



SPECIAL MEETING OF THE MILPITAS CITY COUNCIL

AGENDA

TUESDAY, AUGUST 9, 2022

CITY COUNCIL CHAMBERS, 455 E CALAVERAS BLVD, MILPITAS, CA

6:00 PM (PUBLIC BUSINESS)

For assistance in the following languages, you may call:

Đối với Việt Nam, gọi 408-586-2400

Para sa Tagalog, tumawag sa 408-586-3051

Para español, llame 408-586-3072

The City Council meeting is held in the City Council Chamber at City Hall, 455 E. Calaveras Blvd., Milpitas and via teleconference/Zoom webinar.

You may watch the Council meeting without providing public comment by accessing it via links here.

Meeting shall be livestreamed - Go to:

Facebook: <https://www.facebook.com/CityofMilpitas/>

YouTube: <https://www.ci.milpitas.ca.gov/youtube>

Web Streaming: <https://www.ci.milpitas.ca.gov/webstreaming>

PUBLIC COMMENT INSTRUCTIONS

Oral public comments may be provided live during the City Council meeting in person or by registering for the zoom meeting in advance. To register you will need to provide an email address (not disclosed) and a name. To minimize technical difficulties, please make sure that you have the latest version of the Zoom Application. Below is the link to register for this meeting only:

https://ci-milpitas-ca-gov.zoom.us/webinar/register/WN_VzwgqkOfT_mgA1LOlri61Q

After you register a link will be sent to you to join the City Council meeting in order to give your comments. All registered meeting attendees who wish to speak must click on the "raise hand" icon when the Mayor calls for public comments. If participating by calling in on your phone, dial *9 to use the "raise hand" feature, and when you are called upon, hit *6 to unmute your phone. Your phone number will be displayed in the live meeting. The Mayor will call the speakers to begin.

All comments provided shall be limited to three minutes or less as determined by the Mayor. All members of the public will be limited to one comment per agenda item, and one comment for non-agenda items.

MILPITAS CITY COUNCIL CODE OF CONDUCT

- Be respectful and courteous (words, tone, and body language).
- Model civility.
- Avoid surprises.
- Praise publicly and criticize privately.
- Focus on the issue, not the person.
- Refrain from using electronic devices while on the Council dais.
- Disclose conflicts of interest and affiliations related to agenda items.
- Separate governing from campaigning.
- The Council speaks with one voice after making policy on issues.
- Respect the line between policy and administration.
- Council will hold one another accountable to comply with this Code of Conduct.

CALL MEETING TO ORDER by Mayor and ROLL CALL by Acting City Clerk (6:00 PM)

PLEDGE OF ALLEGIANCE

INVOCATION (Councilmember Phan)

PRESENTATIONS (6:05 PM)

- American Muslim Appreciation Month (Proclamation)

PUBLIC FORUM (6:10 PM)

Those in the audience and via Zoom are invited to address City Council on any subject not on tonight's agenda. In-person speakers wishing to address the Council are requested, but not required to complete a Speaker Card and submit it to the Mayor. In-person speakers will then be asked to come up to the podium and state their name for the record. Those interested in speaking via Zoom may do so by following the instructions on page one (1) of the agenda. Comments may be limited to three (3) minutes or less at the Mayor's discretion. As an item not listed on the agenda, no response is required from City staff or the Council and no action can be taken. The City Council may instruct the City Manager to place the item on a future meeting agenda.

NOTE: If a member of the public wishes to share any presentation materials for Council consideration, they must be submitted to the Clerk's Office by email to CityClerk@milpitas.gov by 12:00 p.m. on the day of the meeting. No presentations will be accepted in person in the Council Chambers.

ANNOUNCEMENTS AND FUTURE AGENDA ITEMS (6:15 PM)

Members of the City Council or City Manager may make brief announcements at this time. Members of the City Council may also suggest future agenda items at this time. For future agenda items, the City Council shall not debate the topic or engage in discussion but shall simply state a "yes" or "no" as to whether to direct the City Manager to place the item on a future meeting agenda. If a majority of the City Council agrees to place an item on a future meeting agenda, the City Manager shall place the item on a future agenda for City Council discussion.

ANNOUNCEMENT OF CONFLICT OF INTEREST AND CAMPAIGN CONTRIBUTIONS

READING OF THE CITY COUNCIL CODE OF CONDUCT

APPROVAL OF AGENDA

CONSENT CALENDAR (6:25 PM)

Consent calendar items are considered to be routine and will be considered for adoption by one motion. There will be no separate discussion of these items unless a City Councilmember, member of the audience or staff requests the Council to remove an item from (or be added to) the consent calendar. Any person desiring to speak on any item on the consent calendar should ask to have that item removed from the consent calendar.

C1. Receive City Council Calendar of Meetings for August 2022 (Staff Contact: Suzanne Guzzetta, Acting City Clerk, 408-586-3001)

Recommendation: Receive City Council Calendar of Meetings for August 2022.

C2. Approve City Council Special Meeting minutes of June 14, 2022, Regular Meeting minutes of June 21, 2022, Special Meeting minutes of July 7, 2022, and Special Meeting minutes of July 11, 2022 (Staff Contact: Suzanne Guzzetta, Acting City Clerk, 408-586-3001)

Recommendation: Approve City Council Special Meeting minutes of June 14, 2022, Regular Meeting minutes of June 21, 2022, Special Meeting minutes of July 7, 2022, and Special Meeting minutes of July 11, 2022.

C3. Receive the Preview List of Anticipated Items for the Next Regular City Council Meeting (Staff Contact: Suzanne Guzzetta, Acting City Clerk, 408-586-3001)

Recommendation: Receive the list of anticipated agenda items for the next regular City Council meeting.

C4. Receive and Review the List of Agenda Items Requested by City Councilmembers (Contact: Suzanne Guzzetta, Acting City Clerk, 408-586-3001)

Recommendation: Review the list of items that have been requested by City Councilmembers and provide direction to staff as necessary. No substantive discussion about any specific item shall occur and the City Council shall hold all debate about the item until it is scheduled as a full agenda item.

C5. Receive an Update on the Emergency Replacement of Two (2) Boilers and Install of a Temporary Heating System for the Public Works, Information Technology, and Police Department Building and Determine that the Condition Continues to Constitute an Emergency (Staff Contact: Tony Ndah, Public Works Director, 408-586-2602)

Recommendation: Receive an update on the emergency replacement of two boilers and the installation of a temporary heating system for the Public Works, Police and Information Technology Department buildings; and (2) Determine by a four-fifths vote that the condition continues to constitute an emergency.

C6. Adopt a Resolution Granting Acceptance of Public Improvements and Approve Reduction of Faithful Performance Bond for Public Improvements for the Anton Ascend (730) and Anton Aspire (750) Residential Projects and Granting Authorization to the Engineering Director/City Engineer to Release the Performance Bond after the One-year Warranty Period. (Staff Contact: Steve Erickson, Director of Engineering/City Engineer, 408-586-3301)

Recommendation: Adopt a resolution granting acceptance of public improvements for the Anton Ascend and Anton Aspire Residential Projects as shown on Public Improvement Plans No. 2-1228 and 2-1229; and approve a reduction in the performance bonds for the Projects, subject to the one-year warranty period and reduction of the faithful performance bonds to \$82,000.00 and \$69,500.00 respectively which shall be in effect for the duration of the warranty period; and grant authorization to the Engineering Director/City Engineer to release the performance bonds after the one-year warranty period, without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

C7. Adopt a Resolution Granting Acceptance of Public Improvements and Approve Reduction of Faithful Performance Bond for Public Improvements for the Centre Pointe – Summerhill Phase 1A Residential Project and Granting Authorization to the Engineering Director/City Engineer to Release the Performance Bond after the One-Year Warranty Period; (Staff Contact: Steve Erickson, Director of Engineering/City Engineer, 408-586-3301)

Recommendation: Adopt a resolution granting acceptance of the completed public improvements for the Centre Pointe – Summerhill Phase 1A Residential Project as shown on Public Improvement Plans No. 2-1221; and approve a reduction in the faithful performance bond to \$166,100.00, which is 10% of the security's original value which shall be in effect for the duration of the warranty period; and grant authorization to the Engineering Director/City Engineer to release the performance bond after the one-year warranty period without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

C8. Approve Budget Appropriation of \$103,602.00 in Fiscal Year 2022/2023 California Transportation Development Act Article 3 (TDA-3) Funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program (Staff Contact: Steve Chan, Transportation and Traffic Manager, 408-586-3324)

Recommendation: Approve budget appropriation of \$103,602.00 in Fiscal Year 2022/2023 California Transportation Development Act Article 3 (TDA-3) Funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program

C9. Approve and Authorize the City Manager to Execute a Stormwater Management Facilities Operation and Maintenance Agreement for S&B Milpitas, LLC for the Lantana at 720 Montague Expressway. (Staff Contact: Steve Erickson, Director of Engineering/City Engineer, 408-586-3301)

Recommendation: Approve and authorize the City Manager to execute a Stormwater Management Facilities Operation and Maintenance Agreement for S&B Milpitas, LLC for Lantana at 720 Montague Expressway.

C10. Consider Recommendations from Mayor Tran for Appointments to City Commissions (Staff Contact: Suzanne Guzzetta, Acting City Clerk, 408-586-3001)

Recommendation: Receive Mayor Tran's recommendations and approve the appointments to City Commissions.

C11. Accept Commissioner Resignations (Staff Contact: Suzanne Guzzetta, Acting City Clerk, 408-586-3001)

Recommendation: Accept the resignations of Aileen Zhong from the Community Advisory Commission and Cecelia Hutnick from the Arts Commission; and direct the Acting City Clerk to post the notice of unscheduled vacancies.

C12. Reconfirm Findings and Determinations Under Resolution No. 9165 and Assembly Bill 361 for the Continuation of Virtual Meetings of the City Council and Legislative Bodies (Staff Contact: Michael Mutalipassi, City Attorney, 408-586-3040)

Recommendation: Move to reconfirm findings and determinations under Resolution No. 9165 and Assembly Bill 361 for the continuation of virtual meetings of the City Council and Legislative Bodies.

PUBLIC HEARINGS (7:00 PM)

Members of the public may be allotted up to three (3) minutes or less at the Mayor's discretion, to comment on any public hearing item. Applicants/Appellants and their representatives may be allotted up to a total of ten (10) minutes for opening statements and up to a total of five (5) minutes maximum for closing statements. Items requested/recommended for continuance are subject to Council's consent at the meeting.

13. 2022 Weed Abatement Assessment Public Hearing and Adopt a Resolution to Confirm the Assessment Report (Staff Contact: Arthur Belton, Deputy Fire Chief / Fire Marshal, 408-586-3384)

Recommendation: Conduct a Public Hearing and Adopt a Resolution Confirming the 2022 Weed Abatement Assessment Report and the Assessment List to be Entered into the Tax Assessment Rolls.

14. Adopt a Resolution Certifying Election Results and Adding the Property Located at 150 Market Street into Community Facilities District No. 2008-1 (Annexation No. 23) (Staff Contact: Steve Erickson, Director of Engineering/City Engineer, 408-586-3301)

Recommendation: Following receipt of election results from the Acting City Clerk, adopt a resolution certifying election results and adding the property located at 150 Market Street into Community Facilities District No. 2008-1 (Annexation No. 23).

15. Conduct a Public Hearing, Adopt a Resolution to Adopt the Climate Action Plan Update and the Addendum to the General Plan Environmental Impact Report and Approve a related Budget Amendment (Staff Contact: Elaine Marshall, Deputy Public Works Director, 408-586-2603)

Recommendation: (1) Open the public hearing for comments and move to close the hearing; (2) adopt a Resolution to Adopt the Climate Action Plan Update and the Addendum to the Milpitas General Plan 2040 EIR for the Milpitas Climate Action Plan Update; (3) approve a Budget Appropriation in the amount of \$150,000 to CIP #3416 for near term implementation of the Climate Action Plan Update.

