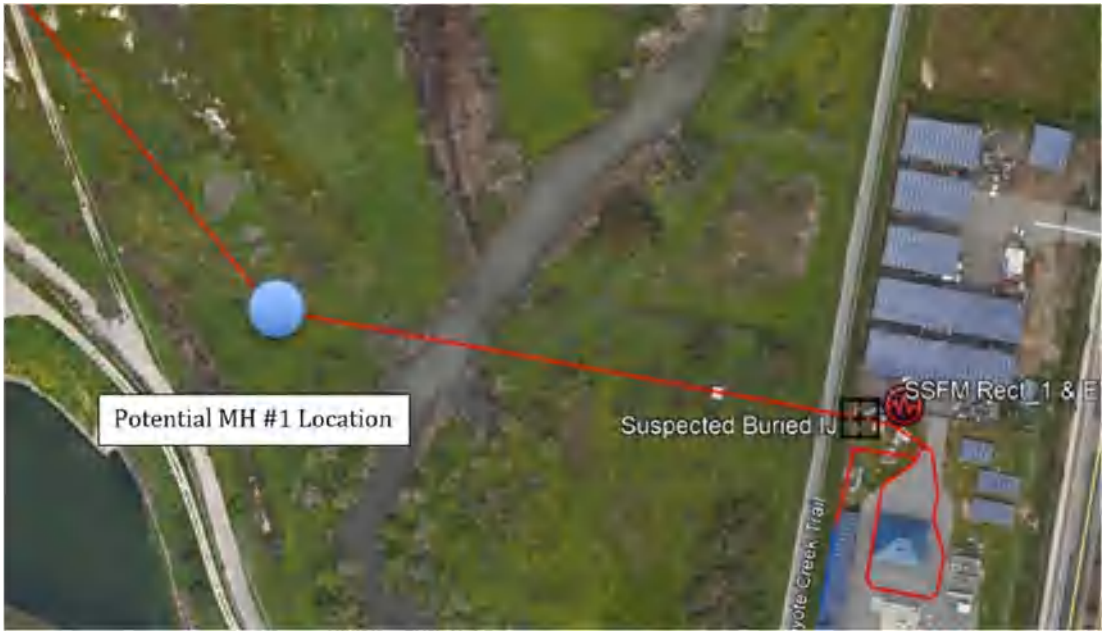


***Figure 4**: Force Main Manhole #1 Location*

Manhole #7: Per Record Drawings, the manhole is approximate 972 feet from manhole #6 (**Figure 05**). Contractor was unable to locate the manhole and speculated it is buried under the existing access road.

***Figure 5:*** *Force Main Manhole #7 Location*

According to the force main profile shown in **Figure 06**, manhole #7 is a critical access point to remove debris from pipe segment between manhole 6-7, 7-8 & 8-9 because it is the low point in the system.

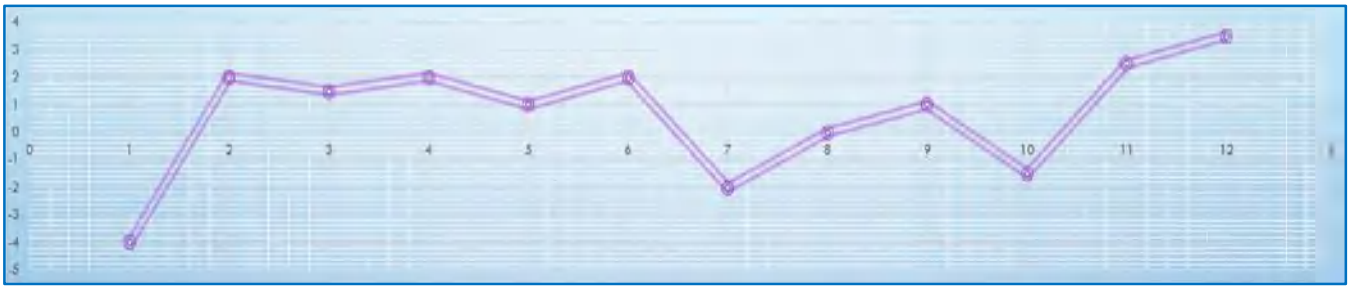

***Figure 6:*** *Force Main Profile*

Manhole #8: Contractor searched for the manhole without success but found a 30' high vertical pipe where the manhole should be located as shown in **Figure 07**. It is assumed the manhole was modified for this vertical pipe. Public Works staff does not have knowledges or the functionality of this pipe. The City does not have existing records of this modification.

***Figure 7**: Force Main Manhole #8 Location*

3. CORRODED MANHOLES' COMPONENTS

The Contractor investigated available manholes and the internal components including air release valves, bolts, gaskets and blind flanges. The components in manholes #9-12 appeared to be in good conditions. However, components in manholes #2 – 6, located in the lagoon area, are significantly corroded and not functional, see **Figure 8 &9.**

***Figure 8**: Force Main Manhole*

***Figure 9**: Corroded Air Release Valve and Blind Flange*

In order to access the force main at manholes, both air release valves and blind flanges must be removed. Since components at manhole #2-6 are significantly corroded, they must be replaced to ensure the force main is properly sealed. The cost of replacing these components with stainless steel is approximately $25,000, which is not included in the project scope and budget. Therefore, the cleaning and CCTV inspection of the segments between manhole #2-6 were postponed until the aforementioned issues are resolved.

4. HIGH LEL AND H2S GAS LEVELS

During first attempt of the removal of the blind flange at MH#12, the Contractor encountered H2S and LEL gases levels that were beyond the maximum value of 100%, which was considered very hazardous. The Contractor had to immediately seal the blind flange and evacuate the area. It was assumed that the existence of high gas levels was due to the stagnant wastewater in the force main for approximate 4 weeks and could not be completely flush out of the system due to challenges accessing the system. Not knowing the exact source of the gases, staff recommended to resume the operation of the FM-A for 48-hours in the hope the gas would dissipate. The strategy was successful, and the Contractor was able to access the manhole safely. The source of the gases were not determined and may appear again in future work if the wastewater is stagnant for a period of time.

5. SEWER OVERFLOW INCIDENT AND UNFUNCTIONAL SLIDE GATE

After resolving the gas issue, Public Works switched the wastewater operation from Force Main A to Force Main B (FM-B) to allow the Contractor to access manhole #12. As the contractor began to remove the blind flange, effluent started to overflow out of the manhole as shown in **Figure 10**. The overflow was a result from the wastewater from FM-B backflowing into FM-A at the Milpitas structure (**Figure 11**). Both FM-A and FM-B are connected directly to the Milpitas structure (**Figure 12)** that serves as a detention basin to receive and store all effluent before sending down to the Plant for treatment via an overflow weir wall.

In order to prevent the backflow from FM-B to FM-A, the FM-A sliding gate in the structure needs to be closed which is currently non-operational. Public Works shut down both force mains to stop the

overflow and allow the contractor to re-install the blind flange. The non-functional sliding gate caused effluent to backflow into the entire system because the elevation of force main A is lower than the Milpitas Structure. Such condition will create the potential overflow situation at other manholes similar to that encountered at manhole #12. To conduct any inspections of FM-A by CCTV, the sliding gate needs to be repaired to isolate the force main from one another.

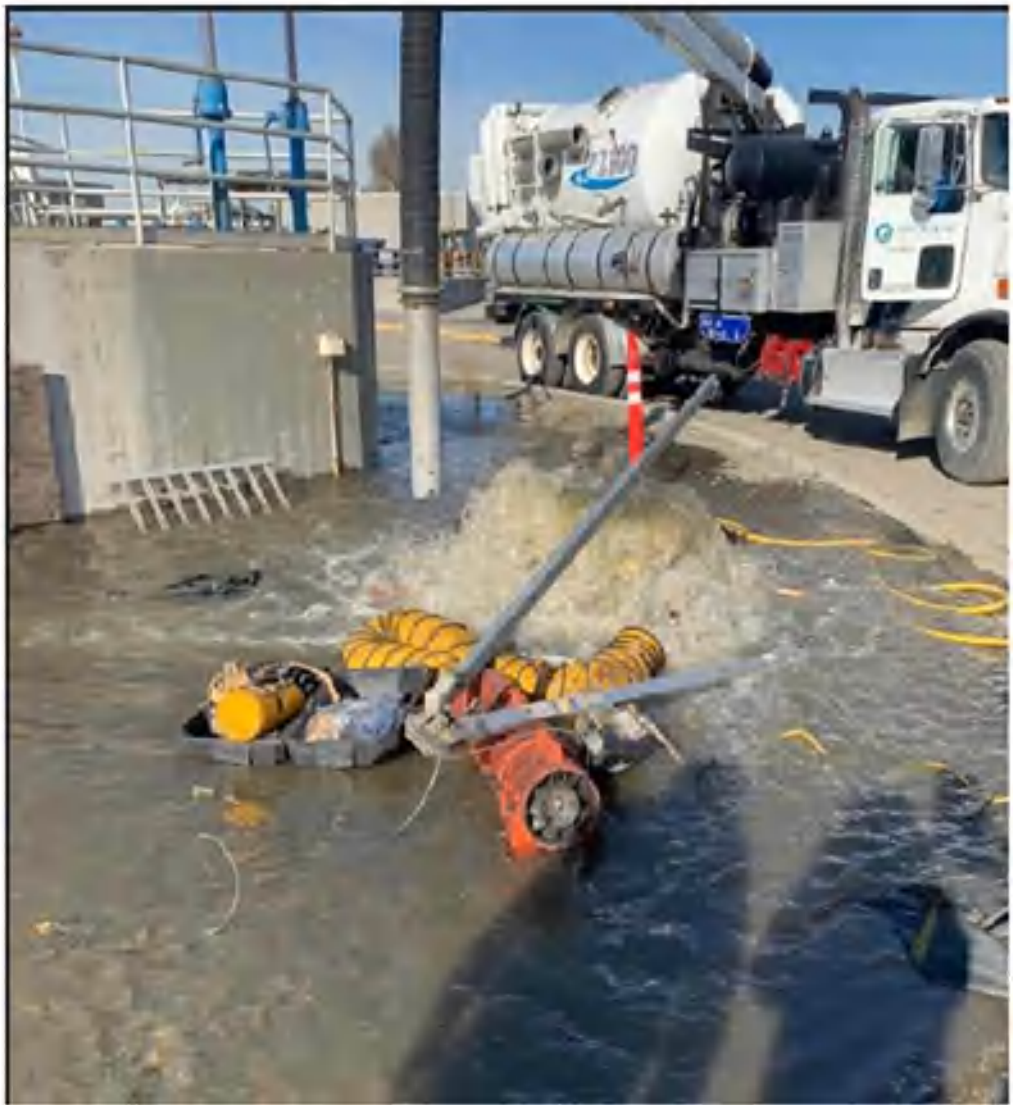

***Figure 10:*** *Sewer Overflow at MH #12*

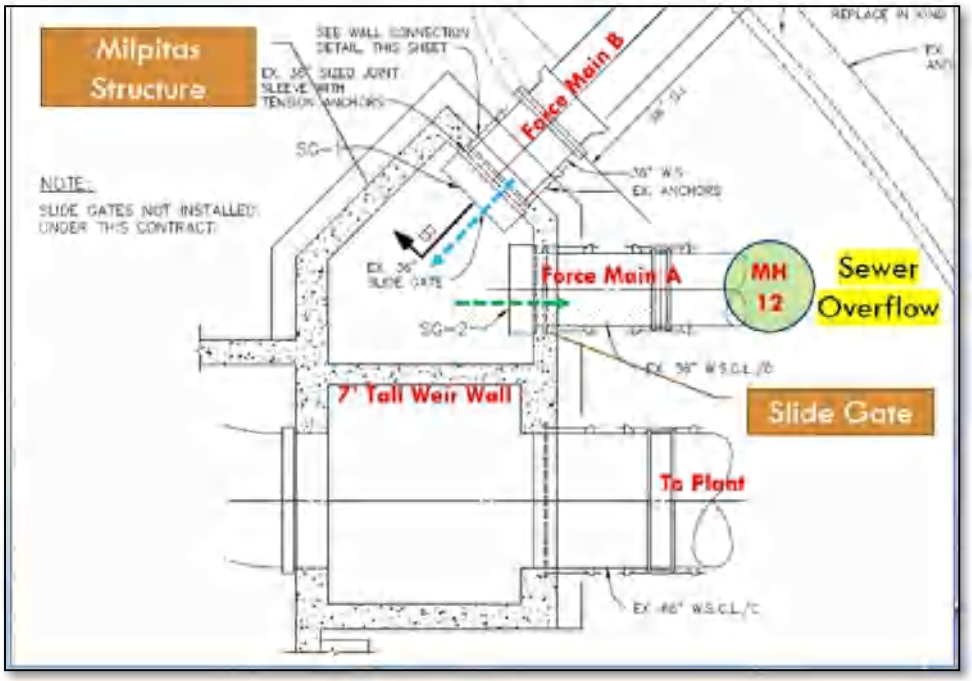


***Figure 11:*** *Milpitas Structure Drawing*

***Figure 12****: Milpitas Structure*

**CONCLUSION**

Due to numerous issues as described, the following tasks shall be completed prior to performing the cleaning and CCTV inspection of the force main.

1. Locate all missing manholes along the force main including manholes #1, 7, and 8.
2. Replace all corroded air release valves and blind flanges for manhole #2 to #6.
3. Repair slide gate at Milpitas Structure so that the FM-A can be isolated from the structure itself.

Based upon this preliminary evaluation, the cost to complete the cleaning and CCTV inspection and all associated work is approximate $ 850,000. The following is the summary of the cost breakdown.

| Description | Cost |
|---|---|
| Cleaning and CCTV inspection | $350,000 |
| Replacement of (6) manholes' parts ( bolts, blind flange, gasket, ARV) | $150,000 |
| Repair slide gate and bypass pumping | $150,000 |
| Permitting process | $30,000 |
| Bidding process and construction administration | $30,000 |
| Construction contingency (20%) | $140,000 |
| TOTAL | $850,000 |

It is assumed the condition of the force main is deteriorating and doesn't meet industrial standards due to the age of the system, level of soil corrosivity surrounding the steel pipe, and the minimal routine maintenance since it was installed in 1974. The City should consider to either rehabilitate or replace the system in the near future. Rehabilitation of existing force main with a liner may extend its service life; however, the City should hire a professional license engineer to evaluate the existing system and provide improvement options and estimated cost. The installation of new force main is another option that the City should consider to ensure the well-being of this critical infrastructure for next 50 years. The estimated project cost for the construction of a new force main is as follows, and detailed cost breakdown is provided in **Attachment D**.

| | |
|---|---|
| Improvement Cost | $14,197,000 |
| Design (20%) | $ 2,839,400 |
| Administration ( 15%) | $ 2,129,550 |
| Testing and Inspection (5%) | $ 709,850 |
| Environmental Review & Permitting ( 5%) | $ 709,850 |
| TOTAL | **$20,585,650** |

Note the Engineering cost estimate provided are based on the construction cost of the Force Main B in 2000 and cost escalations over the past decades. No details planning or study has been conducted as part of this process. The basis for this estimate includes the following assumptions:

- 12,000 linear feet of 36" HDPE line
- The new force main is parallel to the existing force main B (HDPE)
- 12 manholes access with air release valves
- Bore and Jack under Zanker Road & Milpitas Structure
- Micro-tunneling- Coyote Creek crossing

**ATTACHMENTS**

Attachment A : Water Pollution Control Facilities As built
Attachment B : Close Internal Survey Report
Attachment C : Right of Entry Agreement
Attachment C : Detailed Cost Estimate to Construct New Fore Main

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# City of Milpitas Strom Drain Master Plan

# City of Milpitas
## Storm Drain Master Plan
## 2021

**PREPARED FOR:**
City of Milpitas
455 E Calaveras Blvd
Milpitas, CA 95035

**PREPARED BY:**
Schaaf & Wheeler
1171 Homestead Rd, Ste 255
Santa Clara, CA 95050

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

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# List of Abbreviations

| | |
|---|---|
| Ac | Acres |
| BMP | Best Management Practices |
| CIP | Capital Improvement Program |
| CFS | Cubic Feet per Second |
| CMP | Corrugated Metal Pipe |
| CTP | Cooperating Technical Partnership |
| D/S | Downstream |
| EPA | Environmental Protection Agency |
| GIS | Geographic Information System |
| GPM | Gallons Per Minute |
| HDPE | High-Density Polyethylene |
| IDF | Intensity-Duration-Frequency |
| KW | Kinematic Wave |
| LiDAR | Light Detection and Ranging |
| MAP | Mean Annual Precipitation |
| MSL | Mean Sea Level |
| NAVD | National Adjusted Vertical Datum of 1988 |
| NGVD | National Geodetic Vertical Datum of 1929 |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | National Resource Conservation Service |
| RWQCB | San Francisco Regional Water Quality Control Board |
| SDMP | Storm Drain Master Plan |
| TASP | Transit Area Specific Plan |
| UH | Unit Hydrograph |
| U/S | Upstream |

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# Executive Summary

Milpitas completed its first comprehensive storm drainage master plan in 2001, which was updated in 2013. This effort represents a significant re-envisioning of that updated document and has been undertaken to help guide the city of Milpitas (city) to implement a prioritized capital improvement program. This document represents a new and complete Storm Drain Master Plan (SDMP).

The city has been incorporated for more than sixty years. It is beginning to experience the effects of aging storm drainage infrastructure, the need to maintain and replace expensive equipment and facilities, significant planned and completed redevelopment, and changing regulatory requirements. This SDMP identifies the capital improvements needed to maintain recommended levels of protection against local flooding from stormwater runoff, the need for a revenue stream that will allow the necessary capital improvements made, and the need to keep the storm drain system in working order into the future.

## Storm Drainage and Flooding in Milpitas

Flooding within Milpitas is caused by two basic interrelated factors: 1) major creeks and channels that overflow due to limited capacity with flood flow, and 2) inadequate local drainage facilities. Since the operation and maintenance of major creeks and channels are, for the most part, outside the city's control, the focus of this document, therefore, is on local storm drainage collection and pumping facilities owned and operated by the city of Milpitas. Of the major creeks and channels, only Wrigley and Ford Creeks are owned and operated by the city and considered in detail herein.

Urbanization tends to increase the rate of runoff generated from local precipitation. Once primarily agricultural with an economy dominated by fruit and vegetable growers, Milpitas has evolved into a more fully urban community. (Urbanization is generally confined between Coyote Creek to the west and the Calaveras Foothills to the east.) Storm runoff in Milpitas is collected in a system of underground pipes and a network of street gutters. Local runoff flows into creeks and channels that run through the city, ultimately discharging to the San Francisco Bay. Drainage in Milpitas generally is from the southeast to the northwest. Storm drain systems close to the bay also tend to rely heavily upon pumping facilities to move water. Milpitas owns and operates 13 stormwater pumping stations.

## Regional Storm Water Coordination

The Santa Clara Valley Water District (Valley Water) is Milpitas' primary partner in managing local stormwater issues. Valley Water's stated mission is to "provide Silicon Valley safe, clean water for a healthy life, environment, and economy." More specifically, Valley Water manages most of Milpitas's major drainage-ways, including Arroyo de los Coches, Berryessa Creek, Calera Creek, Coyote Creek, Lower Penitencia Creek, East Penitencia Creek, Piedmont Creek, and Tularcitos Creek.

Coordination with Valley Water is integral to the Storm Drain Master Plan's success since all the city's storm drainage systems eventually discharge into a Valley Water-managed facility. Valley Water is keenly interested in any city storm drain project that might impact one of their receiving creeks. In turn, the city has a vested interest in how Valley Water manages its legislated flood protection responsibility. This master plan focuses on storm drainage and flood management, which are only two factors in the overall management of stormwater within Milpitas. The city's storm drain system must address its infrastructure needs considering these factors: new capital assets (Capital Improvement Program); finances (utility

asset management); operations and maintenance; and regulatory compliance (San Francisco Regional Water Quality Control Board's [RWQCB] Municipal Regional Storm Water Permit, National Pollutant Discharge Elimination System [NPDES] permit).

## Basis of System Evaluation

Criteria used to design storm drain systems and evaluate their performance must be defensible yet simple to understand and apply. Ideally, the same criteria used to analyze system performance will also continue for future infrastructure design. Storm drain design criteria set forth by the city of Milpitas, in its July 15, 2010 standards and the Santa Clara County Drainage Manual (2007), is used in this master plan, with some additional provisions as discussed throughout the document.

The ICM model used to evaluate Milpitas' storm drainage system herein was first created as part of FEMA's Cooperating Technical Partnership (CTP) program to study flood hazards within Upper Penitencia Creek, Lower Penitencia Creek, and Berryessa Creek watersheds in San Jose and Milpitas. The basis for analyses described herein is consistent with broader floodplain studies in the area that have already been vetted with Valley Water and FEMA.

Schaaf & Wheeler used data provided by the City and Valley Water and data gathered in the field to construct an integrated hydrologic and hydraulic InfoWorks ICM (Integrated Catchment Modeling) model representing storm drain systems, creeks, and ground surface throughout Milpitas. This model uses a design storm event and land-use-based runoff coefficients to generate runoff from the surface areas tributary to each collection system. The hydraulic capacity of each drainage system component is calculated and resulting overflows to the two-dimensional surface are reviewed to confirm if city drainage system performance criteria are being met. If the existing storm drainage system does not meet specific criteria, the model is then used to establish the capital improvement(s) needed so that those criteria are being met upon the completion of a prioritized capital improvement program.

## Estimated Capital Costs and Annual Revenue Requirements

A prioritized capital improvement program (CIP) is established based on the analytical evaluation of Milpitas' existing storm drainage system using the integrated ICM hydrologic and hydraulic model, a. Figure ES–1 shows the locations of city-wide high-priority capital improvement projects. Table ES-1 includes an estimate of the present worth of capital expenditures required to complete those projects shown in Figure ES–1 and provides capital costs for other low priority capital improvements needed to meet established storm drain performance criteria. Table ES-2 provides the estimated annual revenue stream needed to complete the CIP over 20 years. Except for low priority projects that are optional or potential ancillaries to other site development or public projects, long-term equipment replacement, and annual operations and maintenance.

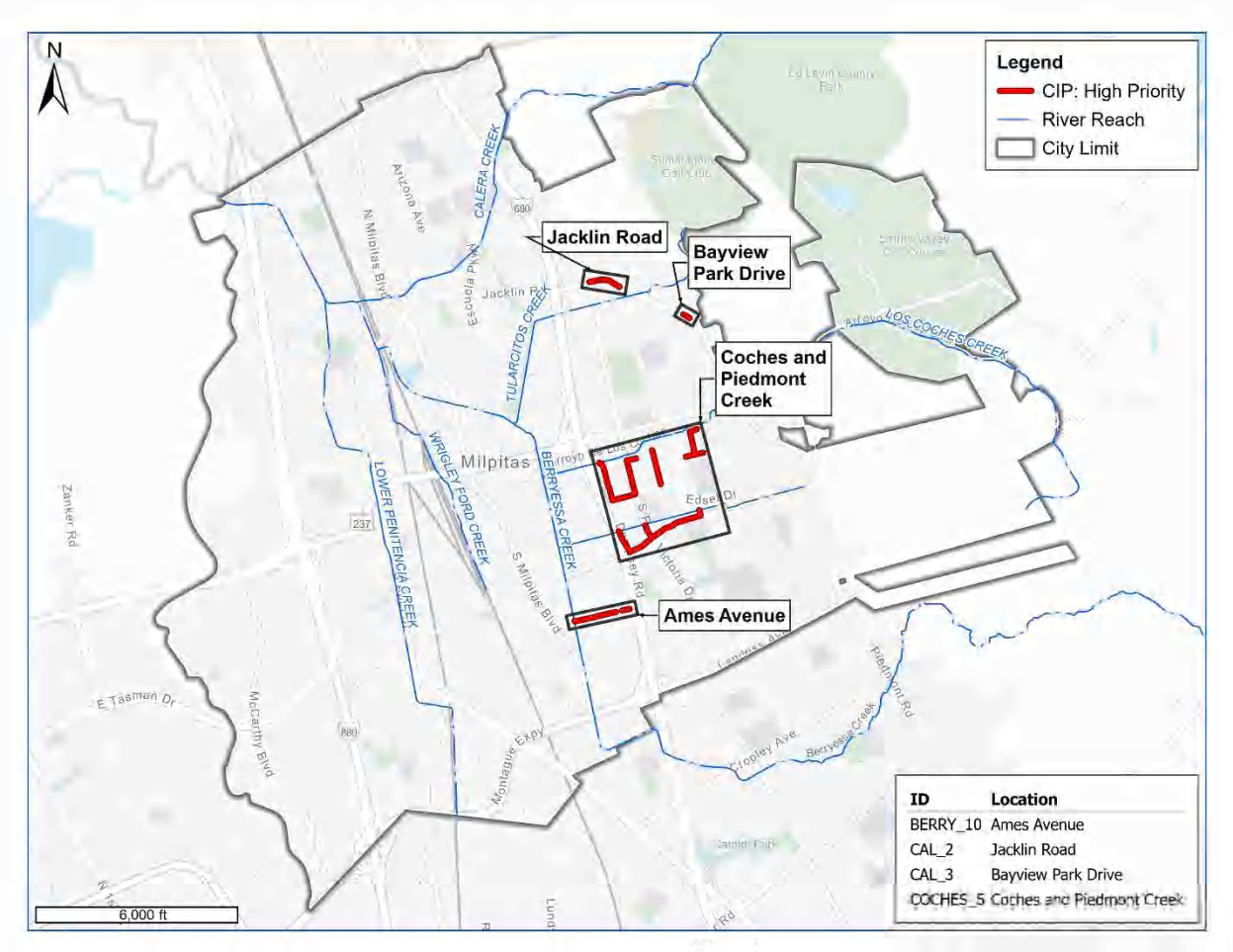



**Figure ES-1: High Priority CIP**

**Table ES-1: Capital Improvement Program Costs**

| Category | Cost |
|---|---|
| High Priority CIP | $14,000,000 |
| Low Priority CIP | $24,000,000 |
| Extension CIP | $1,000,000 |
| Total Budget | $39,000,000 |

**Table ES-2: Summary of Storm Drainage Budget Requirements**

| Category | Present Worth | Annualized Cost |
|---|---|---|
| High Priority Capital Improvements | $14,000,000 | $800,000 |
| Long-Term Equipment Replacement | $48,000,000 | $2,700,000 |
| Annual Operations and Maintenance | | $1,800,000 |
| Total Budget | $62,000,000 | $5,000,000 |

## Work Products

The updated master plan intends to function at several levels. City planners and engineers responsible for capital improvements should find that this document contains sufficient background information and data to serve as a basis for CIP implementation and/or modification. For those city staff and other parties interested in a more in-depth examination of storm drain facilities within Milpitas, the companion InfoWorks ICM model is available.

## Comparison to Previous Master Plan

This updated master plan and corresponding CIP differs from previous master plans due to the ICM model, which integrates updated rainfall and a different hydrologic methodology as described herein. Additionally, the model accounts for surface storage within streets and other open spaces and the precise timing of coincident creek discharges, which was not directly accounted for in previous master plans. These updates generally result in less flooding at the desired level of service and fewer CIP projects to meet the city's storm drainage criteria. Figure ES-2 depicts the CIP from the 2013 master plan for reference.

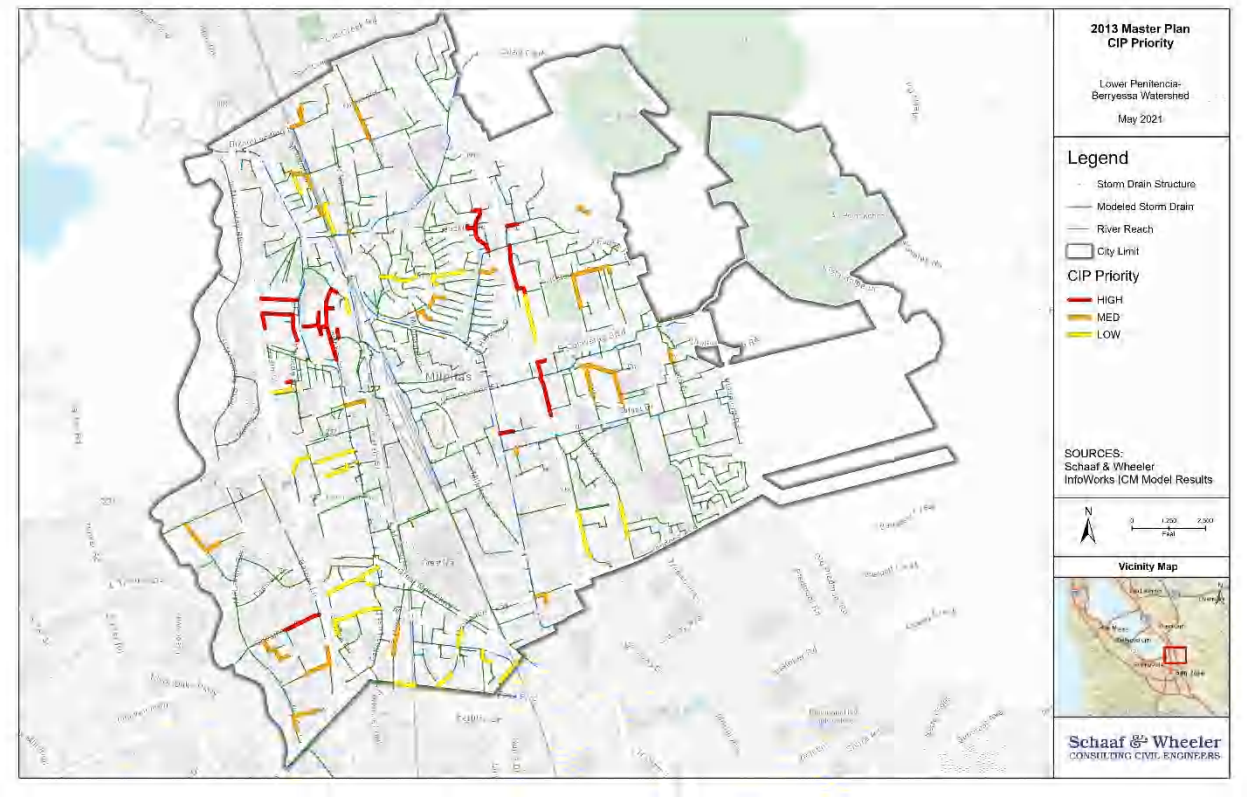



**Figure ES-2: 2013 Master Plan CIP Priority**

# Chapter 1: Introduction

Milpitas completed a comprehensive storm drain master plan in 2001, which was last updated in 2013. This effort represents a substantially new evaluation of Milpitas' storm drain systems and floodplains using tools developed in conjunction with Santa Clara Valley Water District (Valley Water) as part of the Cooperating Technical Partner (CTP) program sponsored by the Federal Emergency Management Agency (FEMA). Under that program, the interaction of storm drains and floodplains within the combined Berryessa Creek and Lower Penitencia Creek watersheds was studied to complete updated flood hazard mapping.

This storm drain master plan update takes advantage of the work completed with Valley Water but adds further detail to comprehensively evaluate storm drain system performance in addition to flood hazard mapping. This master plan focuses on storm drainage infrastructure, while acknowledging that storm drain performance is fully intertwined with floodplain behavior during extreme stormwater runoff events.

This document is a guide for the City of Milpitas (City) to implement a prioritized capital improvement program (CIP) and secure sufficient funds for annual operation and maintenance, and long-term system replacement. This document represents an updated and complete storm drain master plan. Key objectives of this SDMP update include:

- Updating the geographical information systems (GIS) to include pipelines 12 inches and greater in diameter throughout the entire city to reflect all storm drain projects and operational improvements completed by the end of 2020, as well as any changed land uses.
- Utilizing the ICM program to create an integrated hydrologic and hydraulic model that accounts for surface storage and routing and the coincident timing of water surface elevations within the major streams and drainage ways.
- Preparing an updated Capital Improvement Program that remediates identified system deficiencies and provides for underserved areas within the Specific Plan Areas of Milpitas Metro and Main Street Gateway (previously TASP and Midtown).
- Updating projected capital improvement, operations, maintenance, and replacement schedules and costs.

## Authorization

Schaaf & Wheeler Consulting Civil Engineers, Inc. prepared this updated Stormwater Master Plan for the city of Milpitas in accordance with the provisions of an agreement executed by the city in November 2019.

## Study Area

Milpitas is located near San Francisco Bay in what is colloquially referred to as Silicon Valley. Downtown San José is eight miles to the south; San Francisco is about 45 miles to the northwest. The boundary that separates Santa Clara County from Alameda County also forms the northern border between Milpitas and neighboring Fremont. Incorporated Milpitas encompasses 13.5 square miles, all within the 315 square mile Coyote Creek watershed. Placing Milpitas within its regional context (Figure 1-1) demonstrates that events occurring well outside of the city proper can potentially impact flood risks within Milpitas. However, as stated previously, this master plan focuses on the impacts of events occurring within the city itself.

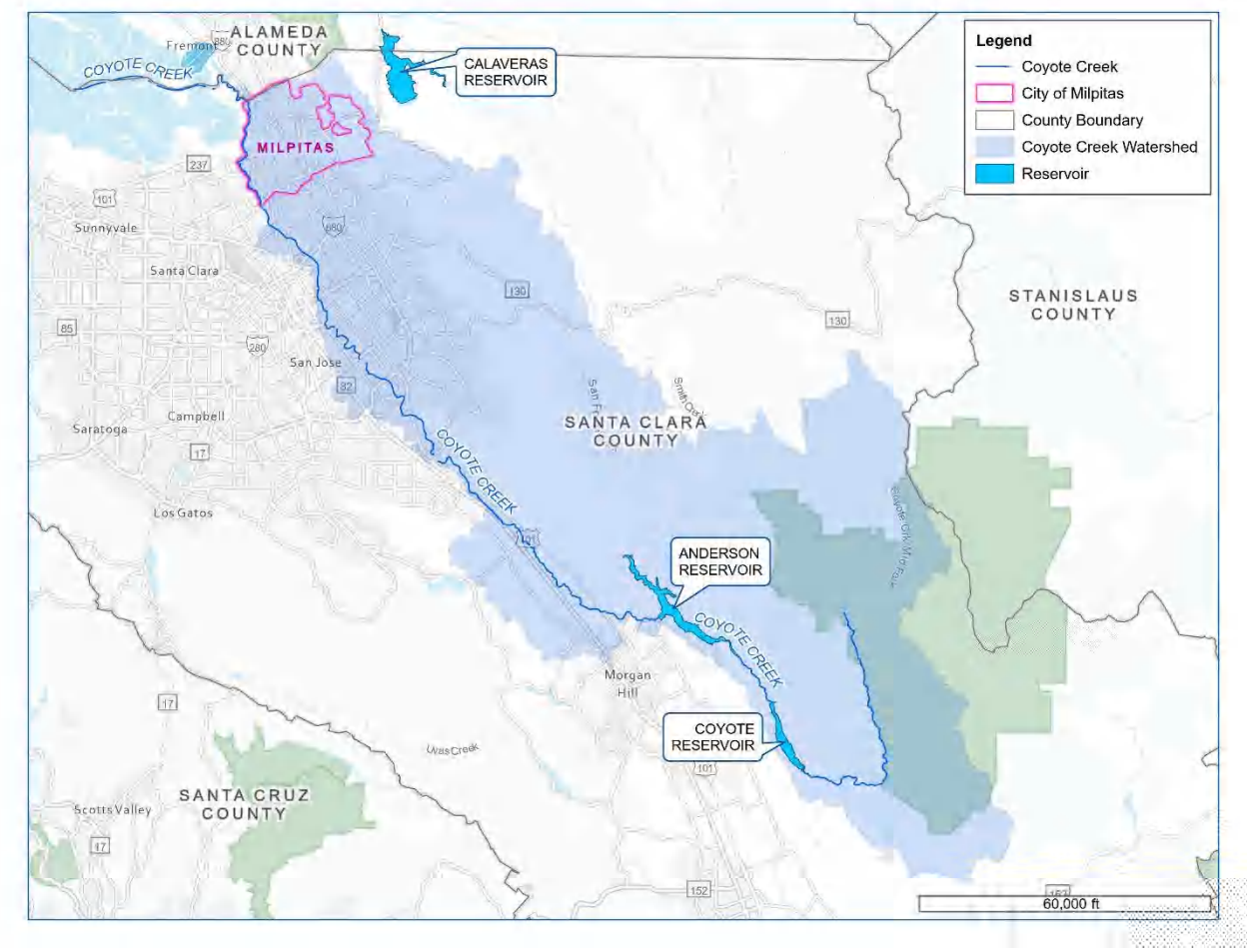



**Figure 1-1: City of Milpitas within the Coyote Creek Watershed**

## Climate

Milpitas has a mild Mediterranean climate with average temperatures ranging from 46°F in the winter to 71°F in the summer. From May to October, there is virtually no chance of precipitation within the area, but winters can be cool and moist. Rainfall is the only significant cause of stormwater runoff (significant snowfall is extremely rare), averaging 14 inches per year near the bay, up to 18 inches annually near the eastern ridgeline.

Most precipitation events in the Milpitas area are either orographic when moist air is lifted over the hills, then cools and condenses, or cyclonic, where rain is with air masses' movement from higher barometric pressure regions to lower pressure. Cyclonic events can also be caused by frontal activity. Warm fronts are generally associated with broad bands of relatively low-intensity rainfall, while higher rainfall intensifies typify cold fronts. Convective precipitation (e.g., thunderstorms) caused by air heating at the ground often leads to too intense localized storms, but it is not common in this area.

## Physiography

The city lies at the Diablo Range base, extending from its foothills on an alluvial plain of the Santa Clara Valley toward San Francisco Bay. Almost half of the city is east of Interstate 680, where elevations vary from about 40 feet mean sea level (MSL) at Evans Road to nearly 800 feet at Monument Peak just west of Calaveras Reservoir. Once on the valley floor, the land falls away from the hill's base toward the west and approaches sea level along the bay.

Soil deposits on the valley floor are characteristic of alluvial fan development. Calera, Tularcitos, Los Coches, and Berryessa Creeks deposited older fans of coarse sand and gravel at the foothill's base. Throughout the city center, younger clays deposited between the creeks are interspersed with smaller amounts of old San Francisco Bay mud. At the western limits of Milpitas, Coyote Creek deposits are found along the edge of alluvial fan deposits from Lower Penitencia Creek. A majority of the soil within Milpitas is either clay or clayey loam with very low infiltration rates when wetted and has a high runoff potential. At the western city limits near Coyote Creek, some soil is loamier with better infiltration characteristics and a moderate to high runoff potential.

## Land Development and Drainage Characteristics

Urbanization tends to increase the rate of runoff generated from local precipitation. Once primarily agricultural with an economy dominated by fruit and vegetable growers, Milpitas has evolved into a more fully urban community. Urbanization is generally confined between Coyote Creek to the west and the Calaveras Foothills to the east. Although some selected hillside development is allowed in the city's General Plan, the hillside area (which comprises almost one-half of the city) is generally zoned for permanent open space, including the Ed Levin Regional Park. The western one half of the city has developed as a mix of residential, commercial, and industrial development, with parks, schools, and greenbelts woven into the urban fabric. Future growth in Milpitas, particularly non-hillside residential will tend to be infill development which will become denser as property values escalate. Recent land-use changes and growth are concentrated within the Main Street Gateway and Milpitas Metro areas. Therefore, storm drain systems serving these tributary areas are the most potentially impacted by new development.

A system of underground pipes and a network of street gutters collect storm runoff in Milpitas. Local runoff flows into creeks and channels that run through the city, ultimately discharging to San Francisco Bay. Drainage in Milpitas generally is from the southeast to the northwest. Storm drain systems closer to the Bay also tend to rely heavily upon pumping facilities to move water.

## Concurrent City Planning

The city of Milpitas has concurrent planning efforts focused within the Main Street Gateway and Milpitas Metro Specific Plan areas. These specific plans focus on the new BART station and downtown areas where infill development has occurred or is planned. Generally, impervious surface does not increase with infill development, so the impacts of the specific plan areas would be based on realigned roads or identifying currently underserved areas where parcels drain by gravity to the street frontage. Improvements associated with these underserved areas are described herein. At the time of this study, plans for new or re-routed city roadways had not been developed.

The city has developed a green stormwater infrastructure (GSI) plan as required under the NPDES Municipal Regional Permit Section C.3.j. The plan relies on information produced in the Santa Clara Basin Stormwater Resource Plan. Opportunities to combine green infrastructure with capacity projects are considered in the stormwater improvements identified in this study.

## Work Products

As discussed in subsequent sections, the following information is available via GIS:

1. ***Inventory of Drainage Facilities.*** Information pertaining to each system component may be accessed graphically through GIS or numerically using the ICM model.
2. ***Tributary Drainage Areas.*** Land areas used to generate local runoff are available in GIS and tabular format with tributary areas, runoff coefficients, and concentration times.
3. ***Ground Surface.*** Ground surface information based on Countywide 2006 LiDAR, updated with available modified ground surface data from developments constructed between 2006 to 2018, is available in raster format.

# Chapter 2: Methodologies

Criteria used to design storm drain systems and evaluate their performance must be defensible yet simple to understand and apply. Ideally, future infrastructure design will use the same criteria used to analyze system performance. As discussed in this chapter and the next, storm drain design criteria set forth by Milpitas in its July 15, 2010 standards and the Santa Clara County Drainage Manual (2007) are used in this master plan; some additional provisions as discussed herein.

An integrated hydrologic and hydraulic InfoWorks ICM model representing storm drain systems, creeks, and ground surface throughout Milpitas was constructed using data from the city and Valley Water and gathered in the field. This model uses a design storm event and land-use-based runoff coefficients to generate runoff from the surface areas tributary to each collection system. The hydraulic capacity of each drainage system component is calculated and resulting overflows to the two-dimensional surface are reviewed to confirm whether city drainage system performance criteria are met. If the existing storm drainage system does not meet specific criteria, the model is then used to establish the capital improvement(s) needed so that those criteria are completed based on the capital improvement priority system described in Chapter 3.

## Data Sources

The comprehensive master plan model was built upon an integrated hydrologic and hydraulic ICM storm drain system model previously created by Schaaf & Wheeler and Wood Rodgers under a Cooperating Technical Partnership (CTP) between Valley Water and FEMA. The CTP model built is based on as-built plans, field surveys, LiDAR and aerial surveys, photos, improvement plans, other data documents, and field investigations. The model has been calibrated to the design storm and validated with stream gauge data of historical events.

For the comprehensive master plan, Schaaf & Wheeler updated the CTP model with data provided by the city of Milpitas in the form of GIS shapefiles of the storm drain network received 04/02/2020. The purpose was to incorporate changes in the storm drain network and include pipes 12 inches in diameter or greater. The CTP model only had pipes 18 inches in diameter or greater. To fill in any new, missing, or conflicting information, Schaaf & Wheeler consulted record drawings for street improvements or tracts as needed. All elevations have been converted to the National Adjusted Vertical Datum of 1988 (NAVD) to match the most currently available LiDAR-based citywide topography.

The most common data transformation involves the conversion of the National Geodetic Vertical Datum of 1929 (NGVD):

NGVD +2.78 feet = NAVD (88).