16. Conduct a Public Hearing and Adopt the Milpitas Water, Sewer, and Storm Master Plans and Addendum to the Environmental Impact Report for the Milpitas General Plan (Staff Contact: Tony Ndah, Public Works Director, 408-586-2602)

Recommendation: (1) Open the public hearing for comments and move to close the hearing; (2) approve resolution to adopt Water Master Plan and direct staff to return with a five-year rate study by December 2022; (3) approve resolution to adopt Sewer Master Plan and direct staff to return with a five-year rate study by December 2022; (4) approve resolution to adopt Storm Master Plan and direct staff to return to Council with various funding options for the Stormwater System by December 2022; and (5) approve resolution to adopt the City of Milpitas Utility Master Plans – Addendum to the Environmental Impact Report for the Milpitas General Plan.

17. Conduct a Public Hearing and Introduce an Ordinance Amending Sections of Chapter 10, Title XI of the Milpitas Municipal Code Relating to Non-Residential Building Heights (Staff Contact: Ned Thomas, Planning Director, 408-586-3273)

Recommendation: (1) Conduct a public hearing and move to close the hearing following comments; (2) City Attorney shall read aloud title of the Ordinance; (3) move to waive the first reading beyond the title and introduce an Ordinance amending sections of Chapter 10 of Title XI of the Milpitas Municipal Code relating to Non-Residential Building Heights and determine that the Municipal Code amendment is exempt from environmental review under the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines Section 15183 (Projects Consistent with a General Plan) and 15061(b)(3) (Common Sense Exemption).

18. Conduct a Public Hearing and Introduce an Ordinance Amending Sections of Chapter 10, Title XI (Zoning) and sections of Chapter 213, Title V (Noise Abatement) of the Milpitas Municipal Code Relating to Outdoor Music in Bars and Restaurants and Review and Permitting Requirements for Special Events (Staff Contact: Ned Thomas, Planning Director, 408-586-3273)

Recommendation: (1) Conduct a public hearing and move to close the hearing following comments; (2) City Attorney shall read aloud title of the Ordinance; (3) move to waive the first reading beyond the title and introduce an Ordinance amending sections of Chapter 10 of Title XI (Zoning) and Chapter 213 of Title V (Noise Abatement) of the Milpitas Municipal Code relating to Outdoor Music in Bars and Restaurants and Review and Permitting Requirements for Special Events and determine that the Municipal Code amendment is exempt from California Environmental Quality Act pursuant to CEQA Guidelines Sections 15183 (Projects Consistent with a General Plan) and 15061(b)(3) (Common Sense Exemption).

COMMUNITY DEVELOPMENT (9:30 PM)

19. Receive Progress Report on The Work Completed and Existing Conditions Analysis from Raimi and Associates and Staff on the Housing Opportunity Zones, Discuss Project Objectives and Priorities, and Provide Direction on Key Planning Concepts and Land Use Strategies (Staff Contact: Ned Thomas, Planning Director, 408-586-3273 and Jay Lee, Principal Planner, 408-586-3077)

Recommendation: Receive progress report on the work completed and existing conditions analysis from Raimi and Associates and staff on the Housing Opportunity Zones, discuss Project objectives and priorities, and provide direction on key planning concepts and land use strategies.

ADJOURNMENT (10:30 PM)

KNOW YOUR RIGHTS UNDER THE OPEN GOVERNMENT ORDINANCE

Government's duty is to serve the public, reaching its decisions in full view of the public. Commissions and other City agencies exist to conduct the people's business. This ordinance assures that deliberations are conducted before the people and City operations are open to the people's review. For more information on your rights under the Open Government Ordinance or to report a violation, contact the City Attorney's office at Milpitas City Hall, 455 E. Calaveras Blvd., Milpitas, CA 95035
e-mail: mmutalipassi@milpitas.gov / Phone: 408-586-3040

The Open Government Ordinance is codified in the Milpitas Municipal Code as Title I Chapter 310 and is available online at the City's website www.milpitas.gov by selecting the Milpitas Municipal Code link.

Materials related to an item on this agenda submitted to the City Council after initial distribution of the agenda packet are available for public inspection at the City Clerk's office at Milpitas City Hall, 3rd floor 455 E. Calaveras Blvd., Milpitas and on City website. City Council agendas and related materials can be viewed online: www.milpitas.gov/government/council/agenda_minutes.asp (select meeting date)

APPLY TO SERVE ON A CITY COMMISSION

Commission application forms are available online at www.milpitas.gov or at Milpitas City Hall. Contact the City Clerk's Office at 408-586-3001 for more information.

If you need assistance, per the Americans with Disabilities Act, for any City of Milpitas public meeting, please call the City Clerk's Office at 408-586-3001 or send an e-mail to CityClerk@milpitas.gov prior to the meeting. You may request a larger font agenda.

July 2022						
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Item # C1.

MILPITAS CITY COUNCIL CALENDAR

August 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 7:00 PM -Parks, Recreation & Cultural Resources Commission (CM)	2	3 2:00 PM -Santa Clara VTA Monthly Briefing - Northeast Group (CM) 5:30 PM -Veterans Commission (RT) 7:00 PM -Community Advisory Commission (EC)	4 5:30 PM -Milpitas Chamber of Commerce Board (EC) 5:30 PM -Santa Clara VTA Board of Directors (CM)	5	6
7	8 4:30 PM -Economic Development and Trade Commission (KD)	9 4:00 PM -Milpitas HOPE Suicide Prevention Task Force 6:00 PM -Special City Council	10 7:00 PM -Silicon Valley Clean Energy Board of Directors (EC) 7:00 PM -Planning Commission	11 4:00 PM -Treatment Plant Advisory Committee (CM) 4:00 PM -Santa Clara VTA Policy Advisory Committee (AP) 4:00 PM -Special Transportation Subcommittee (RT/CM) 7:00 PM -Youth Advisory Commission (EC) 7:00 PM -Cities Assoc of SCC (CM)	12 *4:30 PM -City Council Finance Subcommittee (RT/CM)	13
14	15 7:00 PM -Science, Technology, and Innovation Commission (RT)	16 ?:00 PM -Closed Session 7:00 PM -City Council	17 6:00 PM -Energy and Environmental Sustainability Commission (EC)	18	19	20
21	22	23 1:30 PM -Senior Advisory Commission (EC)	24 12:00 PM -Santa Clara Valley Water District - Water Commission (CM) 5:30 PM -Cities Assoc. of SCC - Recycling and Waste Reduction Commission (AP) 7:00 PM -Planning Commission	25	26	27
28	29	30	31 6:00 PM -Special Planning Commission			

**Finance Subcommittee will only meet as needed*



SPECIAL MEETING OF THE MILPITAS CITY COUNCIL

MINUTES

TUESDAY, JUNE 14, 2022

CITY COUNCIL CHAMBERS, 455 E CALAVERAS BLVD, MILPITAS, CA

5:30 PM

The City Council of the City of Milpitas convened for a Special City Council meeting on June 14, 2022, at 5:30 PM in the City Council Chamber at City Hall, 455 E. Calaveras Blvd., Milpitas, and via teleconference/Zoom webinar.

CALL MEETING TO ORDER by Mayor and ROLL CALL by City Clerk

Mayor Tran called the Special City Council meeting to order at 5:30 PM. Roll Call was taken by City Clerk Wood.

PRESENT: Mayor Tran, Vice Mayor Montano, Councilmembers Chua, Dominguez, and Phan (arrived at approximately 6:00 PM)

ABSENT: None

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Mayor Tran.

ADJOURN TO CLOSED SESSION

*** (a) CONFERENCE WITH LEGAL COUNSEL – ANTICIPATED LITIGATION**

Pursuant to Government Code Section 54956.9(d)(2)

One Potential Case

City as Defendant

Resolution No. 9171 - A Resolution of the City Council of the City Of Milpitas, California, Submitting to the Qualified Voters of the City of Milpitas A Measure Amending Chapter 400 (Mayoral and Councilmanic Term Limits) of Title 1 (Administration) of the Milpitas Municipal Code to Amend Term Limits on Mayoral and City Council Member Service, at a General Municipal Election to be Consolidated with the Statewide General Election to be Held November 8, 2022, and Setting Rules for Arguments and Rebuttals for and Against Said Measure

CLOSED SESSION ANNOUNCEMENT:

City Attorney Mutalipassi reported that Council unanimously gave direction to staff.

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Mayor Tran.

PRESENTATIONS

There were no presentations.

PUBLIC FORUM

There were no speakers.

ANNOUNCEMENTS

Mayor Tran requested staff add the India Independence Day flag-raising for the month of August to the next City Council Agenda and commented on the Eagle Scouts requesting a ceremony at City Hall.

Councilmember Dominguez requested a fee waiver for a fund-raising event on August 28 at the Milpitas Skate Park.

ANNOUNCEMENT OF CONFLICT OF INTEREST AND CAMPAIGN CONTRIBUTIONS

City Attorney Mutalipassi asked the Mayor and City Councilmembers if they had any personal conflicts of interest. By roll call, there were no conflicts of interest. City Attorney Mutalipassi asked the Mayor and City Councilmembers if they had any reportable campaign contributions. By roll call, there were no reportable campaign contributions.

READING OF THE CITY COUNCIL CODE OF CONDUCT

Mayor Tran read the Code of Conduct.

APPROVAL OF AGENDA

Motion: to approve the June 14, 2022, Special Meeting Agenda.

Motion/Second: Mayor Tran / Councilmember Dominguez

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

CONSENT CALENDAR

Motion: to approve the Consent Calendar.

Motion/Second: Mayor Tran / Councilmember Chua

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

1. **Approve and Authorize the City Manager to Execute Amendment Two to the Lease Agreement between the City and Casetronic Engineering Group for the Temporary Fire Station Facility Located at 1126 Yosemite Drive, Project No. 3447(Staff: Steve Erickson, Engineering Director/City Engineer, 408-586-3301, Alex Andrade, Economic Development Director, 408-586-3046)**

Approved and authorized the City Manager to execute Amendment Two to the Lease Agreement between the City and Casetronic Engineering Group for the Temporary Fire Station Facility located at 1126 Yosemite Drive, Project No. 3447.

PUBLIC HEARING**2. Conduct a Public Hearing to Approve the FY2022-25 Consolidated Plan, FY2022-23 Community Development Block Grant Funding Allocations and Corresponding Annual Action Plan, and a Substantial Amendment to the FY2019-20 Annual Action Plan (Staff Contact: Sharon Goei, Building Safety and Housing Director, 408-586-3260)**

Building Safety and Housing Director Goei presented the staff report.

Motion: to open the public hearing.

Motion/Second: Mayor Tran / Councilmember Chua

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

The following spoke:

1. Lindsey Mansfield
2. Teresa Johnson
3. Georgia Bacil
4. Alaina Purcell Schroeder
5. Mira Chandra
6. Marina Sanchez
7. Gloria Baxter
8. Linda Phillips
9. Anna Liza Navarro

Motion: to close the public hearing.

Motion/Second: Mayor Tran / Councilmember Chua

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

After discussion, motion: to adopt the FY2022-25 Consolidated Plan; Adopt the FY2022-23 Annual Action Plan with recommended allocation amounts; approve the Substantial Amendment to the FY2019-20 Annual Action Plan; authorize the City Manager, or designee, to make any necessary changes to the approved FY2022-25 Consolidated Plan, FY2022-23 Annual Action Plan, and FY2019-20 Annual Action Plan as needed to comply with CDBG submission guidelines; and authorize the City Manager, or designee, to execute CDBG agreements with the approved sub-recipients and amend the CDBG agreements as needed to comply with CDBG guidelines.

Motion/Second: Vice Mayor Montano / Councilmember Chua

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

COMMUNITY DEVELOPMENT

3. Receive a Presentation and Provide Direction to Staff on a Proposed Zoning Ordinance Amendment amending Sections of Chapter 10, Title XI of the Milpitas Municipal Code Relating to Maximum Building Heights (Staff Contact: Ned Thomas, Planning Director, 408-586-3273)

Planning Director Thomas introduced the item, and Senior Planner Lillian VanHua presented the staff report.

The following spoke:

1. Bill Korbe
2. Linda Dominguez
3. Frank Bust
4. John Doll

Staff responded to questions from the City Council. Council spoke in support of the proposed Zoning Ordinance Amendment setting forth regulations related to maximum building heights in certain zoning districts. Councilmember Phan voiced concerns with city-wide policy implementation due to potential economic development impacts and stated he could not fundamentally support this item.

COMMUNITY SERVICES

4. Receive a Presentation on the Pilot Street Sweeping Program and Provide Direction to Staff (Staff Contact: Elaine Marshall, Deputy Public Works Director, 408-586-2603)

Deputy Public Works Director Marshall presented the staff report.

Staff responded to clarifying questions from the City Council. Council provided feedback supporting the program and advocated expanding the program to additional areas.

ADJOURNMENT

Vice Mayor Montano asked for a moment of silence for former Fire Battalion Chief Johnny Crane, Jr. Fire Chief Sherrard commented on former Fire Battalion Chief Johnny Crane, Jr.'s service with the City of Milpitas. Mayor Tran adjourned the meeting at 7:56 PM.

Draft meeting minutes submitted by Acting City Clerk, Suzanne Guzzetta



REGULAR MEETING OF THE MILPITAS CITY COUNCIL

MINUTES

TUESDAY, JUNE 21, 2022

CITY COUNCIL CHAMBERS, 455 E CALAVERAS BLVD, MILPITAS, CA
7:00 PM (PUBLIC BUSINESS)

The City Council of the City of Milpitas convened on the regular City Council meeting day of June 21, 2022, in the City Council Chamber at City Hall, 455 E. Calaveras Blvd., Milpitas, and via teleconference/Zoom webinar.

CALL MEETING TO ORDER by Mayor and ROLL CALL by City Clerk

Mayor Tran called the regular City Council meeting to order at 7:00 PM. Roll call was taken by City Clerk Wood.

PRESENT: Mayor Tran, Vice Mayor Montano, Councilmembers Chua, Dominguez, and Phan (arrived at approximately 7:03 PM)

ABSENT: None

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Mayor Tran.

INVOCATION

Vice Mayor Montano introduced Juliette Gomez to lead the Invocation.

PRESENTATIONS

Mayor Tran presented a commendation and a key to the City to retiring Deputy Fire Chief Albert Zamora.

Councilmember Chua presented commendations of appreciation to businesses that supported other organizations in the community through the Chamber of Commerce events.

Vice Mayor Montano presented commendations in recognition of the Russell Girls Volleyball Team.

PUBLIC FORUM

The following people spoke under Public Forum:

1. Barbara Navarro
2. Voltaire Montemayor

ANNOUNCEMENTS AND FUTURE AGENDA ITEMS

City Manager McHarris made the following announcements:

1. The City of Milpitas will host a virtual community workshop on the City's Housing Element on June 28, covering potential housing locations and existing and new proposed housing programs. For more information, go to [MilpitasHousingElement.com](https://www.milpitas.gov/elements/HousingElement).

2. The City of Milpitas will host a virtual community workshop to provide a status update on the Milpitas Gateway Main Street Specific Plan. For more information, go to MilpitasMainStreet.org.

Mayor Tran announced the State of the City and Commissioner Appreciation event will be held on Thursday, June 23 at 5:30 PM at the Veteran Plaza. Mayor Tran made the following requests:

1. City staff apply for the “Better Cities for Pets” certification.
2. Call a Special City Council meeting next Tuesday for a closed session City Manager Performance Evaluation.

Councilmember Dominguez recognized organizations for their efforts in supporting the Juneteenth Independence Day and promoting a Filipino recognition event. She also wanted to recognize June as Pride Month and commented on supporting the LGBTQ+ community.

Councilmember Chua commented on Assembly Bill 1740 which will require core recyclers to keep records of the year, make, and model of the vehicle a catalytic converter was removed from. She also commented on Assembly Bill 2407 which will require core recyclers to report information gathered from sellers to the police, obtain and keep the seller's thumbprint for two years, and receive theft alert notifications regarding the theft of catalytic converters.

Councilmember Dominguez requested the following items:

1. Agendize a discussion for the first meeting in August to move the November 8 meeting date to a non-election day. By a show of hands, there was not a majority in favor of this item.
2. Agendize a discussion to add a section to the Councilmember handbook to address anti-harassment or bullying against the community by an elected official. By a show of hands, there was not a majority in favor of this item.

Vice Mayor Montano announced she attended the Filipino American South Bay summer picnic at Cardoza Park, attended the Cities Association end-of-the-year meeting, and commented on the need to restripe Great Mall Parkway.

Councilmember Chua announced she attended the Filipino American South Bay summer picnic at Cardoza Park, an appreciation dinner for Marico Sayoc, and thanked staff for fixing the pool and sound system at Milpitas Sports Center.

ANNOUNCEMENT OF CONFLICT OF INTEREST AND CAMPAIGN CONTRIBUTIONS

City Attorney Mutalipassi asked the Mayor and City Councilmembers if they had any personal conflicts of interest. By roll call, there were no conflicts of interest. City Attorney Mutalipassi asked the Mayor and City Councilmembers if they had any reportable campaign contributions. By roll call, there were no reportable campaign contributions.

READING OF THE CITY COUNCIL CODE OF CONDUCT

Vice Mayor Montano read the Code of Conduct.

APPROVAL OF AGENDA

Motion: to approve the June 21, 2022, regular meeting agenda.

Motion/Second: Mayor Tran / Councilmember Dominguez
Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran
 NOES: None

CONSENT CALENDAR

Vice Mayor Montano asked to remove item C21.

Motion: to approve the consent calendar with the removal of item C21.

Motion/Second: Mayor Tran / Councilmember Chua

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

C1. Receive the City Council Calendar of Meetings for June and July 2022 (Staff Contact: Wendy Wood, City Clerk, 408-586-3001)

Received the City Council Calendar of Meetings for June and July 2022.

C2. Approve the Regular and Special Meeting Minutes of June 7, 2022 (Staff Contact: Wendy Wood, City Clerk, 408-586-3001)

Approved the Regular and Special Meeting Minutes of June 7, 2022.

C3. Receive the Preview List of Anticipated Items for the Next Regular City Council Meeting (Staff Contact: Wendy Wood, City Clerk, 408-586-3001)

Received the list of anticipated agenda items for the next regular City Council meeting.

C4. Receive and Review the List of Agenda Items Requested by City Councilmembers (Contact: Mayor and City Councilmembers, 408-586-3000)

Reviewed the list of items that have been requested by City Councilmembers.

C5. Authorize the City Manager to Accept CalRecycle Grant of \$107,661 and Approve Related Budget Amendment (Elaine Marshall, Deputy Public Works Director, 408-586-2603)

Authorized the City Manager to accept grant funding from CalRecycle's one-time Senate Bill 1383 local assistance grant and approved a related budget amendment for revenues in the amount of \$107,661 for the Solid Waste Fund (Fund 280) for FY 2021-22.

C6. Approve and Authorize the City Manager to Execute a Stormwater Management Facilities Operation and Maintenance Agreement for Milpitas Town Center 2008 LP for the Chick-fil-A project at 755 East Calaveras Boulevard. (Staff Contact: Steve Erickson, 408-586-3301)

Approved and authorized the City Manager to execute a Stormwater Management Facilities Operation and Maintenance Agreement for Milpitas Town Center 2008 LP for the Chick-fil-A project at 755 East Calaveras Boulevard.

C7. Authorize City Manager to Enter into a Memorandum of Understanding with the MUSD for the Expansion of After the Bell for the Extended Learning Opportunities Program (Staff Contact: Renee Lorentzen, Director of Recreation and Community Services, 408-586-3409)

Authorized City Manager to enter into a Memorandum of Understanding with the MUSD for expansion of After the Bell for the Extended Learning Opportunities Program.

C8. Approve the Accounts Receivable Write-offs for the Fiscal Year Ending June 30, 2022 (Lauren Lai, Finance Director, 408-586-3111)

Approved the accounts receivable write-offs in the amount of \$71,246 for the fiscal year ending June 30, 2022.

C9. Approve and Authorize the City Manager to Execute the Agreement for a One-Year Renewal with Brown & Brown for Excess Workers' Compensation Insurance Coverage for a total agreement amount of \$302,134 (Staff Contact: Jeannine Seher, Human Resources Director, 408-586-3086)

Approved and authorized the City Manager to execute the Agreement for a one-year renewal with Brown & Brown for excess workers' compensation insurance coverage in the amount of \$302,134.

C10. Approve and Authorize the City Manager to Enter into a Side Letter to Amend the Memorandum of Understanding between the City and LIUNA/UPEC Local 792, representing the Milpitas Employees Association (MEA) Unit, Mid-Management-Confidential Unit (Mid-Con), and the Professional and Technical Unit (ProTech) and to Approve and Authorize the City Manager to Enter into three Master Professional Services Agreements for On-Call Temporary Staffing Services (Staff Contact: Jeannine Seher, Human Resources Director, 408-586-3086)

Approved and authorized the City Manager to enter into a Side Letter to amend the Memorandum of Understanding between the City and LIUNA/UPEC Local 792, representing the Milpitas Employees Association (MEA) Unit, Mid-Management-Confidential Unit (Mid-Con), and the Professional and Technical Unit (ProTech) and approved and authorized the City Manager to enter into three Master Professional Services Agreements for on-call temporary staffing services, with a not to exceed annual amount of \$500,000 for each agreement.

C11. Receive an Update on the Emergency Replacement of Two (2) Boilers and Install of a Temporary Heating System for the Public Works, Information Technology, and Police Department Building and Determine that the Condition Continues to Constitute an Emergency (Staff Contact: Tony Ndah, Public Works Director, 408-586-2602)

Received an update on the emergency replacement of two boilers and the installation of a temporary heating system for the Public Works, Police, and Information Technology Department buildings; and determine by a unanimous vote that the condition continues to constitute an emergency.

C12. Amended and Restated Weed Abatement Agreement Between City of Milpitas and the County of Santa Clara Consumer and Environmental Protection Agency - Weed Abatement Program (Staff Contact: Arthur Belton / Albert Zamora, Deputy Fire Chief / Fire Marshal, 408-586-3378 / 3371)

Approved and authorized the City Manager to execute and sign the Amended and Restated Weed Abatement Agreement between the City of Milpitas and the County of Santa Clara Consumer and Environmental Protection Agency - Weed Abatement Program.

C13. Approve Delegation of Authority to the City Manager or Designee to Approve and Execute Project Related Documents and Urgent Administrative Items During the City Council Summer Recess, from the Last City Council Meeting Held in June through August 9, 2022 (Staff Contact: Ashwini Kantak, Assistant City Manager, 408-586-3053)

Approved delegation of authority to the City Manager, or his designee, to approve and execute project related documents, including contract documents, and urgent administrative items during the City Council summer recess from the last City Council meeting held in June through August 9, 2022.

C14. Receive the Monthly Report for Unhoused Services (Staff Contact: Sharon Goei, Building Safety and Housing Director, 408-586-3260)

Received the March 2022 report for unhoused services.

- C15. Adopt a Resolution Accepting and Authorizing the City Manager to Execute the 5- Year Agreement Between Hiderliter De Llamas and Associates (HdL) and the City of Milpitas, and Approving and Authorizing a Sole Source Purchase for the Procurement of HdL Prime Business License Software with Web Module Services for a 5-Year Total Cost of Approximately \$123,700. (Staff Contact: Lauren Lai, Finance Director, 408-586-3111)**

Adopted **Resolution No. 9172** accepting and authorizing the City Manager to execute the 5-Year Agreement Between Hiderliter De Llamas and Associates (HdL) and the City of Milpitas, and approving and authorizing a Sole Source Purchase for the Procurement of HdL Prime Business License Software with Web Module Services for a 5-Year Total Cost of Approximately \$123,700.

- C16. Waive the Second Reading and Adopt Ordinance No. 38.845 Amending Sections of Chapter 10 of Title XI and Sections of Chapter 100 of Title V of the Milpitas Municipal Code Relating to Mobile Food Vending (Food Trucks) (Staff Contact: Ned Thomas, Planning Director, 408-586-3273)**

Moved to waive the second reading and adopted **Ordinance No. 38.845** amending sections of Chapter 10 of Title XI and Section of Chapter 100 of Title V of the Milpitas Municipal Code relating to mobile food vending (Food Trucks).