Sub catchment parameters of the model are based on the current land use data provided by the city in form of GIS shapefile called “ZonedParcels2012”. This is most current land use information available to characterize existing land surfaces. Aerial maps have been used to assign land use for areas not defined by the city parcel data and for recent development since 2012. Future zoning information could be used to analyze land use changes, but future land uses almost uniformly have lower percentages of impervious surface. This master plan does not rely on potential reductions in runoff that may not come to fruition.

Information regarding pump station operation has been obtained from record drawings and information from the 2013 master plan update, corroborated by conversations with City operations and maintenance staff in 2020.

# Modeling Software

## INFOWORKS ICM

InfoWorks ICM by Innovyze is a GIS-based, integrated modeling platform that incorporates both urban and river catchments. The integration of 1D and 2D hydrodynamic simulation techniques allows the modeling of both the above- and below-ground elements of catchments to represent all flow paths accurately.

# Hydrology

## Design Storm

Flood frequency analyses are used to design facilities that control storm runoff since it is impossible to anticipate every conceivable storm's effect. A common practice that both the Milpitas and Santa Clara County standards follow is constructing a design storm. A rainfall pattern is used in hydrologic models to estimate surface runoff – and compare the surface runoff to the capacity of drainage systems designed to convey this runoff to major facilities outside of the city's jurisdiction.

Precipitation-runoff frequency analyses are based on concepts of probability and statistics. Engineers generally assume that a rainfall event's frequency (probability) coincides with direct stormwater runoff frequency. However, the runoff generation depends on several factors (particularly antecedent moisture conditions in the drainage basin) not necessarily dependent upon the precipitation event.

The 10-year storm recurrence interval is used as the design storm to evaluate the flood control systems for this master plan. It is worth noting that over the typical 30-year life of a home mortgage, the chance of experiencing at least one 10-year event is about 96 percent.

The 100-year storm recurrence interval is used as the design storm to evaluate if pump stations have sufficient capacity. A 100-year design storm is assumed to evaluate pump stations as critical facilities where gravity conveyance is not possible and flooding is likely to remain for extended periods.

## Design Storm Duration

A 24-hour storm duration determines the governing design storm event and the conservative operational conditions of the city's drainage facilities. This storm duration is for the following reasons:

1. The 24-hour duration is a standard for many local, state, and federal agencies.
2. The 24-hour duration is short enough to be consistent with the watershed size and long enough to create volume-induced flood problems in the watershed. The 24-hour storm duration generally results in the most extensive floodplain relative to other storm durations within the local historical record.

## Design Storm Rainfall Depths

Design rainfall depths are calculated using the TDS Regional Equation provided by Valley Water:[1]

$$P_{f,d} = A_{f,d} + B_{f,d}(MAP) \quad \text{Equation 1}$$

Where:

$P_{f,d}$ Precipitation depth for a given storm frequency, f and duration, d, in inches

$A_{f,d}$ & $B_{f,d}$ Regression constants and coefficients

MAP Mean annual precipitation, in inches

Af,d and Bf,d values used are displayed below in **Error! Not a valid bookmark self-reference.**-1 and Table 2-2, which are provided by Valley Water as well.

**Table 2-1: $A_{f,d}$ and $B_{f,d}$ Values for Design Rainfall Depth Equation**

| Frequency | Recurrence Interval (Yr) | $A_{f,d}$ | $B_{f,d}$ |
|---|---|---|---|
| | | 24 Hr | 24 Hr |
| 10% | 10 | 0.0028 | 0.1653 |

The resultant design rainfall depths from Equation 1 are displayed in Table 2-2.

**Table 2-2: 24-hour Duration Design Storm Depth per MAP**

| MAP (in) | 24-hour Design Rainfall Depth (in) |
|---|---|
| | 10-Year |
| 12 | 1.99 |
| 13 | 2.15 |
| 14 | 2.32 |
| 15 | 2.48 |
| 16 | 2.65 |
| 17 | 2.81 |
| 18 | 2.98 |
| 19 | 3.14 |
| 20 | 3.31 |
| 21 | 3.47 |

The resultant design rainfall depths from Equation 1 are displayed in Table 2-3.

[1] SCVWD 2013: Precipitation Gage Data and Depth-Duration-Frequency Analysis. Revised from Saah et al. 2004

**Table 2-3: 24-hour Duration Design Storm Depth per MAP**

| MAP (in) | 24-hour Design Rainfall Depth (in) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2-Year | 5-Year | 10-Year | 25-Year | 50-Year | 100-Year | 200-Year | 500-Year |
| 12 | 1.26 | 1.72 | 1.99 | 2.30 | 2.51 | 2.71 | 2.91 | 3.15 |
| 13 | 1.37 | 1.86 | 2.15 | 2.49 | 2.72 | 2.93 | 3.14 | 3.40 |
| 14 | 1.48 | 2.01 | 2.32 | 2.67 | 2.92 | 3.15 | 3.37 | 3.65 |
| 15 | 1.59 | 2.15 | 2.48 | 2.86 | 3.12 | 3.37 | 3.60 | 3.89 |
| 16 | 1.70 | 2.30 | 2.65 | 3.05 | 3.32 | 3.58 | 3.83 | 4.14 |
| 17 | 1.81 | 2.44 | 2.81 | 3.24 | 3.53 | 3.80 | 4.06 | 4.39 |
| 18 | 1.92 | 2.59 | 2.98 | 3.42 | 3.73 | 4.02 | 4.29 | 4.63 |
| 19 | 2.03 | 2.74 | 3.14 | 3.61 | 3.93 | 4.23 | 4.52 | 4.88 |
| 20 | 2.14 | 2.88 | 3.31 | 3.80 | 4.14 | 4.45 | 4.75 | 5.13 |
| 21 | 2.25 | 3.03 | 3.47 | 3.99 | 4.34 | 4.67 | 4.98 | 5.38 |

## Design Storm Temporal Distribution

The 24-hour design storm temporal distribution obtained from Valley Water is displayed as Figure 2-2 below. The temporal rainfall distribution is for a 24-hour design storm with 15-minute intervals.

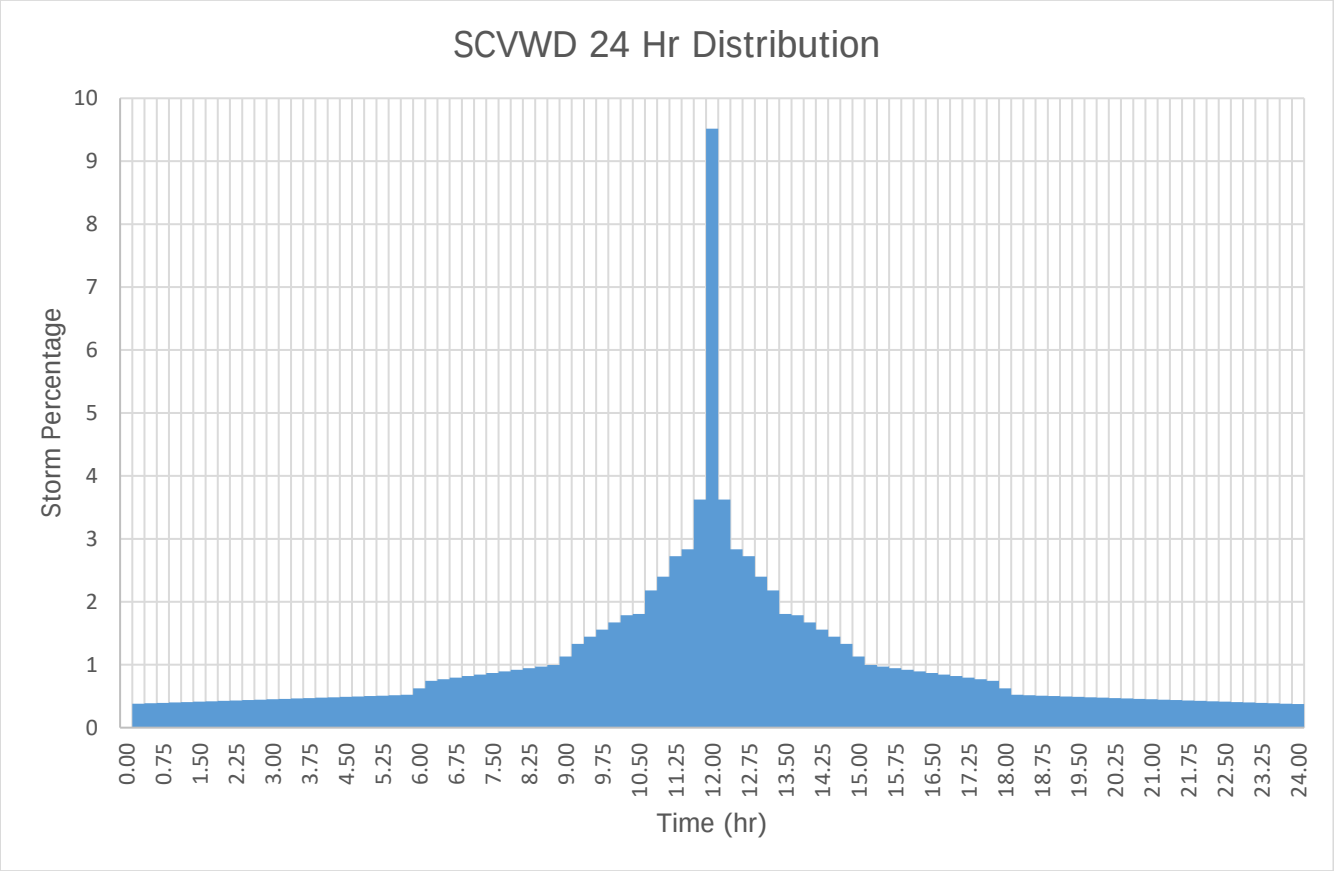



**Figure 2-1: Valley Water 24hr Storm Distribution**

## Historical Storm

Schaaf & Wheeler used the December 11, 2014, a historical event, to validate the Lower Penitencia-Berryessa and Upper Penitencia watershed Model as part of the CTP program. This storm produced 1.2 inches of rain in 3.0 hours, 2.0 inches of rain fell in 12.0 hours, and 3.7 inches of rain fell in 24 hours period in San Jose. The estimated storm recurrence interval based on these depths varies from a 10-year 3-hour, a 5-year 12-hour, and a 100-year 24-hour interval, respectively, for a MAP of 18 inches. This 18-inch MAP is the average for Lower Penitencia-Berryessa and Upper Penitencia watersheds. The December 2014 storm event was one of the most intense urban rainfall events in recent memory, surpassing the wet year of 2016-2017.

It should be noted that based on the response time of the Lower Penitencia-Berryessa and Upper Penitencia watershed (approximately 1 hour), the durations between 3 hours and 12 hours are the most relevant for this study.

In addition, the February 16-20, 2017 event is used to validate the model. Approximately 1.2 inches of rain fell over 3 hours, and 2.7 inches of rain fell in 24 hours. The estimated storm recurrence interval based on these depths varies from a 2-year, 3-hour storm to a 2-year, 24-hour storm.

# Rainfall/Runoff Transformation Method

Described below is the methodology for the transformation of the precipitation into the stormwater runoff. The general steps to transform rainfall into runoff are:

1. Apply a loss method to convert rainfall distributions into excess rainfall. The method is done by accounting for the portion of rainfall from the sky lost to surface depressions, evaporation, and soil infiltration. The amount of precipitation that is lost will not result in direct runoff. Losses also vary over time during a storm. For example, as wetted soil becomes more saturated, losses decrease, and more rainfall becomes surface runoff. Losses are a function of land use and soil conditions.

2. Transform the excess rainfall into surface runoff using the hydrograph methods subsequently described.

3. Route surface runoff hydrographs through the storm drain and creek systems. Where stormwater flows exceed a storm drain or creek's hydraulic capacity, some portion of the runoff hydrograph will be carried over the ground surface. The timing and depth of this overland flow produce flood hazard mapping.

## Hydrograph Method

The transformation of rainfall into runoff can be calculated in a model using various methods. In the detailed regional calibration efforts for smaller urban watersheds that were conducted with Valley Water, Alameda County Public Works Agency (ACPWA), and the city of San Jose, Valley Water it concluded that hydrographs using the Kinematic Wave (KW) method best match recorded flows for the smaller urban watershed (less than 100 acres). For larger, rural, and hilly watersheds, hydrographs using the Snyder Unit Hydrograph (Snyder UH) match recorded flows well. Still, hydrographs using KW methods diverged from those developed using the Snyder UH and the recorded gauge data.

Therefore, the KW method is used for smaller urban watersheds less than 50 acres in size only, and the Snyder UH method is used for all other catchments within the study area.

The combination of the small urban and large rural or open space watersheds in the Lower Penitencia-Berryessa and Upper Penitencia Watershed drainage systems warrant both KW and Snyder's use of UH methods as described above.

## Loss Method

The Horton Loss Rate Method reflects the effects of infiltration in the model because of its initial loss decay and recovery features. The method is also well documented by the Environmental Protection Agency (EPA) and has been used successfully throughout Alameda County, Redwood City, and other Bay Area agencies. Table 2-4 lists the reasonable range of parameters recommended by the EPA.

Infiltration rate ranges from Alameda County (see Table 2-5) are also considered and used in the calibration because of the proximity and geologic similarity to the Lower Penitencia-Berryessa and Upper Penitencia watersheds. These parameters have been calibrated for Alameda County and reflect local soil characteristics in Milpitas.

Horton Loss Equation:[2] $f_p = f_c + (f_0 - f_c)\, e^{-\beta t}$

where:

$f_p$ = Infiltration Capacity
$f_c$ = Constant Rate
$f_0$ = Maximum Infiltration Rate
$\beta$ = Decay constant

**Table 2-4: Horton Loss Equation Parameters[3]**

| Hydrologic Soil Group | Max. Infiltration Rate Range | Min. Infiltration Rate Range | Decay Const. Range | Drying Time Range |
|---|---|---|---|---|
| | (in/hr) | (in/hr) | (1/hr) | (days) |
| A | 5-10 | >=0.45 | 2-7 | 2-14 |
| B | 4-8 | 0.30-0.15 | 2-7 | 2-14 |
| C | 3-6 | 0.15-0.05 | 2-7 | 2-14 |
| D | 1-2 | 0.00-0.05 | 2-7 | 2-14 |

**Table 2-5: Alameda County Loss Parameters [4]**

| Hydrologic Soil Group | Min. Infiltration Rate Range |
|---|---|
| | (in/hr) |
| A | >=0.45 |
| B | 0.35-0.40 |
| C | 0.14-0.25 |
| D | 0.05-0.09 |

The Horton Loss Rate Method can be used for both single-event design storms and continuous simulations with multiple intermittent storms because the initial loss capacity can be recovered. Antecedent soil moisture conditions and the soil storage saturation level before a storm were analyzed before determining the continuous storm simulation's appropriate initial loss rate.

[2] Handbook of Hydrology, David R. Maidment, 1993

[3] Storm Water Management Model User's Manual, Version 5.0, EPA, Revised July 2010

[4] Alameda County Hydrology and Hydraulics Manual, ACPWA, 2003

## Imperviousness

The percentages of directly connecting impervious surface, non-directly touching impervious surface, and porous surface for each land-use shown in Table 2-6 are determined by sampling five areas of the same land use and identifying the average percentage for each surface type. Directly connected impervious surfaces drain the city storm drain system with limited surface attenuation, such as driveways, street pavements, and sidewalks. Non-directly is connecting impervious areas within a sub-basin experience more peak flow attenuation by flowing across pervious surfaces before entering the storm drain. These are mostly roofs that are collected by gutters and discharge to previous lawns.

**Table 2-6: Land Use Percent Impervious**

| LAND USE TYPE | Impervious (%) | | Pervious (%) |
|---|---|---|---|
| | Directly Connecting | Non-Directly Connecting | Area |
| Hillside Very Low Density (HVL): up to 1 unit/10gross acres | 2 | 2 | 96 |
| Hillside Low Density (HDL): up to 1 unit/gross acre | 5 | 6 | 89 |
| Hillside Medium Density (HMD): up to 3 units/gross acre | 9 | 37 | 54 |
| Single Family Low Density (SFL): 3-5 units/ gross acre | 17 | 59 | 24 |
| Single Family Medium Density (SMD): 6-15 units/gross acre | 20 | 56 | 24 |
| Multi-Family Residential Medium Density (MFM): 7-11 units/gross acre | 5 | 58 | 37 |
| Multi-Family Residential High Density (MFH): 12-20 units/gross acre | 33 | 37 | 30 |
| Multi-Family Residential, Very High Density (VHD): 31-40 units/gross acre | 52 | 34 | 14 |
| Urban Residential (URR): 41-75 units/gross acre | 32 | 48 | 20 |
| Mobile Home Park (MHP) | 22 | 72 | 6 |
| Residential Retail High Density Mixed Use (RRMU) | 24 | 64 | 12 |
| Boulevard Very High-Density Mixed Use (BVMU) | 40 | 43 | 17 |
| General Commercial (GNC) | 65 | 24 | 11 |
| Town Center (TWC) | 56 | 36 | 8 |
| Industrial Park (INP) | 46 | 23 | 31 |
| Public Facilities (PF) | 32 | 30 | 38 |
| Parks and Open Space (POS) | 7 | 3 | 90 |

# Hydrograph Method Parameters

## Kinematic Wave

Based on calibration efforts conducted by the ACPWA that were reviewed with the city of San Jose, the KW method was selected for this project as the hydrologic transformation method for small urban sub-basins up to 50 acres in size.

The use of the KW method requires developing watershed parameters that result in consistent, reproducible results; because of the need to simplify the models enough to meet the software, hardware, and data management constraints, applying the KW method to watersheds that vary in size from about 3 acres to 50 acres. Therefore, some modification of KW method parameters is necessary, noting parameters have been carefully vetted during the calibration process to confirm their validity.

For example, the KW method requires a representative watershed "plane" width (Figure 2-6), overland flow length, and slope. In small watersheds, these planes would represent a row of residential lots draining to the street. In larger watersheds, the planes would represent a group of lots and streets draining to a central conveyance. In most cases of larger watersheds, the plane width was assumed to be twice the central conveyance's length, thus representing two planes draining to the central conveyance from each side.

Since this approach (two planes draining to each side of the central conveyance) does not explicitly account for the routing of the runoff in the central conveyance, the resistance parameters used have been carefully calibrated to account for this. They are expressed as overland flow roughness factor, N, developed from the *HEC-1 User Manual*, 1990, Table 12.1. (Table 2-7). Watersheds are broken down into small sub-catchments with a single plane as much as possible to reduce the impact of this simplification.

The KW method parameters include shed area, flow length, watercourse slope, and percent imperviousness. In contrast, the Horton Loss Rate parameters include maximum infiltration losses (initial loss rate) and minimum infiltration capacity (uniform loss rates).

**Table 2-7: Kinematic Wave Method Resistance**

| Surface | N value | Source |
|---|---|---|
| Asphalt/Concrete | 0.05-0.15 | Harley (1975) |
| Bare Packed Soil Free of Stone | 0.10 | Hathaway (1945) |
| Fallov - No Residue | 0.008-0.012 | Engman (1986) |
| Convential Tillage - No Residue | 0.06-0.12 | Engman (1986) |
| Convential Tillage - With Residue | 0.16-0.22 | Engman (1986) |
| Chisel Plow - No Residue | 0.06-0.12 | Engman (1986) |
| Chisel Plow - With Residue | 0.10-0.16 | Engman (1986) |
| Fall Discing - With Residue | 0.30-0.50 | Engman (1986) |
| No Till - No Residue | 0.04-0.10 | Engman (1986) |

| Surface | N value | Source |
|---|---|---|
| No Till (20-40 percent residue cover) | 0.07-0.17 | Engman (1986) |
| No Till (60-100 percent residue cover) | 0.17-0.47 | Engman (1986) |
| Sparse Rangeland with Debris: 0 Percent Cover | 0.09-0.34 | Engman (1986) |
| Sparse Rangeland with Debris - 20 Percent Cover | 0.05-0.25 | Engman (1986) |
| Sparse Vegetation | 0.053-0.13 | Woolhiser (1975) |
| Short Grass Prairie | 0.10-0.20 | Woolhiser (1975) |
| Poor Grass Cover on Moderately Rough Bare Surface | 0.30 | Hathaway (1945) |
| Light Turf | 0.20 | Harley (1975) |
| Average Grass Cover | 0.40 | Hathaway (1945) |
| Dense Grass | 0.17-0.30 | Palmer (1946) |
| Bermuda Grass | 0.30-0.48 | Palmer (1946) |
| Dense Shrubbery and Forest Litter | 0.40 | Harley (1975) |

## Snyder Unit Hydrograph

Based on calibration efforts conducted by the ACPWA that were reviewed with the city of San Jose, the Snyder UH method is selected as the hydrologic transformation method for large sub-basins greater than 50 acres in size. The Snyder UH method is especially appropriate in open space because of the proper application as described previously.

Snyder UH Equation:[5] $Q_p = 640 * C_p * A / t_L$

Where:

$Q_p$ = Peak discharge of the unit hydrograph (cfs)
$C_p$ = storage coefficient / peaking factor
A = Drainage Area (sq mi)
$t_L$ = basin lag time (hr)

The selected Snyder UH method is the ACPWA revised version of the standard Snyder UH documented in HEC-1 and HEC-HMS. ACPWA revised the method based on historical calibration efforts performed in Alameda County, which has similar meteorological characteristics as Santa Clara County.

[5] Handbook of Hydrology, David R. Maidment, 1993

The two major input parameters of the method are Basin Lag Time and Basin Peaking Factor. The Basin Lag Time (see Equation 13) is based on the calculated Basin Roughness (see Equation 12) using the main watercourse Manning's *n* within a sub-basin.

**TABLE 6 BASIN ROUGHNESS FACTORS FOR RURAL WATERSHEDS**

| Basin Type | Basin Roughness Factor (*N*) |
|---|---|
| 1. Rural watersheds with generally clear stream bed and minimal vegetation growth in the drainage reaches. | 0.05 |
| 2. Rural watersheds with moderate to high levels of vegetation growth, or rock and boulder deposits within the main drainage reaches. | 0.07 |
| 3. Rural watersheds with dense vegetation or high levels of boulder deposits within the main drainage reaches. | 0.08 |

(District 2003)

**EQUATION 12 BASIN ROUGHNESS FACTOR FOR URBAN WATERSHEDS**

$$N = 0.3318n^{0.6328} \quad (12)$$

*where:*

$N$ = *basin roughness factor*
$n$ = *Manning's roughness coefficient (from Table 7)*

(District 2003)

**Figure 2-2: Basin Roughness (N) (ACPWA H&H Manual)**

**TABLE 1 MANNING'S ROUGHNESS COEFFICIENT**

| Type of Facility | n |
|---|---|
| **Reinforced Concrete Pipe** | |
| Conduit > 36" diameter | 0.012 |
| Conduit ≤ 36" diameter | 0.014 |
| **Corrugated Metal Pipe** | |
| Annular | 0.021 |
| Helical | 0.013 |
| **Concrete-Lined Channels** | |
| Smooth-troweled | 0.015 |
| District Simulated Stone | 0.017 |
| **Reinforced Concrete Box** | |
| Cast-in-Place | 0.015 |
| Pre-Cast | 0.014 |
| **Earth Channels** | |
| Smooth Geometric | 0.030 – 0.035 |
| Irregular or Natural | 0.045 – 0.050 |

(From 1994, District 1999)

**EQUATION 13 BASIN LAG TIME**

$$t_L = K \cdot N \left( \frac{L \cdot L_c}{\sqrt{S}} \right)^{0.38} \quad (13)$$

Where:

$t_L$ = lag time (hr)
$K$ = distance factor
for $L > 1.7$ mi, $K = 24$
for $L \leq 1.7$ mi, $K = 15.22 + 2.15L + 8.7/L$
If calculated value of $K$ is greater than 30, use $K = 30$
$N$ = basin roughness factor (from **Table 6**, rural watershed or **Equation 12**, urban watershed)
$L$ = length of longest watercourse (mi) (see **Figure 4**)
$L_c$ = length along longest watercourse measured from the point of concentration to a point opposite the watershed centroid (see **Figure 4**)
$S$ = average stream slope (ft / mi from **Equation 11**)

(District 1994)

**Figure 2-3: Manning's n and Basin Lag Time (ACPWA H&H Manual)**

The peaking factor is a function of overland basin storage. Large areas with flat slopes are associated with relatively high amounts of overland basin storage. Conversely, water that falls on steeply sloped areas will run off quickly, with little overland basin storage. The lower the basin storage, the higher the corresponding peaking factor.

**EQUATION 14 BASIN PEAKING FACTOR**

$$C_p = 0.6e^{0.06(S_o/A)} \quad (14)$$

*where:*

$C_p$ = basin peaking factor ($C_p \leq 0.85$)
$S_o$ = average watershed slope (percent from **Attachment 9**)
For $S_o \leq 5\%$, $C_p = 0.6$
$A$ = drainage area ($mi^2$; if $A < 5mi^2$, use $A = 5mi^2$)

(District 1994)

**Figure 2-4: Basin Peaking Factor (ACPWA H&H Manual)**

## Watershed Characteristics

To model the storm drain system and include all pipes 12 inches in diameter and larger, relatively small sub-watersheds have been developed for representation in the models.

The area that contributes runoff to a drainage line within these watersheds is referred to as a "Drainage Area". The smaller sub-watersheds within the Drainage Areas are noted as "Sub-Basins".

Therefore, the hierarchy terminology for watersheds includes:

1. Watersheds – delineating the basin for each major creek system
2. Drainage Areas – delineating the basin for each named drainage line
3. Sub-Basins – delineating the smallest sub-basin for each drainage line

### Watershed Size

Sub-Basins are delineated based on the 2006 topographic LIDAR mapping furnished by Valley Water and the County of Santa Clara, City of San Jose and Milpitas collector system locations, and overland release flow paths. The Sub-Basin size ranges from 0.007 acres in densely developed urban areas to approximately 2,200 acres in undeveloped hilly areas.

The Sub-Basin size ranges from 0.007 acres in densely developed urban areas to approximately 2,200 acres in undeveloped hilly areas.

### Watershed Delineation

Sub-Basins are also delineated based on stream channels and storm drain networks. In the Sub-Basins where the overland flow path and the storm drain network flow path conflicted, the storm drain flow path usually governs, as it usually conveys the most flow.

ESRI ArcMap Hydrology tools condition the input terrain to include underground pipes and channels. This approach ensures that the hydraulically connected pipe systems not modeled (lateral pipes smaller than 12 inches) can be routed to the modeled pipes hydrologically. The conditioned terrain creates sub-basins automatically. Sub-Basins are then further divided to model pipes 12 inches and greater. This approach provides consistent, reproducible watershed delineation results.

### Basin Width

For sub-basins using the KW method, a representative watershed "plane" width needs to be determined. Each sub-basin is classified as either a 2 plane KW or 1 plane KW, shown in Figure 2-6, based on the distance (d), which is the shortest distance between the sub-basin centroid to the longest flow path. If d is relatively small, then the sub-basin is classified as a 2 plane KW, assuming it is the longest flow path runs relatively down the center of the sub-basin; thus, there is 1 KW plane draining from each side of the longest flow path. If d is relatively large, the sub-basin is classified as a 1 plane KW, assuming it is the longest flow path is relatively located along the sub-basin side; thus, there is only 1 KW plane draining into the longest flow path from only one side.

An algorithm can classify the sub-basins automatically. The following calculations are performed using the centroid flow path ($L_c$), which is the length from sub-basin centroid to the sub-basin drainage node along the longest flow path.

Assume 2 plane KW – width ($W_2$),

$$W_2 = 4L_c$$

Assume 1 plane KW – width ($W_1$),

$$W_1 = 2L_c$$

The minimum of |d-0.33$W_1$| and |d-0.33$W_2$| controls whether 1 plane or 2 plane KW, and the appropriate width calculated will be used as the representative watershed "plane".

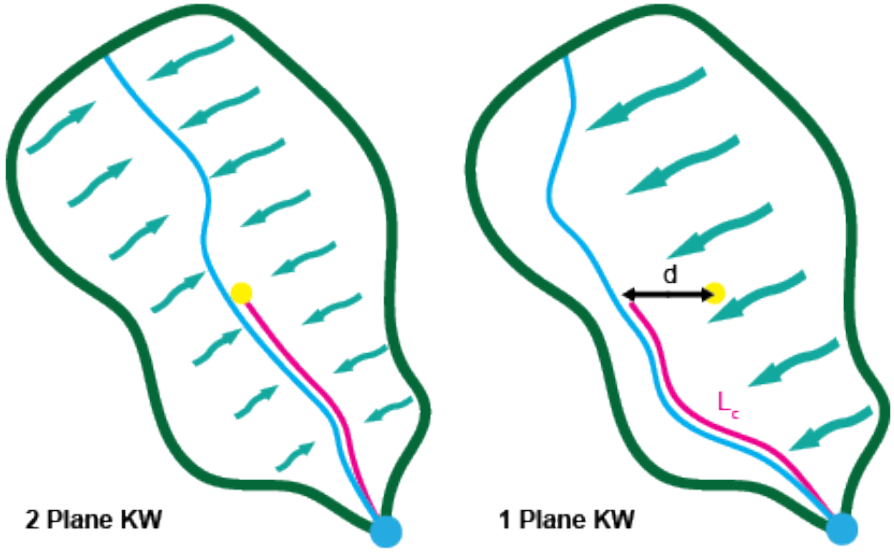



**Figure 2-5: KW Planes**

## Watershed Soils

The National Resource Conservation Service (NRCS) soil survey and map information identifies soils in hydrologic soil groups based upon their infiltration properties.

Hydrologic soil groups "A," "B," "C," "C/D," and "D" are found present within the Berryessa/Penitencia drainage system. Group "A" has a higher infiltration rate than Group "D". "C/D" soils indicate a duality of hydrologic soil conditions. When the groundwater table is seasonably high (less than 24" from the surface), the soil has a "D" type response. When the water table is well-drained (greater than 24" from the surface), the soil has a "C" type response. The open space areas in the eastern portion of the Study area have more Groups "C" and "D". The urban areas along Upper Penitencia, Lower Penitencia, and Berryessa Creeks are mostly undetermined soil groups and are calibrated and validated under Valley Water's previous analysis. Figure 2-7 presents the NRCS Soils Map.

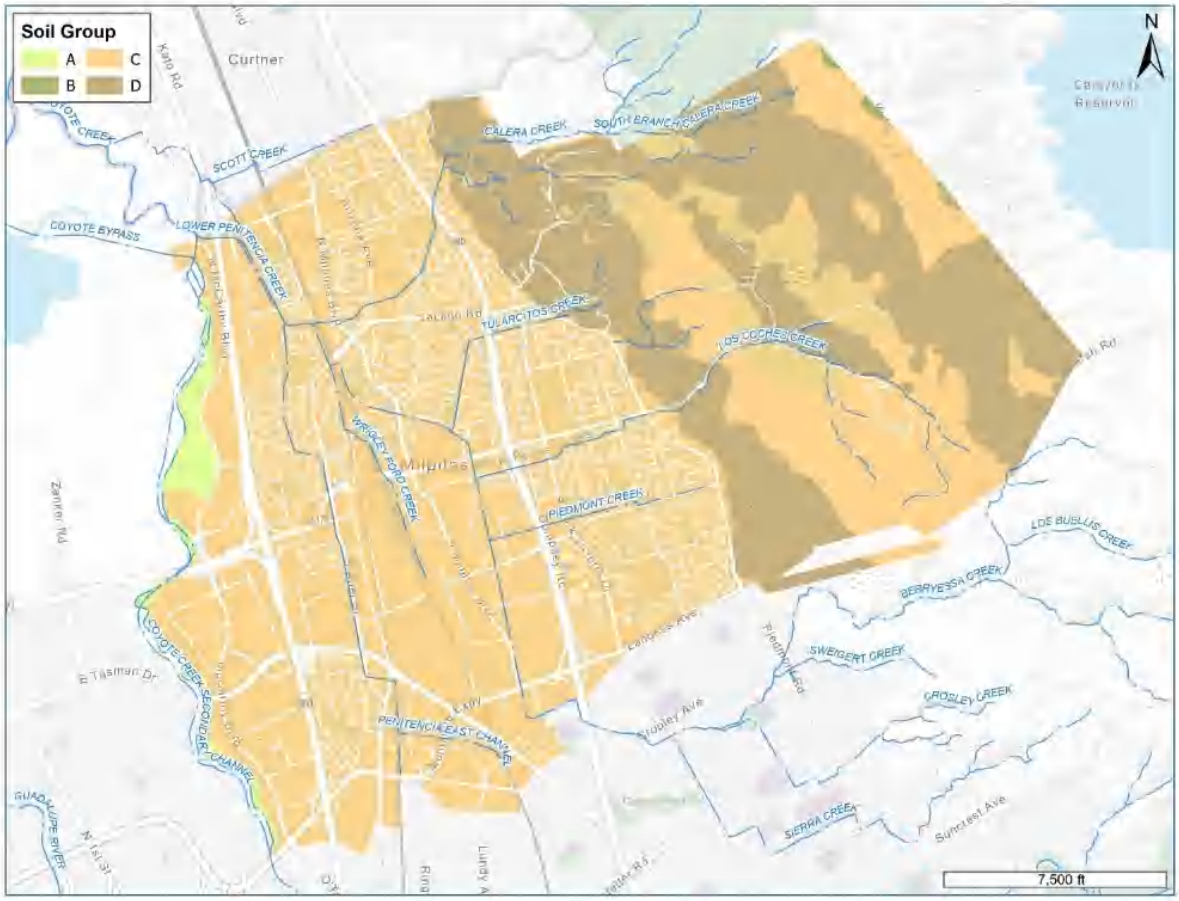



**Figure 2-6: NRCS Soil Classification Map for the Berryessa/Penitencia Watershed**

Each soil type consists of a combination of seven soil groups, A, A/B, B, B/C, C, C/D, D, and the NRCS assigns the dominant hydrologic soil group in the soil survey publication. In the event of an even split of percentages between two soil groups, the soil group with a lower infiltration rate is assigned.

## Loss Rates

The NRCS Soil Group Boundaries are used to calculate each hydrologic soil group's quantity within each watershed. This information is input directly to the model in conjunction with each hydrologic soil group's infiltration properties (defined in Table 2-5).

## Watershed Land Use

The City of Milpitas provided a land-use GIS reflecting the level of development within the city boundary. Each land use category was assigned a value of relative imperviousness based upon Table 2-6. To develop sub-basin-specific hydrology parameters for the KW and Snyder UH methods used a combination of percent imperviousness and underlying soil infiltration regime.

Figure 2-8 shows the land use. Areas with no defined land use in the city's GIS are assigned sub-basin-specific hydrology parameters based on the Esri World Imagery Map.

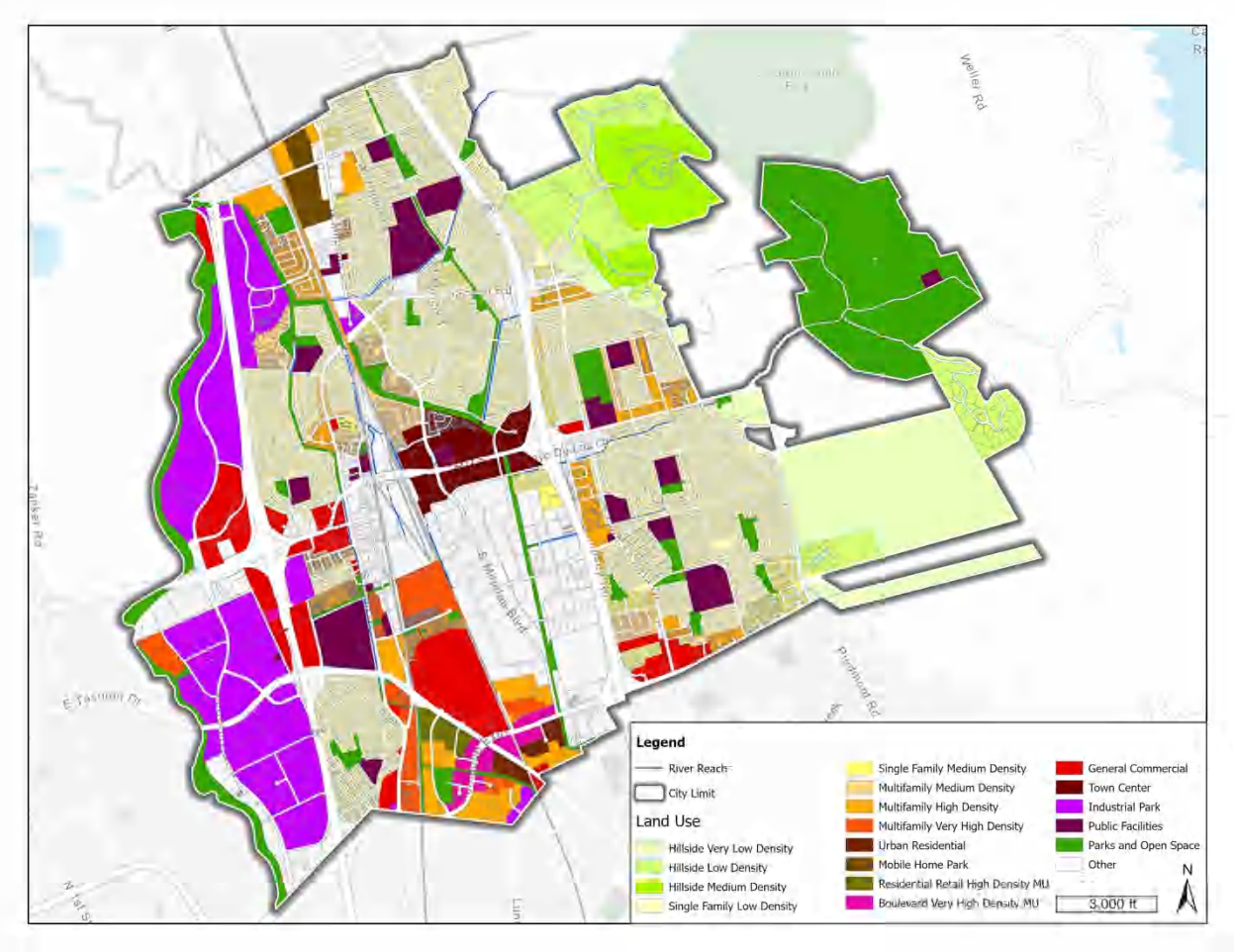



**Figure 2-7: Milpitas Land Use**

# Hydraulics

A detailed representation of both the 'conduit and street' systems and the open channel systems is required in the model to evaluate the city's level of service storm drain system goals. This representation accounts for both conveyance and storage in the streets, conduits, and open channels. The InfoWorks ICM modeling software preforms the hydraulic analysis.

The Valley Water CTP model includes both the Upper Penitencia and Lower Penitencia/Berryessa watersheds, tributary creeks, and storm drain networks in San Jose and Milpitas. That CTP model is truncated at the Milpitas/San Jose boundary to focus on the city of Milpitas storm drain system. Channel, pipe, and 2D surface flow hydrographs are boundary inputs to the Milpitas SDMP model at the border between San Jose and Milpitas.

## Conduit and Street Systems

The conduit and street systems were modeled using parameters as discussed in the following sections.

### Conduit and Manhole Invert Elevations

The city of Milpitas GIS file of the storm drain network provided inverts of conduits and manholes. If inverts are missing from these two data sources, as-builts have been referenced to fill in any data gaps.

If data is still not found from these two data sources, an appropriate assumption is made by referencing upstream and downstream inverts and storm drain pipe cover.

### Conduit Manning's n Roughness

Manning's n-values for conduit and street systems are estimated based on values specified in the reference shown in Table 2-8.

**Table 2-8: Manning's n**

| Conduit Material | Manning's n |
|---|---|
| **Reinforced Concrete Pipe** | |
| Conduit > 36" diameter | 0.012, 0.012* |
| Conduit < 36" diameter | 0.012, 0.014* |
| **Corrugated Metal Pipe** | |
| Annular | 0.021 |
| Helical | 0.018 |
| **Concrete-Lined Channels** | |
| Smooth-Troweled | 0.015 |
| ACPWA Simulated Stone | 0.017 |
| **Reinforced Concrete Box** | |
| Cast-In-Place | 0.015 |
| Pre-Cast | 0.014 |

**Bottom third of the conduit is assigned the first manning's n listed, while the top two-thirds are assigned the second manning's n listed to account for friction loss.*

All conduits of unknown material were assumed to be reinforced concrete pipe. For conduits with materials not listed in the table above, Manning's n values were referenced from other sources[6]. These materials and their associated Manning's n values are listed in Table 2-9.

**Table 2-9: Conduit Manning's n Not Listed in Table 2-8**

| Material | Manning's n |
|---|---|
| Asbestos Cement (ACP) | 0.011 |
| Polyvinyl Chloride (PVC) | 0.009 |
| Cast Iron Pipe (CIP) | 0.012 |
| Ductile Iron Pipe (DIP) | 0.012 |

All conduit material descriptions by pipe segment were obtained from the city of Milpitas.

### Conduit Manhole Losses

Manhole losses are calculated in InfoWorks ICM using the Normal Headloss Method. The method does not account for bend, drop, contraction, and expansion losses but does account for simple junction losses. However, storm drains are generally built on straight alignments of the same diameter from manhole to manhole; without significant bends, drops, contractions, or expansions. Also, particularly for the larger pipe diameters, manholes simply provide periodic access to the top of continuous pipelines.

[6] Engineering ToolBox, (2004). Manning's Roughness Coefficients. [online] Available at: https://www.engineeringtoolbox.com/mannings-roughness-d_799.html [2020]

### Conduit Boundary Conditions

The storm drain network's downstream boundary conditions are dynamically linked to 1D open channels in the InfoWorks ICM model. Creek levees are assumed to hold their elevations if overtopped in a modeling scenario. Levees do not fail in the SDMP analyses as they might for a Federal Emergency Management Association (FEMA) flood hazard analysis.

### Conduit Assumptions

All conduits are assumed to have their full conveyance available. That is, all conduits are modeled with no silt or debris.

## Pump Stations

The Milpitas storm drain system relies heavily on pump stations to move runoff from pipe networks to creeks that flow to San Francisco Bay. There are 13 pump stations owned and operated by the city of Milpitas within the study area, as shown in Figure 2-9. These pump stations are generally located at the discharge points of the city of Milpitas's storm drain system to Lower Penitencia Creek, Berryessa Creek, or Coyote Creek. Four (4) of the 13 stations discharge directly into Coyote Creek. Wrigley-Ford Creek pump station discharges the tributary Wrigley, Ford, and Wrigley-Ford Creeks (owned and operated by the city of Milpitas) to Berryessa Creek.

The pump stations are input into the InfoWorks ICM model based on a combination of data obtained from record drawings and the previous city of Milpitas SDMP (2013). Conversations with City operations and maintenance staff confirmed there have been no changes to pump station capacities since 2013. As-built documents determine the pump station storage volumes, including the larger storage areas at California Circle and Hidden Lake. Where system drawings are not available, storage curves from previous work on the 2013 SDMP and ancillary studies were used. The City of Milpitas provided set levels for the pump stations on- and off-levels. Pumps are modeled as having a flat rate of discharge based on the peak operating levels. A sensitivity analysis validates this simplification, as discussed below.