- C17. Second Reading of Ordinance No. 312 of the City Council of the City of Milpitas Adding Section 3.5 (“Regulation of Lobbying Activities”) to Chapter 310 (“Open Government Ordinance”), of Title I (“Administration”) of the Milpitas Municipal Code (The “Code”) and Modifying Section I-310-3.160 of the Code (Staff Contact: Michael Mutalipassi, City Attorney, 408-586-3040)**

Moved to waive the second reading and adopted **Ordinance No. 312** adding Section 3.5 (“Regulation of Lobbying Activities”) to Chapter 310 (“Open Government Ordinance”), of Title I (“Administration”) of the Milpitas Municipal Code (the “Code”) and Modifying Section I-310-3.160 of the Code).

- C18. Adopt a Resolution to Supersede Resolution 9145 to Add the Commemoration of India Independence Day as a Flag-raising Event at Cesar Chavez Plaza (Staff Contact: Renee Lorentzen, Director of Recreation and Community Services, 408-586-3409)**

Adopted **Resolution No. 9173** to Supersede Resolution 9145 to Add the Commemoration of India Independence Day as a Flag-raising Event at Cesar Chavez Plaza

- C19. Accept Water and Wastewater Arrearage Grants from the Water State Board, Authorize a Subsidy for Residential Accounts with an Outstanding Balance of 85 days, and Over and Approve a Budget Appropriation of \$248,048 for Grants and \$80,000 for Residential Utility Account Subsidy (Staff Contact: Lauren Lai, Finance Director, 408-586-3111)**

Accepted the Water and Wastewater Arrearage Grants from the Water State Board; authorized a subsidy for residential accounts with an outstanding balance of 85 days and over; and approved a budget appropriation of \$248,048 for grants and \$80,000 for residential utility account subsidy

- C20. Consider Recommendations from Mayor Tran for Appointments to City Commissions (Contact: Mayor Tran, 408- 586-3029)**

Received Mayor Tran’s recommendation and approved the appointment to Economic Development and Trade Commission.

- C21. Approve the City Council Policy for Naming Streets, Parks, and Facilities (Staff Contact: Renee Lorentzen, Director of Recreation and Community Services, 408-586-3409)**

This item was pulled from consent.

- C22. Reconfirm Findings and Determinations Under Resolution No. 9165 and Assembly Bill 361 for the Continuation of Virtual Meetings of the City Council and Legislative Bodies (Staff Contact: Michael Mutalipassi, City Attorney, 408-586-3040)**

Moved to reconfirm findings and determinations under Resolution No. 9165 and Assembly Bill 361 for the continuation of virtual meetings of the City Council and Legislative Bodies.

- C23. Authorize the City Manager to Reject All Proposals for RFP No. 22-058 for Abandoned Shopping Cart Retrieval Services (Staff Contact: Sharon Goei, Building Safety and Housing Director, 408-586-3260; and Chris Schroeder, Purchasing Agent, 408-586-3161)**

Authorized the City Manager to reject all proposals for RFP No. 22-058 for Abandoned Shopping Cart Retrieval Services.

- C24. Approve and Authorize the City Manager to Execute Amendment No. 4 to the Shopping Cart Retrieval Services Contract with Alice Wright (Staff Contact: Sharon Goei, Building Safety and Housing Director, 408-586-3260; and Chris Schroeder, Purchasing Agent, 408-586-3161)**

Approved and authorized the City Manager to execute Amendment No. 4 to the Shopping Cart Retrieval Services Contract with Alice Wright, adding a one-year extension to the five-year contract, for a total of six years and increasing the total not-to-exceed amount by \$34,920.00 from \$111,384.62 to \$146,304.62.

- C25. Adopt a Resolution to Amend Resolution No. 1626 the City of Milpitas' Classification Plan to Approve and Adopt the Classification Specifications and Pay Schedules for the Legal Assistant, Assistant City Attorney, Deputy City Attorney, and Deputy Director of Information Technology (Staff Contact: Jeannine Seher, Human Resources Director, 408-586-3086)**

Adopted **Resolution No. 9174** to amend Resolution No. 1626 the City of Milpitas' Classification Plan to approve and adopted the Classification Specifications and Pay Schedules for the Legal Assistant, Assistant City Attorney, Deputy City Attorney, and Deputy Director of Information Technology.

- C26. Adopt a Resolution Approving Rental Rates for Public Spaces in City Hall (Staff Contact: Renee Lorentzen, Director of Recreation and Community Services, 408-586-3409)**

Adopted **Resolution No. 9175** approving rental rates to be added to the Master Fee Schedule for the City Hall Rotunda and the City Hall City Council Chambers.

- C27. Approve and Authorize the City Manager to Execute Amendment No. 2 with Avolve Software for the Maintenance Contract Extension for ProjectDox (Staff Contact: Daniel Nam, IT Director, 408-586-2712; and Chris Schroeder, Purchasing Agent, 408-586-3161)**

Approved and authorized the City Manager to Execute Amendment No. 2 with Avolve Software to extend the maintenance agreement for one (1) additional year and increase the existing contract amount of \$369,731.07 by \$29,906.55 for a total contract amount of \$399,237.62

- C28. Approve the Donation and Fee Waiver/Reduction City Council Policy (Staff Contact: Renee Lorentzen, Director of Recreation and Community Services, 408-586-3409)**

Approved the Donation and Fee Waiver/Reduction City Council Policy.

PUBLIC HEARINGS**29. Conduct a Public Hearing and Adopt a Resolution Confirming the Assessment and Ordering the Levy for the Landscaping and Lighting Maintenance Assessment District No. 98-1, Sinclair Horizon for the Fiscal Year 2022-23 (Staff Contact: Steve Erickson, Engineering Director/City Engineer, 408-586-3301)**

Principal Engineer Alonzo presented the staff report.

Motion: to open the public hearing.

Motion/Second: Mayor Tran / Vice Mayor Montano

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Vice Mayor Montano, Mayor Tran

NOES: None

ABSENT: Councilmember Phan

The following spoke:

1. Voltaire Montemayor

Motion: to close the public hearing.

Motion/Second: Mayor Tran / Vice Mayor Montano

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Vice Mayor Montano, Mayor Tran

NOES: None

ABSENT: Councilmember Phan

Motion: to adopt **Resolution No. 9176** confirming the assessment and ordering the levy for Landscaping and Lighting Maintenance Assessment District No. 98-1, Sinclair Horizon for the Fiscal Year 2022-23.

Motion/Second: Councilmember Chua / Mayor Tran

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

***30. Conduct a Public Hearing and Adopt a Resolution Confirming the Assessment and Ordering the Levy for the Landscaping and Lighting Maintenance Assessment District No. 95-1, McCarthy Ranch for the Fiscal Year 2022-23 (Staff Contact Steve Erickson, Engineering Director, 408-586-3301)**

***Item was taken out of order following item 31.**

Principal Engineer Alonzo presented the staff report.

Motion: to open the public hearing.

Motion/Second: Mayor Tran / Vice Mayor Montano

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

The following spoke:

1. Voltaire Montemayor

Motion: to close the public hearing.

Motion/Second: Mayor Tran / Vice Mayor Montano

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

Motion: to adopt **Resolution No. 9177** confirming the assessment and ordering the levy for Landscaping and Lighting Maintenance Assessment District No. 95-1, McCarthy Ranch for the Fiscal Year 2022-23.

Motion/Second: Councilmember Chua / Mayor Tran

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

COMMUNITY DEVELOPMENT

- *31. Receive a Follow-up Presentation from Staff and Provide Direction on Policy Options and Cost Estimates to Establish a Local Tobacco Retail Permitting (TRP) Program and to Regulate Tobacco Retail Locations and the Sale of Flavored Tobacco and Electronic Cigarette Products in Milpitas (Staff Contacts: Ned Thomas, Planning Director, 408-586-3273; Jay Lee, Principal Planner, 408-586-3077)**

***Item was taken out of order following item 29.**

Planning Director Thomas introduced the item and Associate Planner Atkins presented the staff report.

Vice Mayor Montano requested the recommendation language be changed to “prohibit the sale of flavored tobacco and electronic cigarette products in Milpitas.”

The following spoke:

1. Voltaire Montemayor
2. Carol Baker
3. Jade Chao
4. Dipti Venkatesh
5. Saanvi Kotha
6. Tanya Payyappilly
7. Vanessa Marvin
8. Shiv Pandya
9. Carys Nguyen

Vice Mayor Montano stated she supports having the County provide oversight of the program.

Councilmember Chua supported a partnership with the County.

Councilmember Dominguez stated she supports recommendations to partner with Santa Clara County.

Mayor Tran requested staff remove two of the ashtrays at City Hall, one in the Veterans Plaza and one by the parking lot near the front entrance.

The consensus of the City Council was to move forward with establishing a local tobacco retail permitting program in partnership with Santa Clara County to regulate tobacco retail locations and prohibit the sale of flavored tobacco and electronic cigarette products in Milpitas.

COMMUNITY SERVICES AND SUSTAINABLE INFRASTRUCTURE

32. Authorize City Manager to Execute the Fourth Amendment to the Franchise Agreement with MSI for the Purpose of Assignment of Contract and Modify Certain Service Provisions (Staff Contact: Tony Ndah, Public Works Director, 408-586-2602)

Public Works Director Ndah presented the staff report.

Mayor Tran asked if the use of the “white bags” can be continued.

Representatives from Waste Connections commented on the Mayor’s question and provided information on the contract.

Deputy Public Works Director Marshall provided additional information.

The following spoke:

1. Juliette Gomez
2. Voltaire Montemayor

After discussion, motion: to authorize the City Manager to execute the Fourth Amendment to the Franchise Agreement with MSI for the purpose of Assignment of Contract and modify certain service provisions with an amendment to strike out the following language from the Fourth Amendment to the Franchise Agreement “Additionally, Contractor shall cease requiring and providing “White Bags” for bulky item pick-ups.”

Motion/Second: Vice Mayor Montano / Mayor Tran

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

LEADERSHIP AND SUPPORT SERVICES

33. Rescind Resolution No. 9171 and Approve a Resolution Submitting to the Qualified Voters of the City of Milpitas a Measure Amending Chapter 400 (Mayoral and Councilmanic Term Limits) of Title 1 (Administration) of the Milpitas Municipal Code to Amend Term Limits on Mayoral and City Council Member Service, at a General Municipal Election to be Consolidated with the Statewide General Election to be Held November 8, 2022, and Setting Rules for Arguments and Rebuttals for and Against Said Measure(Staff Contact: Michael Mutalipassi, City Attorney, 408-586-3040)

City Attorney Mutalipassi presented the staff report.

Councilmember Dominguez made a motion to rescind Resolution No. 9171 and include language in the resolution for a lifetime term limit to the Mayoral seat capping it at six years with no cooling-off period. This motion failed due to the lack of a second

The following spoke:

1. Voltaire Montemayor
2. Frank Bush
3. Juliette Gomez
4. Barbara Navarro

After discussion, motion: to rescind Resolution No. 9171; and approve **Resolution No. 9178** submitting to the qualified voters of the City of Milpitas a measure amending Chapter 400 (Mayoral and Councilmanic Term Limits) of Title 1 (Administration) of the Milpitas Municipal Code to amend term limits on the Mayoral and City Council Member service, at a General Municipal Election to be consolidated with the Statewide General Election to be held on November 8, 2022, and setting rules for arguments and rebuttals for and against said measure with an amendment to change the ballot question language to "Shall an ordinance be adopted amending the Milpitas Municipal Code to shorten Councilmember term limits by establishing for both Councilmember and Mayor, effective with the November 8, 2022 General Municipal Election, a ten consecutive year limit on combined Mayoral and City Councilmember service, with a six-year limit on Mayoral service, followed by a two-year "cooling off" period, during which a person may not serve as Mayor or Councilmember?"

Mayor Tran further requested that the Mayor and Vice Mayor prepare the argument in favor of the measure on behalf of the City Council, to which Vice Mayor Montano agreed as part of her motion.

City Attorney Mutalipassi asked for clarification on whether the Council wishes to print the text of the ballot measure.

Mayor Tran stated they would like to be consistent with what they did for Measure F.

Motion/Second: Vice Mayor Montano / Mayor Tran

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

ITEM REMOVED FROM CONSENT

C21. Approve the City Council Policy for Naming Streets, Parks, and Facilities (Staff Contact: Renee Lorentzen, Director of Recreation and Community Services, 408-586-3409)

Vice Mayor Montano asked about creating a subcommittee.

Deputy City Manager Rossmann stated the subcommittee will be agendized for the first meeting in August.

The following spoke:

1. Voltaire Montemayor

Motion: to approve the City Council Policy for Naming Streets, Parks, and Facilities.

Motion/Second: Councilmember Chua / Mayor Tran

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

ADJOURNMENT

Mayor Tran adjourned the meeting at 10:03 PM.

Draft meeting minutes submitted by Acting City Clerk, Suzanne Guzzetta



JOINT SPECIAL MEETING OF THE MILPITAS CITY COUNCIL AND CONGRESSMAN RO KHANNA

MINUTES

THURSDAY, JULY 7, 2022

COMMITTEE MEETING ROOM (1ST FLOOR) MILPITAS CITY HALL

The City Council of the City of Milpitas convened for a Special City Council meeting on July 7, 2022, at 10:45 a.m. in person in the Committee Meeting Room at City Hall, 455 E. Calaveras Blvd., Milpitas.

CALL MEETING TO ORDER by Mayor and ROLL CALL by City Clerk

Councilmember Phan called the Special City Council meeting to order at 10:59 AM. Roll Call was taken by City Clerk Wood.

PRESENT: Councilmembers Chua, Dominguez, and Phan

ABSENT: Mayor Tran and Vice Mayor Montano,

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by City Manager McHarris.

AGENDA ITEMS

1. Federal Community Project Funding Request: Carbon Neutral Homes Incentive Program

City Manager McHarris introduced the item.

Deputy Public Work Director Marshall and a representative from Silicon Valley Clean Energy gave a presentation on the proposed Carbon Neutral Home Incentives Program.

Congressman Ro Khanna commented on the Program and stated the \$3 million funding request submitted by the City of Milpitas has been accepted by the House of Appropriations and is waiting for Congress approval.

PUBLIC FORUM

There were no speakers.

ADJOURNMENT

Councilmember Phan adjourned the meeting at 11:39 AM.

Draft meeting minutes submitted by Acting City Clerk, Suzanne Guzzetta



SPECIAL MEETING OF THE MILPITAS CITY COUNCIL

Item # C2.

MINUTES

MONDAY, JULY 11, 2022
MILPITAS, CA

The City Council of the City of Milpitas convened for a Special City Council meeting on July 11, 2022, at 6:30 p.m. via teleconference/Zoom webinar.

CALL MEETING TO ORDER by Mayor and ROLL CALL by City Clerk

Mayor Tran called the Special City Council meeting to order at 6:37 PM. Roll Call was taken by Assistant City Manager Kantak.

PRESENT: Mayor Tran and Vice Mayor Montano, Councilmembers Chua, Dominguez, and Phan

ABSENT: None

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Mayor Tran.

PUBLIC FORUM

There were no speakers.

ANNOUNCEMENT OF CONFLICT OF INTEREST

City Attorney Mutalipassi asked the Mayor and City Councilmembers if they had any personal conflicts of interest. By roll call, there were no conflicts of interest.

READING OF THE CITY COUNCIL CODE OF CONDUCT

Mayor Tran read the Code of Conduct.

APPROVAL OF AGENDA

Motion: to approve the July 11, 2022, Special Meeting Agenda.

Motion/Second: Mayor Tran / Councilmember Dominguez

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

AGENDA ITEMS

1. **Reconfirm Findings and Determinations Under Resolution No. 9165 and Assembly Bill 361 for the Continuation of Virtual Meetings of the City Council and Legislative Bodies (Staff Contact: Michael Mutalipassi, City Attorney, 408-586-3040)**

Motion: to reconfirm findings and determinations under Resolution No. 9165 and Assembly Bill 361 for the continuation of virtual meetings of the City Council and Legislative Bodies.

Motion/Second: Mayor Tran / Councilmember Chua

Motion carried by the following:

AYES: Councilmembers Chua, Dominguez, Phan, Vice Mayor Montano, Mayor Tran

NOES: None

ADJOURN TO CLOSED SESSION

(a) PUBLIC EMPLOYEE PERFORMANCE EVALUATION

Pursuant to California Government Code Section 54957

Position: City Manager

City Council adjourned to Closed Session to discuss item A.

CLOSED SESSION ANNOUNCEMENT

Mayor Tran, Vice Mayor Montano, and Councilmember Dominguez returned to the open session at approximately 8:06 PM.

Mayor Tran stated there was no reportable action for item A.

ADJOURNMENT

Mayor Tran adjourned the meeting at 8:07 PM.

Draft meeting minutes submitted by Acting City Clerk, Suzanne Guzzetta

TENTATIVE CITY COUNCIL AGENDA ITEM LIST

Item # C3.

as of 08/04/2022

August 16, 2022 – 3rd Tuesday

CLOSED SESSION

INVOCATION (assigned to Councilmember Phan)

PRESENTATION

- Women's Equality Day (Proclamation)
- Milpitas North Valley PAL 12U All Stars
- Tony Ndah Commendation and Key to the City

CONSENT CALENDAR

1. Receive City Council calendar for August 2022 (Suzanne Guzzetta)
2. Approve City Council Special Meeting Minutes of August 9, 2022 (Suzanne Guzzetta)
3. Preview list of items for September 6, 2022 (Suzanne Guzzetta)
4. Councilmember Request List (Suzanne Guzzetta)
5. Receive an Update on the Emergency Replacement of Two (2) Boilers and Install of a Temporary Heating System for the Public Works, Information Technology, and Police Department Building and Determine that the Condition Continues to Constitute an Emergency (Tony Ndah)
6. Second reading of an Ordinance Amending Sections of Chapter 10 (Zoning), Title XI (Planning, Zoning, and Annexation) of the Milpitas Municipal Code Relating to Maximum Building Heights (Ned Thomas)
7. Second reading of an Ordinance Amending Sections of Chapter 10 (Zoning), Title XI (Planning, Zoning, and Annexation), and Chapter 213 (Noise Abatement), Chapter V (Public Health, Safety, and Welfare), of the Milpitas Municipal Code Relating to Outdoor Music as an Accessory Use in Certain Commercial and Mixed Use Zones; and to Modify and Add Regulations Relating to Special Events (Ned Thomas)
8. Approve Report of Actions Taken by the City Manager During the City Council Summer Recess (June 21 through August 9, 2022) (Walter C. Rossmann and Ashwini Kantak)
9. Authorize and Approve Travel to Long Beach, CA for two City Councilmembers along with City Manager to Attend the Annual Conference of the League of California Cities held September 7 - 9, 2022; and Designate Milpitas City Councilmembers as Delegate and Alternates to 2022 League of California Cities Annual Conference (Ashwini Kantak)
10. Update to the Commission Handbook (Suzanne Guzzetta)

PUBLIC HEARING

11. 2022 Public Health Goals Report (Tony Ndah)

COMMUNITY DEVELOPMENT

12. Economic Development Update (Alex Andrade)
13. Objective Design Standards (Ned Thomas)

14. Receive a Status Report on the Homekey Project at 1000 Hillview Court (Ashwini Kantak, Jared Hernandez)

COMMUNITY SERVICES

15. Facility Naming Subcommittee appointments (Renee Lorentzen)

PUBLIC SAFETY

LEADERSHIP

16. Review List of Agenda Item Requests from Individual Councilmembers and Provide Direction to Staff, Through the Prioritization Process, on Group 1 Items; and Provide Additional Clarification to Staff, if any, on Group 2 Items (Ashwini Kantak and Walter Rossmann)

REPORTS

**MILPITAS CITY COUNCIL
AGENDA ITEM REQUESTS**

Item # C4.

OPEN REQUESTS

Request No.	Topic	Submitted by:	Date Requested	STATUS and/or DATE scheduled on City Council meeting agenda:
1	City Staff apply for the "Better Cities for Pets" Certification	Tran	6/21/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September
2	Waive fees for family fundraiser at Milpitas Skate Park	Dominguez	6/14/2022	Staff reached out to the resident multiple times
3	Establish a SPAR fund modelled after the City of Mountain View - sets asides moneys for opportunities to buy real estate	Montano	6/7/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September
4	Memorial Plaque in honor of youth skateboarder that passed away	Montano	6/7/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September
5	Staff provide and explain the Project Homekey Management Manual, see if the MOU is being followed including forming an oversight committee, and explore with County to have check-ins of the units. Dominguez indicated it could be included in Council Member Chua's recommendation. Mayor requested to include County in discussion.	Dominguez	6/7/2022	Item will be agendized for the August 16 City Council meeting including the crime data related to the Homekey Project
6	Quarterly or Monthly crime statistics on Homekey Project	Chua	6/7/2022	PD will present quarterly reports starting in November 2022.
7	Funding to hire a consultant for the Sunnyhills Historical Designation on a state level	Tran	6/7/2022	Request will be included with the Historic Resources Master Plan project approved as part of the 2023-2027 Capital Improvement Program.
8	Local Boy Scouts Fee Waiver for Eagle Scout Ceremony	Tran	6/7/2022	Staff will agendize a fee waiver request for Council consideration for the first meeting in August.
9	Prepare Vision Zero Action Plan	Tran	6/7/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September
10	Requested the City create a youth scholarship fund for under privileged kids to play sports	Montano	5/17/2022	As part of the adoption of the FY 2022-23 Budget, the City Council allocated \$20,000 for this program. Staff will bring forward a policy framework for this program for Council approval in September 2022.
11	Consider policies to regulate automated equipment that would replace a position typically filled by an employee.	Phan	4/19/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September
12	Explore the use of roundabouts as a traffic calming mechanism	Dominguez	4/19/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September
13	Explore the policy for locking mechanisms on shopping carts for large commercial businesses	Tran	4/19/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September
14	Prepare a report on ghost guns; engage in legislative advocacy regarding ghost guns; and incentivize ghost gun buybacks at the May buyback event	Dominguez; Tran	4/5/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September. At the gun buyback event held on May 22, 2022, ghost guns were bought back for \$200 vs. handguns and rifles for \$100.
15	Explore an ordinance or policy to reduce thefts and increase security in the commercial retail parking areas	Chua	4/5/2022	Item will be brought forward as part of the next City Council additional workplan items prioritization in August/September

**MILPITAS CITY COUNCIL
AGENDA ITEM REQUESTS**

Item # C4.

Request No.	Topic	Submitted by:	Date Requested	STATUS and/or DATE scheduled on City Council meeting agenda:
16	Request for Crossing Guards at McCandless and Montague Expressway and review wages for Crossing Guards	Montano	4/5/2022	Per the Information Memorandum issued on June 13, the City will perform school aged pedestrian counts around schools in the City including the McCandless and Montague Expressway intersection at the beginning of the 2022-23 school year and report the findings to the Transportation Subcommittee late fall.
17	Host a Town Hall at City Hall in January, February, and March for the community to share comments about the issue of the unhoused.	Tran	11/2/2021	This item was postponed by Mayor Tran due to the Omicron variant and a rise in COVID-19 cases

ACTIVE REQUESTS				
Request No.	Topic	Submitted by:	Date Requested	STATUS and/or DATE scheduled on City Council meeting agenda:
18	Create a plan for future solar paneling at City facilities	Montano	3/1/2022	Discussed at Spring Quarterly City Council Workplan Items Prioritization Discussion; Approved to move forward at the 5/03/2022 meeting; Discussed at the May 10 budget meeting and approved funding of \$25,000 in the 2022-23 budget
19	Requested the City Attorney's office explore encampment ordinances from the City of Oakland, Los Angeles, or other regional cities and would like a discussion on the existing policies to be brought back before the July recess.	Tran	2/15/2022	4/19/2022 direct the City Attorney to make the recommended changes to the Municipal Code to remove and prohibit property in public
20	Evaluate reopening the childcare center with a non-profit organization running the center	Montano	2/1/2022	Approved during Spring Quarterly City Council Workplan Items Prioritization Discussion on 5/03/2022.
21	Requested an appropriation in an amount not to exceed \$250,000 to procure a contract to address the streetlights that are pending fieldwork.	Tran	2/1/2022	At this time, staff has sufficient Council approved resources to address the remaining streetlight outages; however, will bring relevant actions for Council consideration, if needed.
22	Explore a lease for the vacant land adjacent to the Library for City use	Tran	1/18/2022	Discussed at Spring Quarterly City Council Workplan Items Prioritization Discussion; Approved to move forward at the 5/03/2022 meeting;
23	Requested that staff study the placement of a City sign for the Milpitas Police Department and explore the cost of a new sign	Dominguez	1/18/2021	Staff has been working on upgrading signage and landscaping around the Police Department and Public Works Building. Lit-up signs mounted on the building are scheduled to be installed by the end of August 2022
24	Request for the City to make the temporary third-party food deliver fee caps permanent and add additional provisions for enforcement	Phan	11/16/2021	Discussed at Spring Quarterly City Council Workplan Items Prioritization Discussion; Approved to move forward at the 5/03/2022 meeting
25	Staff to look into mural Art on Great Mall Parkway on the VTA owned Light rail pillars	Montano	11/16/2021	Discussed at Spring Quarterly City Council Workplan Items Prioritization Discussion; Approved at the 5/03/2022 meeting; discussed funding at the 5/10/2022 budget meeting and approved \$100,000 of funding for one site

**MILPITAS CITY COUNCIL
AGENDA ITEM REQUESTS**

Item # C4.