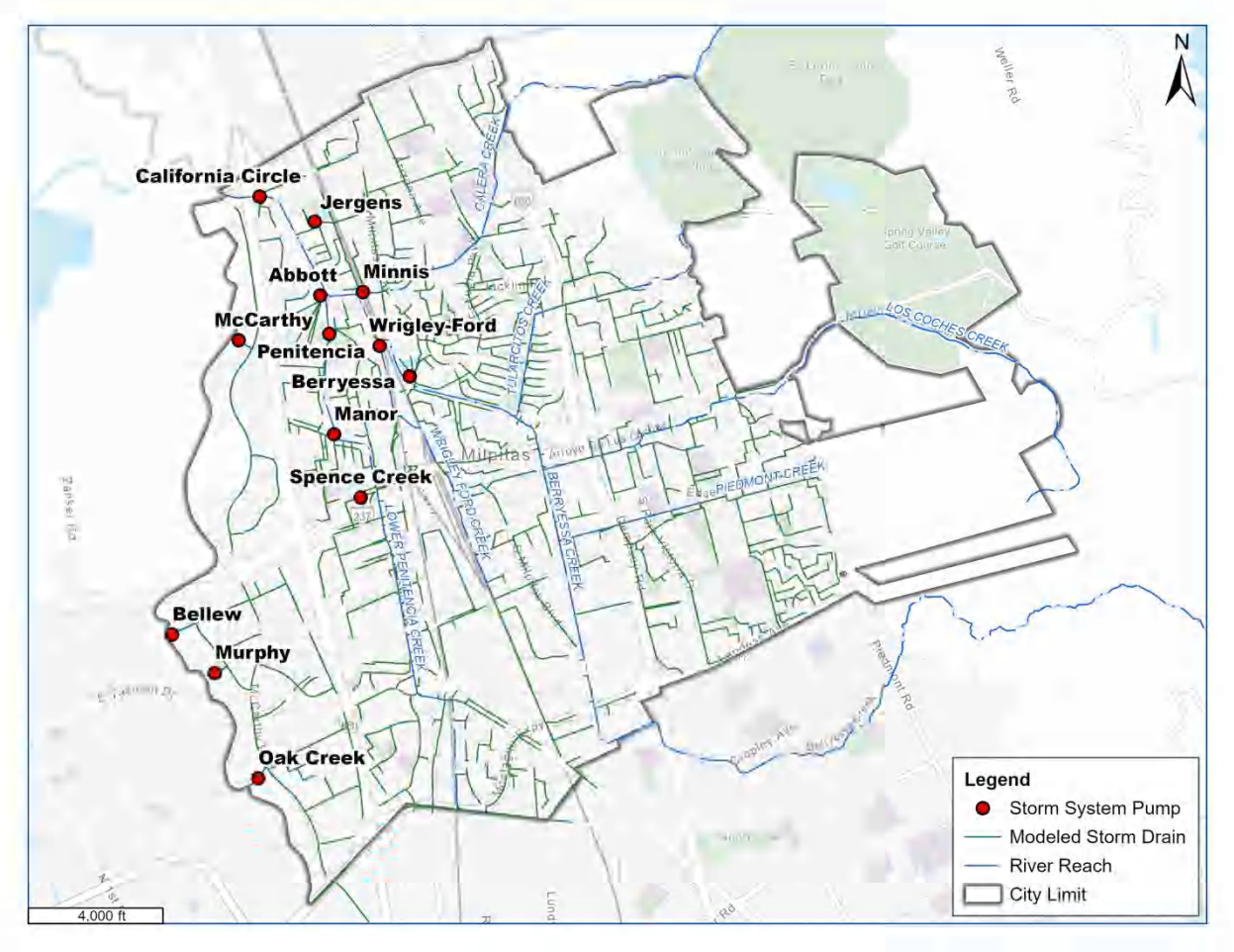



**Figure 2-8: Pump Station Locations**

## Pumping Rate Sensitivity Analysis

To preserve the data associated with pump operation and simplify the ICM model, the pumps are not de-rated for minor losses; nor are pump curves inserted into the model. Pumps are modeled with a constant discharge set the maximum pump flow based on the city's pump curves. A sensitivity analysis has been performed to verify the validity of this assumption. The pipe or creek depth upstream and downstream of the pump station are compared using three pump capacity scenarios to test the pump capacity's sensitivity during the 100-yr storm, which exceeds the 10-year SDMP storm recurrence.

Downstream pipe depths are not sensitive to the pumping capacity, except at the Bellew, McCarthy, and Murphy Pump Stations that discharge to Coyote Creek, as summarized in Table 2-9. Since Coyote Creek is not specifically modeled and the pump discharges are in fact decoupled from the stage in the creek, these pump stations discharge under a free outfall condition, which artificially increases the sensitivity of the downstream water depth to pump capacity.

The sensitivity analysis indicates that the pumping capacity does not change the simulation outcome (maximum depth in the modeled downstream reaches) when the pumping capacity varies between 70% and 110% of its rated capacity. This constant-rate pump capacity methodology is deemed adequate for CIP formulation since there is no change in proposed CIPs based on a variable pumping rate tied to the creek stage at the pump station outfalls.

**Table 2-10: Pump Station Sensitivity Analysis**

| Max Water Depth (ft) during the 100-yr Event | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pump Station | Base Scenario | | 70% Pump Rated Capacity | | 110% Pump Rated Capacity | | Receiving Creek |
| | U/S | D/S | U/S | D/S | U/S | D/S | |
| California | 1.9 | 10.9 | 3.5 | 10.8 | 1.9 | 10.9 | Lower Penitencia |
| Jurgens | 4.8 | 13.3 | 4.8 | 13.2 | 4.8 | 13.3 | Lower Penitencia |
| McCarthy | 10.2 | 4.8 | 11.0 | 3.7 | 11.0 | 4.5 | Coyote Creek |
| Minnis | 6.3 | 10.3 | 13.1 | 10.2 | 6.6 | 10.2 | Calera Creek |
| Abbott | 7.5 | 11.4 | 7.7 | 11.4 | 7.5 | 11.4 | Lower Penitencia |
| Penitencia | 2.2 | 10.7 | 2.2 | 10.6 | 2.2 | 10.7 | Lower Penitencia |
| Wrigley-Ford | 5.4 | 10.8 | 6.3 | 10.7 | 5.5 | 10.8 | Berryessa Creek |
| Berryessa | 6.0 | 9.8 | 6.3 | 9.8 | 6.1 | 9.8 | Berryessa Creek |
| Manor | 3.2 | 9.2 | 5.2 | 9.1 | 3.4 | 9.1 | Lower Penitencia |
| Spence Creek | 7.4 | 12.9 | 7.3 | 12.8 | 7.4 | 12.9 | Lower Penitencia |
| Bellew | 22.8 | 1.2 | 23.2 | 1.0 | 22.8 | 1.2 | Coyote Creek |
| Murphy | 11.4 | 4.0 | 12.3 | 3.8 | 12.0 | 5.2 | Coyote Creek |
| Oak Creek | 6.2 | 5.0 | 7.0 | 4.8 | 6.9 | 4.6 | Coyote Creek |

## Open Channel Systems

The open channel systems are modeled as discussed in the following subsections. Most of the open channels in the Lower Penitencia-Berryessa and Upper Penitencia Watershed in the CTP model are shown, including Upper Penitencia Creek, Sierra Creek, Sweigert Creek, Berryessa Creek, Los Coches Creek, Tularcitos Creek, Calera Creek, Wrigley Creek, Ford Creek, Wrigley-Ford Creek, East Penitencia Creek, and Lower Penitencia Creek. Crosley Creek is not modeled explicitly because its banks are not adjacent to any man-made structures. Crosley Creek was accounted for in hydrologic routing. In the truncated SDMP model for this report, Upper Penitencia, Berryessa upstream of Highway 680, and Sierra Creeks are removed from the model and input as hydrographs.

Open channel cross-sectional geometry is from a variety of sources, including surveys, as-builts, permitted design plans, previous HEC-RAS models, and the 2006 LiDAR dataset. Each source is described in the following sections, while Figure 2-9 spatially displays each creek's cross-section source (channels designated as "Survey" displays the year of the survey). This assumes projects funded by Valley Water at the time of this master plan will be completed, but does not include future planned projects.

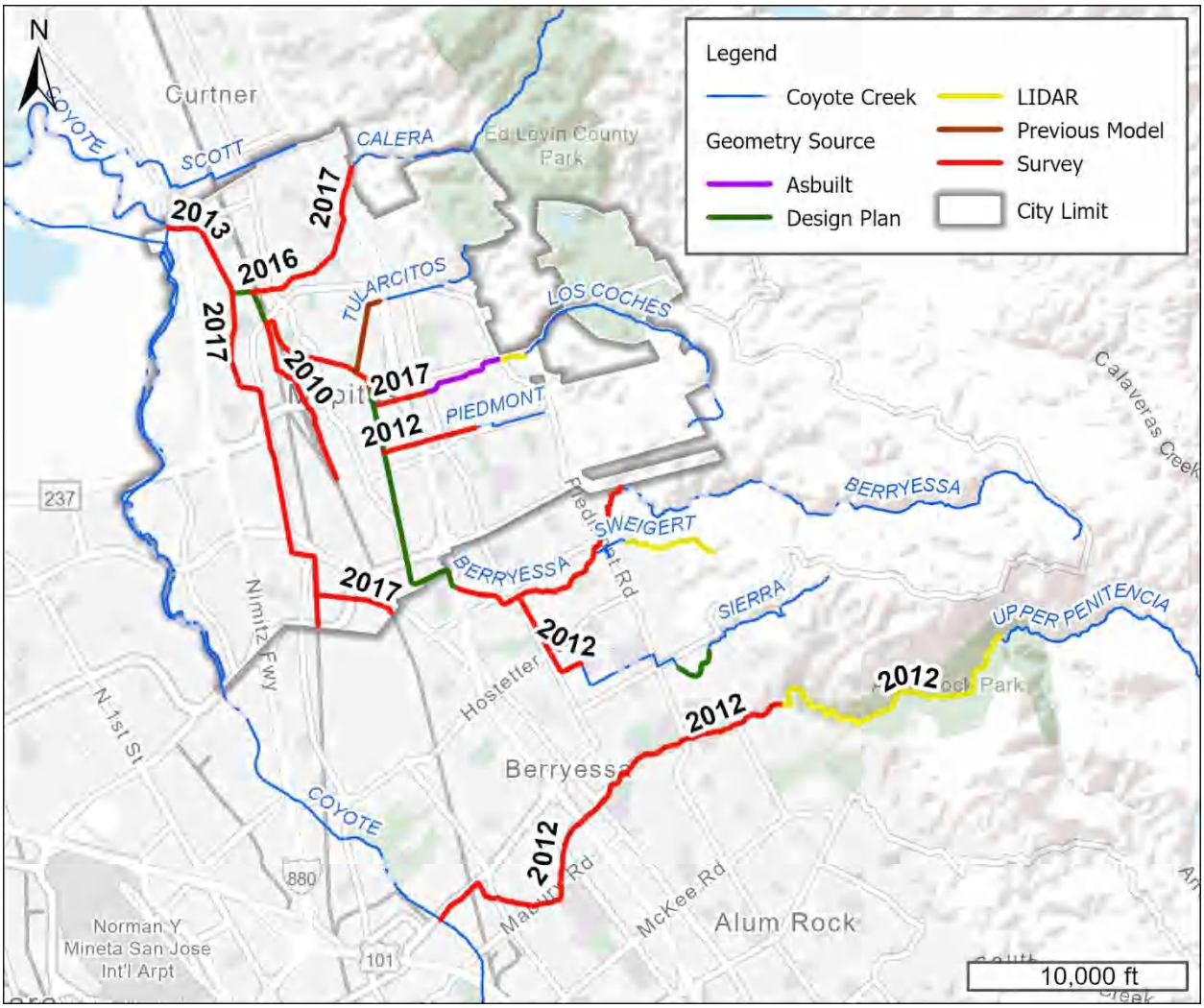



**Figure 2-9: Map of Channel Cross Sectional Geometry Source**

## Levees and Floodwalls

All levees and floodwalls included in the model are assumed to not fail and therefore maintain flow within the channel to the top of bank, levee, or floodwall elevation. This produces the most conservative water surface elevation in the channel for storm drain modeling.

## Storage Areas

Some storage areas in the model define pump station storage. California Circle Pump Station, Wrigley-Ford Pump Station, Berryessa Pump Station, Penitencia Pump Station, Jurgens Pump Station, and Abbott Pump Station are the pump stations with six storage areas defined. Storage areas are represented by stage-storage curves, which have been obtained from record drawings or previous studies.[7]Another storage area in the model not associated with pump stations is Dixon Landing Park, which is used to store surcharges upstream of Jurgens Pump Station.

[7] "City of Milpitas Storm Drain Master Plan", Schaaf & Wheeler, July 2013

**Table 2-11: Pump Station Storage Areas**

| Pump Station | Storage Area |
|---|---|
| California Circle Pump Station | Dixon Landing Lagoon |
| Berryessa Pump Station | Hidden Lake Lagoon |
| Penitencia Pump Station | Hall Park Lagoon |
| Abbott Pump Station | City of Milpitas Drainage Lagoon |
| Wrigley-Ford Pump Station | Storage area located where Ford Creek joins Wrigley-Ford Creek |
| Spence Creek Pump Station | Spence Creek Pump Station Storage Area |

## Channel Bankline

Channel bank lines connect channel overbanks to 2D floodplains hydraulically. Theses lines' ground elevations are sampled from a GIS terrain to ensure smooth transitions from channel overbanks to the 2D floodplains.

Channel bank lines represent floodwalls along Lower Penitencia Creek, Calera Creek, and Berryessa Creek. These elevated tops of wall floodwall elevations have been converted from the as-builts georeferenced to ortho-imagery. These lines, when used as floodwalls, contain runoff within channels until and unless the floodwalls are overtopped.

A map of flood walls and levees is displayed as Figure 2-10.

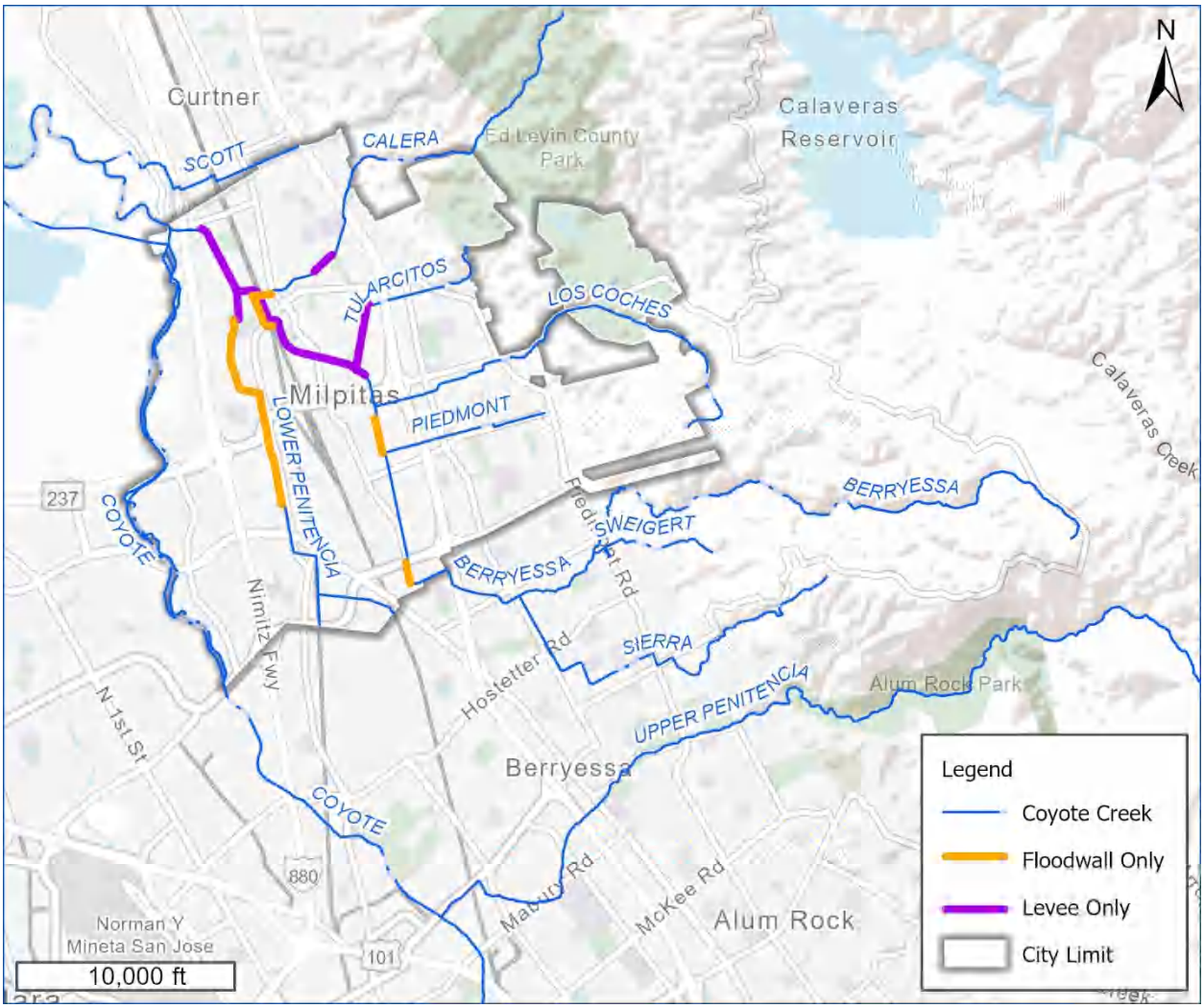
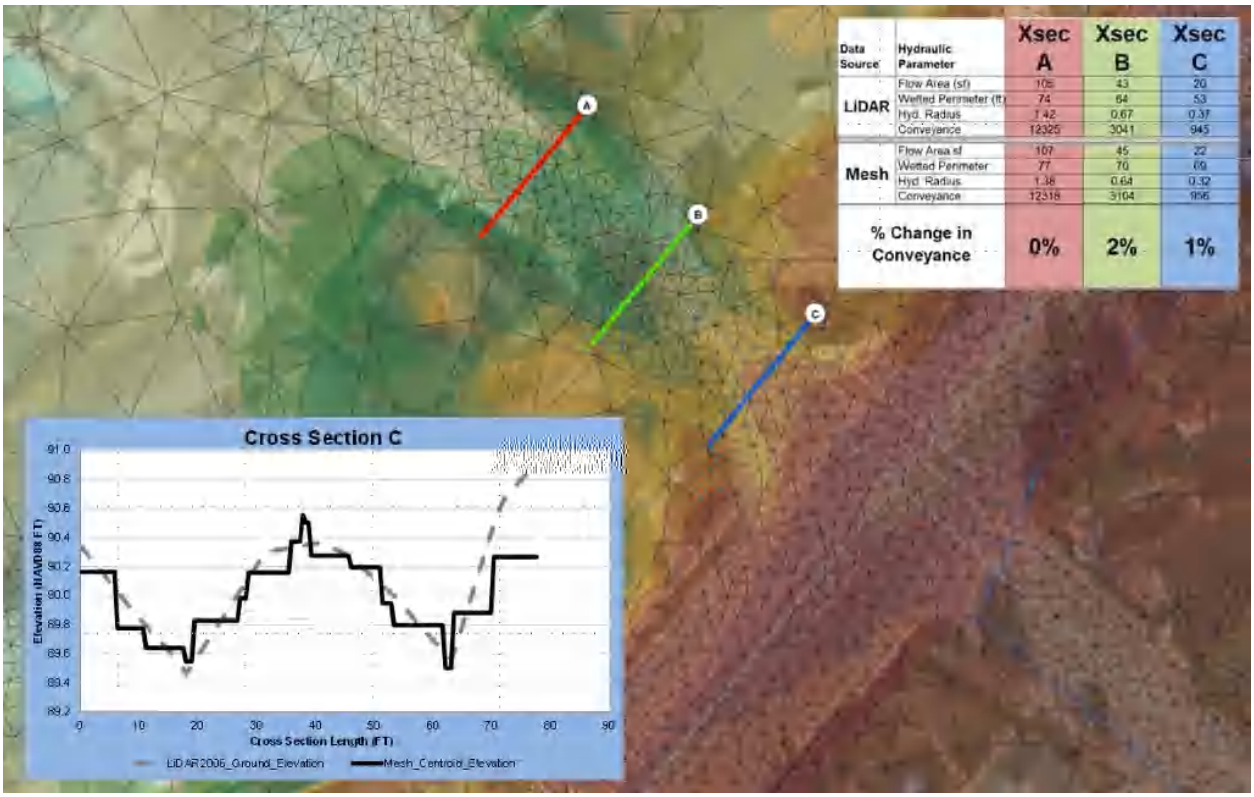



**Figure 2-10: Flood Wall and Levee Map of the Berryessa/Penitencia Watershed**

## Two-Dimensional Surface

A two-dimensional (2D) surface is modeled and linked with pipe nodes to reflect flow exchanges and the hydraulic performance between different drainage facilities when pipe capacities exceed and flow spills to the 2D surface. The features that affect the predicted flooding extents with the spill to the 2D surface resolve the modeled 2D surface and surface roughness.




| Data Source | Hydraulic Parameter | Xsec A | Xsec B | Xsec C |
|---|---|---|---|---|
| LiDAR | Flow Area (sf) | 105 | 43 | 20 |
| | Wetted Perimeter (ft) | 74 | 64 | 53 |
| | Hyd. Radius | 1.42 | 0.67 | 0.37 |
| | Conveyance | 12325 | 3041 | 945 |
| Mesh | Flow Area sf | 107 | 45 | 22 |
| | Wetted Perimeter | 77 | 70 | 69 |
| | Hyd. Radius | 1.38 | 0.64 | 0.32 |
| | Conveyance | 12318 | 3104 | 956 |
| % Change in Conveyance | | 0% | 2% | 1% |

**Figure 2-11: Cross Section Comparison between the Modeled vs. Terrain**

Two-dimensional surface resolutions are classified into two groups. A high-resolution group built to reflect appropriate street conveyance. The model elements (triangles) representing the terrain resolution have sizes ranging from 25 to 500 square feet. The high-resolution group has sufficient accuracy in representing street conveyance, as indicated in Figure 2-11. The percent of cross-section conveyance difference between the modeled and original terrain is less than 5 percent.

A lower resolution group is built for other areas with no well-defined drainage conveyance geometry, such as open space, residential, and commercial areas. The model elements (triangles) that represent a lower resolution terrain have sizes ranging from 1,000 to 5,000 square feet.

Valley Water provided the LiDAR topographic terrain used for the 2D surface modeling and has a cell size/resolution of a 3-foot by 3-foot grid. In addition, known projects completed between the 2006 LiDAR and 2018 are inserted into the 2D surface as fill based on development design plans.

### Two-dimensional Surface Manning's n Roughness

Surface roughness over the 2D grid is estimated with Manning's n values and is typically higher than the channel roughness because of the shallow flow characteristics. Aerial photography and land use classifications made estimates of Manning's n-values for the 2D surface by considering the density of buildings on the overbank and the base "n" values of the open areas of the buildings. Although the density of buildings and the presence of fences and other obstructions vary considerably across a given land use polygon, it is assumed that a general urban roughness value reasonably represents the effects of structures within the floodplain.

Surface land uses are categorized into four different Manning's n values displayed in Table 2-12:

**Table 2-12: Floodplain Manning's n Values**

| Floodplain Description | N value |
|---|---|
| Street | 0.025 |
| Open Space, Institution, Public Facilities | 0.03 |
| Commercial | 0.12 |
| Residential and Industrial | 0.13 |

Based on the above methodology, the model is sufficient to evaluate storm drain system performance for a 10-year design storm. The resulting flooding onto the two-dimensional surface identifies deficiencies that need correction with a Capital Improvement Program (CIP).

# Chapter 3: Capital Improvement Program

This chapter describes deficiencies in major storm drain facilities and outfalls, historical problem areas, pumping and storage facilities, and other known flood hazards. Detailed descriptions of necessary capital improvement projects and their prioritization are provided in this chapter.

## Existing Conditions Flooding

The master plan evaluates the existing storm drain system performance for the 10-year design storm. Figure 3-1 shows the flooding that is modeled to occur with the 10-year design storm. In this flood study, the master plan proposes CIP projects that can eliminate or ameliorate the identified inundation.

# Existing Conditions 10-Year Floodplain

Lower Penitencia-Berryessa Watershed

August 2021

## Legend

- Modeled Storm Drain
- River Reach
- City Limit

CIP Priority

- Low
- High
- Specific Plan Extension

Flood Depth (ft)

- 0 - 1.0
- > 1.0

Land Use - Specific Plan

- Main Street Gateway
- Milpitas Metro

SOURCES:
Schaaf & Wheeler
InfoWorks ICM Model Results

N

0 1,250 2,500
Feet

## Vicinity Map

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

Figure 3-1

## Improvement Projects

Recommended CIP projects are identified graphically, and general project routes are given. The following color code is used throughout this chapter to highlight system performance and general CIP prioritization, as described by Table 3-1:

| | |
|---|---|
| ***Green*** | Satisfactory Performance / No Improvement Necessary |
| ***Red*** | High Priority Project |
| ***Orange*** | Low Priority Project |

CIP priorities are assigned based on inundation impact in the existing condition. A high-priority CIP project addresses extensive flooding on residential or commercial properties that spreads across several streets and can widely disrupt traffic, residential and commercial activities. A low-priority CIP project manages flooding only in streets, minor flooding on properties, or flooding that can only be partially alleviated. No numeric threshold was used in categorizing CIP priorities. The tables of statistics associated with each collection system group give a general indication of the capital expenditure level necessary to correct storm drain deficiencies. Sometimes installing additional pipe lengths is required to complete corrective action.

City-owned storm drainpipes 12 inches and larger in diameter have been evaluated. Pipes that act as laterals are not in the mainline analysis but are assumed to be part of the system that delivers flow into the main drainage lines.

## Alternative Improvement Projects

To increase storm drain system capacity, two essential types of projects are available: installing a new relief sewer parallel to the system lacking capacity; or replacing the overloaded pipe with a larger diameter pipe in the same alignment. The two alternatives can be made equivalent to one another using the following formula, assuming that pipe material and length are equal:

$$D_R = \left( D_e^{2.63} + D_p^{2.63} \right)^{0.38}$$

where $D_R$ = diameter of replacement pipe;

$D_e$ = diameter of overloaded pipe; and

$D_p$ = diameter of parallel relief drain.

The city's selection of a capacity improvement strategy will vary from project to project and be governed by construction constraints, including available rights-of-way and existing utilities. It is most likely that the storm drain CIP for Milpitas will utilize parallel relief drains unless right-of-way and utility constraints appear to favor the pipe's actual replacement, which is more costly.

Installing new parallel drains should be more cost-effective than replacing pipes in most cases since the required pipe size is smaller, and the existing pipe does not need removal. Given the 50 percent contingency applied to unit cost estimates, there is no differentiation between the cost of pipe replacement and parallel drain installation in the CIP. (That is, the cost of existing pipe removal is included in the large contingency.)

Therefore, the default project for in-street improvements is a parallel relief drain, while the default project for improvements within existing off-street easements is pipe replacement. The CIP assumes storm drain size is not allowed to decrease in the downstream direction. Thus, an additional downstream pipe may be listed in the CIP, although there is no indication of substandard storm drain performance based on hydraulic grade calculations.

# Capital Improvement Program

CIP projects are identified in Figure 3-2 and Table 3-1, which will correct inadequate storm drain capacity caused primarily by undersized pipes during a 10-year design storm. The inundation areas that each of the projects specifically address is shown in Figures 3-4 to 3-10. Detailed figures for each CIP project are included in Appendix A.

However, the fourteen (14) identified CIP projects do not resolve surcharges from high creek levels downstream of the storm drain network, nor do they address inlets or manholes at isolated low points with low ground cover. The inundated areas are areas not resolved by the fourteen CIP projects, shown in Figure 3-3. These areas would only be resolved by major creek projects (outside of the scope of this Master Plan) or by the installation of small, localized pump stations, all found to be cost-prohibitive. The inundations are located mainly on the streets and empty lots. There is minor flooding on residential and commercial properties. Figure 3-3 shows that there is one location that is intentionally flooded. Instead of increasing the storm drain capacity for this area, Dixon Landing Park is used as a designated temporary storage area as a cost-effective solution that will not have any critical impact to the City.

# Existing Conditions 10-Year Floodplain

Lower Penitencia-Berryessa Watershed

August 2021

**Tice Drive**

**Jacklin Road**

**Bayview Park Drive**

**North Abel Street**

**Wool Drive**

**Railroad Avenue**

**Coches and Piedmont Creek**

**Foothill Park**

**Main Street - Sinnott Ln**

**Main Street - Carlo Street**

**Main Street - Serra Way**

**Main Street**

**Main Street - Tom Evatt Park**

**Ames Avenue**

**Comet Drive**

## Legend

- Modeled Storm Drain
- River Reach
- City Limit

CIP Priority

- Low
- High
- Specific Plan Extension
- CIP Location

Flood Depth (ft)

- 0 - 1.0
- > 1.0

Land Use - Specifc Plan

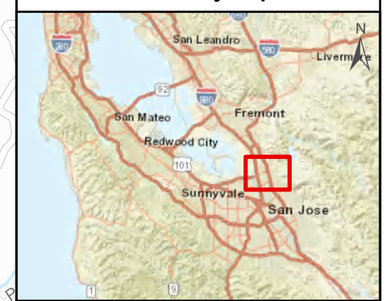
- Main Street Gateway
- Milpitas Metro

SOURCES:
Schaaf & Wheeler
InfoWorks ICM Model Results

N

0 1,250 2,500
Feet

**Vicinity Map**




Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

Figure 3-2

**Post-CIP**
**10-Year Floodpain**

Lower Penitencia-
Berryessa Watershed

April 2021

## Legend

- Modeled Storm Drain
- River reach
- City Limit

### Land Use

- Midtown Specific Plan
- Metro Area Specific Plan

### Remaining Inundation

- High Creek Level
- Intentional Flooding
- Low Point

### Flood Depth (ft)

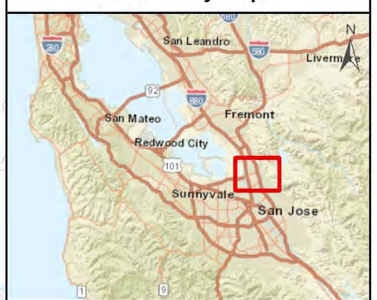
- 0 - 1.0
- > 1.0

SOURCES:
Schaaf & Wheeler
InfoWorks ICM Model Results

N

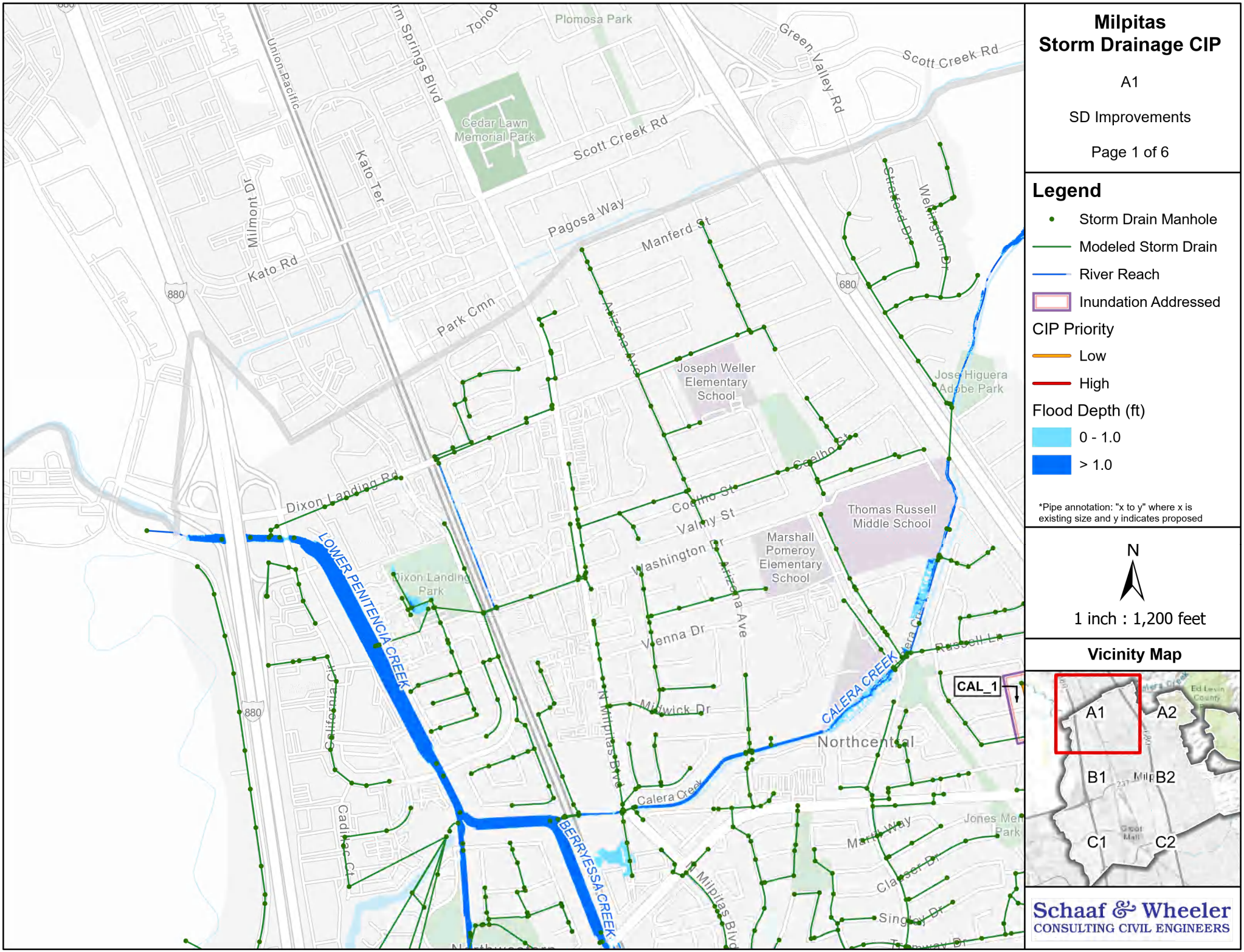
0 1,250 2,500
Feet

**Vicinity Map**




Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

Figure 3-3


Milpitas
Storm Drainage CIP
A1
SD Improvements
Page 1 of 6
Legend
Storm Drain Manhole
Modeled Storm Drain
River Reach
Inundation Addressed
CIP Priority
Low
High
Flood Depth (ft)
0 - 1.0
> 1.0
*Pipe annotation: "x to y" where x is existing size and y indicates proposed
N
1 inch : 1,200 feet
Vicinity Map
A1
A2
B1
B2
C1
C2
CAL_1
Schaaf & Wheeler
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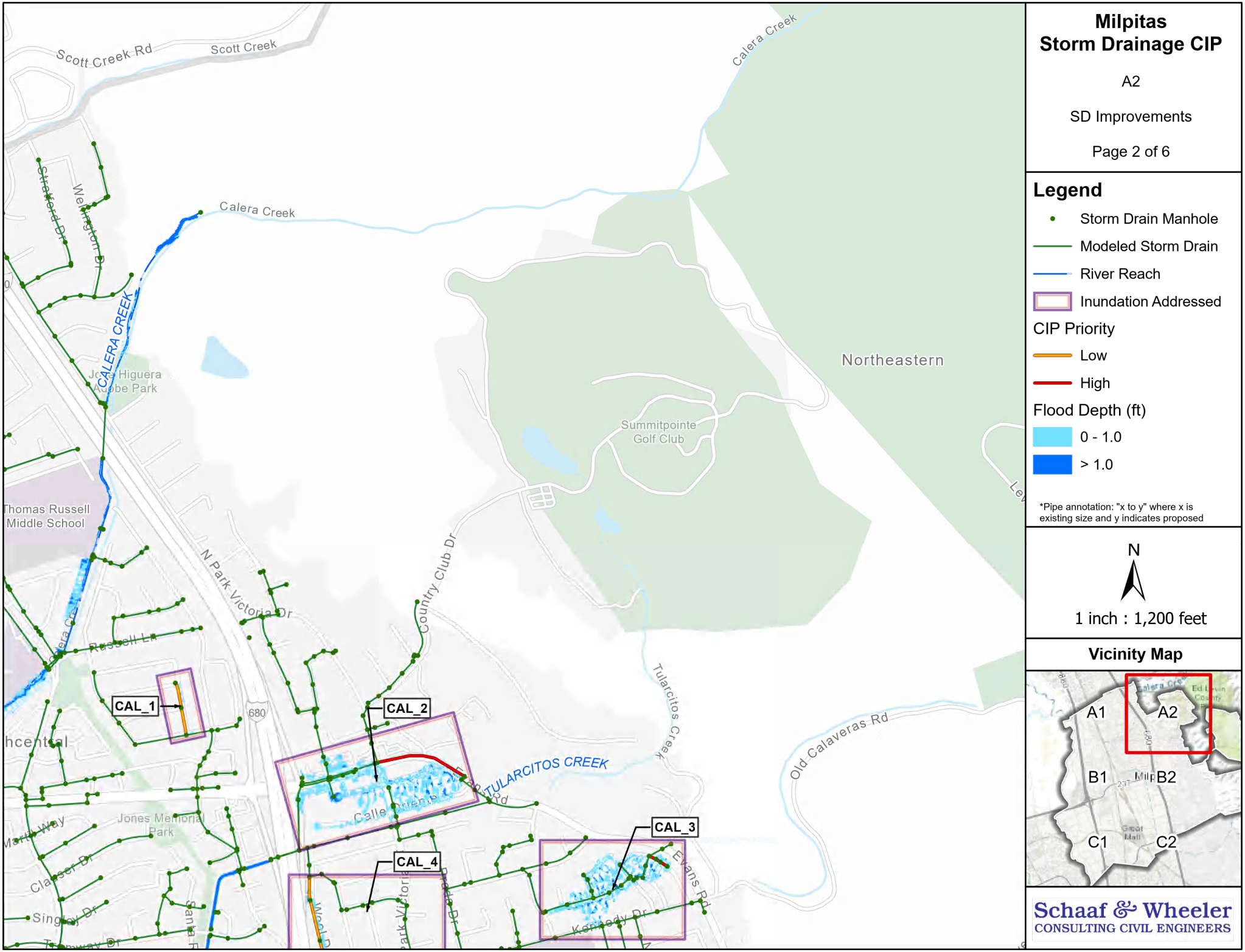
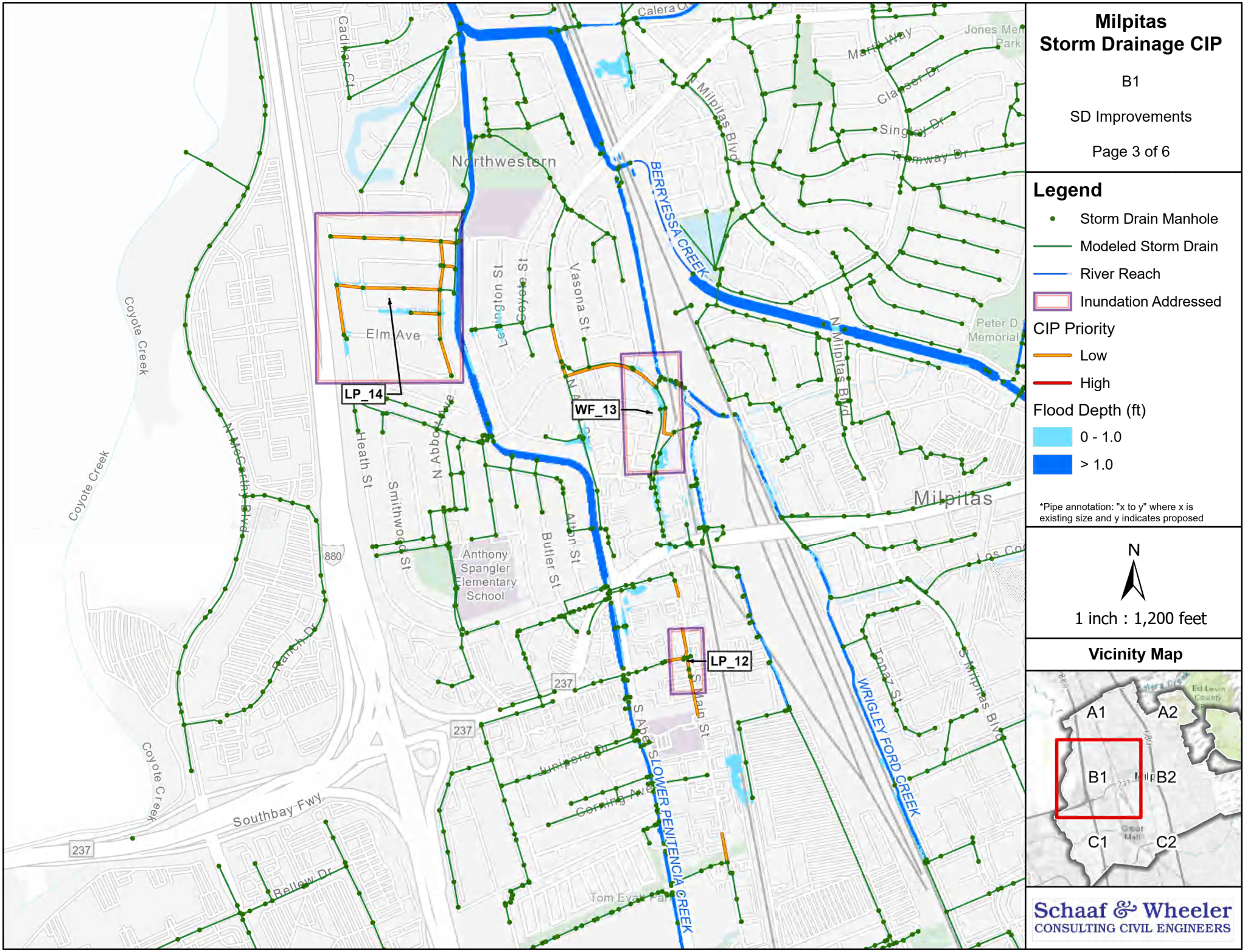
Plomosa Park
Cedar Lawn Memorial Park
Scott Creek Rd
Green Valley Rd
Union Pacific
Milmont Dr
Kato Ter
Kato Rd
Pagosa Way
Manford St
Park Cmn
Dixon Landing Rd
Joseph Weller Elementary School
Jose Higuera Adobe Park
Thomas Russell Middle School
Marshall Pomeroy Elementary School
Dixon Landing Park
Washington Dr
Valmy St
Coelho St
Vienna Dr
Arizona Ave
Midwick Dr
N Milpitas Blvd
Calera Creek
CALERA CREEK
LOWER PENITENCIA CREEK
BERRYESSA CREEK
Northcentral
Russell Ln
Cadillac Ct
Jones Memorial Park
Clayton Dr
Singley Dr
880
680


Scott Creek Rd
Scott Creek
Calera Creek
Stratford Dr
Wellington Dr
CALERA CREEK
Jose Higuera Adobe Park
Northeastern
Summitpointe Golf Club
Thomas Russell Middle School
N Park Victoria Dr
Country Club Dr
Russell Ln
680
CAL_1
CAL_2
CAL_3
CAL_4
TULARCITOS CREEK
Tularcitos Creek
Old Calaveras Rd
Evans Rd
Kennedy Dr
Jones Memorial Park
Classer Dr
Singley Dr
Calle Ohlone
Milpitas
Storm Drainage CIP
A2
SD Improvements
Page 2 of 6
Legend
Storm Drain Manhole
Modeled Storm Drain
River Reach
Inundation Addressed
CIP Priority
Low
High
Flood Depth (ft)
0 - 1.0
> 1.0
*Pipe annotation: "x to y" where x is existing size and y indicates proposed
N
1 inch : 1,200 feet
Vicinity Map
A1
A2
B1
B2
C1
C2
Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS




# Milpitas Storm Drainage CIP

B1

SD Improvements



## Legend

- Storm Drain Manhole
- Modeled Storm Drain
- River Reach
- Inundation Addressed

CIP Priority

- Low
- High

Flood Depth (ft)

- 0 - 1.0
- > 1.0

*Pipe annotation: "x to y" where x is existing size and y indicates proposed

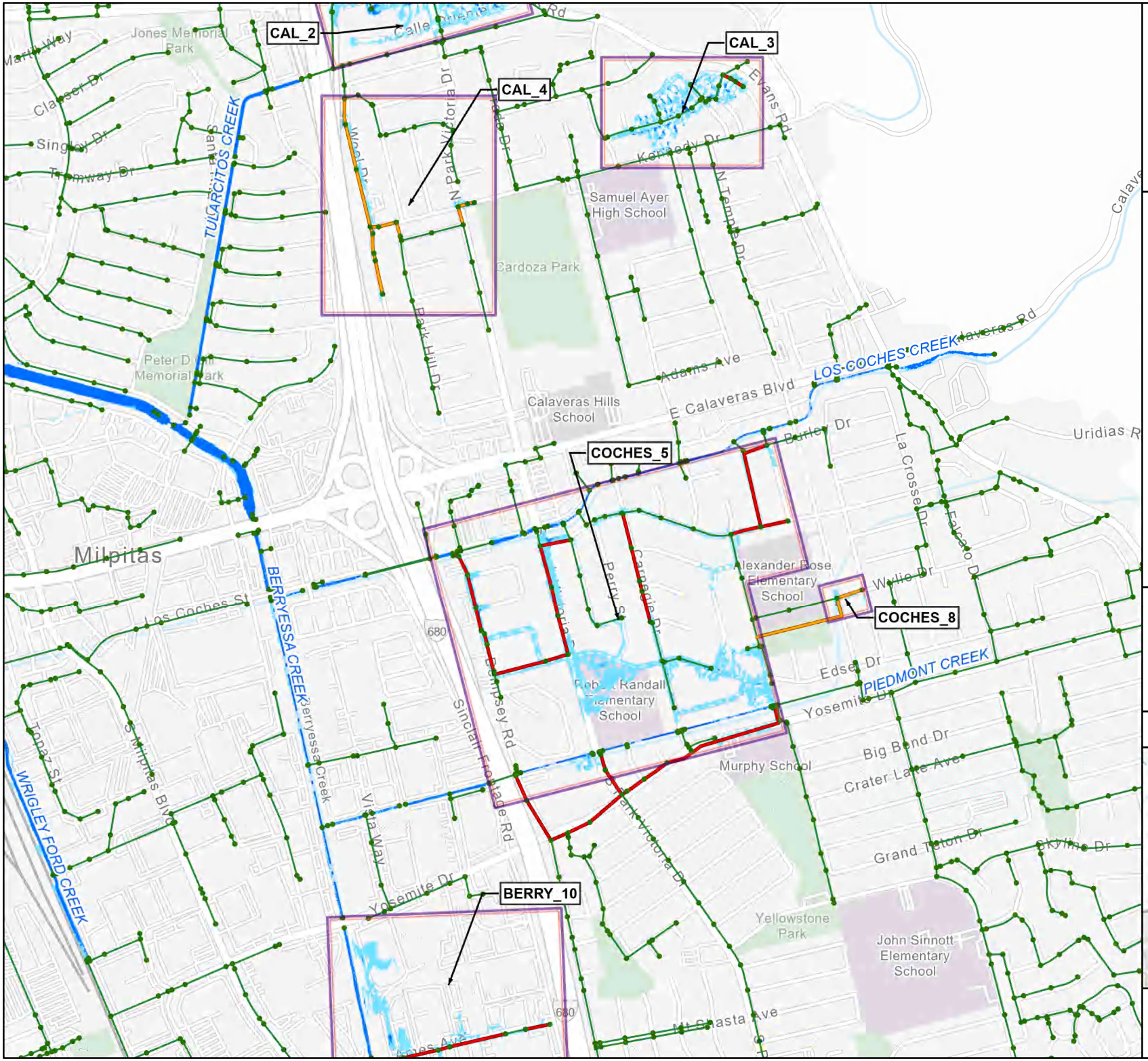
N

1 inch : 1,200 feet

## Vicinity Map




Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS




# Milpitas Storm Drainage CIP

B2

SD Improvements



## Legend

- Storm Drain Manhole
- Modeled Storm Drain
- River Reach
- Inundation Addressed

CIP Priority

- Low
- High

Flood Depth (ft)

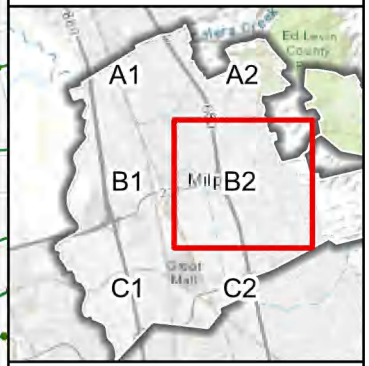
- 0 - 1.0
- > 1.0

*Pipe annotation: "x to y" where x is existing size and y indicates proposed

N

1 inch : 1,200 feet

## Vicinity Map

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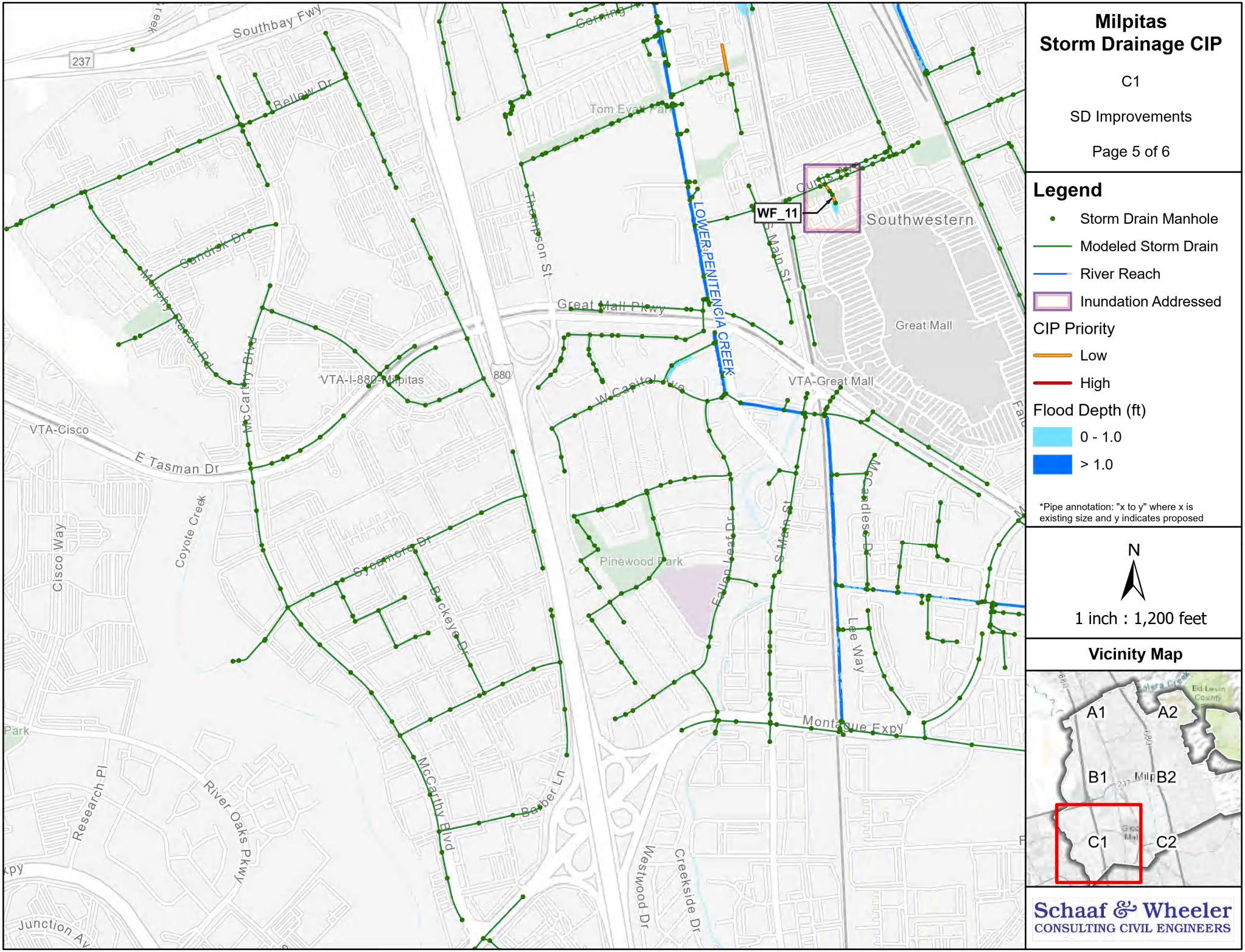



# Milpitas Storm Drainage CIP

C1

SD Improvements



## Legend

- Storm Drain Manhole
- Modeled Storm Drain
- River Reach
- Inundation Addressed

CIP Priority

- Low
- High

Flood Depth (ft)

- 0 - 1.0
- > 1.0

*Pipe annotation: "x to y" where x is existing size and y indicates proposed

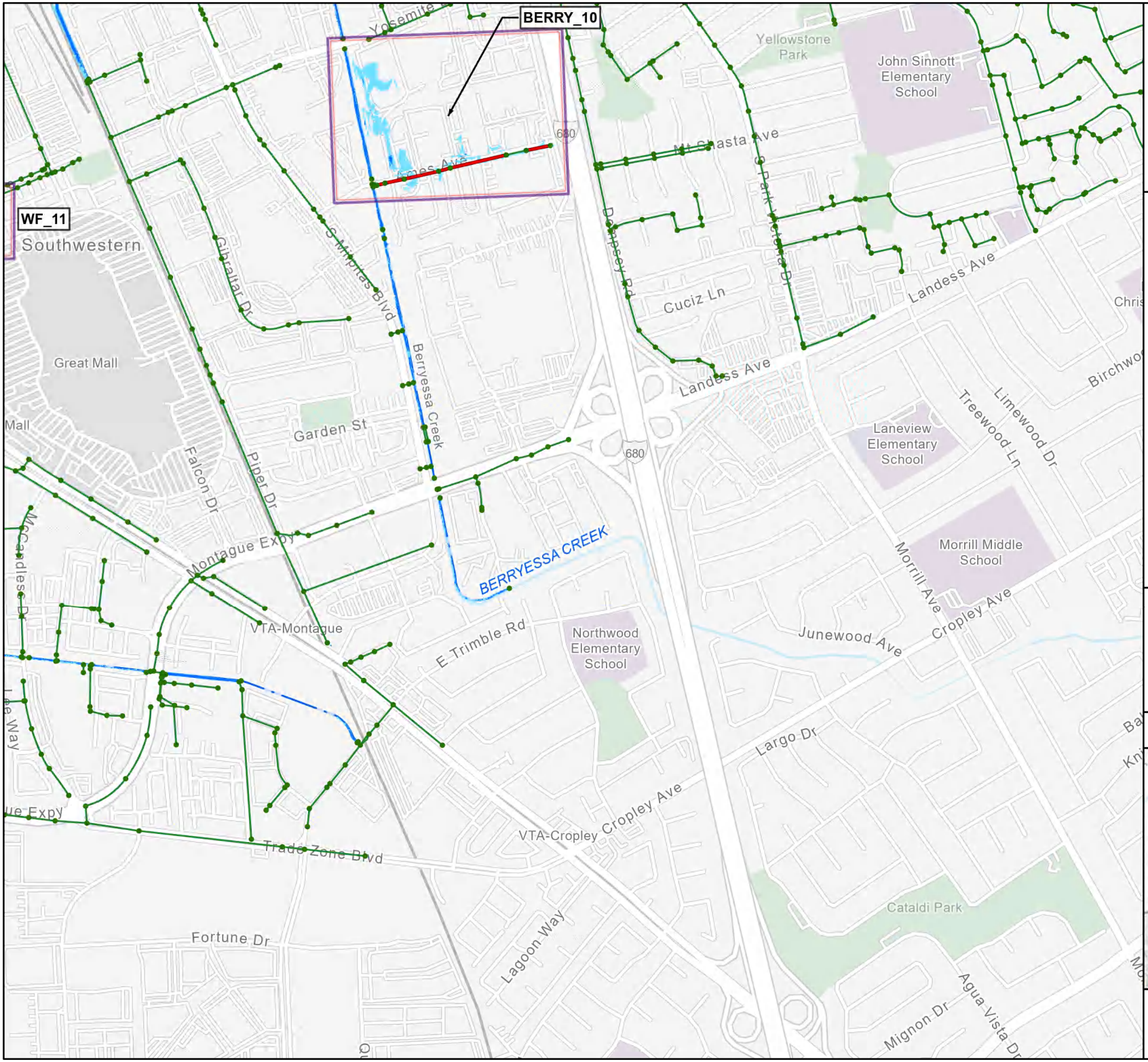
N

1 inch : 1,200 feet

## Vicinity Map




Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS




# Milpitas Storm Drainage CIP

C2

SD Improvements



## Legend

- Storm Drain Manhole
- Modeled Storm Drain
- River Reach
- Inundation Addressed

CIP Priority

- Low
- High

Flood Depth (ft)

- 0 - 1.0
- > 1.0

*Pipe annotation: "x to y" where x is existing size and y indicates proposed

N

1 inch : 1,200 feet

## Vicinity Map

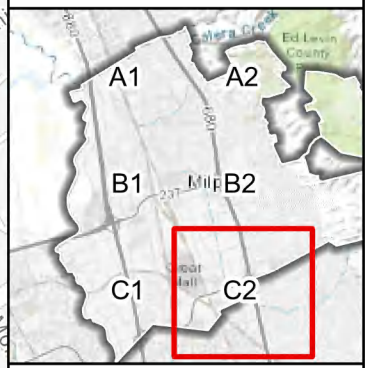



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**Table 3-1: Capital Improvement Projects**

| ID | Project | Priority | Replacement Option | Parallel Option |
|---|---|---|---|---|
| CAL_2 | Jacklin Road | High | Install approximately 950 LF of 30-inch RCP along Jacklin Rd between Calle Oriente and N Park Victoria Dr. | Use replacement option. |
| CAL_3 | Bayview Park Drive | High | Replace approximately 210 LF of existing 12-inch RCP on Bayview Park Dr with 24-inch RCP. | Install approximately 210 LF of 24-inch RCP on N Bayview Dr. |
| COCHES_5 | Coches and Piedmont Creek | High | Replace approximately 490 LF of existing 12-inch RCP on Edsel Dr between Dempsey Rd and Shirley Dr with 36-inch RCP. Replace approximately 640 LF of existing 18-inch RCP and approximately 710 LF of existing 21-inch RCP with 36-inch RCP on Dempsey Road between Edsel Dr to the outfall. | Install approximately 1840 LF of 36-inch RCP on Edsel Dr between Dempsey Rd and Shirley Dr and on Dempsey Road between Edsel Dr to the outfall. |
| | | | Install approximately 350 LF of 18-inch RCP from Rodrigues Ave to S Park Victoria Dr. Install approximately 1390 LF of 36-inch RCP from S Park Victoria Dr to Edsel Dr., directing flow away from Los Coches Creek. | Use replacement option of installing approximately 350 LF of 18-inch RCP from Rodrigues Ave to S Park Victoria Dr. Install approximately 1390 LF of 36-inch RCP from S Park Victoria Dr to Edsel Dr., directing flow away from Los Coches Creek. |
| | | | Replace approximately 710 LF of existing 27-inch RCP and 490 LF of existing 30-inch RCP with 36-inch RCP on Carnegie Dr between Mercury Ct and Canton Dr. | Replace approximately 710 LF of existing 27-inch RCP and 490 LF of existing 30-inch RCP with 36-inch RCP on Carnegie Dr between Mercury Ct and Canton Dr. |
| | | | Connect existing at Burley Drive outfall to new improvements where Lawton Dr and Canton Dr | Use replacement option for connect existing at Burley Drive outfall to |

| ID | Project | Priority | Replacement Option | Parallel Option |
|---|---|---|---|---|
| | | | intersects with approximately 920 LF of new 24-inch RCP to direct flow away from Los Coches Creek. | new improvements where Lawton Dr and Canton Dr intersects with approximately 920 LF of new 24-inch RCP to direct flow away from Los Coches Creek. |
| | | | Replace approximately 260 LF of existing 12-inch RCP with 18-inch RCP on Canton Dr between Beacon Dr and Lawton Dr. Replace approximately 280 LF of existing 12-inch RCP with 24-inch RCP on Canton Dr between Lawton Dr and Roswell Dr. | Install 15-inch RCP on Canton Dr between Beacon Dr and Lawton Dr. Install 24-inch RCP on Canton Dr between Lawton Dr and Roswell Dr. |
| | | | Install approximately 1260 LF of 54-inch RCP on Yosemite Dr between Roswell Dr and Zion Ct. Replace approximately 250 LF of existing 12-inch RCP with 54-inch RCP on Yosemite Dr between Zion Ct and S Park Victoria Dr. Install approximately 390 LF of 54-inch RCP on Yosemite Dr from S Park Victoria Dr to existing main between S Park Victoria Dr and Dempsey Rd. Replace approximately 220 LF of existing 18-inch RCP and approximately 170 LF of existing 33-inch RCP on Yosemite Dr between S Park Victoria Dr to Dempsey Rd with 60-inch RCP. Replace approximately 690 LF of existing 42-inch RCP on Dempsey Rd between Yosemite Dr and the outfall with 60-inch RCP.<br><br>Remove or abandon approximately 274 LF of existing 39-inch RCP, approximately 170 LF of existing 42 –inch RCP, and outfall along S Park Victoria Dr. Install approximately 425 LF of 30-inch RCP to direct flow | Use replacement option. |

| ID | Project | Priority | Replacement Option | Parallel Option |
|---|---|---|---|---|
| | | | away from Piedmont Creek from the 3 inlets along S Park Victoria Park Dr. currently draining to Piedmont Creek in approximately 25 LF of 15-inch RCP. | |
| BERRY_10 | Ames Avenue | High | On Ames Ave replace approximately 230 LF of existing 18-inch RCP with 24-inch RCP. Replace approximately 640 LF of existing 24-inch RCP with 30-inch RCP. Replace approximately 510 LF of existing 24-inch RCP with 42-inch RCP. Replace approximately 80 LF of 30-inch RCP and approximately 50 LF of existing 30-inch CMP with 42-inch RCP. | Install approximately 1050 LF of 24-inch RCP and approximately 430 LF of 42-inch RCP on Ames Ave. |
| LP_14 | North Abel Street | Low | Replace approximately 160 LF of existing 12-inch RCP on Maple Ave with 24-inch RCP. | Parallel option: Install approximately 160 LF of 24-inch RCP on Maple Ave. |
| | | | Along Redwood Ave, replace approximately 740 LF of existing 15-inch RCP and 400 LF of existing 21-inch RCP with 30-inch RCP, and 160 LF of existing 24-inch RCP with 36-inch RCP. | Install approximately 1,300 LF of 24-inch RCP in Redwood Ave from Heath St to the existing Abbott Ave SD. |
| | | | On Abbott Ave, replace approximately 400 LF of existing 15-inch RCP with 24-inch RCP between Walnut Dr and Elm Ave; approximately 255 LF of existing 21-inch RCP from Elm Ave to Willow Ave and approximately 250 LF of existing 24- inch RCP with 42-inch RCP from Willow Ave to Chestnut Ave. Install approximately 520 LF of 42-inch RCP in Abbott Ave from Chestnut to Redwood Ave. | Install approximately 1,425 LF of 36-inch RCP in Abbott Ave from Walnut Dr to Redwood Ave. |
| | | | Along Chestnut Ave, replace approximately 270 LF of existing | Install approximately 1,060 LF of 36-inch RCP in |

| ID | Project | Priority | Replacement Option | Parallel Option |
|---|---|---|---|---|
| | | | 18- inch RCP, 420 LF of existing 21-inch RCP, and 370 LF of existing 24-inch RCP with 42-inch RCP. | Chestnut Ave from Heath St to Abbott Ave. |
| | | | Replace approximately 50 LF of 12-inch RCP and 520 LF of 15-inch RCP with 42-inch RCP in Heath St from Elm Ave to Chestnut Ave. | Install approximately 520 LF of 36-inch RCP in Heath St from Elm Ave to Chestnut Ave. |
| CAL_4 | Wool Drive | Low | Replace approximately 315 LF of existing 15-inch RCP and approximately 350 LF of existing 18-inch RCP on Moretti Ln to Kennedy Dr with 24-inch RCP. Replace approximately 70 LF of existing 18-inch RCP and approximately 540 LF of existing 27-inch RCP with 30-inch RCP on Moretti Ln and Wool Dr adjacent to Kennedy Dr. Replace approximately 660 LF of existing 27-inch RCP on Wool Dr with 36-inch RCP between Kennedy Dr and Traughber St. | Install approximately 570 LF 24-inch RCP on Moretti Ln to Kennedy Dr. Install approximately 1270 LF 30-inch RCP on Wool Dr from Kennedy Dr. |
| | | | Replace approximately 150 LF of existing 12-inch RCP on Kennedy Dr and approximately 170 LF of existing 15-inch RCP on N Park Victoria Dr between Kennedy Dr and Park View Dr with 18-inch RCP. | Install approximately 150 LF of 18-inch RCP on Kennedy Dr and approximately 170 LF of 18-inch RCP on N Park Victoria Dr between Kennedy Dr and Park View Dr. |
| | | | Replace approximately 920 LF of existing 27-inch RCP extending from Park View Dr to Kennedy Dr to where it intersects with Wool Dr with 30 RCP. | Install approximately 920 LF of 18-inch RCP extending from Park View Dr to Kennedy Dr to where it intersects with Wool Dr. |
| COCHES_8 | Foothill Park | Low | Replace approximately 250 LF of existing 12-inch RCP with 24-inch RCP on Wylie Dr between Bixby Dr | Use replacement option. |

| ID | Project | Priority | Replacement Option | Parallel Option |
|---|---|---|---|---|
| | | | and Temple Dr. Install approximately 150 LF of 30-inch RCP along S Temple Dr. from Wylie Dr. and then approximately 800 LF of 30-inch RCP between S Temple Dr. and Roswell Dr. | |
| CAL_1 | Tice Drive | Low | Replace approximately 260 LF of existing 12-inch RCP and approximately 290 LF of existing 15-inch RCP on Tice Dr. between Rivera St and Horcajo St with 18-inch RCP. | Install approximately 610 LF of 18-inch RCP on Tice Dr between Rivera St and Horcajo St. |
| WF_11 | Comet Drive | Low | Replace approximately 220 LF of existing 12-inch RCP with 24-inch RCP on Comet Dr between Metro Walk Dr and Curtis Ave. | Install approximately 220 LF of 24-inch RCP on Comet Dr between Metro Walk Dr and Curtis Ave. |
| WF_13 | Railroad Avenue | Low | Install approximately 350 LF of 36-inch RCP from Railroad Ave to Marylinn Dr. Install approximately 1020 LF of 42-inch x 28-inch rectangular RCP along Marylinn Dr to N Abel St. Replace the approximately 150 LF of existing 24-inch RCP with 42-inch x 28-inch rectangular RCP. | Use replacement option. |
| LP_12 | Main Street – Serra Way | Low | Replace approximately 190 LF of existing 12-inch RCP on S Main St with 15-inch RCP. Replace approximately 270 LF of existing 12-inch RCP from S Main St to Serra Way with 18-inch RCP. | Install approximately 190 LF of 15-inch RCP on S Main St. Install approximately 270 LF of 18-inch RCP from S Main St to Serra Way. |

## Underserved Areas

Potential future CIP projects have been identified within areas currently underserved by storm drainage infrastructure to address potential future development needs within those areas and the connection of new storm drainage infrastructure to the City system. Main Street Gateway Specific Plan and Milpitas Metro Specific Plan (formerly Transit Area Specific Plan) are recognized as underserved areas (see Figure 3-3) by the City. The Milpitas Metro Specific Plan area is now almost entirely built out, and there are no longer adequate areas identified that do not have adequate storm water runoff collection.

However, some vacant and underutilized parcels hold potential for development or redevelopment. Four (4) potential CIP projects are proposed to address those that do not have a storm drain line serving them already in the Main Street Gateway Specific Plan. These projects are identified in Table 3-2, and detailed maps are included in Appendix A. The identified projects have no priority. While they are not necessary to correct deficiencies within the existing storm drain system, they will need to be built when the developments they service occur.

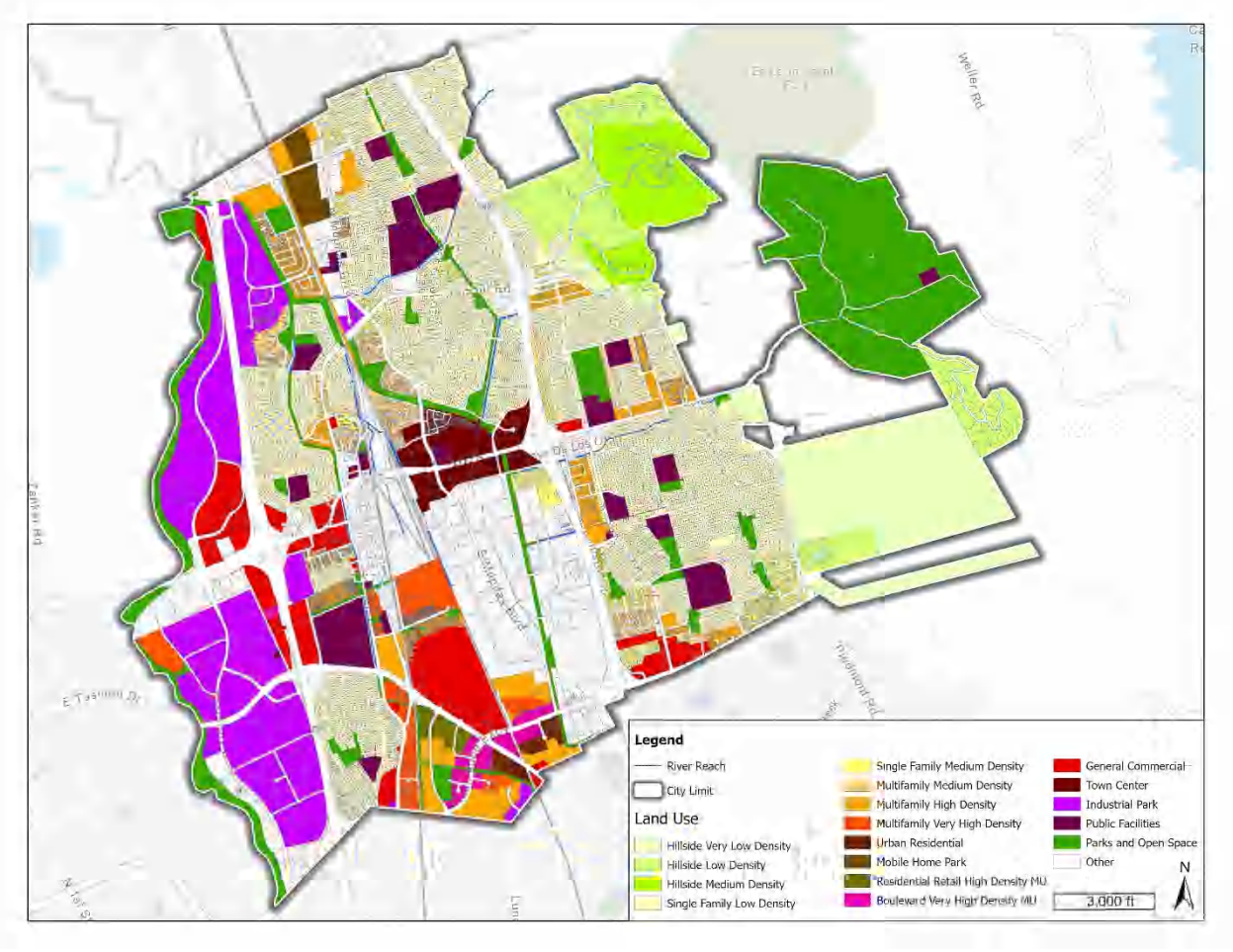



**Figure 3-10: Milpitas Future Plan Land Use Map**

**Table 3-2: Capital Improvement Projects for Underserved Areas**

| ID | Project | Priority | Replacement Option | Parallel Option |
|---|---|---|---|---|
| LP_15 | Main Street – Tom Evatt Park | --- | Install approximately 170 LF of 18-inch RCP on S Main St to the existing 24-inch RCP on Carlo St. | Use replacement method. |
| LP_16 | Main Street | --- | Install approximately 450 LF of 18-inch RCP on S Main St to the improvement project of the existing system on Serra Way. | Use replacement method. |
| LP_17 | Main Street – Sinnott Lane | --- | Install approximately 70 LF of 18-inch RCP on S Main St from near Sinnott Ln to the improvement project of the existing system. | Use replacement method. |
| LP_18 | Carlo Street | --- | Install approximately 300 LF of 18-inch RCP on S Main Street to the existing system. | Use replacement method. |

## Multi-benefit and Green Street Projects

The City has developed a green stormwater infrastructure (GSI) plan as required under the NPDES Municipal Regional Permit Section C.3.j. The plan relies on information produced in the Santa Clara Basin Stormwater Resource Plan. There are several green streets and public parcel projects identified in the plan that are depicted in Figure 3-4. It may be beneficial to construct these green stormwater infrastructure projects simultaneously as the CIP identified herein. These opportunities are identified where GSI projects and storm drain CIP projects overlap or are directly adjacent to one another. These opportunities are listed in Table 3-3. For those CIP projects which do not overlap with green stormwater infrastructure projects identified, each should be reviewed for GSI potential even if it is not included in the GSI Plan.

**Table 3-3: Capital Improvement Projects to Include Green Stormwater Infrastructure**

| CIP ID | Project | GSI Location | GSI Type |
|---|---|---|---|
| BERRY_10 | Ames Avenue | Street | Green Street |
| COCHES_5 | South Park Victoria | Street | Green Street |
| COCHES_6 | Carnegie Drive | Street | Green Street |
| COCHES_8 | Foothill Park | Park/Open Space | Green Street and detention |
| PIED_9 | Yosemite Drive | Street | Green Street and detention |
| WF_11 | Comet Drive | Park/Open Space | Green Street and detention |

For Green Street projects, the street greening could be included as part of the design of the storm drain system capacity upgrade when on the same stretch of street. Detention projects would require more detailed concept design to accomplish both flood control and green infrastructure goals. Flooding identified near Foothill Park could potentially be remedied with an integrated project which greens the park and provides detention storage. Similarly, the Yosemite Drive and South Park Victoria projects could potentially be remedied by storage facilities in Merryhill and Robert Randall schools, respectively. Storage facilities are discussed in more detail in subsequent sections.

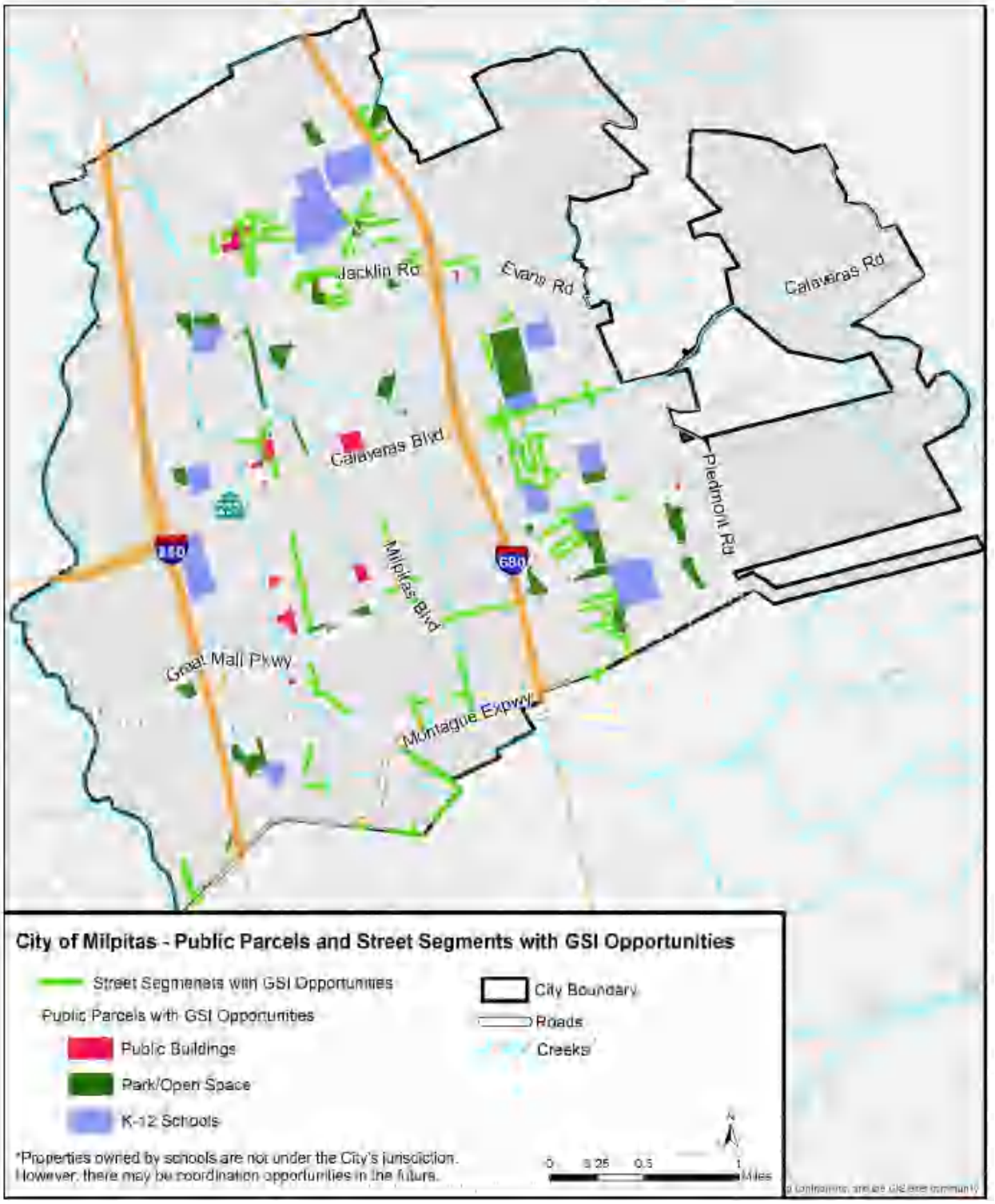



**Figure 3-11: Green Stormwater Opportunity Map from Santa Clara Basin Stormwater Resource Plan**

## Storm Trouble Spots

The city has identified 15 inlet locations that flood during storms. These are shown in Figure 3-5. To address these storm trouble spots, inlet replacements are proposed for these locations except for the

one at Evans at Bayview Park. That storm trouble spot will be addressed by the Bayview Park Drive CIP project.

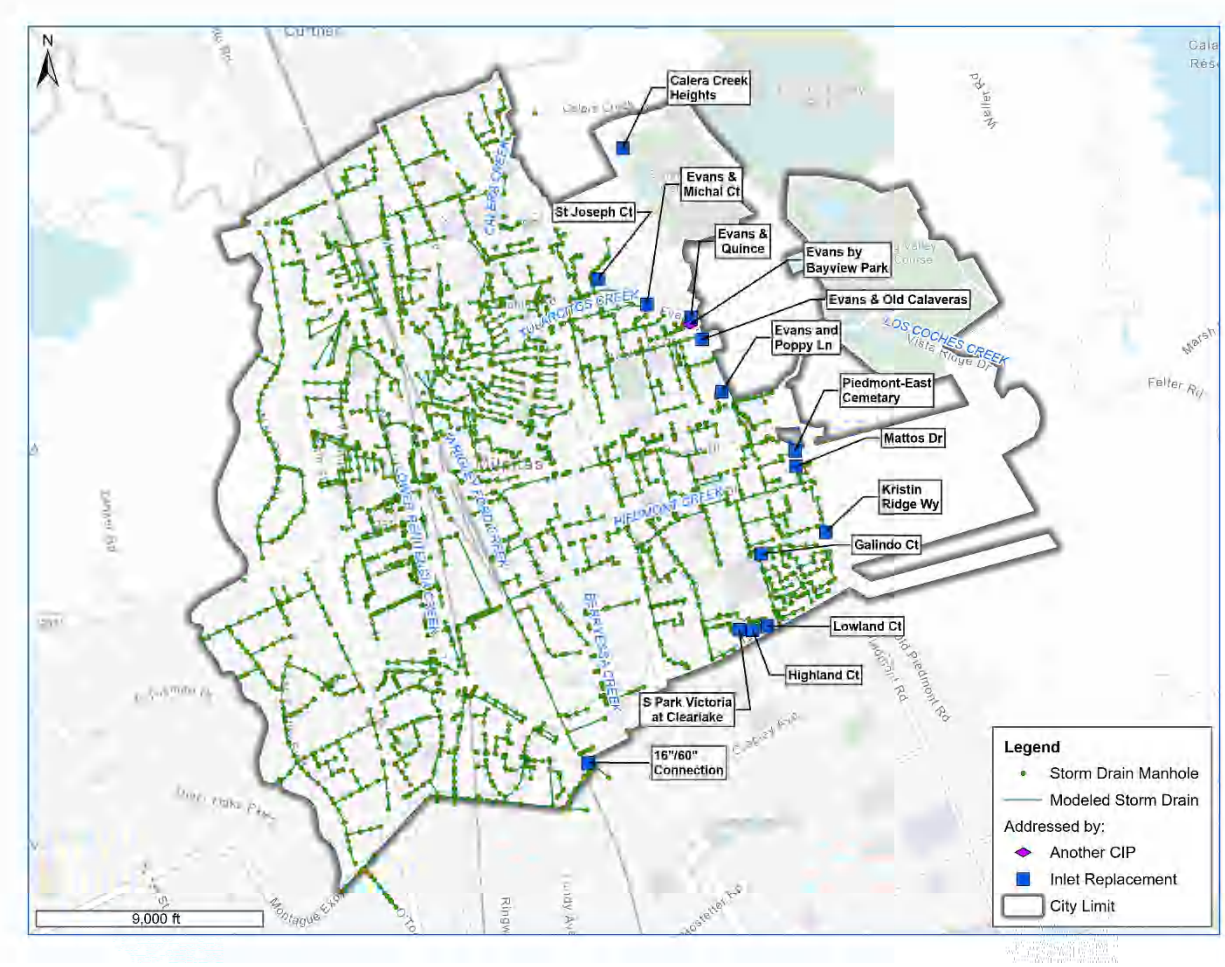



**Figure 3-12: Storm Trouble Spots**

## Storage Facilities

Two basic categories of stormwater storage are commonly used: detention and retention. Some facilities blur the distinction between the two but, in general:

Detention refers to the temporary storage of incoming runoff that exceeds the permissible release. After the storm event, the facility empties and returns to its natural function – such as a parking lot or park.

Retention facilities, on the other hand, hold on to the excess runoff for an indefinite period. Natural ponds and lakes exemplify retention facilities where water levels change only through evaporation, infiltration, and additional storm runoff.

With the tight clay that underlies much of Milpitas, true retention facilities are not advantageous. However, several storage facilities in the city do serve a dual role for both stormwater detention and retention. For instance, pumps are used to move to attenuate flood waves through the facility, but a permanent pool of water remains behind for aesthetic (or perhaps recreational) purposes.

Properly designed, constructed, and maintained stormwater storage facilities could reduce peak flows, thereby better utilizing the capacity of downstream conveyance facilities. Such facilities can also

potentially mitigate the need for system upgrades. The efficacy of any detention facility and ancillary improvements in the quality of storm runoff to receiving waters needs evaluation on a case-by-case basis. However, some general design criteria need to be applied to every basin:

1. Basins should be sized so that their output does not exceed the downstream facilities' design capacity.
2. There must be an overflow section capable of safely discharging the 100-year peak inflow (should outlet works become clogged) without causing property damage.
3. At least one foot of freeboard over the maximum 100-year water surface elevation should be provided for excavated basins. Three feet of freeboard (minimum) must be provided where berms or levees create basins.
4. Infiltration capacity shall not be considered when designing basins, unless percolation rates are determined by on-site soil testing certified by a Civil or Geotechnical Engineer.
5. Debris and sediment loading must be considered in design (see below).
6. Ponds and basins need to be designed with shallow side slopes (5:1 minimum) so that people and animals may extricate themselves from the water should the need arise. A safety shelf may also be considered. Facilities that pose an inordinate risk to the public should be fenced off. Openings larger than six inches in diameter must be screened to protect children and animals.
7. A mechanism for draining the basin should be provided. If the basin also serves as a pumping forebay, the pumping facilities must fully dewater the basin.
8. Facilities designed for the permanent (or semi-permanent) retention of water should be deep enough to avoid eutrophication (accumulation of excess nutrients that stimulates plant growth) and breeding insects. Pond surface areas should be at least one-half acre, with a minimum depth of 10 feet over at least a quarter of the area. The average depth over the rest of the pond needs to be at least five feet. Basin outlets should be positioned opposite the inlet to promote circulation. Stocking permanent ponds with fish also promote good water quality.
9. Underdrain systems to minimize wetness should be considered for detention facilities not intended as permanent water features. This helps prevent the facility from encouraging insect populations and provides for a quicker return to its dry weather function.
10. Basin bottoms and sides should be stabilized with vegetation to withstand periodic flooding and prevent erosion. Basin outlets need to be provided with erosion protection, such as riprap.

## Debris Loading

Detention and retention basins will eventually fill up with sediment and other debris, reducing their storage capacity to where they will not operate as designed. Therefore, some considerations of debris loading must be made for each basin. Depending upon the desired frequency of maintenance, some allowance for "dead" storage should be made to handle sediment and debris. Based on work by Schaaf & Wheeler for the Santa Clara Valley Water District, the following empirical relationships (debris load per unit drainage area) are used to evaluate debris loading:

| | |
|---|---|
| Highly urban areas | 0.1 acre-feet/$mi^2$/year |
| Hillside open space | 0.4 acre-feet/$mi^2$/year |

# Chapter 4: Pump Stations

Each of Milpitas' thirteen (13) stormwater pumping stations is evaluated based on the set of criteria described herein. Detailed pump station assessment evaluation criteria are presented in Appendix B. This chapter describes how well each of the city's pumping facilities performs against the established performance criteria, identifies those stations with deficiencies, prioritizes the correction of said deficiencies, and establishes the requisite master plan improvements to remedy those deficiencies.