Request No.	Topic	Submitted by:	Date Requested	STATUS and/or DATE scheduled on City Council meeting agenda:
26	Have a picture of Albert Vogel Sr. put up in the Senior Center	Montano	10/19/2021	Approved to move forward at the 1/11/2022 Council meeting; Staff engaged the artist of the existing mural regarding this Council approved item.
27	Requested the City extend the outdoor dining options through March of next year	Phan	9/21/2021	Planning Director to provide information on current outdoor dining extension
28	Partner with the Rotary Club of Silicon Andhra to promote the stem cell donor outreach with a webinar and campaign to help increase the number of donors	Chua	8/17/2021	Staff will include the stem cell donor information in regularly scheduled wellness event
29	Include a bust of Maria Lemire on the Mural in front of the Senior Center	Montano	8/17/2021	Approved to move forward at the 1/11/2022 Council meeting; Staff engaged the artist of the existing mural regarding this Council approved item.
30	City to highlight mental health resources on the website	Dominguez	8/17/2021	Staff issued an Information Memorandum on August 1, 2022
31	Look into allowing outdoor music and would like the ordinance brought back to Council.	Montano	8/5/2021	Approved to move forward at the 1/11/2022 Council meeting; scheduled for 8/9/22 City Council Meeting
32	Look into opening up the Senior Center on Saturdays for half a day	Chua	8/5/2021	As presented by staff on 1/11/2022, this pilot is scheduled for completion in fall 2022. In preparation for the pilot, staff will issue a survey to seniors asking for the types of services they are seeking; hire staff based on the feedback; and start the three-month pilot in September 2022.
33	Look into bringing back a roller rink	Montano	8/5/2021	Approved to move forward at the 1/11/2022 Council meeting. Funding for the program will need to be prioritized through the FY 22-23 budget process; Discussed at 5/10/2022 budget meeting and approved \$100,000 funding for a two-day event in 2023
34	Requested that the City have mini-libraries in the low-income areas of the City.	Montano	4/20/2021	8/09/2021 Council voted 3-1-1 to move this item forward, staff to follow up with Vice Mayor Montano on specific vision. Staff met with the Vice Mayor. The City will continue to facilitate libraries as needed but will not take a lead role in funding or operating them.
35	Staff to create a plan on how to increase the number of local businesses doing business with the City	Chua	4/6/2021	At 8/9/2021 Council meeting, Council voted that this item may have to come back for additional discussion because there may be some legal considerations.
36	Staff to provide information on a landmark policy for the City of Milpitas	Tran	3/16/2021	8/09/2021 Council voted 5-0 to move this item forward; this item will be included for funding consideration in the development of the FY 2023-27 CIP for assessment of historical and cultural resources and development of landmark policy; The funding for the assessment of historical and cultural resources and development of a landmark policy will be included in the 2023-2027 Capital Improvement Program scheduled for adoption on May 3, 2022. This project will be scheduled to begin in FY 2022-23.

**MILPITAS CITY COUNCIL
AGENDA ITEM REQUESTS**

Item # C4.

Request No.	Topic	Submitted by:	Date Requested	STATUS and/or DATE scheduled on City Council meeting agenda:
37	Amendment to the existing ordinance for third-party food delivery vendor services to prohibit regulatory response fees	Phan	2/16/2021	Agendized for discussion on 3/16/2021, deferred to 4/06/2021; CC direction for City Attorney to prepare a report; At the 11/12/2021 Transportation Subcommittee, the Subcommittee directed to bring back this request to Council as part of the FY 2022-23 budget process.
38	Ordinance to ban vaping in the City	Montano	12/15/2020	Ordinance regarding a ban on use in certain areas adopted by Council on 6/15/2021. Discussion related to access to products brought forward on 6/21/2022. Planning staff is coordinating with the County Dept. of Environmental Health on an agreement for administration and enforcement. Staff will bring back the draft ordinance in Fall 2022
39	Review City policy on speed bumps	Tran	12/15/2020	Presented to Transportation Subcommittee on 02/12/2021; voted on 3/16/2021 to revisit this item; On April 8, 2022 the Transportation Subcommittee Meeting provided input on a draft policy to be brought forward for Council consideration in Fall 2022
40	Consider change in term limits for Mayor + Councilmembers	Montano	6/16/2020	8/4/2020: Voted 3 -2 to pursue; 2/02/2021 to agendize for a future meeting; 3/16/2021 voted 3-1-1 to move forward. Scheduled for 3/15/2022; rescheduled for 4/05/2022; 4/05/2022 could gave direction to move forward with Councilmember term limits and discuss the Mayoral seat at a later date; Discussed at the 5/10/2022 budget meeting and had a consensus not want to move forward with a ballot measure for the Mayor term limit; Councilmember term limits scheduled for June 7; Scheduled for June 21 meeting; Ballot Measure to appear on November 8, 2022 General Municipal Election
41	Consider Community Museum and Park on Main St.	Phan	8/20/2019	to Rules Subcommittee 8/23/2019. Moved to Specific Plan Community Conversation events.



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Receive an Update on the Emergency Replacement of Two (2) Boilers and Install of a Temporary Heating System for the Public Works, Information Technology, and Police Department Building and Determine that the Condition Continues to Constitute an Emergency (Staff Contact: Tony Ndah, Public Works Director, 408-586-2602)
Category:	Consent Calendar-Community Services and Sustainable Infrastructure
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Receive an update on the emergency replacement of two boilers and the installation of a temporary heating system for the Public Works, Police and Information Technology Department buildings; and (2) Determine by a four-fifths vote that the condition continues to constitute an emergency.

Background:

Pursuant to Public Contract Code section 22050 and [Council Resolution No. 9134](#), the Director of Public Works, in the case of emergency, may authorize a repair of a public facility and procure the work without giving notice for bids to let contracts. An emergency is defined as “a sudden, unexpected occurrence that poses a clear and imminent danger, requiring immediate action to prevent or mitigate the loss or impairment of life, health, property, or essential public services.” Additionally, State law requires the Public Works Director, as the City official with delegated authority to take emergency action, to report any emergency authorization and the reason(s) for the authorization to the City Council not later than seven days after the action, or at its next regularly scheduled meeting if that meeting will occur not later than 14 days after the action. Further, the Public Works Director is required to report why the emergency would not permit a delay resulting from a competitive solicitation for bids and the City Council is required to review the emergency action at every regularly scheduled meeting thereafter until the emergency repair is completed. The City Council shall continue to review the emergency action at every regularly scheduled meeting thereafter until the action is terminated. At each review, the City Council shall determine, by a four-fifths vote, whether there is a need to continue the action.

Consistent with applicable State law and Council Resolution, on April 1, 2022, the Public Works Director authorized the City to contract with its existing HVAC maintenance contractor, Environmental Systems Inc. (ESI), for the replacement of two (2) boilers and the installation of a temporary heating system for the Public Works, Information Technology and Police Department buildings.

At the June 21, 2022, City Council meeting, the City Council received an update regarding the emergency replacement of two (2) boilers and the installation of a temporary heating system for the Public Works, Information Technology and Police Department buildings and determined that the condition continues to constitute an emergency.

Analysis:

The install of the temporary heating system was completed on Friday, April 15, and is currently operational providing heat to the building. Due to supply chain delays, the two (2) new boilers, which were ordered, are expected to arrive in mid-August versus mid-July, as previously reported. The rental period for the temporary boiler is set to expire on August 29, 2022. If supply chain issues continue to impact the delivery of the boiler,

the rental agreement for the temporary boiler may need to be extended for an additional month, at a cost of \$4,000.

Staff is recommending that the City Council determine, by a four-fifths vote, that there is a need to continue the emergency action declared by the Public Works Director. Staff will return to City Council with an update at every regularly scheduled City Council meeting until the emergency action is terminated.

Fiscal Impact:

The estimated repair and temporary heating installation cost of \$208,968 will be paid from the Unanticipated Expenditure Reserve.

California Environmental Quality Act:

The emergency repair work is exempt from CEQA, per CEQA Guidelines Section 15301, Existing Facilities and 15302, Replacement or Reconstruction.

Recommendations:

1. Receive an update on the emergency replacement of two (2) boilers and the installation of a temporary heating system for the Public Works, Police and Information Technology Department buildings.
2. Determine by a four-fifths vote that the condition continues to constitute an emergency.

Attachment:

N/A



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Adopt a Resolution Granting Acceptance of Public Improvements and Approve Reduction of Faithful Performance Bond for Public Improvements for the Anton Ascend (730) and Anton Aspire (750) Residential Projects and Granting Authorization to the Engineering Director/City Engineer to Release the Performance Bond after the One-year Warranty Period. (Staff Contact: Steve Erickson, Director of Engineering/City Engineer, 408-586-3301)
Category:	Consent Calendar-Community Development
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Adopt a resolution granting acceptance of public improvements for the Anton Ascend and Anton Aspire Residential Projects as shown on Public Improvement Plans No. 2-1228 and 2-1229; and approve a reduction in the performance bonds for the Projects, subject to the one-year warranty period and reduction of the faithful performance bonds to \$82,000.00 and \$69,500.00 respectively which shall be in effect for the duration of the warranty period; and grant authorization to the Engineering Director/City Engineer to release the performance bonds after the one-year warranty period, without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

BACKGROUND:

On June 6th, 2017 the City Council approved the public improvement plans and the Subdivision Improvement Agreement for the Anton Ascend and Anton Aspire Residential Projects located at 730 and 750 E. Capitol Avenue, respectively. Public improvements include construction of curb; gutter; sidewalk; storm water treatment facilities; 8-inch recycled water main extensions; 12-inch potable water main extension; streetlights; undergrounding overhead utilities; decorative crosswalks; landscaping; and other miscellaneous items of work along East Capitol Avenue. This project also completed construction of the South Milpitas Blvd extension from East Capitol Avenue to Penitencia Creek.

ANALYSIS:

The Developer, Anton Milpitas 730 LLC and Anton Milpitas 750 LLC has satisfactorily completed all required public improvements in accordance with the City approved public improvement plans. The improvements are now ready for acceptance by the City Council and commencement of the 1-year warranty period. Staff recommends the City Council adopt a Resolution granting acceptance of the public improvements, and approve reduction of the Projects performance bonds to \$82,000.00 and \$69,500.00, respectively, which are 10% of the security's original value. Staff also recommends the City Council grant authorization to the Engineering Director/City Engineer to release the performance bonds after the one-year warranty period without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

POLICY ALTERNATIVE(S):

Alternative 1:

Not approve the resolution granting acceptance of public improvements including the reduction of the Projects performance bonds.

Pros: None

Cons: Not granting acceptance of public improvements would limit public use of improvements and does not promote orderly completion and close-out of completed projects and would conflict with the City's obligations under the Subdivision Improvement Agreement for this Project.

Reason for Not Recommending: Granting acceptance of public improvements would allow public use of sidewalk improvements and promotes orderly completion and close-out of the Projects. Staff recommends adoption of a resolution granting acceptance of public improvements including the reduction of the Projects performance bonds.