## Pump Station Performance Criteria

Stormwater pump stations owned and operated by Milpitas must meet, at a minimum, the criteria established herein. If a pump station is substantially improved or rehabilitated, the performance and design guidelines provided in the Appendix should be followed.

### Capacity

Every pump station should be capable of discharging the 100-year runoff from its tributary area. One way to accomplish this is a combination of pumping capacity and retention storage. Pump stations with lesser capacity (e.g. a 10-year capacity) may only be considered if there is a fail-safe way to overflow excess flows without causing property damage. Nearly all the pumping facilities within the city meet these criteria. Table 4-1 compares current pump station capacities to the potential 100-year inflow.

### Number of Pumps

For redundancy, in every pump station, installing at least two identical pumps is necessary. It is unnecessary to include standby pumps because providing excess capacity is expensive and not justified by the relatively small risk of having a major storm event coincide with mechanical failure. (Schedule pump maintenance for the summer months.)

No pumping station in Milpitas is equipped with fewer than two identical pumps. Most stations have three main pumping units, and the Jurgens Pump Station has four. Each of the stations (except California Circle, Abbott, and Minnis) has a smaller electric dewatering pump to drain the wet well when water falls below the minimum allowable pumping level for the large stormwater pumps. Permanent retention ponds are maintained at the California Circle, Berryessa and Abbott stations, eliminating a small dewatering pump's utility. In contrast, the Minnis and Berryessa stations utilize submersible pumps capable of nearly completely dewatering their respective wet wells.

### Standby Power

An emergency engine-generator capable of starting the largest motor while simultaneously running all other motors and auxiliary loads should be installed at each stormwater pump station where the primary pump drivers are electric motors. Pump stations without standby power or engine-driven pumps are at risk of becoming inoperable during an electrical power outage.

The lack of adequate automatic standby power is a potentially significant deficiency. When mapping special flood hazards, FEMA will only consider pumping capacity for those pumps with engine drive units or motor drivers that can be started and operated at the station with an automatic standby power generator installed. Portable generators and manual power transfer capabilities are not sufficient.

# Pump Station Evaluations

Table 4-1 provides a summary of pump station capacities and emergency readiness throughout Milpitas. Further detailed evaluation for each station follows the identified deficiencies and recommended improvements. Figure 4-1 shows pump station locations within the city. When evaluating pump station capacity, available storage is in consideration. Table 4-2 provides a summary of pump stations with recommended CIP.

**Table 4-1: Pumping Station Summary**

| ID | Facility | Year Built | Approximate Capacity | Primary Drivers | Standby Power | Description |
|---|---|---|---|---|---|---|
| 1 | California Circle Pump Station | 1983 | 100-year | Engines | n/a | page 53-54 |
| 2 | Jurgens Pump Station | 1989 | 10-year | Engines | n/a | page 55-56 |
| 3 | McCarthy Pump Station | 1994 | 100-year | Engines | n/a | page 57 |
| 4 | Abbott Pump Station | 1983 | 100-year | Motors | NO | page 58-59 |
| 5 | Minnis Pump Station | 1978 | 100-year | Motors | NO | page 60-61 |
| 6 | Penitencia Pump Station | 1960 | 100-year | Engines | n/a | page 62-63 |
| 7 | Wrigley-Ford Pump Station | 1993 | 100-year | Engines | n/a | page 64 |
| 8 | Berryessa Pump Station | 1977 | 100-year | Engines | n/a | page 65-66 |
| 9 | Manor Pump Station | 1993 | 100-year | Motors | n/a | page 67 |
| 10 | Spence Creek Pump Station | 1988 | 100-year | Motors | NO | page 68 |
| 11 | Bellew Pump Station | 1985 | 100-year | Motors/ Engine | YES | page 69 |
| 12 | Murphy Pump Station | 1983 | 100-year | Engines | n/a | page 70 |
| 13 | Oak Creek Pump Station | 1979 | 100-year | Engines | n/a | page 71 |

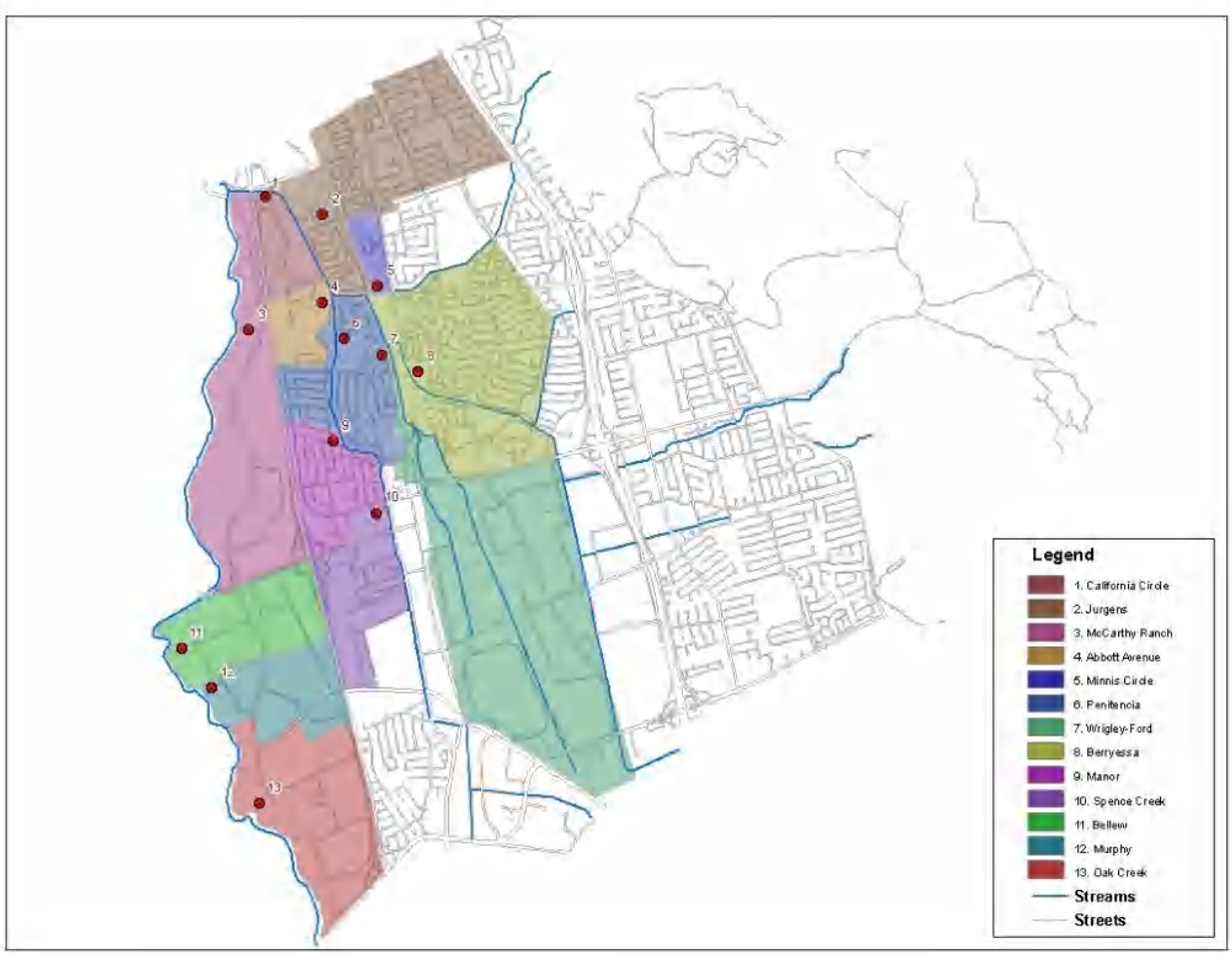



**Figure 4-1: Storm Water Pump Stations in Milpitas**

**Table 4-2: Pump Station CIP Summary**

| Pump Station | Priority | CIP Details |
|---|---|---|
| Murphy | High | Control system rehabilitation |
| Penitencia | High | Complete pump station replacement. |
| Abbott | Low | Provide complete station replacement, including raising floor above base flood elevation |
| Jurgens | Low | Pump station replacement to provide increased level of design protection and eliminate the periodic flooding of Dixon Landing Park. |
| Spence Creek | Low | Provide permanent standby power. |

# California Circle Pump Station

| | |
|---|---|
| Facility ID | **SD-1** |
| Location | California Circle at Dixon Landing Road |
| Discharges to | Lower Penitencia Creek at STA 15+00 |
| WSEL at Discharge Location | 11.4 feet NAVD |
| Pipe Discharge Elevation | Invert 13.8 feet NAVD |
| Storage | 2.5-acre wet pond |
| Design Lagoon Elevation | 9.9 feet NAVD |
| Top of Lagoon Bank | 14.0 feet NAVD |
| Tributary Area | 263 acres |
| Station Capacity | 117 cfs |

This facility drains a retention pond located at the intersection of Dixon Landing Road and Interstate 880. The lagoon is designed as a wet pond with standing water; the normal minimum water surface elevation is 4.5 NAVD. Stormwater is pumped through three 28-inch diameter (SDR 26) high-density polyethylene (HDPE) pipes to Lower Penitencia Creek, near the top of the levee. This facility was originally designed to drain an industrial area of 150 acres. However, a detailed accounting of tributary area based on Interstate 880 / Highway 237 freeway interchange plans indicates that 263 acres are potentially tributary to the lagoon, as tabulated below.

**Table 4-3: Areas Tributary to California Circle Lagoon**

| Location | Land Use | Tributary Area (acres) |
|---|---|---|
| Abbott Avenue | Residential | 53 |
| California Circle | Industrial | 83 |
| Route 880/237 | Freeway | 127 |
| Total | | 263 |

Of these 263 acres, 210 acres (about 80 percent) are directly tributary to the lagoon and pump station. Runoff from the Abbott Avenue area can be discharged into Hall Park Lagoon and thence to Penitencia Creek through a storm drain outfall. Still, runoff above its capacity flows into the ditch running between Glenmoor Circle and Redwood Avenue and then into the freeway channel. The Abbott Lagoon drains the area between the outfall to Hall Park Lagoon on the south and the California Circle storm drain system on the north. This facility is adequate, so overflows are not anticipated from these potentially tributary areas, and they are not included in Table 4-3.

Since the last master plan update, engine components including starters and radiators have been replaced and the controls have been refurbished.

## Equipment Schedule

| | |
|---|---|
| Pumps | (3) Aurora 24P axial flow rated 17,000 gpm at 14 feet TDH (86hp) |
| Prime Power | (3) Caterpillar 3208 diesel engines rated at 175hp (2,400 rpm) |
| Standby Power | Not required |
| Fuel Storage | 2,000 gallons for 96 hours run time at peak load with 3 pumps |
| Finish Floor Elevation | 14.3 feet NAVD |
| Base Flood Elevation | 12.5 feet NAVD |

## Resolution of Previously Identified Deficiencies

1. The finished floor elevation is six inches below the base flood elevation as shown on the currently effective Flood Insurance Rate Map (FIRM). Flood hazards depicted by the FIRM are based on spills from Lower Penitencia Creek becoming trapped behind the downstream levee adjacent to the pump station. However, unpublished flood hazard mapping based on the FEMA CTP work indicates this is not an issue. For the purpose of the Storm Drain CIP, the CTP work is considered the best available information.
2. The discharge pipe invert at elevation 13.8 feet NAVD is two feet above the 100-year water surface elevation in Lower Penitencia Creek based on effective FEMA data. However, if the creek were to rise above the published elevation, creek water could potentially flow into the pond back through the discharge pipes when the pumps are off. Eventually, the volume of water that flows back into the lagoon will cause the pumps to start again, thereby eliminating the problem. When fewer than three pumps are operating, some water will be re-circulated through the system (which is inefficient). Still, since this situation is beyond the design condition, this deficiency does not require remedial action.

Capital improvements are not proposed for California Circle Pump Station, noting that the control systems were upgraded since the last master plan update in 2013.

## California Circle Lagoon Operation

Surcharging storm drains within the California Circle area control the maximum allowable water surface in the lagoon. Due to the grade up to Dixon Landing Road, California Circle does not naturally release to the lagoon, so excess water on the street does not drain. Maximum design water surface elevations in the lagoon for the above-listed pumping levels and the lowest adjacent street grade, located on California Circle opposite Lower Penitencia Creek from Terra Mesa Way, are indicated in Table 4-4.

**Table 4-4: California Circle Lagoon Operation**

| | 10-year |
|---|---|
| Lowest Adjacent Street Grade (feet NAVD) | 12.28 |
| Maximum Lagoon Stage (feet NAVD) | 6.51 |

## Jurgens Pump Station

| | |
|---|---|
| Facility ID | **SD-2** |
| Location | 345 Jurgens Drive |
| Discharges to | Lower Penitencia Creek at STA 26+50 |
| Design WSEL at Discharge Location | 12.3 feet NAVD 88 |
| Storage | 1 ac-ft in City Park |
| Tributary Area | 433 acres (residential) |
| Station Capacity | 150 cfs |
| 10-year Inflow | 144.0 cfs |
| 100-year Inflow | 145.5 cfs |
| Deficit | Not applicable due to storage in Dixon Landing Park However, City desires to eliminate the need to store water in the park. |

Located in Dixon Landing Park, this facility drains mixed residential areas between Penitencia Creek and Interstate 680 at Milpitas's northern end. The system was designed to function in tandem with detention storage in the park itself since the pump station is undersized even for a ten-year event. During the February 3, 1998 storm, Jurgens Pump Station was overwhelmed by storm runoff (albeit some from Berryessa Creek overflows) to the point at which engine batteries and other control equipment were inundated, thus shutting down the station. A subsequent investigation of local rainfall during the storm, however, indicated that even if Berryessa Creek had not spilled through a gap in its levee near the railroad, local runoff rates that exceeded pumping capacity would still have overwhelmed the station and caused its failure since control equipment was located less than one foot above the finished floor elevation.

A failed attempt was made to "flood-proof" the pump station by sealing floor openings and raising essential control equipment above the floor so that the equipment does not shut off during a flooding event. Based on the CTP model and assuming the pumps do not shut off during a storm, water will pond to the following elevation with the current pumps in operation.

$$WSEL_{100} = 12.0 \text{ feet NAVD (2 feet above finished floor)}$$

Maximum ten-percent flood limits are shown in Figure 4-2. Based on available topography and aerial photographs, the one-percent flooding does not inundate private property. Periodic inundation is limited to facilities within Dixon Landing Park, including the snack bar and restrooms.

### Capital Improvement Program

To eliminate the temporary storage of excess runoff within Dixon Landing Park, a new station with a capacity of at least 243 cfs (110,000 gpm) would be required. It is not feasible to retrofit the existing pumping facility to nearly double its capacity. Such a project would entail demolishing the existing facility, building an upsized replacement pump station, and replacing the existing 72-inch diameter discharge pipe to Lower Penitencia Creek with at least a 96-inch diameter discharge pipe. An order of magnitude estimate of construction cost is $10 to $15 million. This is part of the Capital Improvement Plan as a ***Low Priority*** project with an estimated cost of $15 million in 2021 dollars.

**Figure 4-2: 10-year Ponding Adjacent to Jurgens Pump Station**

## Equipment Schedule

| | |
|---|---|
| Pumps | (4) Johnston 24PO axial flow rated 16,000 gpm at 10 feet TDH (700rpm, 60hp) |
| | (1) 3,000 gpm 25 hp electric jockey |
| Prime Power | (4) Caterpillar 3208 diesel engines rated at 150 hp (2,400 rpm)<br>(4) Randolph right angle gear drives (7:2) rated at 110 hp |
| Standby Power | Not required |
| Control Power | 120 VAC backed up by 24 VDC batteries with charger |
| Fuel Storage | 2,500 gallons; 125 hours at peak load (4 pumps) |
| Finish Floor Elevation | 10.0 feet NAVD |
| Effective BFE | 12.0 feet NAVD |

## Station Operation

In response to the February 1998 station shutdown, the City tried flood-proofed the equipment by sealing access openings on the floor and relocating the controls, so the station can continue to operate even with a base flood elevation two feet above the finished floor. Unfortunately, this has not prevented water from the wet well from entering the equipment room when the park floods. It is imperative that the engines do not shut down during a storm, so if the City believes that could happen, the wet well should be sealed. Since the last master plan update, improvements have been made to building ventilation, so the engines no longer overheat.

# McCarthy Pump Station

| | |
|---|---|
| Facility ID | **SD-3** |
| Location | 1005 N McCarthy Boulevard |
| Discharges to | Coyote Creek at STA 145+00 |
| Design WSEL at Discharge Location | 18.6 feet (NAVD '88) |
| Storage | Wet Well |
| Tributary Area | 185 acres (mixed use) |
| Station Capacity | 400 cfs |
| 10-year Inflow | 259.3 cfs |

Located in the McCarthy Ranch Development, this facility drains mixed-use areas between Coyote Creek and Interstate 880, north of State Highway 237. This station has excess capacity and the luxury of leaving one pump as standby. The facility is 25 years old, but every indication is that the pumping plant is well-maintained and operating as intended.

## Equipment Schedule

| | |
|---|---|
| Pumps | (3) Cascade 48AM axial flow (500 rpm, 560 hp, 60,000 gpm at 28 feet TDH) |
| | (1) Cascade 12MF 3,400 gpm 30 hp electric jockey |
| Prime Power | (3) Caterpillar 3412 diesel engines rated at 750 hp (2,100 rpm) |
| Standby Power | Not required |
| Control Power | 120 VAC backed up by 24 VDC batteries with charger |
| Fuel Storage | 2,000 gallons; 22 hours at peak load (3 pumps) |
| Finish Floor Elevation | 18.5 feet NAVD |
| Effective BFE | Shaded Zone X (area of moderate flood hazard) |

## Pump Station Operation

Capital improvements are not necessary for the McCarthy Pump Station. However, to enhance operational efficiencies and minimize pump cycling, it is recommended to have the pump starts rotate so that each motor will start no more than five times per hour.

# Abbott Pump Station

| | |
|---|---|
| Facility ID | **SD-4** |
| Location | 1225 N Abbott Avenue |
| Discharges to | Lower Penitencia Creek at STA 46+50 |
| Design WSEL at Discharge Location | 10.9 feet NAVD |
| Outfall Invert Elevation | 18.3 feet NAVD |
| Storage | 27 ac-feet in lagoon |
| Tributary Area | 53 acres (park and industrial) |
| Station Capacity | 24 cfs |
| Required Capacity | 17 cfs |
| Excess Capacity | 17 cfs |
| 10-year Lagoon Level | 9.5 feet NAVD |
| 100-year Lagoon Level | 10.3 feet NAVD |

Located on Abbott Avenue, the facility serves as a recreational and aesthetic feature inside an industrial park. If the pump station is functioning properly, there is no problem with flooding in the area. Pump motors have recently been rewound, and the station is in good working order.

However, the prime drivers are electric motors without any provision for standby power. If the pump station's power supply were to fail during a 24-hour storm, the lagoon could exceed the maximum ponding level. Ponding levels above 12.0 feet NAVD will begin to flood the adjacent property, so making standby power provisions will reduce the risk of flooding in extreme events.

Since the last master plan update, the pump motors have been rebuilt.

## Equipment Schedule

| | |
|---|---|
| Pumps | (2) Aurora axial flow pumps rated 5,350 gpm at 16 feet TDH |
| Prime Power | (2) Westinghouse 30 hp vertical electric motors (480V, 3 phase) |
| Standby Power | None |
| Fuel Storage | n/a |
| Finished Floor Elevation | 13.7 feet NAVD |
| Effective BFE | 10.3 feet NAVD |

## Deficiencies

1. The pump station is not provided with standby power in the form of an emergency engine-generator set; so, if the power were to fail during an intense storm, adjacent properties could be flooded depending upon prior lagoon levels and duration of the power outage.
2. Abbott Pump Station discharges to Penitencia Creek via twin 18-inch diameter high-density polyethylene outfalls through the western levee without flap gates. However, the discharge outfalls are almost 1.5 feet above the design water surface in Penitencia Creek. Should water levels ever exceed the design freeboard, the situation would exceed the design condition because any water that runs back through the pump discharge pipes into the lagoon would eventually cause the pumps to start. Hence, this "deficiency" does not require remedial action.

## Capital Improvement Recommendation

Providing emergency standby power is a ***Low Priority*** project associated with the Abbott station. (Note that engine-generator sizing is approximate only and requires a full load analysis.). The engine-generator should be in a building like the pump house to preserve this station's aesthetic feel. Estimated capital costs are summarized in Table 4-5.

**Table 4-5: Medium Priority CIP for Abbot Pump Station**

| Capital Improvement | Estimated Cost |
|---|---|
| 125 kW standby engine-generator | $225,000 |
| Automatic transfer switch | $75,000 |
| Electrical modifications | $100,000 |
| Building for standby power equipment and site improvements | $200,000 |
| Construction Subtotal | $600,000 |
| Engineering, CM, and Administration (20%) | $120,000 |
| Contingencies (50% nominal) | $380,000 |
| | **$1,100,000** |

## Supplemental Recommendation

A style of pump with fewer maintenance requirements might be more appropriate at this pump station. In 2005 a pump specialist recommended the replacement of the existing line shaft pumps with axial flow submersible pumps because, in his opinion, they should require less maintenance and experience less corrosion. The pump specialist's recommendation is retained in this Storm Drain Master Plan as information only.

Repair and the replacement of parts for the two existing pumps would cost about $60,000. If the impellers are not available "off the shelf", the disassembled pump(s) would likely take up shop space while awaiting delivery of that part. This would add shop rental costs to the costs already enumerated. The cost to replace the existing Aurora Verti-Line 14P pumps with the same pump type would be about $300,000. Replacement of the existing pumps with axial flow submersible pumps requiring less maintenance is about $250,000.

# Minnis Pump Station

| | |
|---|---|
| Facility ID | **SD-5** |
| Location | 1125 N Milpitas Boulevard |
| Discharges to | Calera Creek at STA 1+50 |
| Design WSEL at Discharge Location | 9.6 feet NAVD 88 |
| Storage | None |
| Tributary Area | 30 acres (commercial and industrial) |
| Station Capacity | 33 cfs |
| 10-year Inflow | 8.5 cfs |
| 100-year Inflow | 20 .4cfs |
| Excess Inflow | 12.6 cfs |

Located off of North Milpitas Boulevard, the Minnis Pump Station drains a low-lying area adjacent to Minnis Circle that cannot drain by gravity into Calera Creek. The station is located within a mapped 100-year special flood hazard area (Zone AH Elevation 16 feet NAVD). A projected capacity deficit exists for the 100-year inflow. However, even if this capacity deficit were to be corrected, the area would still be subject to 100-year flooding from Calera Creek until Valley Water solves Calera Creek's capacity issues. Therefore, improving pump station capacity has been downgraded from medium priority to low priority. However, when the Minnis station gets scheduled for long-term replacement (Chapter 9), pumping capacity should be increased to 100-year as described below.

The station is equipped with recently replaced submersible electric pumps and motors, and a set of plugs and automatic transfer switch for standby power if a portable generator can be made available.

The pump station is a duplex Flygt-style station with submersible pumps and motors mounted on a rail with a 14-inch quick disconnect discharge elbow. The pumps are housed in an 11-foot square underground structure. Personnel do not enter this structure but rather pull the rail systems pumps to the surface for lubrication and repair. Electrical meters and controls are enclosed in weatherproof housings and mounted on a pedestal above the pump access slab.

Since the last master plan update, the pumps and motors have been replaced and a portable standby power with ATS has been added.

## Equipment Schedule

| | |
|---|---|
| Pumps | (2) Flygt CP 3300 submersible electric rated 4,500 gpm at 45 feet |
| Standby Power | Trailer mounted portable with automatic start and transfer switch |
| Control Power | 120 VAC (no backup) |
| Fuel Storage | n/a |
| Finished Slab | 16.7 feet NAVD |
| Effective BFE | 15.9 feet NAVD (Zone AH) |

## Deficiencies

Pump station capacity is not sufficient for the influent 100-year design flow, and without pumping, this water becomes trapped by the Calera Creek floodwall. Given that there is sufficient reaction time to bring portable standby power to the site and the pump station has more than 100-year discharge capacity, no capital improvement project is identified for Minnis Pump Station.

# Penitencia Pump Station

| | |
|---|---|
| Facility ID | **SD-6** |
| Location | La Honda Drive |
| Discharges to | Lower Penitencia Creek at STA 57+50 |
| Design WSEL at Discharge Location | 10.0 feet NAVD |
| Storage | Hall Memorial Park Lagoon |
| Tributary Area | 215 acres (residential) |
| Station Capacity | 65 cfs |
| 10-year Inflow | 64.4 cfs |
| 100-year Inflow | 80.4 cfs |
| 10-year Lagoon Level | 8.3 feet NAVD |
| 100-year Lagoon Level | 9.0 feet NAVD |
| Top of Lagoon Bank | 14 feet NAVD |

This ancient pump station sits across Penitencia Creek from the Hall Park Lagoon. A 60-inch gravity bypass pipe allows storm runoff to drain when creek levels are low. Another 60-inch pipe crosses beneath the creek and ties the lagoon to the pump station wet well. This pipe enters the lagoon in a bubble-up box equipped with a combination flap gate and slide gate. With the slide gate open, water levels in the lagoon and wet well equalize, so the system behaves as a single detention pond. In combination with available lagoon storage, the pumping station has sufficient capacity. A discharge standpipe, located above the creek floodwall elevation, provides backflow protection from Penitencia Creek. While the facility remains operational, it needs to be completely replaced in the near future.

Using the Jarad Global Positioning System and a rod to measure water depths, Schaaf & Wheeler conducted surveys of the lagoon between July 20 and July 25, 2000. The references used were the North American Vertical Datum of 1988 (NAVD88) and the North American Horizontal Datum of l983 (NAD83).

Since the last master plan update, the engines have been rebuilt.

## Storage Capacity

Based on the survey, Hall Park Lagoon can store about 25 acre-feet before spilling north onto Abbott Avenue. Its summer water surface elevation is 6.4 feet, and the average depth of bottom sediment is about 1.5 feet. The lake overflows when its water surface elevation reaches about 13.5 feet.

## Lagoon Odors

During the fall, when the city draws down the lake in preparation for winter storms, some neighbors have complained of odors. Adding oxygen can minimize odors caused by the activity of microbes in the sediment and water. Aerators were not operating at Hall Park during Schaaf & Wheeler's survey. Operating the aerators could reduce odors if the one-foot reduction in water surface during the winter is a problem because the lagoon becomes very shallow (about a foot deep). A microbiologist could help identify and implement further biological and chemical solutions.

## Storm Drain Backup

All of the storm drain outfalls into the lagoon are above the summer water surface elevation of 6.4 feet, so lagoon water is not likely to back up into neighboring storm drains during the summer months. Design lagoon levels are based upon the 2000 survey of Hall Park Lagoon and the pumping equipment data and operating levels contained herein. Figure 4-3 shows the storage-elevation curve for the lagoon.

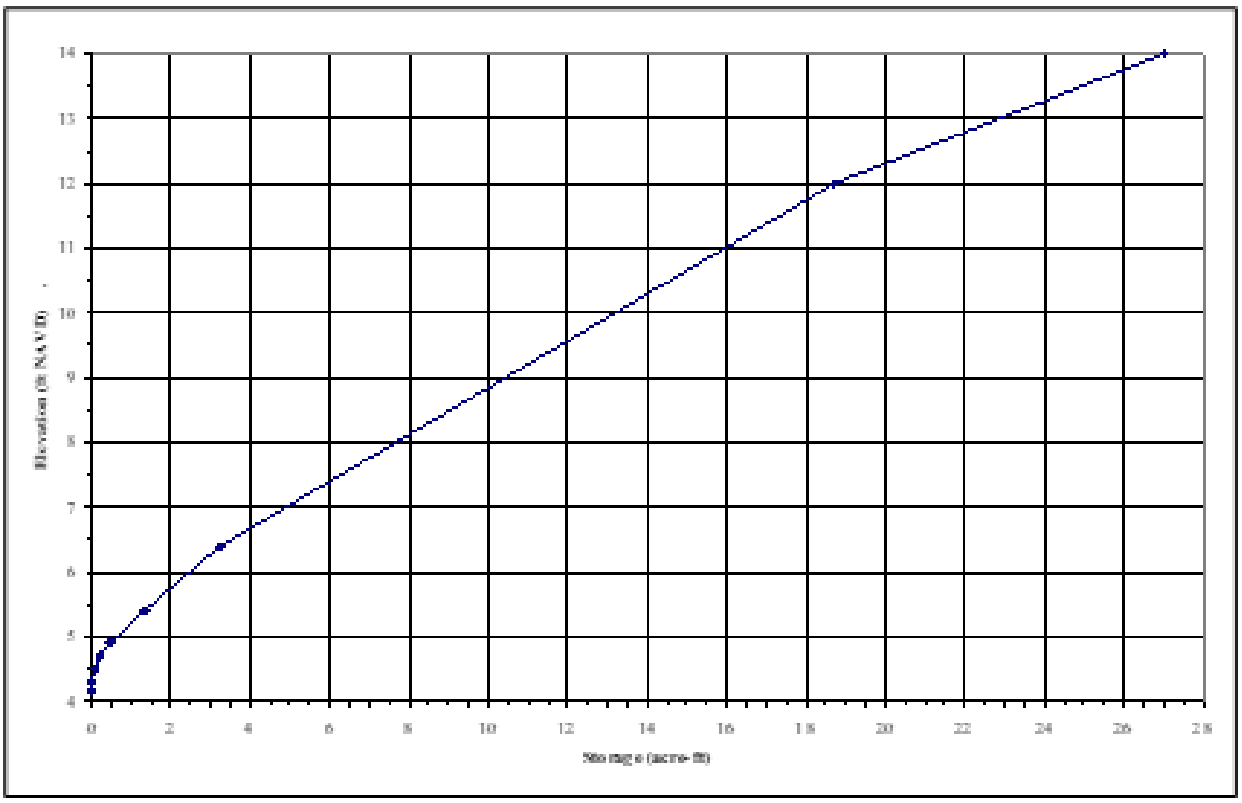


**Figure 4-3: Storage Elevation Curve for Hall Memorial Park Lagoon**

## Pump Station Equipment Schedule

| | |
|---|---|
| Pumps | (3) Fairbanks Morse 6310 axial flow (700 rpm, 40 hp, 9,750 gpm at 12 feet TDH) |
| | (1) Fairbanks Morse 6360 (840 gpm 7.5 hp electric jockey) |
| Prime Power | (3) Fiat 8041I05 diesel engines rated at 60 hp |
| Standby Power | Not required |
| Finish Floor Elevation | 14.3 feet NAVD |
| Effective BFE | 15.4 feet NAVD |

## Capital Improvement Recommendation

Given its age and the equipment condition, a complete station replacement for the Penitencia Pump Station is a ***High Priority***, including raising the floor above the base flood elevation. Based on a survey of available storage volume, the resulting 100-year water surface elevation of 10.1 feet is less than the spill elevation. It does not affect storm drain performance or recommended improvements, so the assumed pump station capacity and operation do not necessarily need to be modified. Detailed design will need to account for proper submergence for pump operation and maintain sump dimensions recommended by the Hydraulic Institute and pump manufacturers. The new axial flow pumps will likely be electric motor driven with a standby diesel engine-generator set that may require Tier 4 emissions control equipment. Estimated capital costs are provided in Table 4-6.

**Table 4-6: High Priority CIP for Penitencia Pump Station**

| Capital Improvement | Estimated Cost |
|---|---|
| Demolish existing structure and equipment | $500,000 |
| Wetwell and sump modifications, trash rack | $1,000,000 |
| Furnish and install (3) axial flow pumps | $700,000 |
| Furnish and install new motors and electrical panels | $1,250,000 |
| New pump station building | $700,000 |
| Automatic standby power generator | $750,000 |
| Site grading and pump discharge outfall construction | $600,000 |
| Construction Subtotal | $5,500,000 |
| Engineering, CM, and Administration (20%) | $1,000,000 |
| Contingencies (50% nominal) | $3,500,000 |
| | **$10,000,000** |

# Wrigley-Ford Pump Station

| | |
|---|---|
| Facility ID | **SD-7** |
| Location | Levee access from Marylinn Drive |
| Discharges to | Berryessa Creek at STA 24+00 |
| Design WSEL at Discharge Location | 10.1 feet NAVD |
| Storage | Forebay and channel storage |
| Tributary Area | 760 acres (commercial and industrial) |
| Station Capacity | 432 cfs |
| 10-year Inflow | 297.6 cfs |
| 100-year Inflow | 408.2 cfs |
| Excess Capacity | 23.8 cfs |

The downstream reach of Wrigley-Ford Creek was created when Valley Water realigned the original Berryessa Creek channel in 1974. To prevent Berryessa Creek flows from backing up into the old channel, a flood-gate structure with three 60-inch discharge pipes was built in 1976. At the time, Wrigley-Ford Creek's high flows would combine with high Berryessa stages and flood residential properties adjacent to the old channel. High water surface elevations in Wrigley-Ford Creek also made local drainage to that creek problematic.

In 1991 Valley Water built the Wrigley-Ford Pump Station to pump tributary creek flows into Berryessa Creek, eliminating the local flooding and gravity drainage problems. This pump station is outfitted with a weir and low flow gravity bypass system so that the pumps only operate when hydrologic conditions warrant. Recirculation piping was also constructed, enabling the pump station to be tested before each storm season using a limited amount of water that is generally available year-round. A resistive load bank furnished for the standby diesel engine-generator set so that the EG-set may be exercised and tested against load during the summer months.

## Equipment Schedule

| | |
|---|---|
| Pumps | (3) Couch EC54 axial flow (240 rpm, 130 hp, 65,000 gpm at 5.8 feet TDH) |
| | (1) Flygt 3102X-441 submersible (500 gpm 5 hp electric jockey) |
| Prime Power | (3) US Motors Model RE 150hp, 1200 rpm horizontal electric motors |
| | (3) Amarillo Gear Co. 5:1 right angle propeller pump drive |
| Standby Power | 400 kV Caterpillar 3406TA diesel engine-generator set (600 hp) |
| Fuel Storage | 500 gallons; 24 hours with 3 pumps, 52 hours with 1 pump |
| Control Power | 120 VAC backed up by 24 VDC batteries with charger |
| Finish Floor Elevation | 20.7 feet NAVD |
| Effective BFE | 16.4 feet NAVD |

## Pump Station Operation

Capital improvements are not necessary for the Wrigley-Ford Pump Station. Originally set pump operating levels may still be used, as they will ensure that the pumps do not start more than twice per hour as recommended by the motor manufacturer. The pumps regularly rotate, allowing all three pumps to alternate for lesser storm events, and using forebay and channel storage prevent cycling.

# Berryessa Pump Station

| | |
|---|---|
| Facility ID | **SD-8** |
| Location | Folsom Circle |
| Discharges to | Berryessa Creek at STA 48+75 |
| Design WSEL at Discharge Location | 10.3 feet (NAVD 88) |
| Storage | 52 acre-feet based on 2000 survey of Hidden Lake |
| Tributary Area | 550 acres (res. and commercial) |
| Station Capacity | 150 cfs |
| 10-year Inflow | 187 cfs |
| 100-year Inflow | 329.1 cfs |
| Normal Lake Level | 9.0 feet NAVD |
| 10-year Lake Level | 9.0 feet NAVD |
| 100-year Lake Level | 13.3 feet NAVD (not including Calera Creek overflows) |
| Allowable Lake Level | 12.0 feet NAVD |
| Lake Spill Elevation | 13.5 feet NAVD |

Hidden Lake was originally constructed as a storm drainage detention facility to act as a forebay for the Berryessa Pump Station, serving residential and commercial areas on both sides of Berryessa Creek. A 60-inch diameter storm drain crosses the creek and drains the Beresford Meadows area and the Town Center. The current operating practice is to use this lake as an aesthetic amenity throughout the year. Residents have complained of objectionable odors and sights whenever the city has lowered the normal water level for winter pumping in the past.

Using the Jarad Global Positioning System and a rod to measure water depths, Schaaf & Wheeler conducted surveys of Hidden Lake between July 20 and July 25, 2000. The references used were the North American Vertical Datum of 1988 (NAVD88) and the North American Horizontal Datum of 1983 (NAD83). This lake can store about 52 acre-feet before spilling north onto Erie Circle (Figure 4-4). Its summer water surface elevation is 8.8 feet, and the average depth of bottom sediment is about 0.75 feet. The lake overflows when its water surface reaches about 13.5 feet in elevation. Local street grades are about 14 feet in elevation. Some flooding of adjacent properties can be expected in a 100-year runoff event once the lagoon elevation reaches about 12 feet.

Berryessa Pump Station was rehabilitated in 2006, including installing replacement equipment and the elevations of all controls to the flood-proofed elevation of 16.78 feet NAVD. Electrical equipment has been replaced since 2013. Although the building itself is not flood-proofed, equipment essential to pump function that would fail if submerged is raised above the regulatory flood elevation. The electric motor, air intake stationary louver, main distribution panel, metering panel, jockey pump starter, and backup diesel engine have all been raised above the minimum flood-proofing elevation. In addition, conduits are run from the ceiling. With these essential elements above water, the pumps can operate if the building itself is flooded. Electronic controls have also recently been replaced. Occasional problems with odors during low lake levels have been resolved using aerators.

Since the last master plan update, the electronics have been replaced.

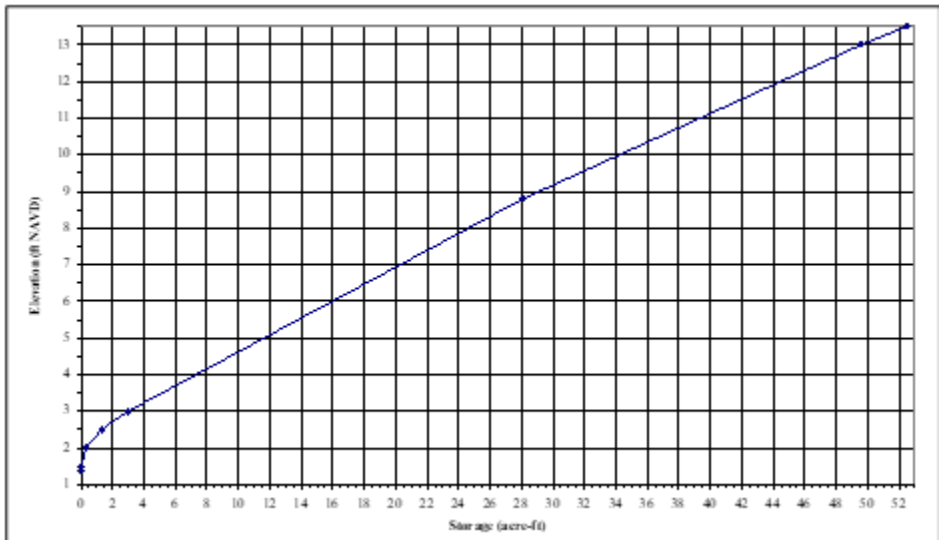



**Figure 4-4: Storage Elevation Curve for Hidden Lake**

## Equipment Schedule

| | |
|---|---|
| Pumps | (3) Berkeley 30M26 580 rpm 140 hp axial flow rated 22,500 gpm at 14 feet TDH |
| | (1) Berkeley 10K3M 7.5 hp 650 gpm jockey |
| Prime Power | (3) Waukesha-Scania\F67D3U 150 hp diesel engines |
| | (1) GE 240V, 3φ electric motor (jockey) |
| Standby Power | Not required |
| Control Power | 120 VAC backed up by 24 VDC batteries with charger |
| Fuel Storage | 1,000 gallons; ~48 hours run time at peak load |
| Flood-proofed Elevation | 16.8 feet NAVD |
| Effective BFE | 17.0 feet NAVD |

## Deficiencies

There are no identified pump station deficiencies and no recommended capital improvements.

# Manor Pump Station

| | |
|---|---|
| Facility ID | **SD-9** |
| Location | Marylinn Ave. and Barker St. |
| Discharges to | Lower Penitencia Creek at STA 90+00 |
| Design WSEL at Discharge Location | 9.5 feet NAVD |
| Storage | Wet Well Only |
| Tributary Area | 146 acres (residential and commercial) |
| Station Capacity | 95 cfs |
| 10-year Inflow | 95.7 cfs |
| 100-year Inflow | 113.3 cfs |

Residential and commercial areas drain to the Manor Pump Station, which activates when the adjacent 21-inch diameter bypass can no longer drain local runoff into Penitencia Creek, either because it becomes overloaded or the creek stage is high.

Since the last master plan update, the pumps and motors have been rebuilt.

## Equipment Schedule

| | |
|---|---|
| Pumps | (3) Flygt 7060-885, 880 rpm, 85 hp submersible axial flow (14,000 gpm at 12') |
| | (1) Flygt CP-3102 submersible centrifugal jockey pump (5 hp) at 600 gpm |
| Standby Power | 600A automatic transfer switch for on-site engine-generator |
| Control Power | 120 VAC backed up by 24 VDC batteries with charger |
| Fuel Storage | n/a |
| Electrical Pad Elevation | 18.2 feet NAVD |
| Effective BFE | 16.0 feet NAVD |

A third axial flow pump has been added to the pump station since the completion of the 2001 master plan, so the station now has adequate capacity for the design 10-year inflow. The pumps and motors were recently rebuilt.

## Deficiencies

There are no identified pump station deficiencies and no recommended capital improvements.

# Spence Creek Pump Station

| | |
|---|---|
| Facility ID | **SD-10** |
| Location | 11 Butler Street |
| Discharges to | Lower Penitencia Creek at STA 110+00 |
| Design WSEL at Discharge Location | 9.1 feet NAVD |
| Storage | Wetwell Only |
| Tributary Area | 109 acres (residential and commercial) |
| Station Capacity | 94 cfs |
| 10-year Inflow | 43.5 cfs |
| 100-year Inflow | 68.0 cfs |
| Excess Capacity | 8cfs |

***Note pump station inoperable at time of study**

Residential and commercial areas drain to Spence Creek until Penitencia Creek backwater forces runoff over a weir into the Spence Creek Pump Station. This facility discharges water to Lower Penitencia Creek through 600 feet of 42" diameter RCP force main. At the time of the master plan update, this station was inoperable due to pump equipment issues, electrical issues, and pump control issues.

This pump station is needed based on the 10-year storm CTP model. Figure 4-5 shows that without the pump, residential areas will become inundated.

**Figure 4-5: 10-year Inundation With and Without Spence Creek Pump Station**

## Equipment Schedule

| | |
|---|---|
| Pumps | (2) Flygt 7080-885, 880 rpm, 215 hp submersible axial flow (21,000 gpm at 26') |
| | (1) Flygt CP-30856 submersible centrifugal jockey pump (3 hp) at 300 gpm |
| Standby Power | 800A Kirk-Key Interlock (manual transfer switch) for portable engine-generator |
| Control Power | 120 VAC backed up by 24 VDC batteries with charger |
| Fuel Storage | n/a |
| Electrical Pad Elevation | 18.2 feet NAVD |
| Effective BFE | 18.0 feet NAVD |

## Deficiency

The station is inoperable, and while a plug and manual transfer switch are provided for a portable engine generator-set, there is no guarantee that either the EG-set or personnel to plug it in and turn it on will be available when power fails. Without any associated flood storage, adjacent areas will begin to flood just as soon as the power is gone. (This can occur with relatively minor storms if Penitencia Creek levels preclude gravity drainage.) The station needs to be retrofit with a permanent skid-mounted 400kW engine generator-set equipped with an automatic transfer switch to provide emergency power whenever the PG&E power supply fails, and there is a call for one of the pumps. Electrical work is required to make the station operational and the current bubbler level sensor needs replacement. ***[Low Priority]***

## Capital Improvement Recommendation

Permanent standby power needs to be furnished at the site. Estimated capital costs are:

**Table 4-7: Low Priority CIP for Spence Creek Pump Station**

| Capital Improvement | Estimated Cost |
|---|---|
| 800A automatic transfer switch | $60,000 |
| Motor Control Center modifications | $80,000 |
| Miscellaneous electrical work | $40,000 |
| 400kW EG-Set in acoustic enclosure | $240,000 |
| Engineering and Administration (20%) | $80,000 |
| Contingency (50%) | $250,000 |
| CIP Cost | **$750,000** |

# Bellew Pump Station

| | |
|---|---|
| Facility ID | **SD-11** |
| Location | 481 Murphy Ranch Road |
| Discharges to | Coyote Creek at STA 616+00 |
| Design WSEL at Discharge Location | 32.7 feet NAVD |
| Storage | Wet well only |
| Tributary Area | 270 acres (industrial) |
| Station Capacity | 375 cfs |
| 10-year Inflow | 45.6 cfs |
| 100-year Inflow | 49.7 cfs |
| Excess Capacity | 325.3 cfs |

Located at the end of Bellew Drive within the Milpitas Business Park Development, this facility drains the industrial area located between Coyote Creek and Interstate 680; from State Highway 237 to the Hetch-Hetchy aqueduct. This station has excess capacity to discharge the 100-year inflow.

Since the last master plan update, the underground fuel tank has been replaced with a belly tank under the emergency generator.

## Equipment Schedule

| | |
|---|---|
| Pumps | (3) Cascade 42MF axial flow (460 rpm, 600 hp, 56,000 gpm at 29 feet TDH) |
| | (1) Cascade 10MF 3,100 gpm 40 hp electric jockey |
| Prime Power | (2) Baldor 1,800 rpm 600 hp electric motors with variable frequency drive |
| | (1) Caterpillar 3412 diesel engine rated at 750 hp (2,100 rpm) |
| Standby Power | Diesel generator to run electric motors |
| Control Power | 120 VAC backed up by 24 VDC batteries with charger |
| Fuel Storage | 2,500 gallons; 72 hours at peak load (3 pumps) |
| Finish Floor Elevation | 25.2 feet NAVD |
| Effective BFE | Shaded Zone X (area of moderate flood hazard) |

## Identified Deficiencies

Capital improvements are not necessary to maintain adequate pumping capacity at the Bellew Pump Station. However, during the Coyote Creek flood event of 2017, which produced water surface elevations in the creek that were a few feet from spilling over the levee at the Bellew Pump Station outlet, the outlet itself was submerged and water was flowing back through the pump discharge into the station wet well. City crews tried to improve the backflow prevention but could not; an engineered solution is needed to prevent creek backflow when the outlet is submerged and prevent excessive pump cycling due to high stage at Coyote Creek.

# Murphy Pump Station

| | |
|---|---|
| Facility ID | **SD-12** |
| Location | 801 Murphy Ranch Road |
| Discharges to | Coyote Creek at STA 636+00 |
| Design WSEL at Discharge Location | 34.0 feet NAVD |
| Storage | Wet well only |
| Tributary Area | 130 acres (industrial) |
| Station Capacity | 200 cfs |
| 10-year Inflow | 118.8 cfs |
| 100-year Inflow | 197.5 cfs |
| Excess Capacity | 2.5 cfs |

Located just south of the Hetch-Hetchy aqueduct in the Milpitas Business Park Development, this facility drains the industrial area located between Coyote Creek and Interstate 680; from Hetch-Hetchy to Tasman Drive. This station has excess capacity to discharge the 100-year inflow. A control system upgrade is planned in the near future.

## Equipment Schedule

| | |
|---|---|
| Pumps | (3) Cascade 30MF axial flow (525 rpm, 250 hp, 30,000 gpm at 27 feet TDH) |
| | (1) Cascade 8MF 2,900 gpm 25 hp electric jockey |
| Prime Power | (3) Cumins NT655P diesel engines rated at 335 hp (2,600 rpm) |
| Standby Power | Not required |
| Control Power | 120 VAC backed up by 24 VDC batteries with charger |
| Fuel Storage | 2,000 gallons; 120 hours at peak load (3 pumps) |
| Finish Floor Elevation | 27.7 feet NAVD |
| Effective BFE | Shaded Zone X (area of moderate flood hazard) |

## Identified Deficiencies

Capital improvements are not necessary to maintain adequate pumping capacity at the Murphy Pump Station. However, during the Coyote Creek flood event of 2017, which produced water surface elevations in the creek that were a few feet from spilling over the levee at the Murphy Pump Station outlet, the outlet itself was submerged and water was flowing back through the pump discharge into the station wet well. City crews tried to improve the backflow prevention but could not; an engineered solution is needed to prevent creek backflow when the outlet is submerged and prevent excessive pump cycling due to high stage at Coyote Creek.

Control systems have exceeded their life expectancy and with performance issues becoming increasingly problematic, control system rehabilitation is a ***high priority project*** expected to cost $250,000.

# Oak Creek Pump Station

| | |
|---|---|
| Facility ID | **SD-13** |
| Location | 1521 McCarthy Boulevard |
| Discharges to | Coyote Creek at STA 678+00 |
| Design WSEL at Discharge Location | 38.3 feet NAVD |
| Storage | Wet Well and Pipe |
| Tributary Area | 280 acres (industrial) |
| Station Capacity | 320 cfs |
| 10-year Inflow | 102.5 cfs |
| 100-year Inflow | 216.4 cfs |
| Excess Capacity | 103.6 cfs |

Oak Creek Pump Station drains an industrial area at the southwestern corner of Milpitas, between Coyote Creek and Interstate 680 Tasman Drive to Montague Expressway. Because the direct-drive engines appear to be slightly overloaded when the Coyote Creek stage is high, they tend to run warm. A control system upgrade is planned soon.

## Equipment Schedule

| | |
|---|---|
| Pump | (3) Aurora 36P axial flow (590 rpm, 600hp, 48,000 gpm at 28.5 feet TDH) |
| | (1) Aurora 10LM 2,900 gpm 25 hp electric jockey |
| Prime Power | (3) Caterpillar 3408 diesel engines rated at 480 hp (2,100 rpm) |
| Standby Power | Not required |
| Fuel Storage | 2,000 gallons; 80 hours at peak load (3 pumps) |
| Finish Floor Elevation | 33.7 feet NAVD |
| Effective BFE | Shaded Zone X (area of moderate flood hazard) |

## Identified Deficiencies

Capital improvements are not necessary to maintain adequate pumping capacity at the Oak Creek Pump Station. However, during the Coyote Creek flood event of 2017, which produced water surface elevations in the creek that were a few feet from spilling over the levee at the Oak Creek Pump Station outlet, the outlet itself was submerged and water was flowing back through the pump discharge into the station wet well. City crews tried to improve the backflow prevention but could not; an engineered solution is needed to prevent creek backflow when the outlet is submerged and prevent excessive pump cycling due to high stage at Coyote Creek.

Control systems have exceeded their life expectancy and with performance issues becoming increasingly problematic, control system rehabilitation is a ***high priority project*** expected to cost $250,000.

# Chapter 5: Operations, Maintenance, and Replacement

The intent of this Master Plan is not as a treatise on storm drain system operations and maintenance requirements or techniques (city operations and maintenance staff are the foremost authorities on this subject.) Rather, some foresight provided into anticipated ongoing maintenance schedules, including periodic replacement of major storm drain system components.

Milpitas is over 60 years old, and some of its older storm drainage infrastructures, particularly pumping equipment, are reaching the end of its useful life. Over the next several decades, major equipment replacements will be needed, and the city needs to set aside sufficient funds for annual facility maintenance and a systematic long-term replacement program, as outlined in Chapter 6.

## General Maintenance Regimen

Table 5-1 presents very general criteria that may be useful in establishing a routine maintenance regimen. Again, city staff will have the best feel for the necessary frequency and extent of ongoing maintenance on a system-by-system basis. Also, maintenance needs will fluctuate depending upon seasonal and annual factors, particularly the amount of precipitation; and to a lesser extent, the general climate.

It is vitally important that all collection, storage, and pumping systems be in working order prior to the start of Milpitas's wet season near the end of October. Realizing the limited number of maintenance staff and the finite number of hours in a year, it is a given that certain items will have higher priorities than others.

**Table 5-1: Storm System Maintenance Guidelines**

| Category | Schedule |
|---|---|
| Inlet Inspection | annually (summer-fall) |
| Inlet Cleaning | as required (ongoing) |
| Storm Drainpipe Cleaning | continuous if possible (ongoing) |
| Channel Cleaning | annually (fall) |
| Detention Basin Dredging | every ten years |
| Wet Well cleaning | annually (fall) |
| Direct Observation/Inspection | monthly (year-round) |
| Pump Exercising | monthly (year-round) |
| Engine Exercising | monthly at full load (year-round) |
| Equipment Lubrication | per manufacturers' recommendations |
| Preventative Maintenance per Equipment O&M | annually (spring) |
| Clean and Polish Diesel Fuel/Remove Water | annually (fall) |
| Underground Storage Tank Inspection | weekly |
| Aboveground Storage Tank Inspection | monthly |
| Motor / Engine Control Testing | annually (fall) |

## Collection System Maintenance

The storm drain and channel system cannot function if one of its components is plugged. Even though hydraulic analyses say criteria are met, blocked inlets, pipes, or channels will cause flooding, potentially with serious consequences; lagoons and pumping forebays need to be monitored and periodically dredged to preserve design capacities. Even the most rigorous maintenance programs cannot prevent all problems during a storm event; still, problems must not accumulate.

It is also important to maintain the more natural drainage features such as open channels and lagoons as drainage features, so they do not become jurisdictional and require extensive regulatory permits to perform what should be routine maintenance.

Based on system history, the most significant problems occur at the base of the foothills, where sediment- and debris-laden runoff are easily carried within the steeper pipes and streets. This sediment and debris, some of which originates outside of the city limits in unincorporated Santa Clara County, are deposited as the topography flattens out to the west.

Adding debris basins and modifying inlets along Evans Road and Piedmont Road could help with the maintenance effort. Depending on the desired frequency for maintenance, storage in debris basins made to handle sediment and debris as described in Chapter 3. Retrofitting certain storm drain inlets to mimic the existing inlet for Piedmont Creek on Piedmont Road, as shown in Figure 5-1, would also help ease downstream maintenance.

**Figure 5-1: Trash and Debris Protection at Piedmont Creek Inlet**

Another area of concern is where so-called “self-cleansing” velocities of two feet per second are not maintained even with significant runoff. This circumstance may occur in larger diameter pipelines, particularly in the terminal drainage areas west of Interstate 880. Collection systems in terminal drainage areas have been designed to handle the 100-year discharge where pipes are continuously submerged in water due to backwater from pump stations.

## Open Channel Maintenance

Open channels are important to maintain to allow for proper stormwater drainage from the city storm drain system. Debris and overgrown vegetation in open channels owned by the city should be removed to keep creek levels low so that stormwater in the collection system can drain out and not surcharge. There are surcharges causing flooding in the storm drain network in the existing system due to high creek levels in Wrigley-Ford Creek. Figure 5-2 shows that decreasing the Manning's roughness coefficient of Wrigley-Ford Creek to reflect the effects of maintained creek results in reduced surcharges in the collection system. Figure 5-3 and 5-4 show the creek WSEL profile with and without maintenance allowed by the Wrigley-Ford Creek maintenance permit for 10-year and 100-year storm.

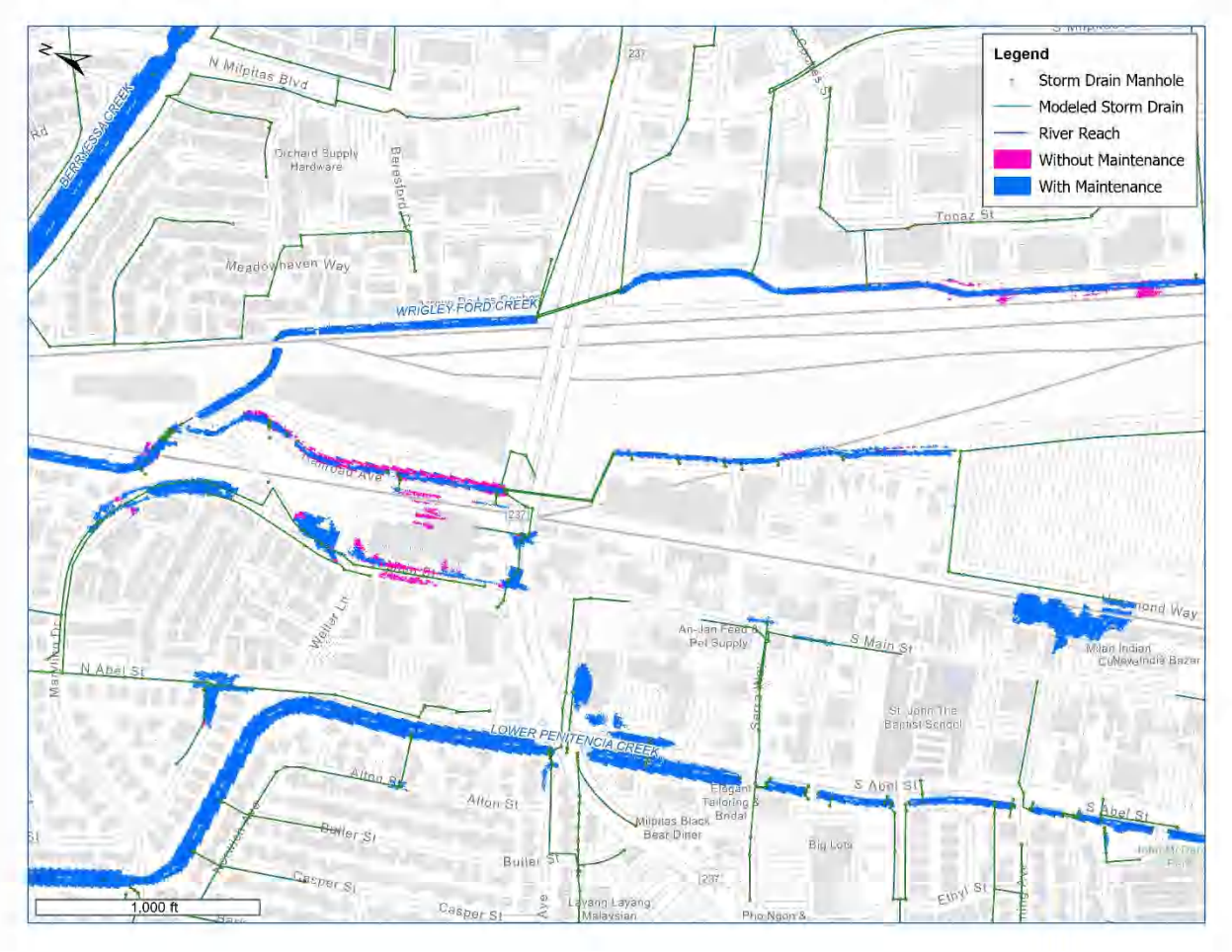



**Figure 5-2: Wrigley-Ford Creek Flooding with and Without Maintenance for 10-Year Storm**

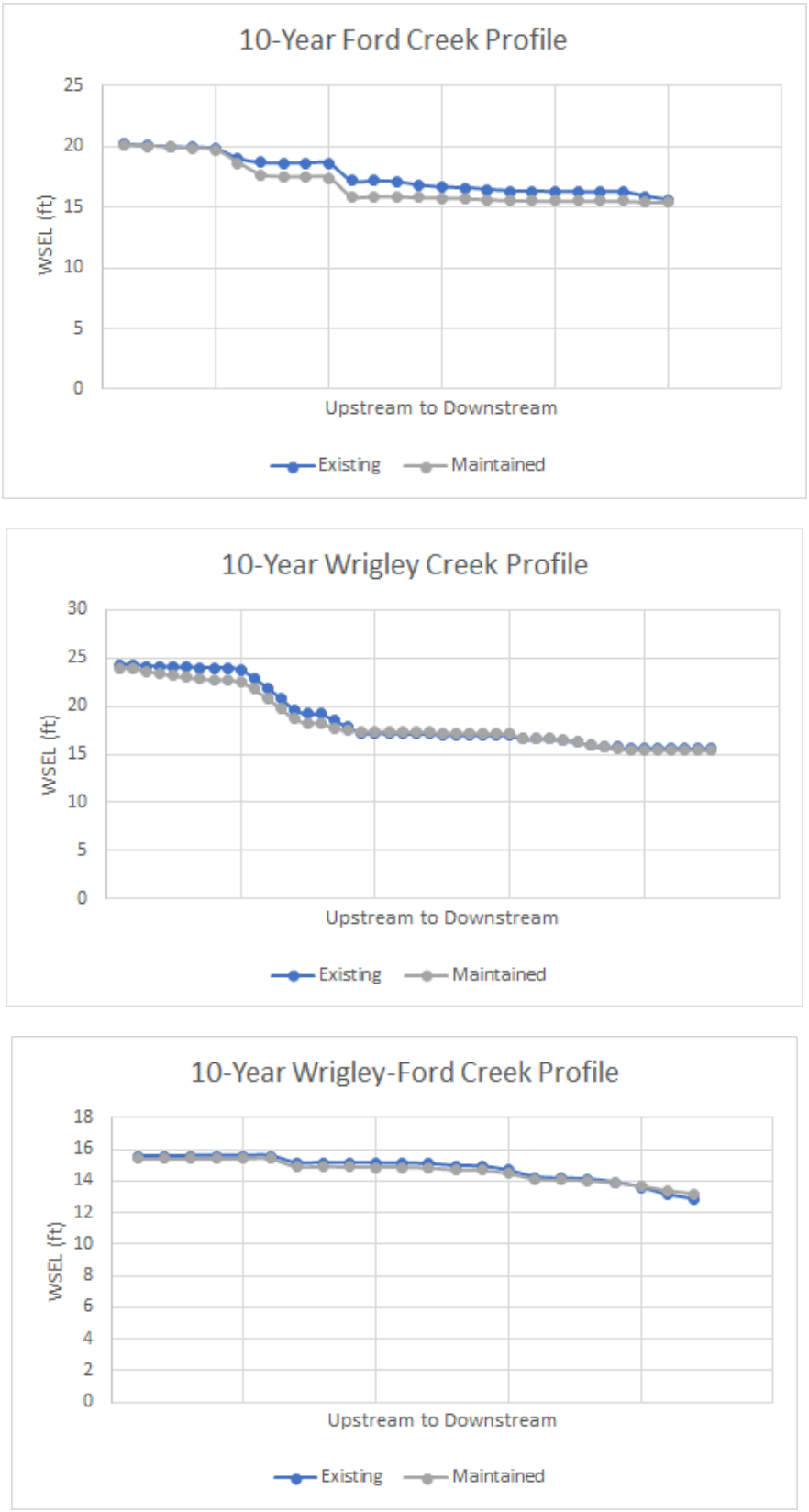
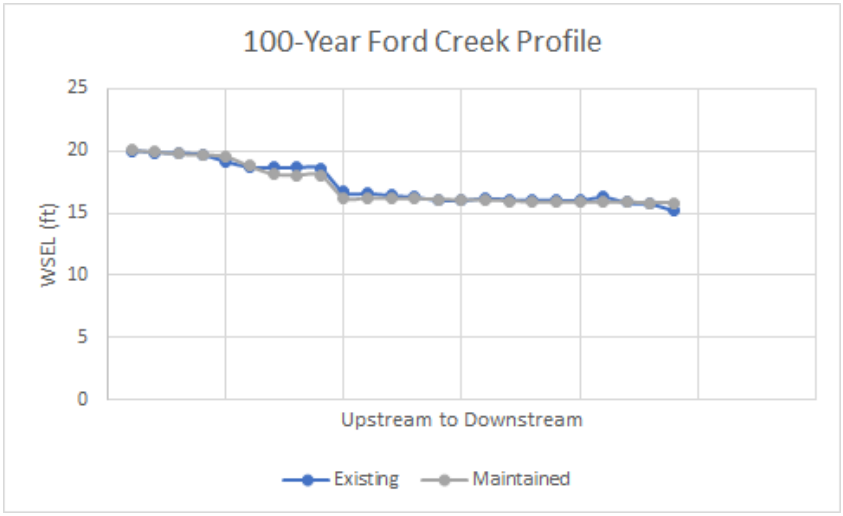
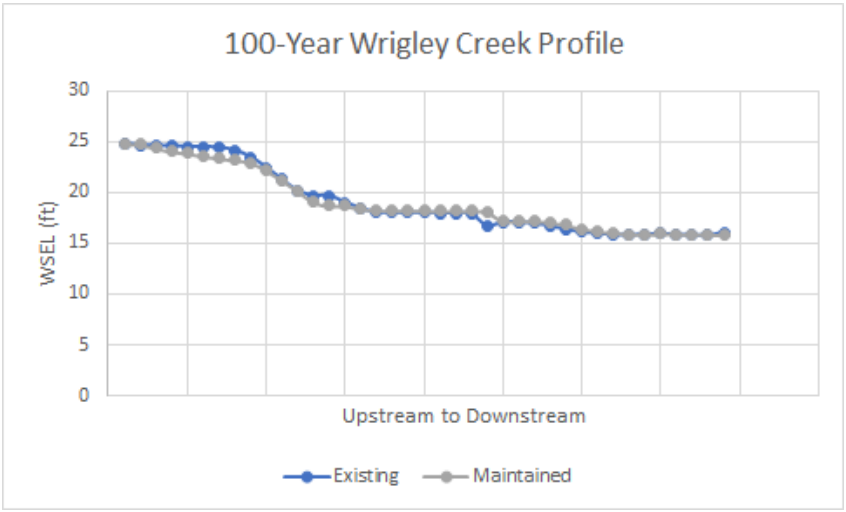



**Figure 5-3: 10-Year Storm Profile With and Without Maintenance on Wrigley, Ford, and Wrigley-Ford Creek**



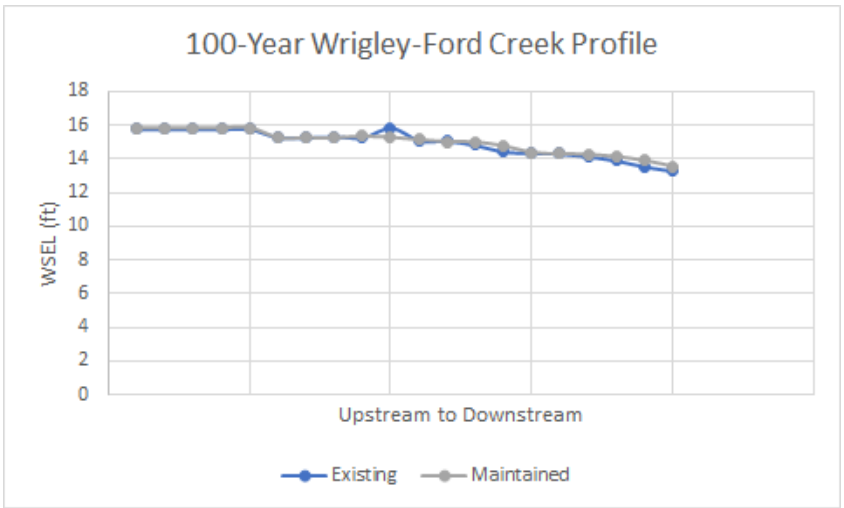




**Figure 5-4: 100-Year Storm Profile With and Without Maintenance on Wrigley, Ford, and Wrigley-Ford Creek**

## Pumping Facility Maintenance

Pumping stations are critical to maintain since mechanical or electrical failure can jeopardize system operation. Each pump station should have a bound copy of its site-specific operations and maintenance manual on-site, and all personnel need to be familiar with the contents of these manuals.

Proper equipment lubrication and maintenance following manufacturers' recommendations (which must be included in the operations and maintenance manual) is essential to efficient operation and longevity, particularly when one considers how infrequently pump operation may occur. For this reason, recommending the city retrofit any pump station control system that does not automatically alternate lead and lag pump status so that each pump within a station operates roughly the same number of hours every year.

Appendix B outlines pump station design, maintenance, and operation features that can help further the maintenance effort. All engine drive units installed run on diesel fuel. Table 5-2 summarizes the recommended frequency.

**Table 5-2: Typical Maintenance Frequency for Engines and EG Sets**

| Maintenance Task | Operating Time | Calendar Time |
|---|---|---|
| Inspect fuel, oil level, coolant | 8 hr | 1 m |
| Inspect air cleaner, battery | 50 hr | 1 yr |
| Clean governor linkage, breather, air cleaner | 100 hr | 1 yr |
| Clean fuel filter, replace oil filter, change crankcase oil, check switchgear | 200 hr | 1 yr |
| Clean commutator, collector rings, relays, cooling system; inspect brushes, valve clearances, starting and stopping systems, water pump | 500 hr | 1 yr |
| Check injectors, grind valves (if required), remove carbon, clean oil passages, replace secondary fuel filter, clean generator, and grease bearings | 1000 hr | 2 yr |

# Municipal Regional Stormwater Permit Requirements

Milpitas participates in the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) as a co-permittee under the California Regional Water Quality Control Board San Francisco Bay Region (Water Board) Municipal Regional Stormwater NPDES Permit (Order No. R2-2015-0049). Also referred to as the "MS4 Permit" or "MRP", it became effective November 19, 2015. Requirements outlined in the city's MS4 Permit are subject to change. As such, this storm drain master plan does not intend to document specific NPDES requirements or their implementation; but rather provide a brief background regarding the requirements likely to affect system-wide operation and maintenance. An allowance is made in Chapter 6 for typical annual costs to satisfy system-wide permit requirements. A permit update (MRP3.0) is in the draft form currently and anticipated to be adopted in 2021.

## Regulatory Background

The Water Board has found that stormwater runoff from urban and developing areas within the San Francisco Bay region contains significant sources of pollutants that contribute to water quality impairment in the waters of the region. In Milpitas, these could include creeks, streams, and San Francisco Bay. In conformance with the Clean Water Act, the Water Board has established total maximum daily loading

limits (TMDLs) for various pollutants to gradually eliminate the water bodies' impairment and attain water quality standards.

As a co-permittee, Milpitas is required to effectively prohibit the discharge of anything other than stormwater into storm drain systems and watercourses. It is specifically prohibited from discharging rubbish, refuse, sediment, or other solid wastes into surface waters or anywhere such trash will eventually transport to surface waters, including floodplain areas.

## Routine Practices

Implement best management practices (BMPs) to control and reduce polluted stormwater and non-stormwater discharges to storm drains and watercourses during operation, inspection, and routine repair and maintenance activities of municipal facilities and infrastructure, including storm drain infrastructure. These practices apply to:

- Road repair and maintenance
- Sidewalk and other hardscape repairs, maintenance, and cleaning
- Structural maintenance (e.g., bridge repair) and graffiti removal
- Stormwater pump station operation and maintenance
- Corporation yard activities
- Construction sites
- Pesticide toxicity control

Milpitas must implement an industrial and commercial site control program at all sites that could reasonably be considered to cause storm water runoff pollution. Routine inspections and enforcement to abate actual or potential pollution sources need to be consistent with an Enforcement Response Plan prepared to confirm the implementation of appropriate and effective pollutant controls by industrial and commercial site operators. In addition, Milpitas is responsible detecting and eliminating illicit discharges by any party within its jurisdiction. An illicit discharge program shall be developed and implemented to include active surveillance, a centralized point of contact for complaints, a tracking system, and reporting. Public outreach and water quality monitoring, which can be collaborative with other co-permittees such as the Santa Clara Valley Water District, also permit requirements.

## New Development and Redevelopment

Milpitas administers the implementation of new development and redevelopment projects to comply with the Municipal Regional Stormwater Permit requirements. For regulated projects (which is a function of size, land use, and location), this includes project review and permitting in the areas of site design, onsite stormwater treatment, hydro-modification management, landscaping, trash enclosures, plumbing, swimming pool water disposal, and fire test water disposal. The MS4 Permit does allow the city to consider the construction of regional stormwater treatment facilities in lieu of treatment on individual building sites. Such regional stormwater treatment facilities are not factored into capital planning for the stormwater system described in this master plan document.

## Green Infrastructure

The City of Milpitas Green Infrastructure Plan (GI Plan) aims to gradually transform the urban landscape and storm drainage systems from "gray" to "green". It involves shifting from having stormwater runoff flow directly off impervious surfaces into the storm drainage system to having runoff flow into a local, sustainable system such as draining into vegetated areas for infiltration and evaporation, collecting runoff for non-potable uses, using permeable pavements, and treating runoff with biotreatment. This green

infrastructure will help limit the transport of pollutants in stormwater by reducing runoff. Coordinating the proposed CIP projects with street greening can lower the marginal cost of stormwater management.

### Trash Capture

The city must capture all trash originating from the city's Municipal Separate Sewer System (MS4) before it enters the waterways by the year 2022 (draft permit may revise the deadline to 2023). The city is accomplishing this through full trash capture systems and devices located at individual storm drain inlets. One example is the screening device at Wrigley-Ford Pump Station. It is outside the scope of the master plan to identify and model these devices; however, the design and operation of these devices may result in impediments to flow and the potential to cause localized flooding. This needs consideration during the locating and design of these devices, and ongoing operations and maintenance.

## System Replacement

With predominantly reinforced concrete pipe, collection system materials can be expected to last indefinitely, so a major replacement schedule for the pipe is not presented. System breaks, joint misalignment, and other problems do occur, of course, so periodic collection system rehabilitation has been included with the estimated annual maintenance cost.

On the other hand, pumping facilities rely heavily on mechanical and electrical equipment that will wear out, particularly since the stations are not operated constantly. On average, pumping equipment can be expected to last anywhere from 20 to 30 years with proper maintenance. Structural facilities should last much longer – at least 50 years – although metal, wood, and even concrete surfaces all require regular care.

Table 5-3 lists Milpitas' pumping facilities, their approximate age, and possible dates for mechanical and electrical equipment replacement to be completed within 5-year intervals based on input from city staff. Major rehabilitation might include complete pump station replacement, depending upon the circumstances. City maintenance crews need to monitor the condition of these facilities and prepare for system replacement several years in advance.

More detailed pump station assessments are provided in Chapter 6. Thorough individualized pump station assessments should be made prior to undertaking major equipment replacement or station rehabilitation.

**Table 5-3: Pumping Facility Replacement**

| ID | Station Name | Originally Built | Age (years) | Recent Equipment Replacement | Proposed Schedule for | |
|---|---|---|---|---|---|---|
| | | | | | Equipment Replacement | Major Rehabilitation |
| 1 | California Circle | 1983 | 38 | | 2030 | 2070 |
| 2 | Jurgens | 1989 | 32 | Ventilation | Low Priority CIP | Low Priority CIP |
| 3 | McCarthy Ranch | 1994 | 27 | | 2045 | 2075 |
| 4 | Abbott Avenue | 1983 | 38 | Equip rehab/motors | 2040 | 2070 |
| 5 | Minnis[1] | 1978 | 43 | Pumps/ATS | 2050 | 2050 |
| 6 | Penitencia[1] | 1960 | 61 | Engines rebuilt | High Priority CIP | High Priority CIP |
| 7 | Wrigley-Ford | 1993 | 28 | | 2035 | 2070 |
| 8 | Berryessa[2] | 1977 | 44 | electronics | 2045 | 2045 |
| 9 | Manor | 1993 | 28 | Pumps and motors rebuilt | 2040 | 2070 |
| 10 | Spence Creek | 1988 | 33 | | 2030 | 2065 |
| 11 | Bellew[3] | 1985 | 36 | | 2060 | 2060 |
| 12 | Murphy | 1983 | 38 | | 2035 | 2070 |
| 13 | Oak Creek | 1979 | 42 | | 2025 | 2055 |

[1]Scheduled as High-priority CIP
[2]All pumping, electrical, and control equipment replaced and flood-proofed in 2006
[3]Two engines replaced with electric motors, variable frequency drives, and controls in 2012

# Chapter 6: Storm Drainage Funding Requirements

This chapter summarizes budget requirements to fund Capital Improvement Program projects described in Chapter 3, and facility maintenance and replacement as outlined in Chapter 4 and 5. Table 6-1 summarizes these projects.

**Table 6-1: Comprehensive Master Plan CIP Projects**

| CIP Project | Priority |
|---|---|
| CAL_2 | High |
| CAL_3 | High |
| COCHES_5 | High |
| BERRY_10 | High |
| Inlet Replacements | High |
| Murphy Pump Station | High |
| Penitencia Pump Station | High |
| CAL_1 | Low |
| CAL_4 | Low |
| COCHES_8 | Low |
| WF_11 | Low |
| LP_12 | Low |
| WF_13 | Low |
| LP_14 | Low |
| Wrigley-Ford Creek Maintenance | Low |
| Abbott Pump Station | Low |
| Jurgens Pump Station | Low |
| Spence Creek Pump Station | Low |
| LP_15 | Extension |
| LP_16 | Extension |
| LP_17 | Extension |
| LP_18 | Extension |

Table 6-2 summarizes estimated annual costs for implementing the proposed priority Capital Improvement Program, near-term equipment replacement, facility maintenance, and future facility replacement. All cost estimates are in 2020 dollars (ENR Index = 10,000). Annual equal payment capital recovery costs assume 20-year financing with a six percent interest rate. The cost of money associated with actual project timing is assumed to be included with CIP contingencies. CIP implementation estimates in Table 6-2 assume that where feasible, the parallel pipe alternative will be selected to save cost. For the purpose of setting aside sufficient funds for future work, the amortized annual costs for low priority projects are not calculated since these optional projects would likely be built only with outside funding in conjunction with other work.

**Table 6-2: Storm Drainage Funding Requirements**

| Category | Present Worth | Annualized Cost |
|---|---|---|
| High Priority CIP Implementation | $15,000,000 | $1,000,000 |
| Long-Term Equipment Replacement | $45,000,000 | $3,500,000 |
| Annual Operations and Maintenance | --- | $2,500,000 |
| Total Budget | $60,000,000 | $7,000,000 |

Spread over Milpitas' 6,048 acres of developed or developable land, the average annual cost per acre is $1,160 to fund high priority Master Plan improvements, replace equipment and maintain storm drainage facilities.

## Cost Basis of Capital Improvement Program

Chapter 3 discusses evaluation criteria used to prioritize improvements. Based on hydrologic and hydraulic analyses of stormwater collection and pumping facilities, master plan improvements will bring systems into compliance with performance criteria. This is a master plan level effort. Hence, many of the practical constraints that will govern the detailed design and construction of actual infrastructure improvements are unknown at this time, such as:

- Utility interference and relocation;
- Right-of-way and/or easement availability;
- Traffic control requirements;
- Geotechnical and hazardous waste conditions;
- Archaeological discoveries and environmental impacts; and/or
- Regulatory and permitting requirements.

Since these impacts cannot be estimated with any certainty, this master plan's approach is to estimate capital improvement costs based on current construction market conditions and apply 10% for mobilization and demobilization, 5% for traffic control, and 40% on contingency. A 40% contingency has been included to account for 15% design and 25% construction contingency. Table 6-3 and 6-4 provides unit cost information for storm drain collection systems. Costs are based on bids from past storm drain projects adjusted to the current ENR index.

**Table 6-3: Storm Drainpipe Collection Costs per Lineal Foot**
(All costs in 2020 dollars)

| Diameter | 18" | 24" | 30" | 36" | 42" | 48" | 54" | 60" | 72" | 84" | 94" |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pipe | $283 | $350 | $447 | $516 | $614 | $692 | $789 | $898 | $1,171 | $1,590 | $1,920 |
| 10% Mob/Demob | $28 | $35 | $45 | $52 | $61 | $69 | $79 | $90 | $117 | $159 | $192 |
| 5% Traffic Control | $14 | $18 | $22 | $26 | $31 | $35 | $39 | $45 | $59 | $80 | $96 |
| 40% Contingency | $113 | $140 | $179 | $206 | $246 | $277 | $316 | $359 | $469 | $636 | $768 |
| **Total Unit Cost** | **$439** | **$543** | **$693** | **$800** | **$952** | **$1,073** | **$1,223** | **$1,392** | **$1,816** | **$2,465** | **$2,976** |

**Table 6-4: Storm Drain Manhole Costs per Unit**
(All costs in 2020 dollars)

| Diameter | 18" | 24" | 30" | 36" | 42" | 48" | 54" | 60" | 72" | 84" | 94" |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Manhole | $13,369 | $13,655 | $13,941 | $14,228 | $14,514 | $14,801 | $16,080 | $16,406 | $18,268 | $20,915 | $23,005 |
| 10% Mob/Demob | $1,337 | $1,366 | $1,394 | $1,423 | $1,451 | $1,480 | $1,608 | $1,641 | $1,827 | $2,091 | $2,301 |
| 5% Traffic Control | $668 | $683 | $697 | $711 | $726 | $740 | $804 | $820 | $913 | $1,046 | $1,150 |
| 40% Contingency | $5,347 | $5,462 | $5,577 | $5,691 | $5,806 | $5,920 | $6,432 | $6,562 | $7,307 | $8,366 | $9,202 |
| **Total Unit Cost** | **$20,722** | **$21,165** | **$21,609** | **$22,053** | **$22,497** | **$22,941** | **$24,923** | **$25,429** | **$28,315** | **$32,418** | **$35,658** |

Table 6-5 details the calculation of estimated CIP cost by Master Plan improvement priority.

**Table 6-5: Storm Drain Capital Improvements Costs**
(All costs in 2020 dollars)

| Category | Cost |
|---|---|
| High Priority CIP | $14,000,000 |
| Low Priority CIP | $24,000,000 |
| Extension CIP | $1,000,000 |
| Total Budget | $39,000,000 |

## Annual Maintenance Costs

Existing storm drainage infrastructure and new improvements to be constructed from the CIP must be operated and maintained as described in Chapter 5. Based on these regimens and input from city staff, the annual funding levels summarized by Table 6-6 are recommended for facility operation, preventative maintenance, programmed replacement, and mandated non-point source control programs. Some allowance should also be made for increased power and fuel costs for pumping.

**Table 6-6: Storm Drain Annual Operation and Maintenance Costs**
(All costs in 2020 dollars)

| Category | Cost |
|---|---|
| Annual Operations | $600,000 |
| Preventative Maintenance | $500,000 |

| Category | Cost |
|---|---|
| Wrigley-Ford Creek Maintenance | $800,000 |
| NPDES Permit Compliance | $300,000 |
| Programmed Replacement | $300,000 |
| Total Annual Costs | **$2,500,000** |

## Cost of Major Facility Replacement

Replacing major mechanical equipment for pumping stations is outside of the annual allowance made for programmed replacement. Detailed cost estimates to replace equipment at the Abbott Pump Station and Oak Creek Pump Station have been prepared. Estimated costs in 2020 dollars for other pump station replacement projects are based on the unit costs indicated in Table 6-7. Equal payment series capital-recovery fund amounts for equipment replacement and major rehabilitation are given in Table 6-8, based on an interest rate of six percent, and beginning to accumulate the annual fund in 2020.