FISCAL IMPACT:

The public improvements have been constructed for the City by the Developer as a requirement of the Subdivision Improvement Agreement for these Projects. The City will have responsibility for ownership and the perpetual maintenance for the improvements following the acceptance of the project and completion of the 1-year warranty period. The Public Works Department will provide the maintenance for the accepted improvements and funding will be through future budget appropriations as the Council adopts the annual operating budget.

California Environmental Quality Act (CEQA):

Granting acceptance of public improvements and reducing faithful performance bond for public improvements are not considered projects under CEQA as there will be no direct or reasonably foreseeable indirect physical change in the environment. Further, environmental analysis of the construction of public improvements was analyzed at the time the overall project, including the Subdivision Improvement Agreement was considered and approved by the City Council.

RECOMMENDATION:

Adopt a resolution granting acceptance of public improvements for the Anton Ascend and Anton Aspire Residential Projects as shown on Public Improvement Plans No. 2-1228 and 2-1229; and approve a reduction in the performance bonds for the Projects, subject to the one-year warranty period and reduction of the faithful performance bonds to \$82,000.00 and \$69,500.00 respectively which shall be in effect for the duration of the warranty period; and grant authorization to the Engineering Director/City Engineer to release the performance bonds after the one-year warranty period, without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

Attachment(s):

1. Resolution

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS APPROVING ACCEPTANCE AND REDUCING PERFORMANCE BONDS OF THE ANTON ASCEND (730) AND ANTON ASPIRE (750) RESIDENTIAL PROJECT AND GRANTING AUTHORIZATION TO THE CITY ENGINEER TO RELEASE THE PERFORMANCE BOND AFTER THE ONE-YEAR WARRANTY PERIOD

WHEREAS, the City Council of the City of Milpitas on June 6, 2017, approved the plans and specifications for the Anton Ascend and Anton Aspire Residential Projects, (the “Project”) to be completed by Anton Milpitas 730 LLC and Anton Milpitas 750 LLC., as part of its Residential Project on 730 and 750 East Capitol Avenue; and

WHEREAS, the City of Milpitas has heretofore entered into a subdivision improvement agreement on June 6, 2017 with Anton Milpitas 730 LLC and Anton Milpitas 750 LLC, for the Anton Ascend and Anton Aspire Residential Project; and

WHEREAS, Anton Milpitas 730 LLC and Anton Milpitas 750 LLC., as Principal, and Fidelity and Deposit Company of Maryland, as Surety, executed and posted certain Performance Bonds No. 9246629 and No. 9246630 conditioned upon the faithful performance of the provisions of said subdivision improvement agreement and upon the faithful performance of all improvement work required thereunder; and

WHEREAS, said public improvements for the Anton Ascend and Anton Aspire Residential Projects have been completed and the subdivision improvement agreement provides that the security shall extend for a period of one year after the date of acceptance of said improvements to cover the warranty period of said improvements under said agreement; and

WHEREAS, the City Council is willing to consent to a reduction in the penal sum of said security during said one-year warranty period; and

WHEREAS, the Engineering Director/City Engineer of the City of Milpitas has made a final inspection of said improvements for the Anton Ascend and Anton Aspire Residential Project and recommends that the City Council of the City of Milpitas accept the same as constructed in accordance with the approved plans and specifications.

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. Those certain public improvements constructed as part of the Anton Ascend and Anton Aspire Residential Project, are hereby accepted as constructed in accordance with the approved plans and specifications upon recommendation of the City Engineer of the City of Milpitas.
3. The penal sums of the faithful performance bonds securing said improvements may be reduced to the sums of \$82,000.00 and \$69,500.00, respectively, upon request of Principal and Surety, with said penal sums as reduced to apply from the date of completion and acceptance of said improvements and to extend for the balance of the term of one year of said security. Provided, however, that nothing herein contained shall in any way be deemed to be a waiver, release or relinquish by City of any obligations imposed upon the developer or his surety, or sureties, by law or by the above referend public improvement agreement, save and except as expressly set forth herein.
4. The City Council grants authorization to the Engineering Director/City Engineer to release the performance bond after the one-year warranty period without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

PASSED AND ADOPTED this ____ day of _____, 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Suzanne Guzzetta, Interim City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Adopt a Resolution Granting Acceptance of Public Improvements and Approve Reduction of Faithful Performance Bond for Public Improvements for the Centre Pointe – Summerhill Phase 1A Residential Project and Granting Authorization to the Engineering Director/City Engineer to Release the Performance Bond after the One-Year Warranty Period; (Staff Contact: Steve Erickson, Director of Engineering/City Engineer, 408-586-3301)
Category:	Consent Calendar-Community Development
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Adopt a resolution granting acceptance of the completed public improvements for the Centre Pointe – Summerhill Phase 1A Residential Project as shown on Public Improvement Plans No. 2-1221; and approve a reduction in the faithful performance bond to \$166,100.00, which is 10% of the security's original value which shall be in effect for the duration of the warranty period; and grant authorization to the Engineering Director/City Engineer to release the performance bond after the one-year warranty period without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

BACKGROUND:

On September 5, 2017, the City Council approved the Subdivision Improvement Agreement for Centre Pointe - Summerhill Residential Project's Phase 1A, 1B and 2 located within the Transit Area Specific Plan area. Public improvements constructed by the Projects for the City include curb, gutters; sidewalk; decorative crosswalks; driveway aprons; storm water treatment facilities; Storm Drain pipelines; utility service laterals; streetlight; landscaping; and other miscellaneous items of work along Centre Pointe Drive and Montague Expressway. The Phase 1A Project, has now been completed, and Projects 1B and 2 are wrapping up Building Permit review and are to begin construction later this summer with expected completion of Spring 2024.

ANALYSIS:

The Developer, SHAC Centre Pointe LLC, has successfully completed all required public improvements for the Phase 1A Project in accordance with the City approved public improvement plans. The public improvements are now ready for acceptance by the City Council and commencement of the 1-year warranty period. Staff recommends the City Council adopt a Resolution granting acceptance of the public improvements, and to approve a reduction of the performance bond to \$166,100.00, which is 10% of the security's original value, and grant authorization to the Engineering Director/City Engineer to release the performance bond after the one-year warranty period without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

POLICY ALTERNATIVE(S):

Alternative 1:

Not approve resolution granting acceptance of public improvements including the reduction of the performance bond.

Pros: None

Cons: Not granting acceptance of public improvements would limit public use of improvements and does not promote orderly completion and closeout of the Project and would be in conflict with the City's obligation under the Projects Subdivision Improvement Agreement.

Reason for Not Recommending: Granting acceptance of public improvements would allow public use of sidewalk improvements and allows for the completion and closeout of the Project. Staff recommends adoption of the resolution granting acceptance of public improvements.

FISCAL IMPACT:

The public improvements have been constructed by the Developer as a requirement of the Subdivision Improvement Agreement. The City will have ownership and perpetual maintenance responsibilities for the public improvements following acceptance of the project and completion of the 1-year warranty period. The Public Works Department will provide the maintenance for the accepted improvements and funding will be through future budget appropriations as the Council adopts the annual operating budget.

California Environmental Quality Act (CEQA):

Granting acceptance of public improvements and reducing faithful performance bond for public improvements are not considered projects under CEQA as there will be no direct or reasonably foreseeable indirect physical change in the environment. Further, environmental analysis of the construction of public improvements was analyzed at the time the overall project, including the Subdivision Improvement Agreement was considered and approved by the City Council

RECOMMENDATION:

Adopt a resolution granting acceptance of the completed public improvements for the Centre Pointe – Summerhill Phase 1A Residential Project as shown on Public Improvement Plans No. 2-1221; and approve a reduction in the faithful performance bond to \$166,100.00, which is 10% of the security's original value which shall be in effect for the duration of the warranty period; and grant authorization to the Engineering Director/City Engineer to release the performance bond after the one-year warranty period without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

Attachment(s):

Resolution

RESOLUTION NO. _____

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS APPROVING
ACCEPTANCE AND REDUCING PERFORMANCE BOND OF CENTRE POINTE - SUMMERHILL
RESIDENTIAL PROJECT PHASE 1A, TRACT NO. 10408, AND GRANTING AUTHORIZATION TO
THE CITY ENGINEER TO RELEASE THE PERFORMANCE BOND AFTER THE ONE-YEAR
WARRANTY PERIOD**

WHEREAS, the City Council of the City of Milpitas on January 15, 2019, approved the plans and specifications for the Centre Pointe - Summerhill Residential Project, Tract 10408 (the "Project"), to be completed by SHAC Centre Pointe Apartments LLC, as part of its two mixed use buildings consisting of 694 dwelling units, 36,500 square feet of commercial space and other associated site improvements; and

WHEREAS, the City of Milpitas has heretofore entered into a subdivision improvement agreement on September 28, 2017 with SHAC Centre Pointe Apartments LLC, for the Centre Pointe – Summerhill Residential Project Subdivision; and

WHEREAS, SHAC Centre Pointe LLC, as Principal and International Fidelity Insurance Company, as Surety, executed and posted a certain Performance Bond No. 0728575 (Phase 1A) conditioned upon the faithful performance of the provisions of said subdivision improvement agreement and upon the faithful performance of all improvement work required thereunder; and

WHEREAS, said public improvements for Centre Pointe - Summerhill Residential Project Phase 1A have been completed and the subdivision improvement agreement provides that the security shall extend for a period of one year after the date of acceptance of said improvements to cover the warranty period of said improvements under said agreement; and

WHEREAS, the City Council is willing to consent to a reduction in the penal sum of said security during said one-year warranty period; and

WHEREAS, the City Engineer of the City of Milpitas has made a final inspection of said improvements for Centre Pointe - Summerhill Residential Project Phase 1A and recommends that the City Council of the City of Milpitas accept the same as constructed in accordance with the approved plans and specifications.

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. Those certain public improvements constructed as part of Centre Pointe - Summerhill Residential Project Phase 1A, Tract No. 10408, are hereby accepted as constructed in accordance with the approved plans and specifications upon recommendation of the Engineering Director/City Engineer of the City of Milpitas.
3. The penal sum of the faithful performance bond securing said improvements may be reduced to the sum of \$166,100.00, upon request of Principal and Surety, with said penal sum as reduced to apply from the date of completion and acceptance of said improvements and to extend for the balance of the term of one year of said security. Provided, however, that nothing herein contained shall in any way be deemed to be a waiver, release or relinquish by City of any obligations imposed upon the

developer or his surety, or sureties, by law or by the above referenced public improvement agreement, save and except as expressly set forth herein.

4. The City Council grants authorization to the Engineering Director/City Engineer to release the performance bond after the one-year warranty period without further City Council action provided all required warranty work is completed to the satisfaction of the Engineering Director/City Engineer.

PASSED AND ADOPTED this 9th day of August 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Suzanne Guzzetta, Interim City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Approve Budget Appropriation of \$103,602.00 in Fiscal Year 2022/2023 California Transportation Development Act Article 3 (TDA-3) Funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program (Staff Contact: Steve Chan, Transportation and Traffic Manager, 408-586-3324)
Category:	Consent Calendar-Community Services and Sustainable Infrastructure
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Approve budget appropriation of \$103,602.00 in Fiscal Year 2022/2023 California Transportation Development Act Article 3 (TDA-3) Funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program

BACKGROUND:

The California Transportation Development Act, (TDA) was approved in 1971 and allows Counties to establish a quarter-cent sales tax to provide funding for a variety of transportation projects, including: Transit operations Bus and rail projects Special transit services for disabled riders Pedestrian and bicycle facilities Transportation planning Transportation Development Act Article 3 (TDA-3), provides annual funding for bicycle and pedestrian projects within the Bay Area, and the Metropolitan Transportation Commission (MTC) sets policies and procedures for the TDA-3 funding. The City of Milpitas receives guaranteed TDA-3 funding annually for pedestrian and bicycle improvement projects. The funding amount is based on a population formula, and funding for fiscal year 2022/23 is \$103,602. The City Council adopted Resolution, No. 9143 (**Attachment 1**) on May 3, 2022 as required to receive the annual TDA-3 funding, and staff submitted the grant proposal application to MTC. The funds will be available for use beginning July 1, 2022.

ANALYSIS:

The \$103,602 in Fiscal Year 2022/23 TDA-3 funding is now available. Staff recommends the City Council approve the appropriation (**Attachment 2**) of this funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program. This Project provides for the replacement of damaged and non-compliant Americans with Disability Act (ADA) sidewalk curb ramps to meet State and Federal access requirements. Improvement locations will be determined during the project design phase which staff will start later this year. The construction phase is estimated to start Summer/Fall of 2023.