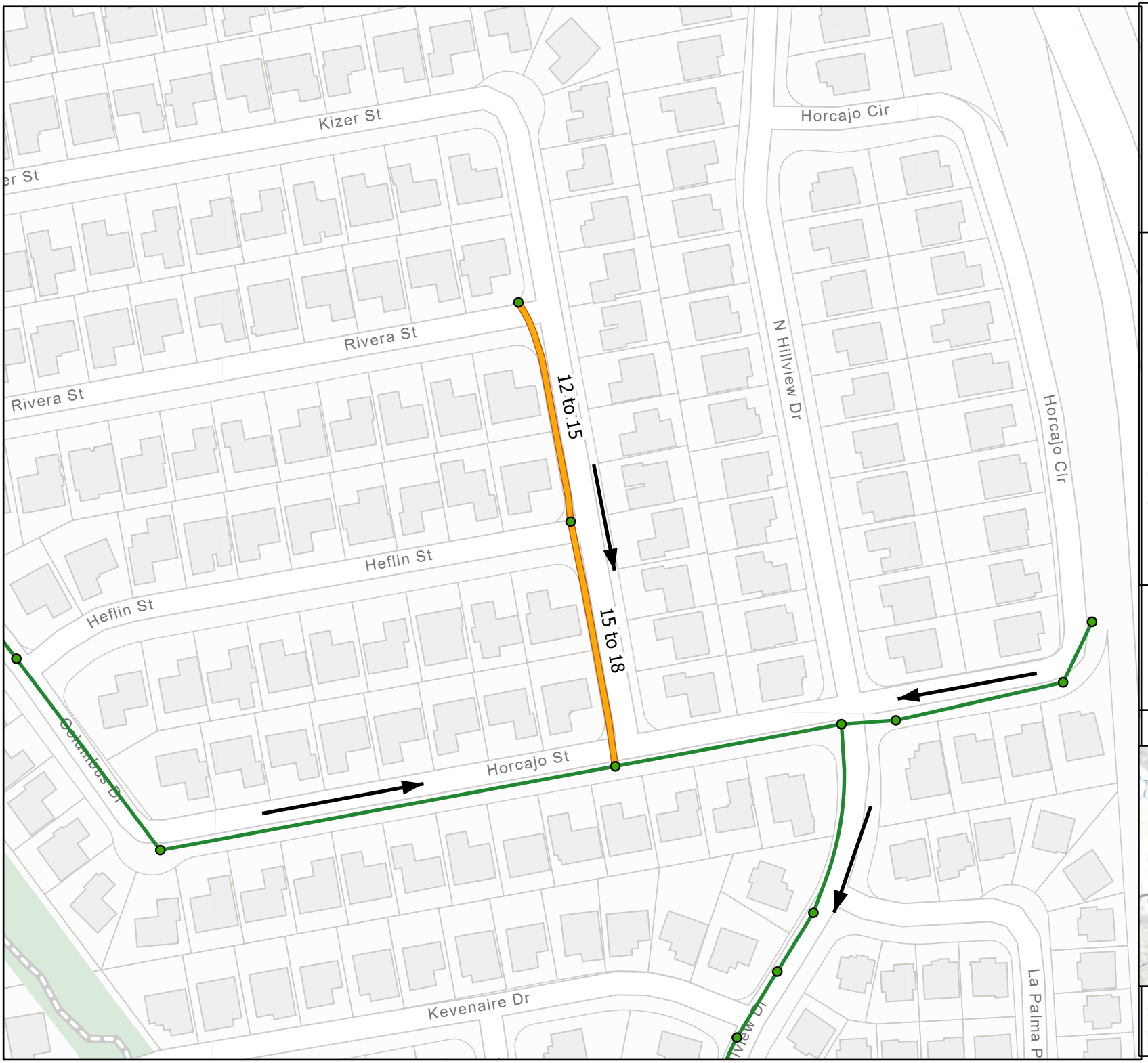
**Table 6-7: Storm Pumping and Storage Unit Costs**
(All costs in 2020 dollars; ENR = 13,500)

| Category | Unit Cost |
|---|---|
| Axial Flow Pump and Driver | $3,500 per cfs of capacity |
| Direct Drive Engine | $950 per horsepower |
| Engine-Generator Set | $700 per kilowatt |
| Pump Building | $400 per square foot |
| Storage Excavation | $40 per cubic yard |

**Table 6-8: Pumping Facility Replacement**

| ID | Facility | Next Scheduled Replacement | | | Second Scheduled Replacement | | |
|---|---|---|---|---|---|---|---|
| | | Year | Cost | Annual Fund | Year | Cost | Annual Fund |
| 1 | California Circle | 2030 | $1,000,000 | $136,000 | 2070 | $2,000,000 | $129,000 |
| 2 | Jurgens | CIP | $0 | $0 | 2075 | $3,000,000 | $185,000 |
| 3 | McCarthy | 2040 | $3,000,000 | $262,000 | 2080 | $5,000,000 | $313,000 |
| 4 | Abbott | CIP | $0 | $0 | 2050 | $1,000,000 | $73,000 |
| 5 | Minnis | 2050 | $1,000,000 | $73,000 | 2080 | $1,000,000 | $63,000 |
| 6 | Penitencia | CIP | $0 | $0 | 2070 | $2,500,000 | $161,000 |
| 7 | Wrigley-Ford | 2035 | $2,000,000 | $206,000 | 2065 | $3,000,000 | $226,000 |
| 8 | Berryessa | 2045 | $3,000,000 | $234,000 | 2060 | $1,000,000 | $67,000 |
| 9 | Manor | 2040 | $1,000,000 | $87,000 | 2070 | $1,000,000 | $65,000 |
| 10 | Spence Creek | CIP | $0 | $0 | 2065 | $1,000,000 | $65,000 |
| 11 | Bellew | (2012) | $0 | $0 | 2055 | $3,000,000 | $208,000 |
| 12 | Murphy | CIP | $0 | $0 | 2070 | $3,000,000 | $193,000 |
| 13 | Oak Creek | 2025 | $2,000,000 | $475,000 | 2055 | $3,000,000 | $208,000 |
| | **Total** | | **$13,000,000** | $1,500,000 | | **$30,000,000** | $2,000,000 |

# Appendix A Storm Drain Inundation Maps




# Milpitas Storm Drainage CIP

CAL_1
Tice Drive
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

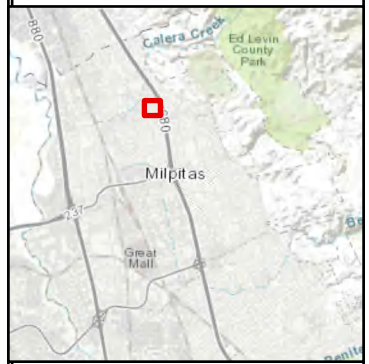
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 150 feet

## Vicinity Map

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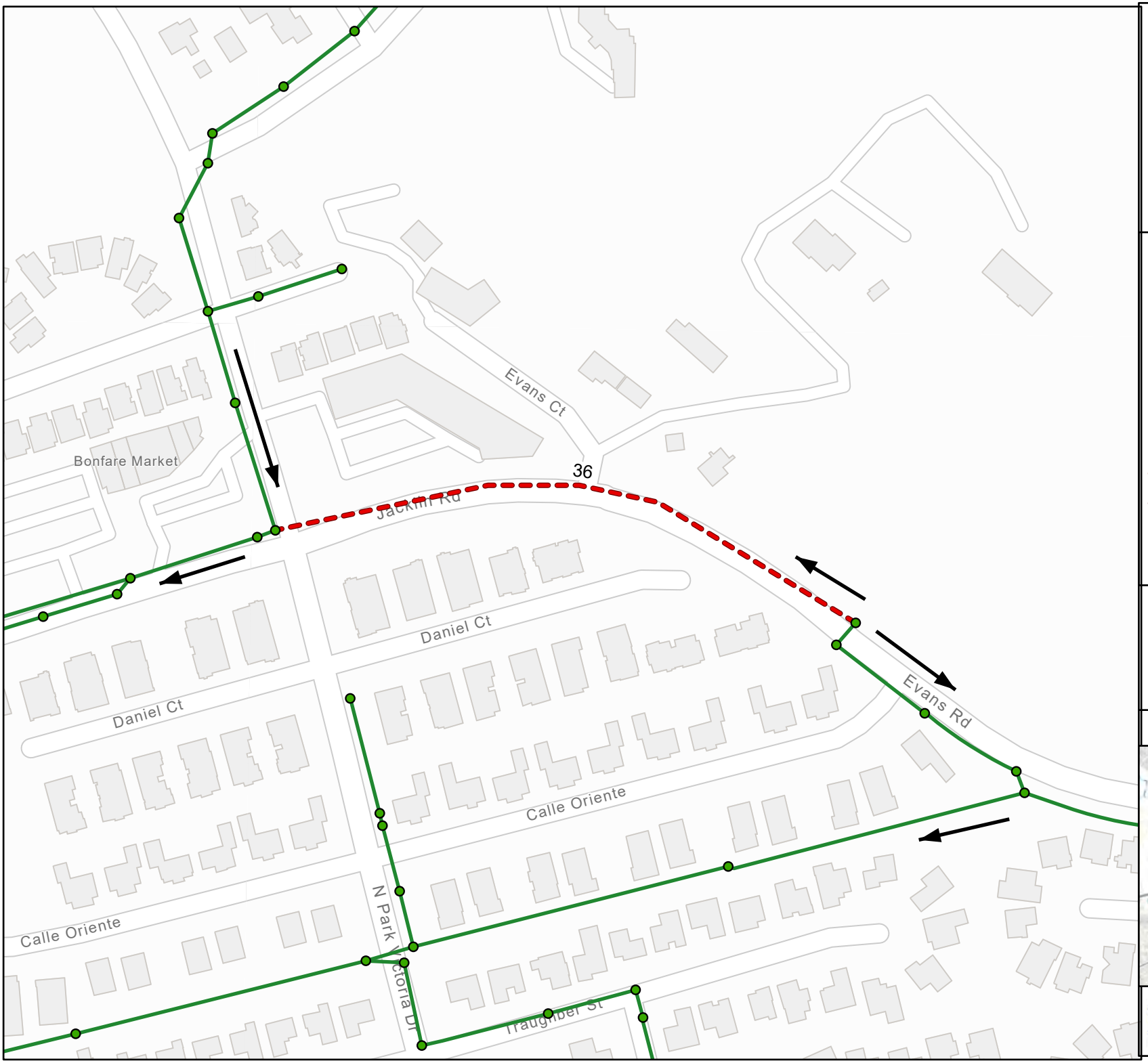



# Milpitas
# Storm Drainage CIP

CAL_2
Jacklin Road
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

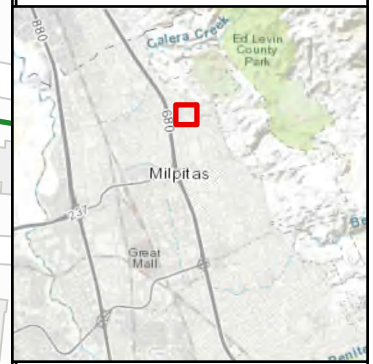
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 200 feet

## Vicinity Map

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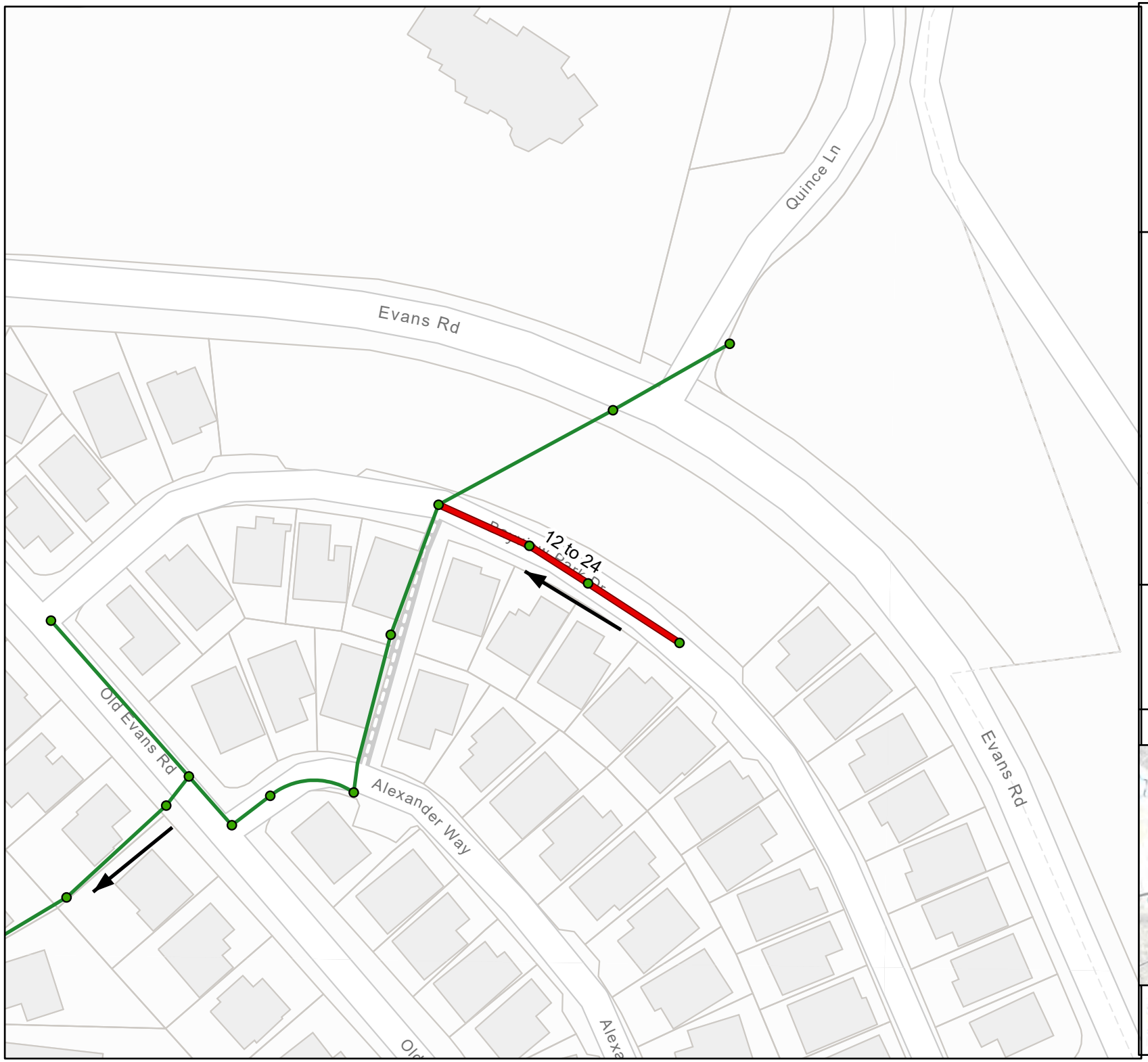
# Milpitas
# Storm Drainage CIP

CAL_3
Bayview Park Drive
SD Improvements






## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 100 feet

## Vicinity Map

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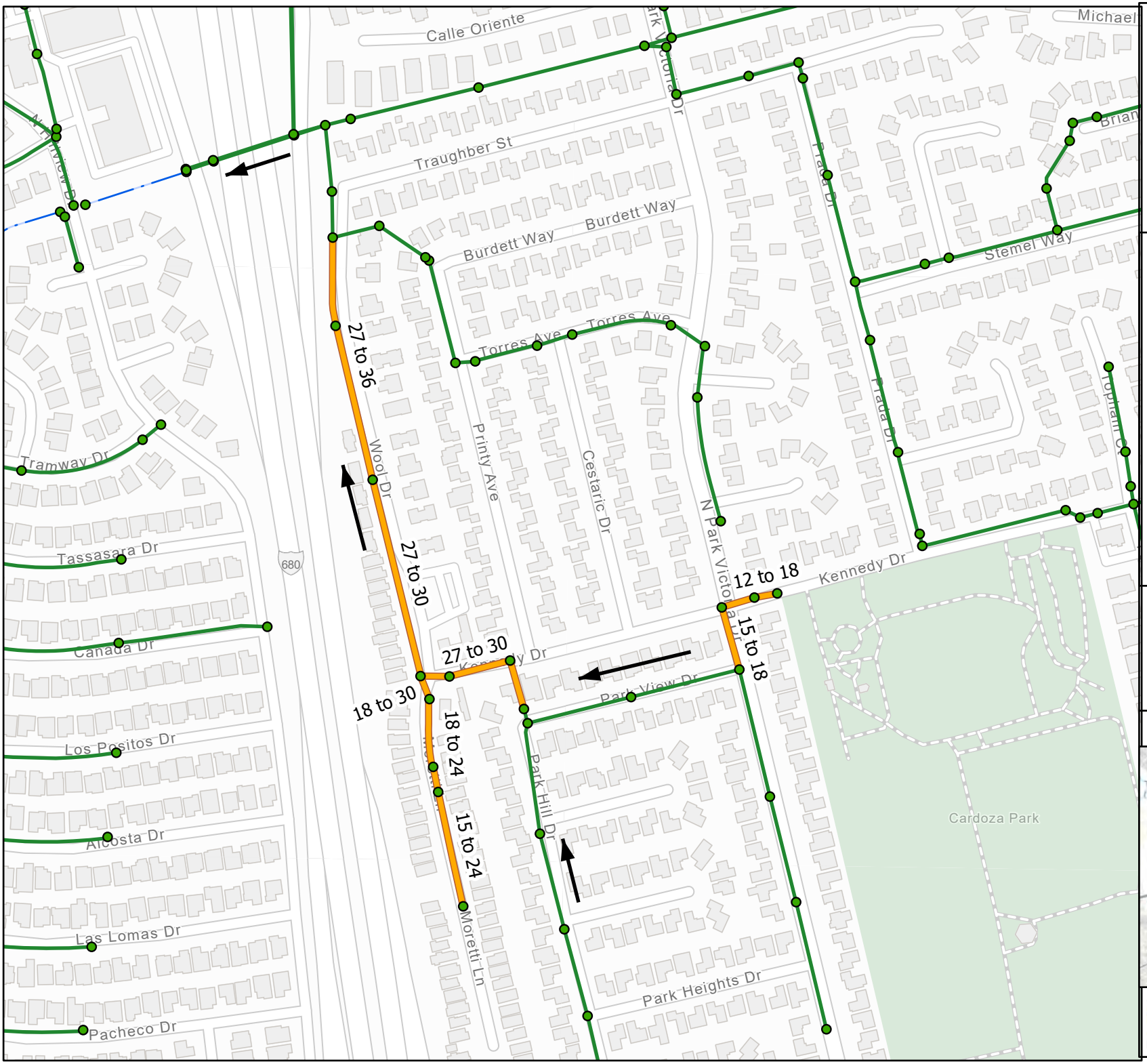



# Milpitas Storm Drainage CIP

CAL_4
Wool Drive
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

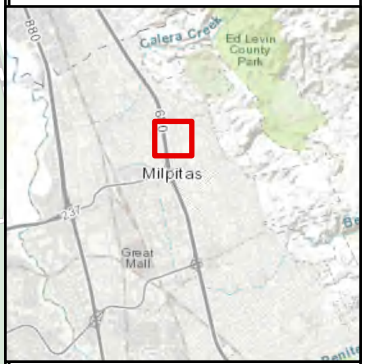
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 350 feet

## Vicinity Map

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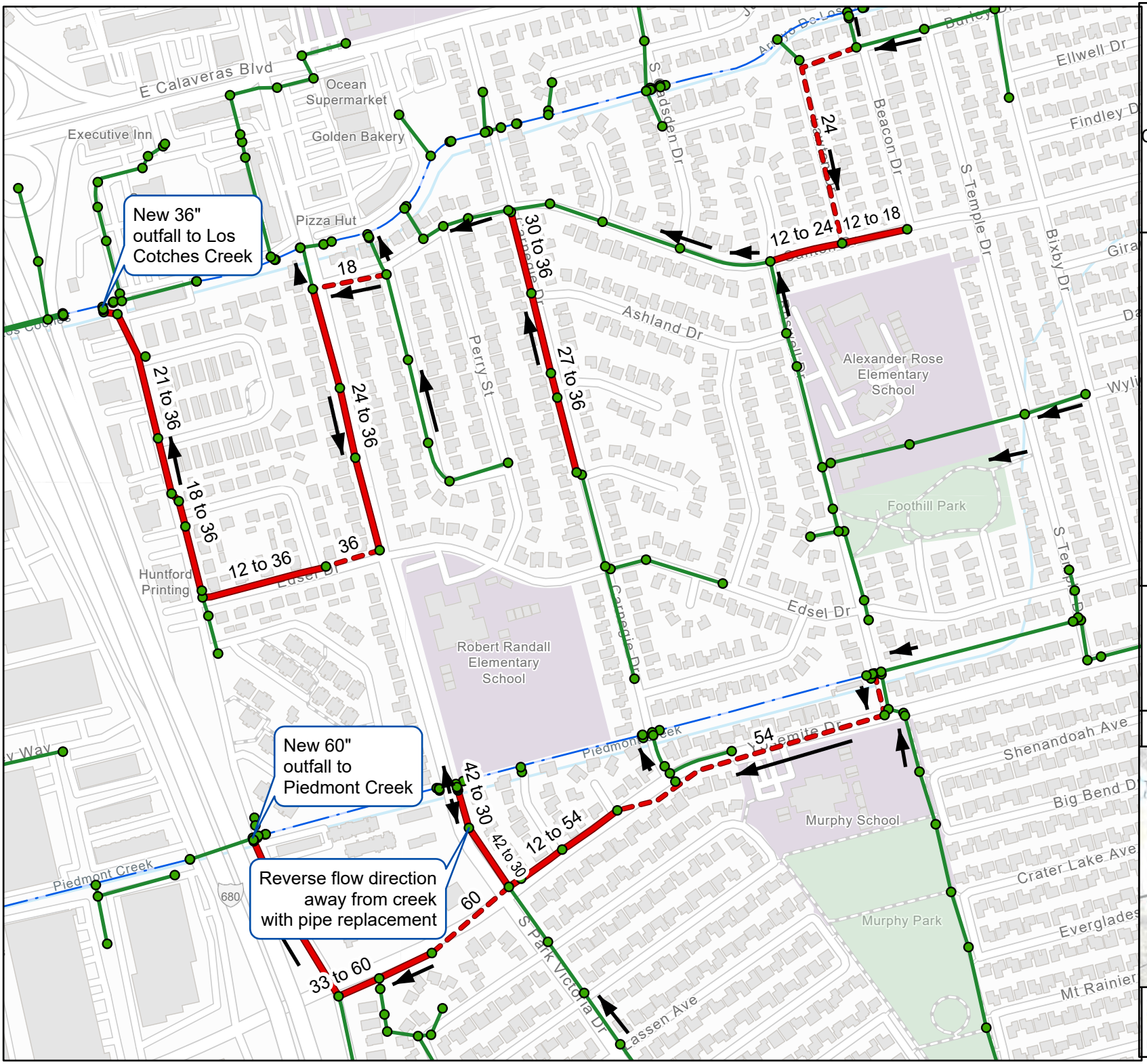



# Milpitas Storm Drainage CIP

COCHES_5
Coches and Piedmont Creek SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

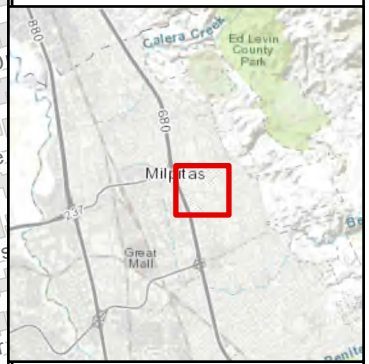
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 500 feet

## Vicinity Map

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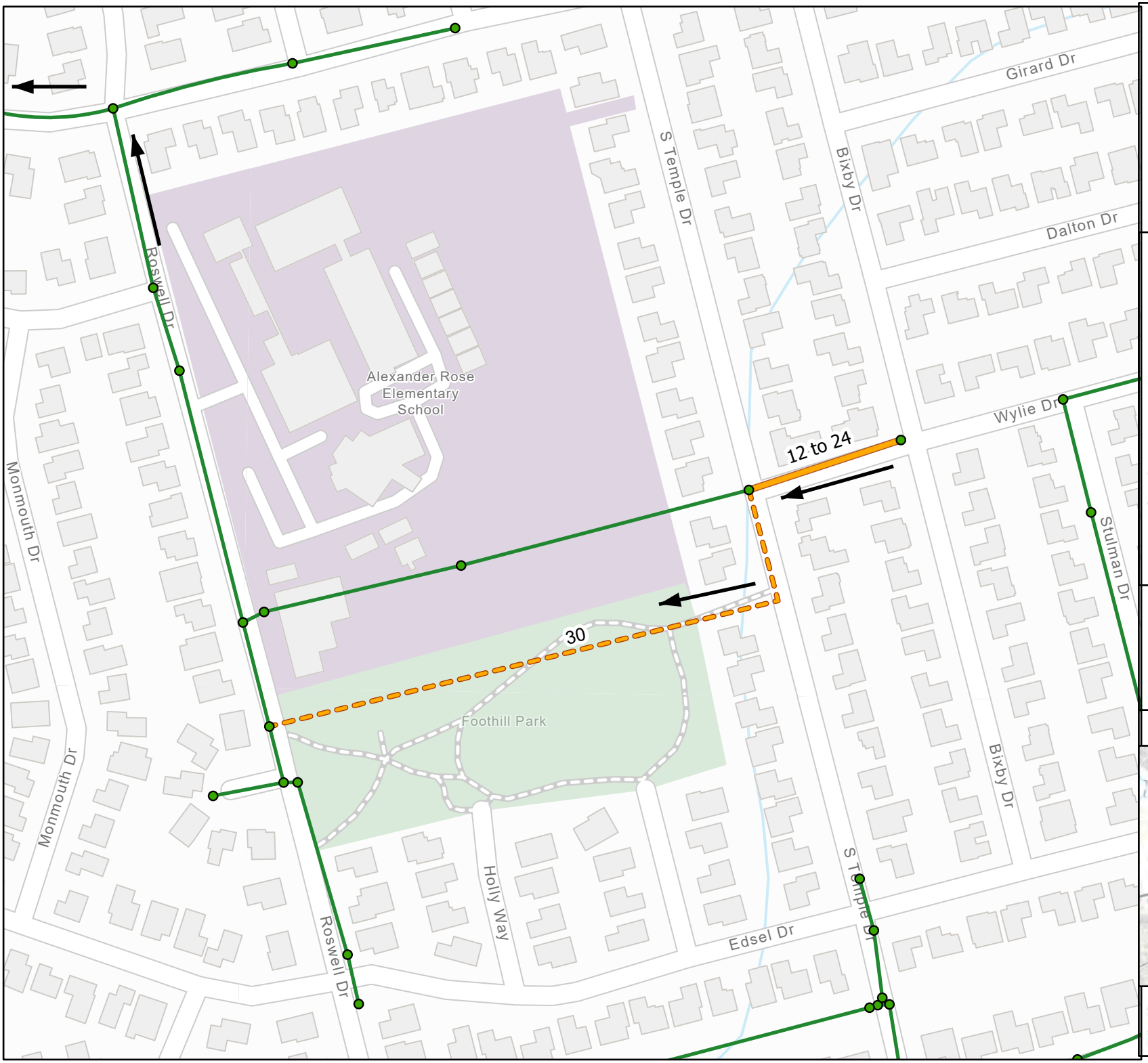



# Milpitas Storm Drainage CIP

COCHES_8
Foothill Park
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

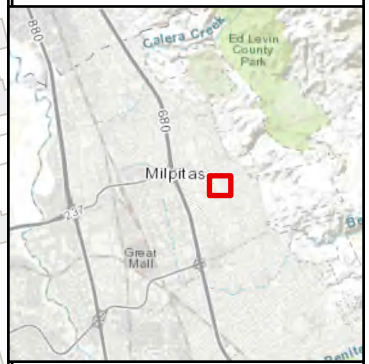
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 200 feet

## Vicinity Map

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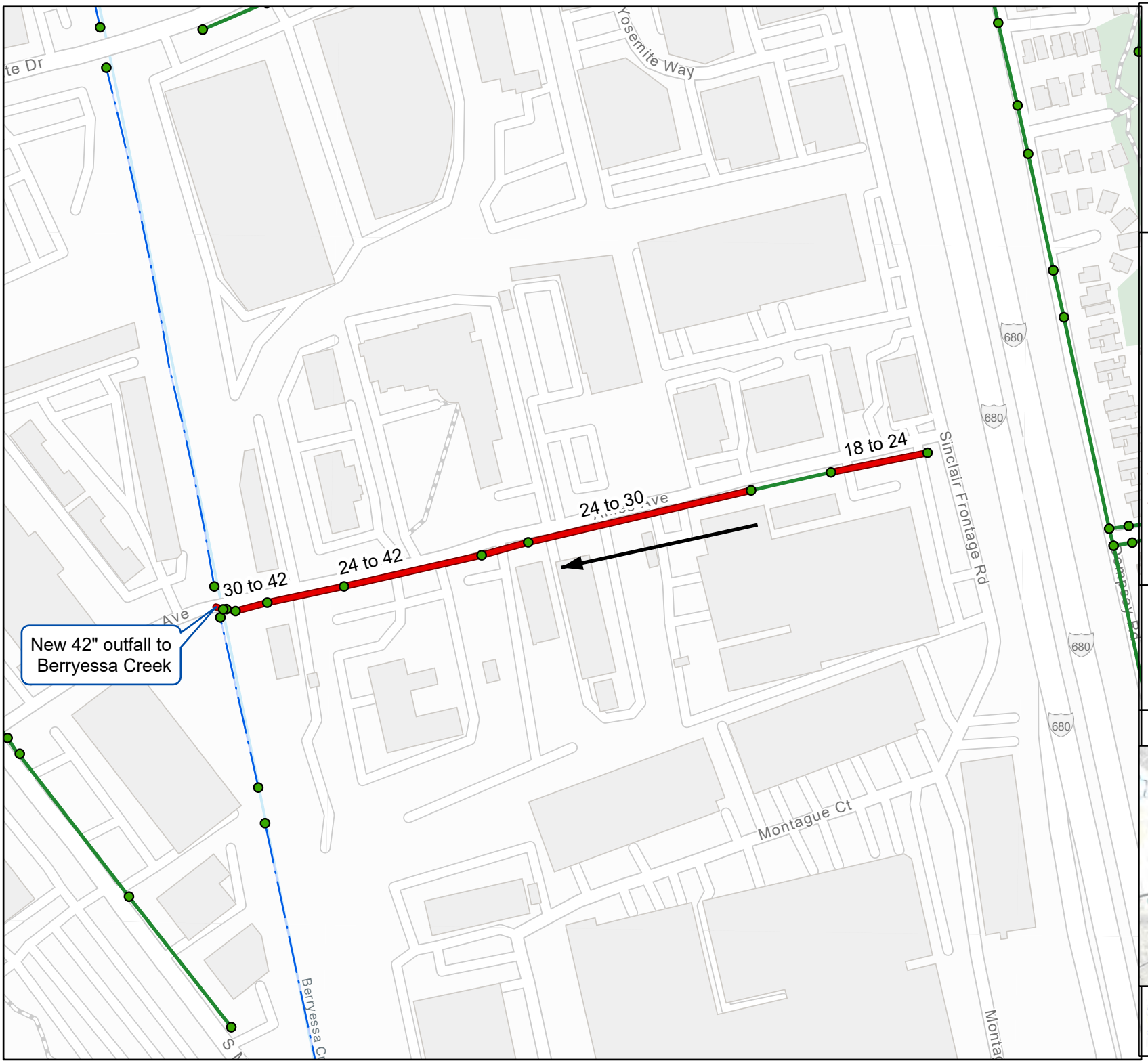



# Milpitas
# Storm Drainage CIP

BERRY_10
Ames Avenue
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

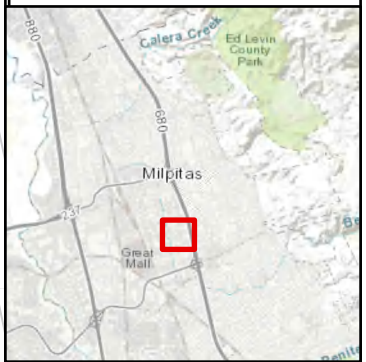
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 300 feet

## Vicinity Map

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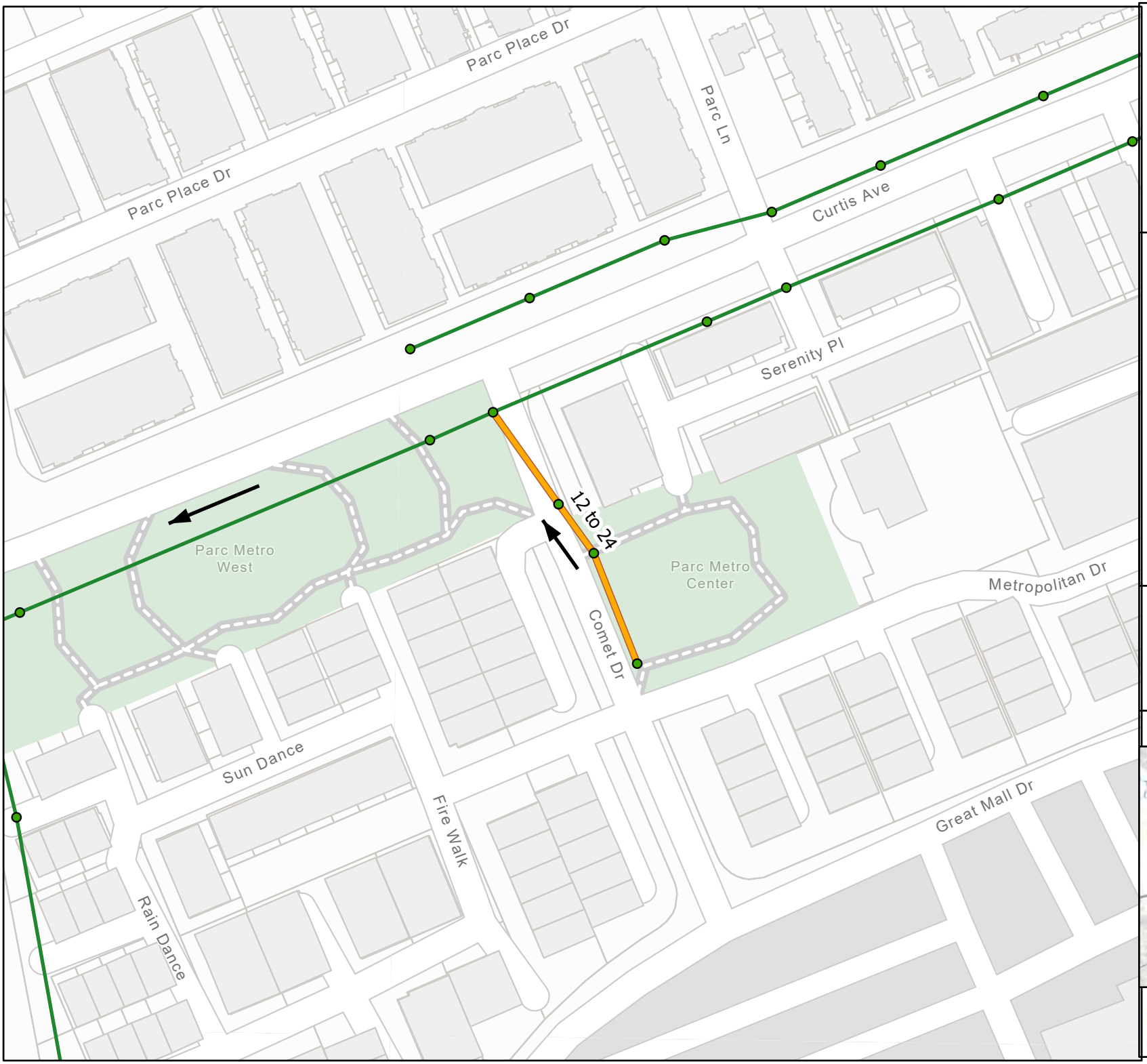


# Milpitas Storm Drainage CIP

WF_11
Comet Drive
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 100 feet

## Vicinity Map

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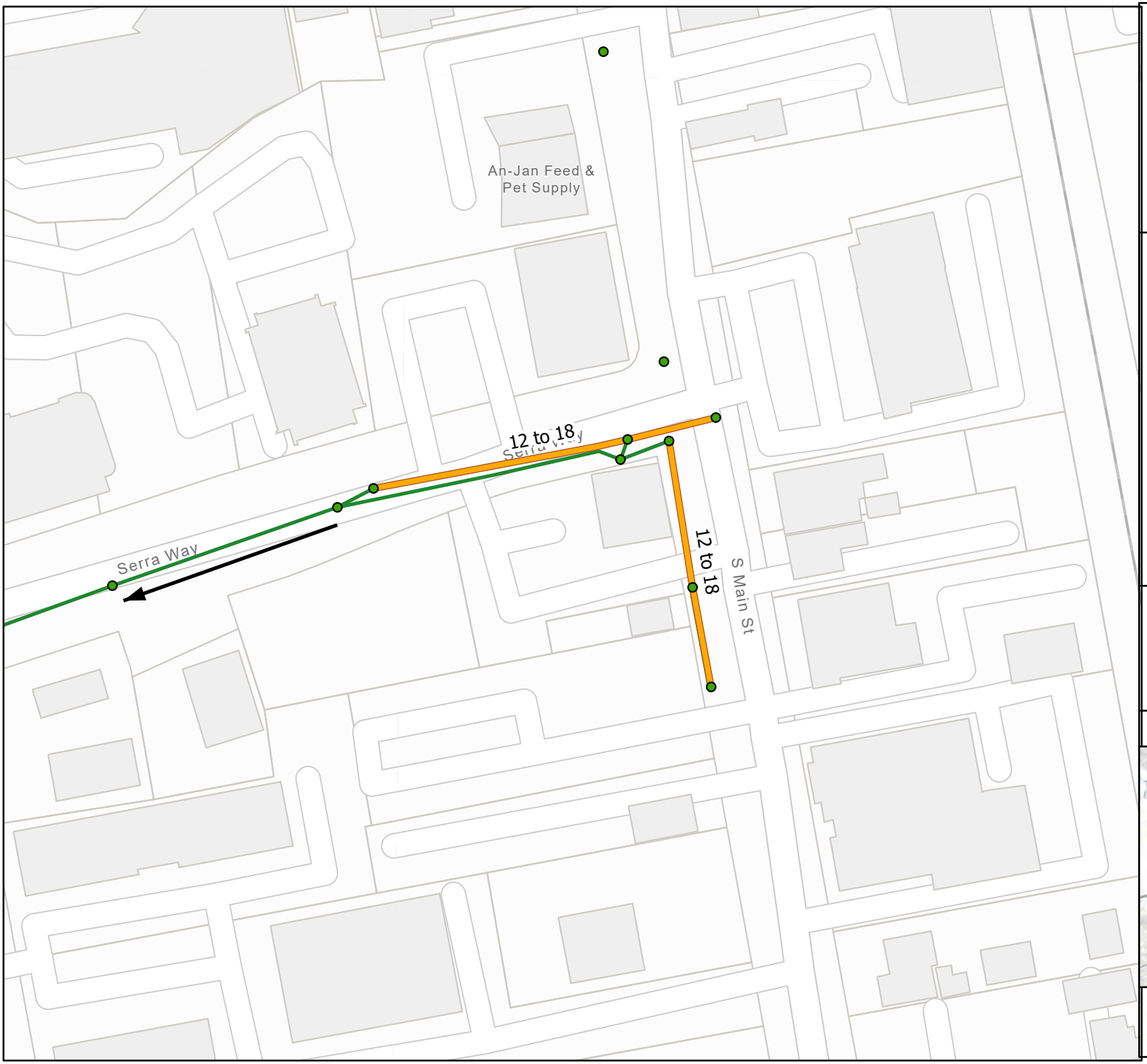


# Milpitas
# Storm Drainage CIP

LP_12
Main Street - Serra Way
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 100 feet

## Vicinity Map

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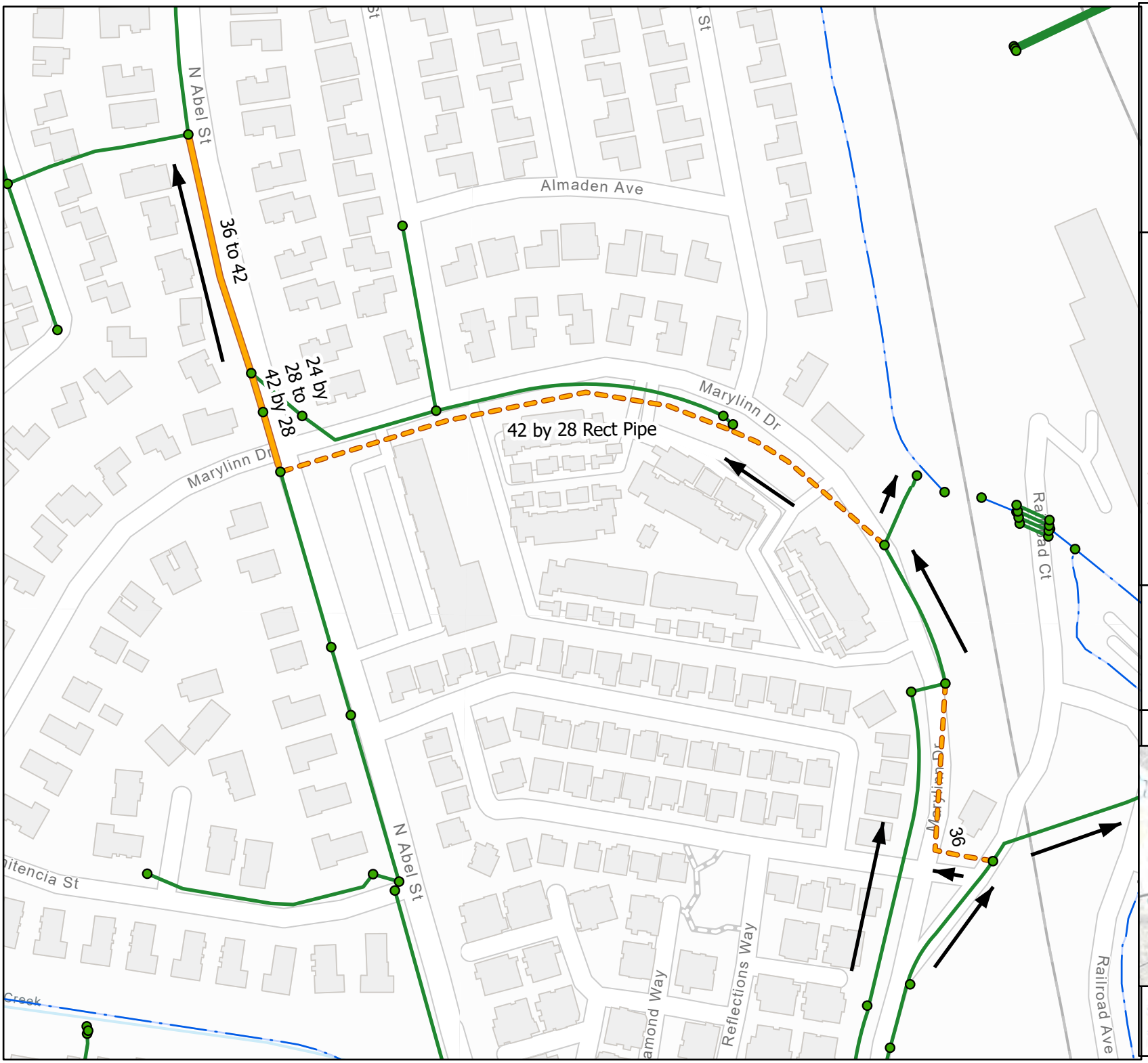


# Milpitas Storm Drainage CIP

WF_13
Railroad Avenue
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 200 feet

## Vicinity Map

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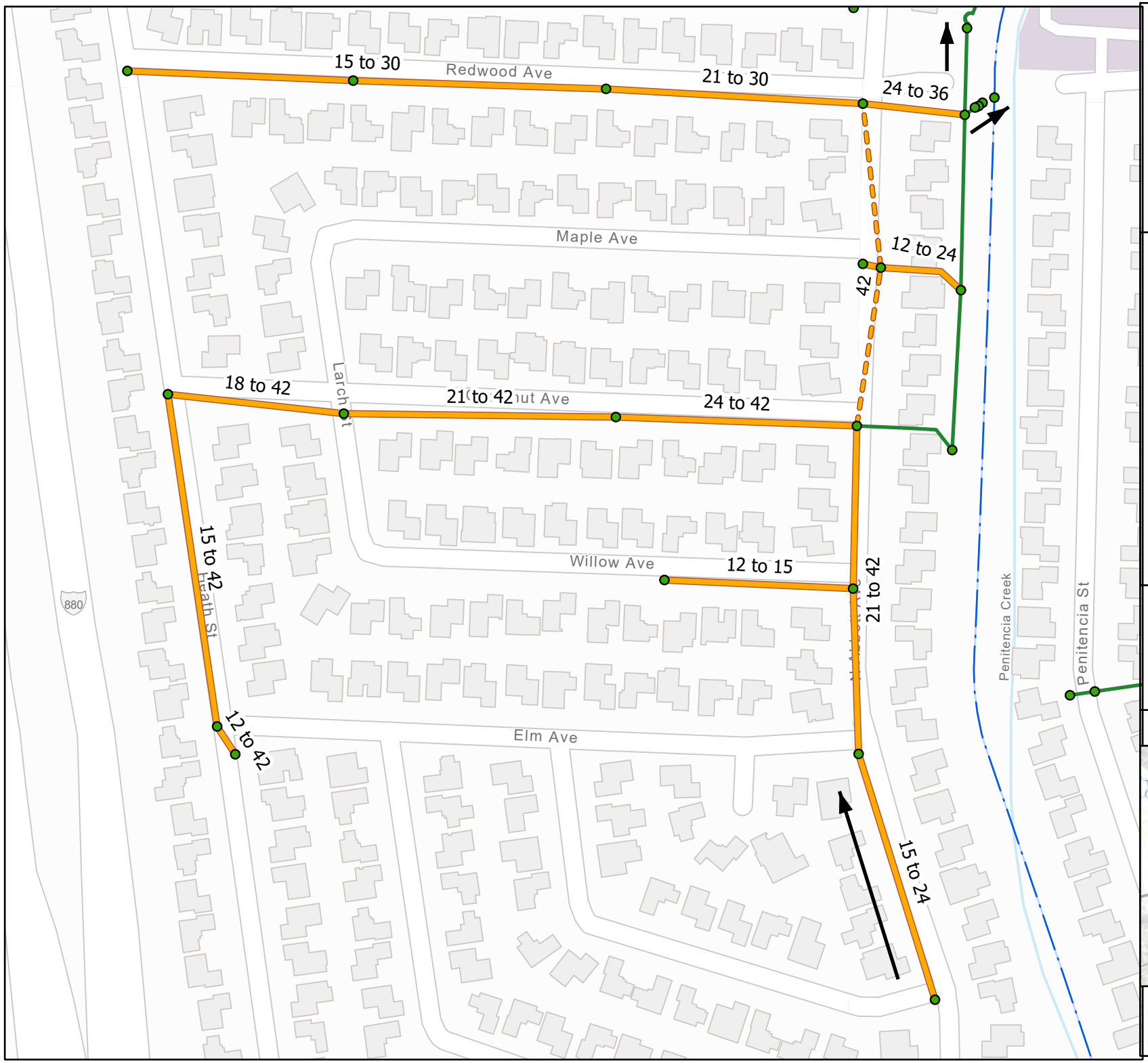



# Milpitas Storm Drainage CIP

LP_14
North Abel Street
SD Improvements

Page 11 of 15

## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

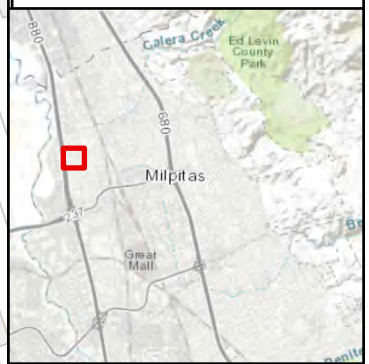
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 200 feet

## Vicinity Map

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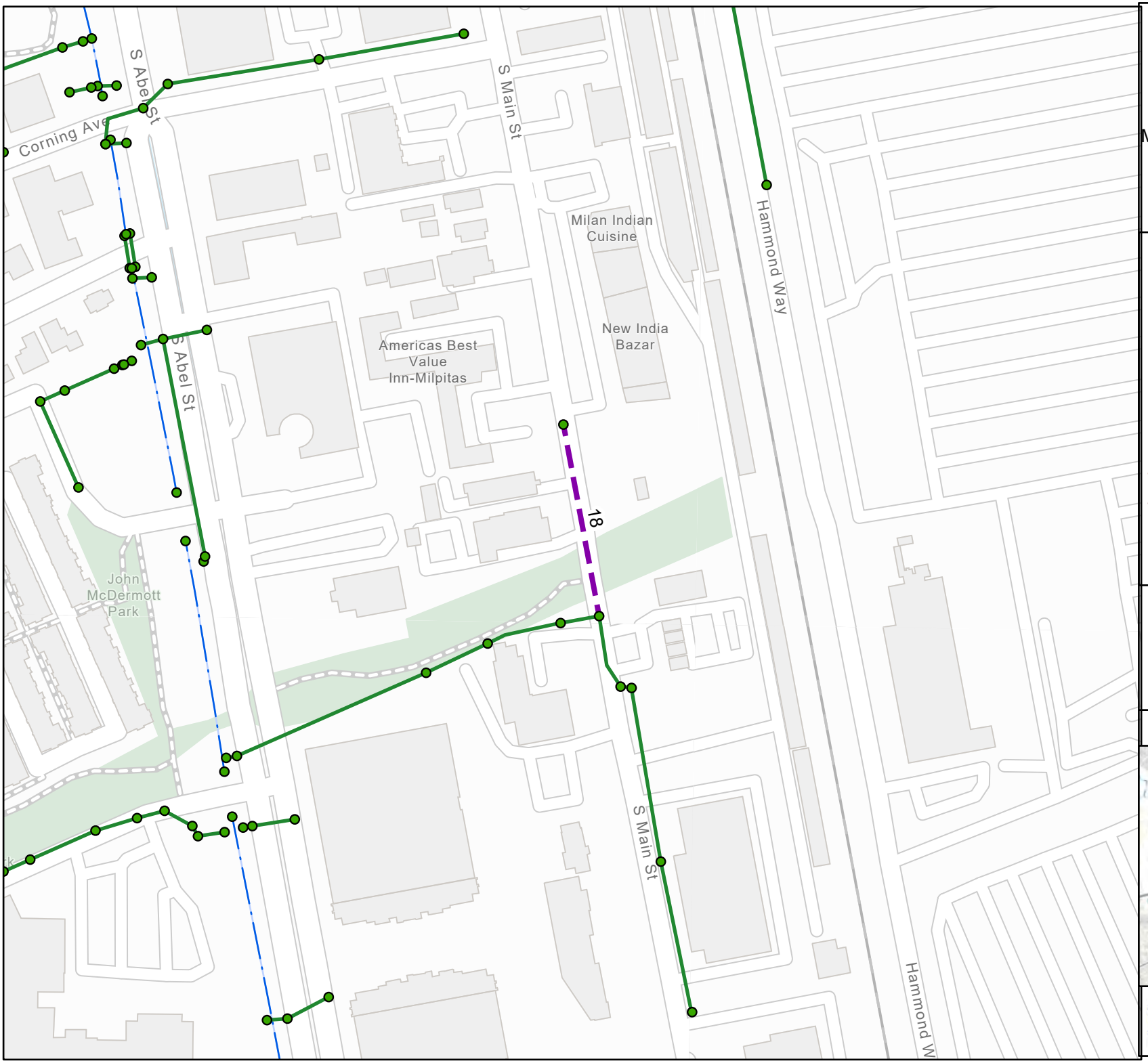



# Milpitas
# Storm Drainage CIP

Under-served Area
LP_15
Main Street - Tom Evatt Park
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

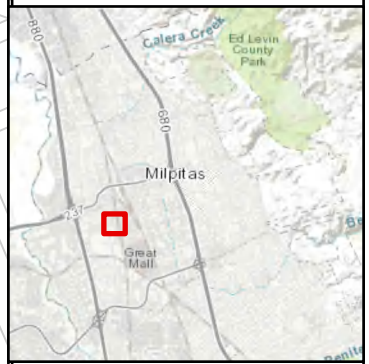
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 200 feet

## Vicinity Map




Schaaf & Wheeler
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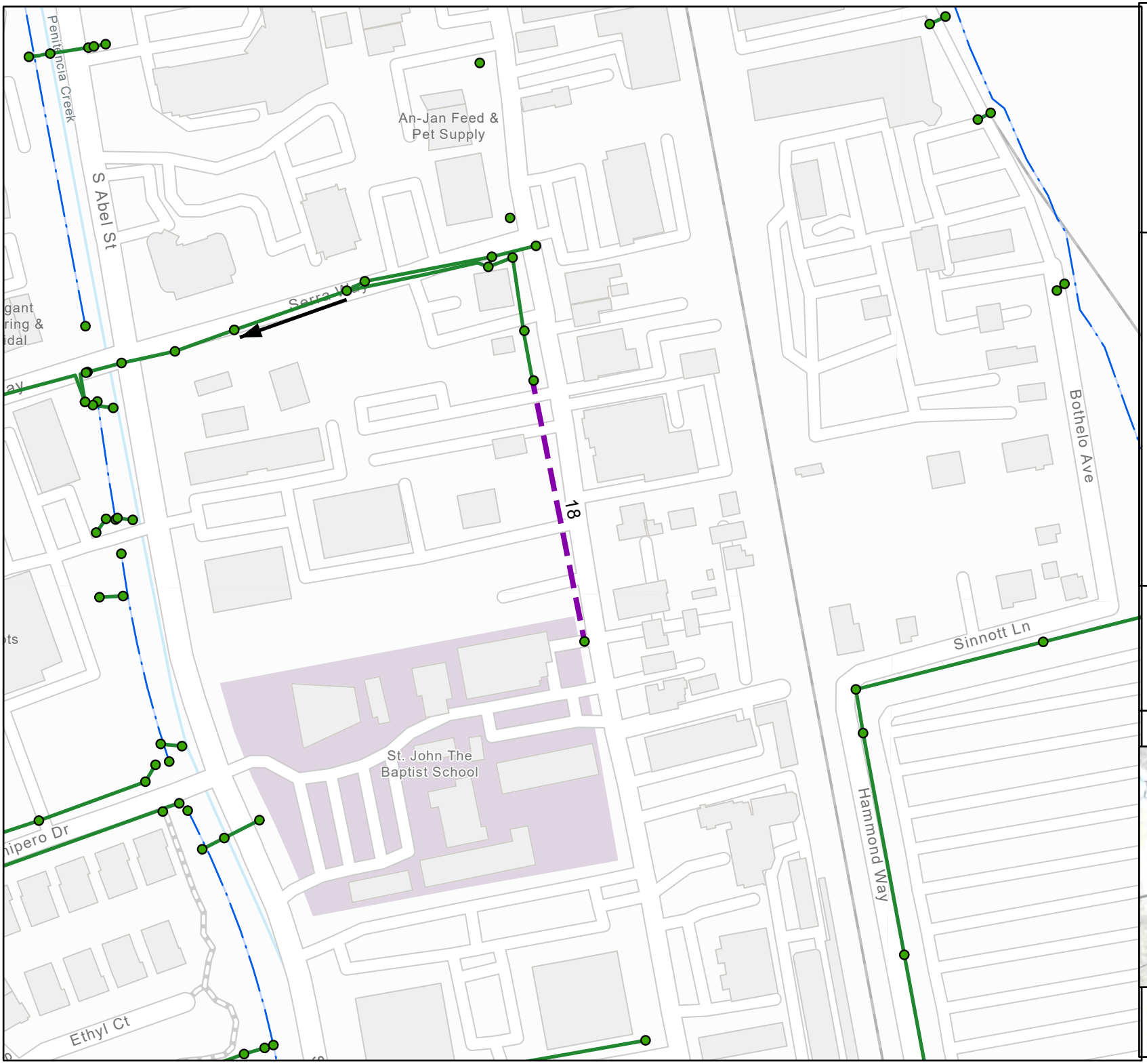



# Milpitas
# Storm Drainage CIP

Under-served Area
LP_16
Main Street
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

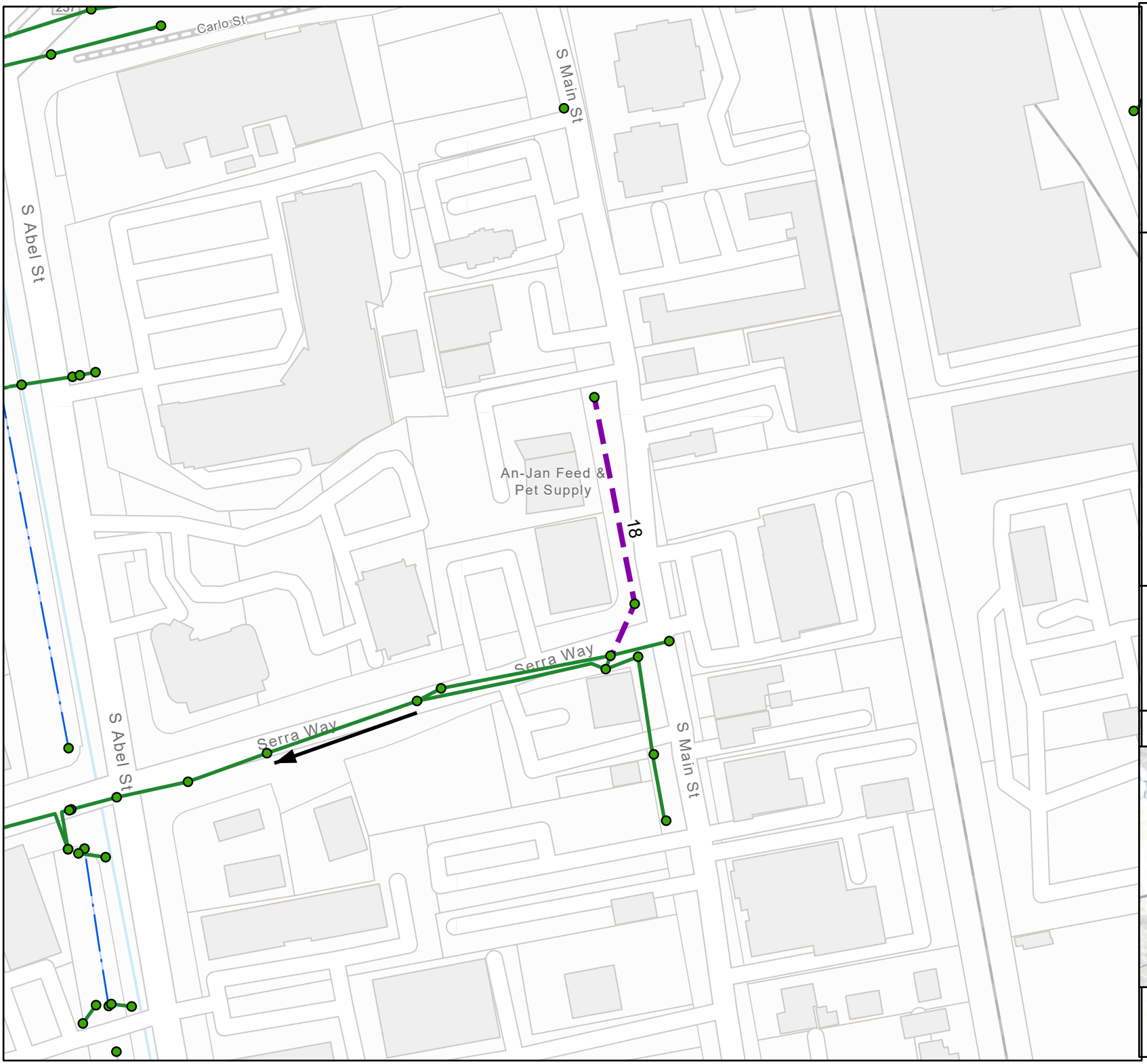
*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 200 feet

## Vicinity Map

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS




# Milpitas
# Storm Drainage CIP

Under-served Area
LP_17
Main Street - Sinnott Ln
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

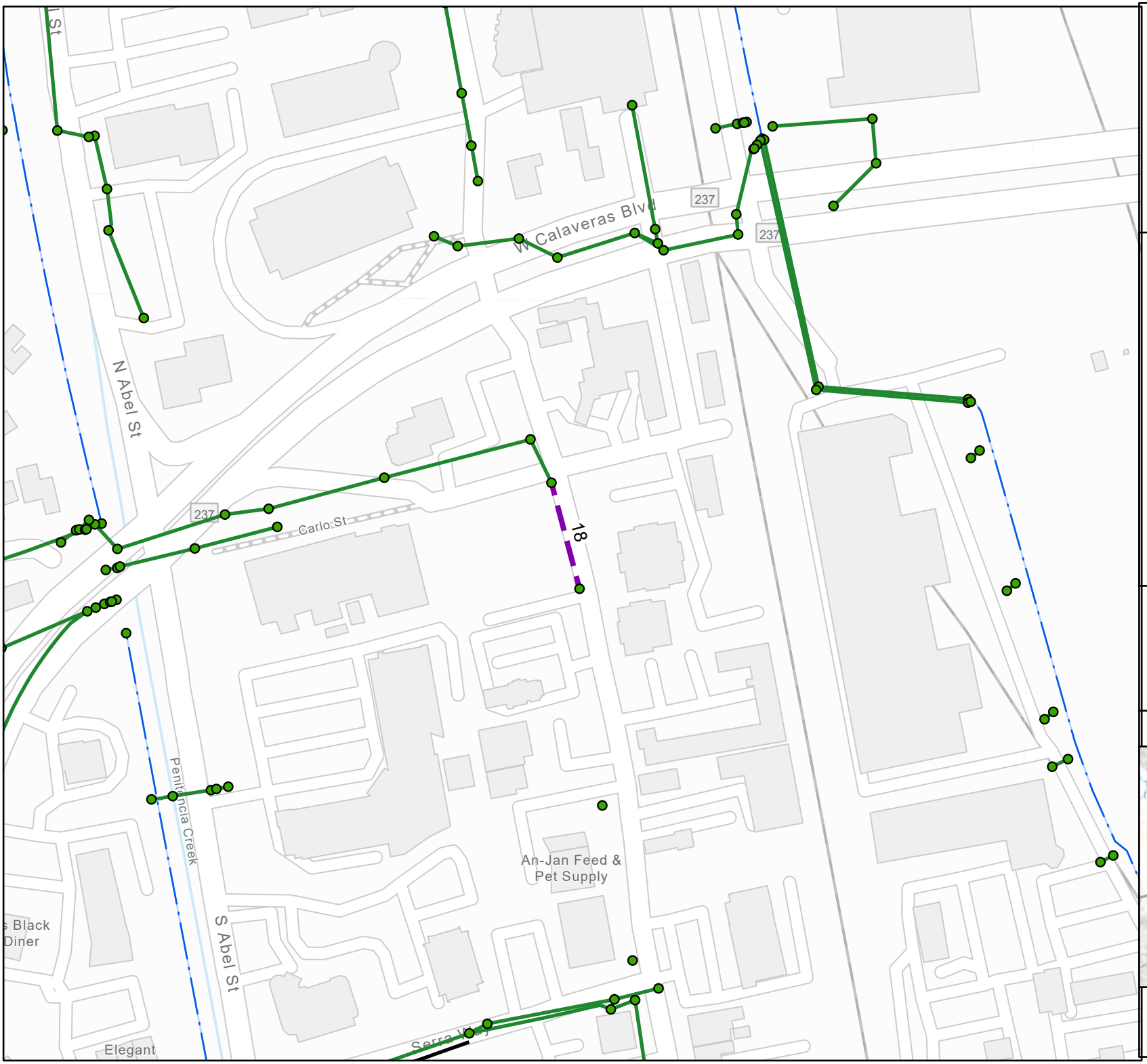
*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 150 feet

## Vicinity Map

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS




# Milpitas
# Storm Drainage CIP

Under-served Area
LP_18
Main Street - Carlo Street
SD Improvements



## Legend

- Storm Drain Structure
- Modeled Storm Drain
- River reach

CIP Priority

- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed

N

1 inch : 200 feet

## Vicinity Map

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# Appendix B Pump Station Recommendations

General recommendations for pump station design and operation, including upgrading and rehabilitating existing stations are contained in this appendix.

## Pump Station Design Guidelines

These recommendations apply to the design of new or substantially renovated pumping facilities.

### Capacity

Every pump station should be capable of discharging the 100-year runoff from its tributary area. A combination of pumping capacity and retention storage can accomplish this. Pump stations with lesser capacity (e.g., ten-year) should be considered only if there is a fail-safe way to overflow excess flows without causing property damage. Nearly all of the pumping facilities within the city meet these criteria. Table 6-1 indicates whether individual pump stations have sufficient capacity.

#### *Number of Pumps*

For redundancy, at least two identical pumps must be installed in every stormwater pump station. It is not unnecessary to include standby pumps because providing excess capacity is expensive and not justified by the relatively small risk of having a major storm event coincide with mechanical failure. (Schedule pump maintenance for the summer months as well.) However, installing a larger number of smaller pumps is generally better than a lesser number of large pumps for the same capacity. When individual pumps comprise a smaller percentage of overall pump station capacity, having one pump out is less detrimental. In terms of redundancy and ease of maintenance, all pumping units within one particular station should be identical.

No pumping station in Milpitas is equipped with fewer than two identical pumps. Most stations have three main pumping units, and the Jurgens Pump Station has four. All stations (except California Circle, Abbott, and Minnis) have a smaller electric dewatering pump to drain the wet well when water falls below the minimum allowable pumping level for the large stormwater pumps. Permanent retention ponds are maintained at the California Circle and Abbott stations, while the Minnis station utilizes submersible pumps capable of dewatering the wet well.

### Pump and Driver Types

Pump selection is on a station-by-station basis and needs coordination with city operations staff for consistency with other similar pump stations. Prime power for new pumping stations should be by an electric motor rather than direct-drive engines if at all possible, particularly for frequent operation. Electric motors are quieter, require less space and ventilation, and are not subject to tighter air quality restrictions in the future. Diesel engines drive a majority of the existing stormwater pumps in Milpitas. This pump driver style eliminates the need for standby power at most stations, and the city has generally experienced reliable operation.

While electric motors are recommended for new stations, the costs of adding power distribution and switching equipment, motor starters, and a standby engine-generator set to older stations generally preclude the replacement of engine drive units with electric motors. Hence, when old pumping units are upgraded or replaced, the type of replacement drive units should be consistent with existing equipment.

## Pump Operation and Cycling

Lead and lag pumps should be automatically alternated on every start to minimize pump cycling and extend the operating life of the equipment. Sufficient operational wet well storage ($Vol_p$) must also be available to prevent excessive pump cycling for proposed operating levels:

$$Vol_p = t\left(\frac{Q_i}{Q_p}\right)\left(Q_p - Q_i\right)$$

where $Vol_p$ = active sump volume per pump (cubic feet)

$t$ = pump cycle time to fill and empty volume (minutes)

$Q_i$ = inflow into station (cubic feet per minute)

$Q_p$ = flow rate of pump (cubic feet per minute)

Differentiating the equation shows that the minimum pump cycle time occurs when flow into the pump station is exactly one-half the pumping rate. Required sump volume is determined by setting the maximum number of pumps starts per hour below the maximum criterion established by the pump, motor, or engine manufacturers. In the absence of specific data, the pump starts should be limited to six per hour. This criterion is based on general limits set by large electric motor manufacturers; diesel engine suppliers also recommend that engines should run at least five to ten minutes at full operating temperatures each time they're started.

Pumping equipment must be specified so that motor or engine nameplate ratings are not exceeded at any point on the pump characteristic curve. Pump performance under different hydraulic conditions should be analyzed to ensure that pumps operate within manufacturers' recommended limits. Pumps must discharge their rated flow against the 100-year design tailwater elevation at the station outfall.

This criterion is evaluated on a station-by-station basis. Most of the control systems used by the city have the ability to automatically rotate lead and lag pump sequences.

## Forebay, Intake and Wet Well Design

If retention storage is necessary, designing the pump station forebay provides access to that storage over the pumps' operating range. The design of the forebay also plays a role in whether the retention will be wet or dry. Certain three-dimensional hydraulic phenomena often present in large pump intakes must be avoided to minimize the potential for submerged vortices, free-surface vortices, stagnations and flow separations, uneven or unsteady flow distribution, swirl of flow entering the pumps, or air entrainment.

These phenomena can lead to the degradation of pump performance, including decreased pump capacity, reduced pump efficiency, excessive wear, and increased vibration and noise. Although quantifying this complex hydraulic behavior is virtually impossible without scaled physical model studies, pumping intakes and sumps designed in conformance with one of the following standards should perform at their optimal level under varying operating conditions:

British Hydromechanics Research Association (BHRA)

Hydraulic Institute

Pump manufacturer design guidelines

Failure to properly design intake configurations can lead to negative performance, as described above. Since it is difficult to quantitatively analyze the three-dimensional flow phenomena associated with large pump intakes, any unusual intake, wet well, or sump designs that do not conform to an established standard are subject to physical model testing.

Most of Milpitas' pump stations are designed to house several pumps in the same wet well. Under these conditions, the primary objective in inlet design is still to provide an even, air-free flow distribution to each pump intake regardless of pump configuration or which pumps are operating. Given the difficulty of providing uniform flow distribution in multiple pump sumps, current design standards favor using a "unitized" wet well, whereby a number of single-pump sumps (pump cells) are placed side by side.

In Milpitas, only the Wrigley-Ford Pump Station utilizes this unitized sump approach and strictly meets current Hydraulic Institute standards for sump design. During individual pump station evaluations, inlet and sump dimensions are compared to recommended standards. Most station dimensions do not strictly match those standards. Correcting the deficiencies, however, can be extremely difficult and expensive. Since most pump stations operate for only a limited number of hours in any year, and there has been no demonstrated catastrophic loss of efficiency, the master plan does not recommend correcting sump design deficiencies. In order to minimize problems caused by deficient sump inlet design, proper pump submergence must be maintained. This will lower intake velocities and help reduce the risk of vortex formation and air entrainment.

Pumping equipment that demonstrates excessive wear, vibration, noise, and particularly cavitation may be indicative of more serious hydraulic problems associated with the sump and intake. In those instances, physical model studies and sump rehabilitation is warranted.

### *Submergence*

Established operating prevent excessive cycling and provide for adequate pump submergence, defined as the minimum allowable height of the low water level above the pump suction inlet. Inadequate submergence can lead to the inducement of free-surface and submerged vortices, the entrainment of air, a reduction in pumping capacity, and premature pump failure. Limited pump submergence can also potentially lead to pump cavitation, which may cause severe damage. As a rule of thumb, the minimum water depth should be two bell diameters over the wet well floor for submergence of one and a half bell diameters (BHRA guidelines). Recent design guidelines published by the Hydraulic Institute (1998) suggest the following formula for establishing minimum pump submergence:

$$S = D(1 + 2.3\,F_D)$$

where $S$ = submence (feet)

$D$ = pump bell diameter (feet)

$F_D$ = Froude number at pump inlet, given as:

$$F_D = \frac{V}{(g\ D)^{0.5}}$$

$V$ = velocity at the pump suction inlet (fps)

$g$ = gravitational acceleration

## Discharge Piping

Pump discharge piping must protect upstream systems and properties from damage caused by backwater from high tides or tailwater. Discharge flap gates or check valves should be provided, or pipe discharge elevations need to be three feet above the design tailwater level and/or one foot above protective levees.

## Pump Testing

Station design should provide for the testing of pumps with water under non-storm conditions. A means for recirculating water, or some other method, can be provided to enable a test of reasonable duration (15 minutes). This may also be important since engines need exercise at least once a month and should be done so under load (see Chapter 9).

Most pump stations in the city do not have the means to recirculate water for testing. (Wrigley-Ford Storm Water Pump Station is a notable exception.) Those stations with large forebays – California Circle, Abbott, Penitencia, and Berryessa – can simply discharge water over an extended period of time without necessarily needing an influent runoff. For other stations, unfortunately, providing additional piping for testing is difficult.

## Standby Power

An emergency engine-generator, capable of starting the largest motor while running all other motors and auxiliary loads, should be installed at each stormwater pump station that does not utilize engines for prime pump drivers. Diesel is the preferred fuel, but natural gas engines may be considered as an alternative since they are reliable and burn cleanly. Natural gas engines, however, tend to be underpowered compared to diesel engines. There is also a risk that the fuel will not be available when needed.

Gasoline is not an acceptable fuel for stationary engines because it is a fire and explosion hazard, and the allowable storage period is very short. Diesel fuel is much less hazardous and can be stored for up to a year in double-walled tanks meeting requirements set forth by the Fire Department. All fuel piping must be double contained.

Discussions with city operations and maintenance personnel indicate that a majority of the city's pumping stations have been upgraded to meet current fuel storage requirements, with double-walled tanks (about one-half of which are above ground), double-contained fuel piping, and leak detection.

Engine-generators should be housed in a sound-attenuated weatherproof enclosure or inside buildings meeting appropriate codes for such use. Proper ventilation will be provided for engine aspiration and cooling. Some means for exercising the engine-generator set under load must also be furnished, either through pump testing with water as described above, load banks, or a combination of both. Generators

must be present on-site and connected to the power supply with an automatic transfer switch to be considered as available in an emergency. The use of portable generators, or even permanently parked generators with manual transfer switches, is not recommended since crews may not be able to respond to high water alarms, physically reach the pump station with a generator, and manually restore power before property damage has occurred. This is the current condition at the Spence Creek and Manor stations.

Small lift or pumping stations that generally handle “nuisance” flows (if the pump station were to fail to operate significant property damage does not occur) would not necessarily require a standby power source.

## Controls and SCADA

The pump starts and stops using a programmable logic controller (PLC) or programmable pump controller. Pump station controls are tied into the city's Supervisory Control and Data Acquisition (SCADA) telemetry system. City operations and maintenance staff shall coordinate pump station controls and level monitoring systems regarding function and standardization. They must also provide control with standby power to ensure that the station can function even during prolonged power outages. The preferred mechanism for providing standby power to control systems is rechargeable batteries.

## Equipment Housing

All electrical equipment in or open to the wet well must be explosion-proof and placed a minimum of one foot above the base flood elevation (BFE). Submersible motors should also be explosion-proof. Control panels must not be located so they are subject to possible flooding. All equipment must be housed in NEMA-rated weatherproof enclosures or in buildings. Sufficient lighting (including back-up battery power) should be provided so that crews may work on equipment during the night. Also, access must be provided that will allow for the removal and reinstallation of all equipment.

Consider noise abatement, visual impacts, and odor control when locating a pump station and designing the equipment housing. This is particularly important where the installation of engine units are near residential areas.

### *Ventilation*

Good ventilation is important to maintaining a dry, benign environment for mechanical and electrical equipment within a pump station. Proper ventilation helps reduce the deterioration of equipment due to condensation and provides better working conditions for city crews. Without adequate ventilation, enclosures below grade may be classified as confined spaces, requiring special permits and rescue equipment for anyone entering them. Explosive gases from illegally dumped flammable liquids may also accumulate in wet wells and ancillary spaces. Many deaths and illnesses have been attributed to poor ventilation at pump stations.

Wet wells can intentionally be designed as a confined space, particularly if there is no regular need for personnel to enter them. (The only equipment allowed in such a wet well includes explosion-proof measuring devices and submersible pumps.) However, proper ventilation should be provided for pump station buildings, particularly those housing engines or engine-generators.

All heating, ventilating, and cooling systems should be designed in conformance with city ordinances; uniform building, fire, mechanical, plumbing, and energy codes; the National Electric Code and NFPA; EPA regulations; Occupational Safety and Health Act (OSHA) requirements; and ASHRAE design standards.

Radiator exhaust ducts should be designed based on actual airflow requirements, but in general, they need to discharge at air velocities no greater than 800 to 1500 feet per minute. Intake louvers that bring air into the pump station should be designed with sufficient free area to maintain velocities of 250 to 400 feet per minute. This helps keep the rain out of the pump station when the engines are operating.

### Low Flow Bypass

If conditions permit, a gravity outflow pipe that bypasses the pump station should be installed. During low tailwater conditions, a substantial savings in pumping costs can be realized. Pumping stations with bypass capability include Penitencia, Wrigley-Ford, Spence Creek, and Manor.

## Pump Station Operation and Maintenance Guidelines

These general recommendations apply to all pumping facilities as appropriate.

### Pumps

Large axial flow pumps with right angle gear drives, which are the predominant pump type in the systefm, actually require fairly little maintenance. Shafts and bearings need to be periodically balanced and/or replaced. The frequency of inspection (pumps will need to be pulled out of the building) will vary depending upon the “L-10” bearing life rating of the pump in question. Average bearing life is defined as the operating hours at which half of the group of bearings fails, and the rest continue to operate. AFBMA (the Anti-Friction Bearing Manufacturers Association) defines average life statistically as three to five times the L-10 life. (For example, the Wrigley-Ford pumps have 50,000-hour bearings.) Although grease is the most maintenance-free bearing lubricant, most of the pumps in Milpitas have drip fee oil systems, which ensure the lowest bearing operating temperature. Consequently, the oiling reservoir needs to be checked on a routine basis and topped off as necessary

### Engines

Manufacturers’ maintenance instructions should be followed to the letter, particularly when the engine is still under warranty. Maintenance schedules depend somewhat on whether the engine is used as the prime pump driver (as in most stations) or is on standby (such as for power generation).

A typical schedule of maintenance based on references provided by Cummins/Onan (Sanks, 1989) is provided as Table B-1, giving both operating hours and calendar time.

Diesel engines should be operated at full power for at least 15 to 30 minutes after reaching operating temperatures once a month to eliminate carbon deposits. Unfortunately, without significant stormwater inflow to the station, pump engines cannot be run under load for any significant length of time (the water quickly runs out). Wrigley-Ford Pump Station is equipped both with a resistive load bank to provide a working load for automatic exercise and a discharge pipe system to recirculate available water back into the forebay. The pumps can be tested and exercised without large amounts of inflow.

Other stations with permanent water storage (California Circle Lagoon, Abbott Lagoon, Hall Memorial Park lagoon, and Hidden Lake) could be run for 15 minutes every month, although lagoon levels will not necessarily return to normal quickly. Unless provisions for the recirculation of test water at the other pump stations are made, those engines cannot be exercised under load during the summer months. Providing for test water recirculation has not been included in the Capital Improvement Program because retrofitting existing stations to operate in this manner is difficult.

Diesel oil is safer to store than most fuels and is easy to obtain and transport, but diesel deteriorates in storage and must be turned over every six months to one year.

**Table B-1: Typical Maintenance Frequency for Engines and EG-Sets**

| Maintenance Task | Operating Time | Calendar Time |
|---|---|---|
| Inspect fuel, oil level, coolant | 8 hr | 1 m |
| Inspect air cleaner, battery | 50 hr | 1 yr |
| Clean governor linkage, breather, air cleaner | 100 hr | 1 yr |
| Clean fuel filter, replace oil filter, change crankcase oil, check switchgear | 200 hr | 1 yr |
| Clean commutator, collector rings, relays, cooling system; inspect brushes, valve clearances, starting and stopping systems, water pump | 500 hr | 1 yr |
| Check injectors, grind valves (if required), remove carbon, clean oil passages, replace secondary fuel filter, clean generator, grease bearings | 1000 hr | ---- |

## Assumed Pump Operating Levels

Operating levels are assumed at individual pumping facilities for storm drain master plan modeling. It is noted that the city changes these levels depending upon station operating needs, including repair and maintenance. Actual operating levels and station operation manual guidelines supersede the levels provided herein. All levels are feet NAVD with distance above the wet well floor in parentheses.

### *California Circle Pump Station (SD-1)*

Current pump operating levels are:

| | |
|---|---|
| #3 ON | 9.3 feet NAVD |
| #2 ON | 7.5 |
| #1 ON | 5.8 |
| PUMPS OFF | 4.5 |

When the pump settings listed above are analyzed, the maximum one-percent lagoon level is 11.0 feet NAVD. Although this is less than the minimum elevation on California Circle, it is only 0.8 feet lower than the one-percent water surface elevation in Lower Penitencia Creek. To minimize pond fluctuations while beginning pumping in time to accommodate inflow during heavy runoff periods, the pump-on levels for the second and third pumps in the rotation could be lowered during the rainy season. Since a large volume of storage is available, the pump set points can be set closer together without excessive cycling, which is assumed for storm drain master plan modeling.

| | | |
|---|---|---|
| HI ALARM | 11.0 | (17.0') |
| #3 ON | 7.5 | (15.5') |
| #2 ON | 6.5 | (12.5') |
| #1 ON | 5.5 | (11.5') |
| #3 OFF | 5.0 | (11.0') |
| #2 OFF | 4.7 | (10.7') |
| #1 OFF | 4.5 | (10.5') |
| LOW ALARM | 1.5 | (7.5') |

### *Jurgens Pump Station (SD-2)*

To minimize pump cycling the following operating levels are assumed.

| | | |
|---|---|---|
| HI ALARM | 9.5 | (19.0') |
| #4 ON | 8.0 | (17.5') |
| #3 ON | 7.5 | (17.0') |
| #2 ON | 7.0 | (16.5') |
| #1 ON | 5.0 | (14.5') |
| #4 OFF | 1.5 | (11.0') |
| #3 OFF | 1.0 | (10.5') |
| #2 OFF | 0.5 | (10.0') |
| #1 OFF | 0.0 | (9.5') |
| LOW ALARM | -1.0 | (8.5') |

### *McCarthy Pump Station (SD-3)*

To enhance operational efficiencies and minimize pump cycling, however, it is recommended that pump starts rotate and the following operating levels are assumed. Pumps will start no more than five times per hour.

| | | | |
|---|---|---|---|
| HI ALARM | 2.0 | (19.0') | |
| #3 ON | 1.5 | (18.5') | |
| #2 ON | 1.0 | (18.0') | |
| #1 ON | 0.5 | (17.5') | |
| #3 OFF | -4.5 | (12.5') | |
| #2 OFF | -5.0 | (12.0') | |
| #1 OFF | -5.5 | (11.5') | |
| LOW ALARM | -6.0 | (11.0') | Drainage Pumps |
| JOCKEY ON | -15.5 | (1.5') | |
| JOCKEY OFF | -17.0 | (-0.5') | |
| LOW ALARM | -17.5 | (-1.0') | Jockey Pump |

### *Abbott Pump Station (SD-4)*

These operating levels are sufficient to prevent pump cycling, while maintaining the aesthetic function of the lagoon. (Elevations are given as feet NAVD with distance above the wet well floor in parenthesis.

| | | |
|---|---|---|
| HI ALARM | 11.0 | (16.0') |
| #2 ON | 9.5 | (14.5') |
| #1 ON | 9.0 | (14.0') |
| #2 OFF | 8.5 | (13.5') |
| #1 OFF | 8.0 | (13.0') |
| LOW ALARM | 6.0 | (11.0') |

### *Minnis Pump Station (SD-5)*

The following operating levels allow for eight starts per hour in alternation, since wet well storage is very limited. Pump settings are provided in feet NAVD with the distance from the wet well floor in parentheses.

| | | |
|---|---|---|
| HI ALARM | 5.0 | (12.0') |
| #2 ON | 4.5 | (11.5') |
| #1 ON | 4.0 | (11.0') |
| #2 OFF | -3.5 | (3.5') |
| #1 OFF | -4.0 | (3.0') |
| LOW ALARM | -4.5 | (2.5') |

### *Penitencia Pump Station (SD-6)*

Original pump operating levels are assumed per record plans.

| | | |
|---|---|---|
| HI ALARM | 12.0 | (12.2') |
| #3 ON | 9.8 | (10.0') |
| #2 ON | 8.3 | (8.5') |
| #1 ON | 6.3 | (6.5') |
| ALL OFF | 5.3 | (5.5') |
| SUMMER WSEL | 6.4 | (6.6') |

### *Wrigley-Ford Pump Station (SD-7)*

Minimum individual pump cycle times (based on pump rotation) and settings are given below.

| | | | |
|---|---|---|---|
| HI ALARM | 13.7 | (17.0') | |
| #3 ON | 13.2 | (16.5') | 2 starts per hour |
| #2 ON | 12.7 | (16.0') | 2 starts per hour |
| #1 ON | 12.2 | (15.5') | 1 start per hour |
| #3 OFF | 12.0 | (15.3') | |
| #2 OFF | 11.7 | (15.0') | |
| #1 OFF | 11.2 | (14.5') | |
| JOCKEY ON | -5.5 | (1.0') | |
| JOCKEY OFF | -6.5 | (-0.5') | |

### *Berryessa Pump Station (SD-8)*

City staff has provided current pump settings, which are indicated below as referenced from the pump station sump floor (elevation -6.0 feet□NAVD). The resulting 100-year water surface elevation of 10.7 feet would not cause spill out of the lake or property damage in the absence of Calera Creek overflows, and with overflow from Calera Creek, the resulting flood level of 15 feet remains below the pumping equipment flood-proof elevation. (Levels have been referenced to feet NAVD with distance above the wet well floor given parenthetically.)

| | | |
|---|---|---|
| HI ALARM | 10.0 | (16.0') |
| #3 ON | 9.5 | (15.5') |
| #2 ON | 9.0 | (15.0') |
| #1 ON / #3 OFF | 8.5 | (14.5') |

| | | | |
|---|---|---|---|
| #2 OFF | 8.0 | (14.0') | |
| #1 OFF | 7.0 | (13.0') | |
| SUMMER WSEL | 9.0 | (15.0') | |

### *Manor Pump Station (SD-9)*

The assumed design operating levels are sufficient to prevent pump cycling, while maintaining minimum pump submergence levels.

| | | | |
|---|---|---|---|
| HI ALARM | 7.7 | (12.5') | |
| #3 (NEW) ON | 6.7 | (11.5') | |
| #2 ON | 6.2 | (11.0') | |
| #1 ON | 5.7 | (10.5') | |
| #3 (NEW) OFF | 2.7 | (7.5') | |
| #2 OFF | 1.7 | (6.5') | |
| #1 OFF | 0.7 | (5.5') | |
| LOW ALARM | -0.7 | (4.5') | Stops Drainage Pumps |
| JOCKEY ON | -3.8 | (1.0') | |
| JOCKEY OFF | -6.8 | (-2.0') | |
| LOW ALARM | -7.3 | (-2.5') | Stops Jockey Pump |

### *Spence Creek Pump Station (SD-10)*

The design operating levels are sufficient to prevent pump cycling, while maintaining minimum pump submergence levels. Spence creek itself also provides storage volume that helps limit pump starts. (All levels are referenced to feet NAVD with distance from wet well bottom indicated parenthetically.)

| | | | |
|---|---|---|---|
| HI ALARM | 14.2 | (10.5') | |
| #3 ON | 14.0 | (10.3') | |
| #2 ON | 13.7 | (10.0') | |
| #1 ON | 11.7 | (8.0') | |
| #3 OFF | 11.2 | (7.5') | |
| #2 OFF | 10.2 | (6.5') | |
| #1 OFF | 9.2 | (5.5') | |
| LOW ALARM | 8.2 | (4.5') | Stops Drainage Pumps |
| JOCKEY ON | 4.7 | (1.0') | |
| JOCKEY OFF | 1.7 | (-2.0') | |
| LOW ALARM | 1.2 | (-2.5') | Stops Jockey Pump |

### *Bellew Pump Station (SD-11)*

| | | | |
|---|---|---|---|
| HI ALARM | 15.0 | (19.0') | |
| #3 ON | 14.0 | (18.0') | |
| #2 ON | 13.5 | (17.5') | |
| #1 ON | 13.0 | (17.0') | |
| #3 OFF | 8.0 | (12.0') | |
| #2 OFF | 7.5 | (11.5') | |
| #1 OFF | 7.0 | (11.0') | |
| LOW ALARM | 6.5 | (10.5') | Drainage Pumps |
| JOCKEY ON | -2.5 | (1.5') | |
| JOCKEY OFF | -4.1 | (-0.1') | |
| LOW ALARM | -17.5 | (-1.0') | Jockey |

### *Murphy Pump Station (SD-12)*

| | | | |
|---|---|---|---|
| HI ALARM | 19.2 | (16.2') | |
| #3 ON | 19.0 | (16.0') | |
| #2 ON | 18.5 | (15.5') | |
| #1 ON | 18.0 | (15.0') | |
| #3 OFF | 14.0 | (11.0') | |
| #2 OFF | 13.5 | (10.5') | |
| #1 OFF | 13.0 | (10.0') | |
| LOW ALARM | 11.5 | (8.5') | Drainage Pumps |
| JOCKEY ON | 4.0 | (1.0') | |
| JOCKEY OFF | 2.8 | (-0.2') | |
| LOW ALARM | 2.5 | (-0.5') | Jockey Pump |

### *Oak Creek Pump Station (SD-13)*

| | | | |
|---|---|---|---|
| HI ALARM | 20.0 | (14.0') | |
| #3 ON | 19.5 | (13.5') | |
| #2 ON | 19.0 | (13.0') | |
| #1 ON | 18.5 | (12.5') | |
| #3 OFF | 17.0 | (11.0') | |
| #2 OFF | 16.5 | (10.5') | |
| #1 OFF | 16.0 | (10.0') | |
| LOW ALARM | 15.5 | (9.5') | Drainage Pumps |
| JOCKEY ON | 7.0 | (1.0') | |
| JOCKEY OFF | 5.8 | (-0.2') | |
| LOW ALARM | 5.5 | (-0.5') | Jockey Pump |