POLICY ALTERNATIVE(S):

Alternative 1:

Pros: Deny request to appropriate \$103,602 TDA-3 funding into Project No. 4283 for use in repairing and replacing non-compliant ADA ramp and sidewalks.

Cons: A denial of this request would cause the City to not claim eligible expenditures and may delay a request for reimbursement of the funds and it would delay implementation of Project No. 4282 ADA Curb Ramp Transition Program.

Reason for Not Recommending: The repair and replacement of old, non-compliant, and potentially hazardous ADA sidewalk curb ramps is a requirement of the State and Federal ADA regulations. The funding of Project No. 4283 is recommended, and the use of the annual TDA funding is appropriate.

FISCAL IMPACT:

FY22/23 TDA Article 3 funding in the amount of \$103,602 is recommended to be appropriated into the Construction Phase 7 of Project No. 4283 ADA Curb Ramp Transition Program.

California Environmental Quality Act (CEQA):

The project is categorically exempt under CEQA Article 19 Section 15301 for maintenance of existing public streets.

RECOMMENDATION:

Approve Budget Appropriation of \$103,602 in Fiscal Year 2022/2023 California Transportation Development Act Article 3 (TDA-3) Funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program.

Attachment(s):

1. Resolution No. 9143
2. Budget Change Form

RESOLUTION NO. 9143

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS REQUESTING OF THE METROPOLITAN TRANSPORTATION COMMISSION THE ALLOCATION OF FISCAL YEAR 2022/2023 TRANSPORTATION DEVELOPMENT ACT ARTICLE 3 PEDESTRIAN/BICYCLE PROJECT FUNDING

WHEREAS, Article 3 of the Transportation Development Act (TDA), Public Utilities Code (PUC) Section 99200 et seq., authorizes the submission of claims to a regional transportation planning agency for the funding of projects exclusively for the benefit and/or use of pedestrians and bicyclists; and

WHEREAS, the Metropolitan Transportation Commission (MTC), as the regional transportation planning agency for the San Francisco Bay region, has adopted MTC Resolution No.4108, entitled "Transportation Development Act, Article 3, Pedestrian and Bicycle Projects," which delineates procedures and criteria for submission of requests for the allocation of "TDA Article 3" funding; and

WHEREAS, MTC Resolution No. 4108 requires that requests for the allocation of TDA Article 3 funding be submitted as part of a single, countywide coordinated claim from each county in the San Francisco Bay region; and

WHEREAS, the City of Milpitas desires to submit a request to MTC for the allocation of TDA Article 3 funds to support the projects described in Attachment B to this Resolution, which are for the exclusive benefit and/or use of pedestrians and/or bicyclists.

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. The City of Milpitas declares it is eligible to request an allocation of TDA Article 3 funds pursuant to Section 99234 of the Public Utilities Code.
3. There is no pending or threatened litigation that might adversely affect the project or projects described in Attachment B to this Resolution, or that might impair the ability of the City of Milpitas to carry out the project.
4. The project has been reviewed by the countywide Bicycle Advisory Committee or equivalent and has been approved by MTC to use the countywide BAC and the countywide BAC provides for expanded representation of the City of Milpitas and the designated representatives are familiar with the bicycle and pedestrian needs of the City of Milpitas.
5. The City of Milpitas attests to the accuracy of and approves the statements in Attachment A to this Resolution.
6. A certified copy of this Resolution and its attachments, and any accompanying supporting materials shall be forwarded to the congestion management agency, countywide transportation

planning agency, or county association of governments, as the case may be, of Santa Clara County for submission to MTC as part of the countywide coordinated TDA Article 3 claim.

PASSED AND ADOPTED this 3rd day of May 2022, by the following vote:

AYES: (5) Mayor Tran, Vice Mayor Montano, Councilmembers Chua, Dominguez, and Phan

NOES: (0) None

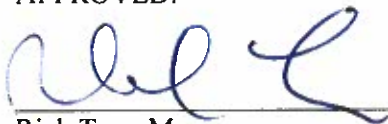
ABSENT: (0) None

ABSTAIN: (0) None

ATTEST:

Wendy Wood, City Clerk

APPROVED:



Rich Tran, Mayor

APPROVED AS TO FORM:



Michael Mutalipassi, City Attorney

Lauren Lai, Finance Director/Risk Manager

APPROVED AS TO CONTENT:

Steven Erickson, Engineering Director/City Engineer

Resolution No. 9143

Attachment A

Re: Request to the Metropolitan Transportation Commission for the Allocation of Fiscal Year 2022/2023 Transportation Development Act Article 3 Pedestrian/Bicycle Project Funding

Findings

Page 1 of 1

1. That the **City of Milpitas** is not legally impeded from submitting a request to the Metropolitan Transportation Commission for the allocation of Transportation Development Act (TDA) Article 3 funds, nor is the **City of Milpitas** legally impeded from undertaking the project(s) described in "Attachment B" of this resolution.
2. That the **City of Milpitas** has committed adequate staffing resources to complete the project(s) described in Attachment B.
3. A review of the project(s) described in Attachment B has resulted in the consideration of all pertinent matters, including those related to environmental and right-of-way permits and clearances, attendant to the successful completion of the project(s).
4. Issues attendant to securing environmental and right-of-way permits and clearances for the projects described in Attachment B have been reviewed and will be concluded in a manner and on a schedule that will not jeopardize the deadline for the use of the TDA funds being requested.
5. That the project(s) described in Attachment B comply with the requirements of the California Environmental Quality Act (CEQA, Public Resources Code Sections 21000 et seq.).
6. That as portrayed in the budgetary description(s) of the project(s) in Attachment B, the sources of funding other than TDA are assured and adequate for completion of the project(s).
7. That the project(s) described in Attachment B are for capital construction and/or design engineering; and/or for the maintenance of a Class I bikeway which is closed to motorized traffic; and/or for the purposes of restriping Class II bicycle lanes; and/or for the development or support of a bicycle safety education program; and/or for the development of a comprehensive bicycle and/or pedestrian facilities plan, and an allocation of TDA Article 3 funding for such a plan has not been received by the **City of Milpitas** within the prior five fiscal years.
8. That the project(s) described in Attachment B is included in a locally approved bicycle, pedestrian, transit, multimodal, complete streets, or other relevant plan.
9. That any project described in Attachment B that is a bikeway meets the mandatory minimum safety design criteria published in Chapter 1000 of the California Highway Design Manual.
10. That the project(s) described in Attachment B will be completed before the funds expire.
11. That the **City of Milpitas** agrees to maintain, or provide for the maintenance of, the project(s) and facilities described in Attachment B, for the benefit of and use by the public.

Resolution No. 9143

Attachment B

Page 1 of 1

TDA Article 3 Project Application Form

Fiscal Year of this Claim: 2022/2023 Applicant: City of Milpitas

Contact person: Steve Chan

Mailing Address: 455 E. Calaveras Blvd, Milpitas, CA 95035

E-Mail Address: schan@ci.milpitas.ca.gov Telephone: (408) 586-3324

Secondary Contact (in event primary not available): Fanny Yu

E-Mail Address: fyu@ci.milpitas.ca.gov Telephone: (408) 586-3318

Short Title Description of Project: ADA Curb Ramp Transition Program

Amount of claim: \$103,602

Functional Description of Project:Construction of ADA ramps and sidewalk closure as part of City's ADA Curb Ramp Transition Program FY22/23. Locations to be determined later.**Financial Plan:**

List the project elements for which TDA funding is being requested (e.g., planning, engineering, construction, and contingency). Use the table below to show the project budget for the phase being funded or total project. Include prior and proposed future funding of the project.

Project Elements: Installation of ADA ramps and sidewalk closure of various city streets.

Funding Source	All Prior FYs	Application FY	Next FY	Following FYs	Totals
TDA Article 3		\$103,602			\$103,602
List all other sources:					
1.					
2.					
3.					
4.					
Totals		\$103,602			\$103,602

Project Eligibility:	YES?/NO?
A. Has the project been approved by the claimant's governing body? (If "NO," provide the approximate date approval is anticipated). June 2023	No
B. Has this project previously received TDA Article 3 funding? If "YES," provide an explanation on a separate page.	No
C. For "bikeways," does the project meet Caltrans minimum safety design criteria pursuant to Chapter 1000 of the California Highway Design Manual? (Available on the internet via: http://www.dot.ca.gov).	N/A
D. Has the project been reviewed by a Bicycle Advisory Committee (BAC)? (If "NO," provide an explanation). Enter date the project was reviewed by the BPAC: BPAC was dissolved by City Council in 2018 and designated oversight to the Parks Recreation & Cultural Resources Commission	Yes
E. Has the public availability of the environmental compliance documentation for the project (pursuant to CEQA) been evidenced by the dated stamping of the document by the county clerk or county recorder? (required only for projects that include construction).	Yes
F. Will the project be completed before the allocation expires? Enter the anticipated completion date of project (month and year) December 31, 2023	Yes
G. Have provisions been made by the claimant to maintain the project or facility, or has the claimant arranged for such maintenance by another agency? (If an agency other than the Claimant is to maintain the facility provide its name:)	Yes

City of Milpitas, California

BUDGET CHANGE FORM

Type of Change	From*		To*	
	Account	Amount	Account	Amount
Check one: ☐ Budget Appropriation ☐ Budget Transfer	311-9514283153565	\$103,602	311-951428374800	\$103,602

Approve Budget Appropriation of \$103,602 in Fiscal Year 2022/2023 California Transportation Development Act Article 3 (TDA-3) Funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program.

Background:

The California Transportation Development Act, (TDA) was approved in 1971 and allows Counties to establish a quarter-cent sales tax to provide funding for a variety of transportation projects, including: Transit operations Bus and rail projects Special transit services for disabled riders Pedestrian and bicycle facilities Transportation planning Transportation Development Act Article 3 (TDA-3), provides annual funding for bicycle and pedestrian projects within the Bay Area, and the Metropolitan Transportation Commission (MTC) sets policies and procedures for the TDA-3 funding. The City of Milpitas receives guaranteed TDA-3 funding annually for pedestrian and bicycle improvement projects. The funding amount is based on a population formula, and funding for fiscal year 2022/23 is \$103,602. The City Council adopted Resolution, No. 9143 (Attachment 1) on May 3, 2022 as required to receive the annual TDA-3 funding, and staff submitted the grant proposal application to MTC. The funds will be available for use beginning July 1, 2022.

Analysis:

The \$103,602 in Fiscal Year 2022/23 TDA-3 funding is now available. Staff recommends the City Council approve the appropriation (Attachment 2) of this funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program. This Project provides for the replacement of damaged and non-compliant Americans with Disability Act (ADA) sidewalk curb ramps to meet State and Federal access requirements. Improvement locations will be determined during the project design phase which staff will start later this year. The construction phase is estimated to start Summer/Fall of 2023.

Policy Alternatives:**Alternative 1:**

Pros: Deny request to appropriate \$103,602 TDA-3 funding into Project No. 4283 for use in repairing and replacing non-compliant ADA ramp and sidewalks.

Cons: A denial of this request would cause the City to not claim eligible expenditures and may delay a request for reimbursement of the funds and it would delay implementation of Project No. 4282 ADA Curb Ramp Transition Program.

Reason for Not Recommending: The repair and replacement of old, non-compliant, and potentially hazardous ADA sidewalk curb ramps is a requirement of the State and Federal ADA regulations. The funding of Project No. 4283 is recommended, and the use of the annual TDA funding is appropriate.

Fiscal Impact:

FY22/23 TDA Article 3 funding in the amount of \$103,602 is recommended to be appropriated into the Construction Phase 7 of Project No. 4283 ADA Curb Ramp Transition Program.

California Environmental Quality Act:

The project is categorically exempt under CEQA Article 19 Section 15301 for maintenance of existing public streets.

Recommendation:

Approve Budget Appropriation of \$103,602 in Fiscal Year 2022/2023 California Transportation Development Act Article 3 (TDA-3) Funding for use in City Capital Improvement Program Project No. 4283 American Disability Act (ADA) Curb Ramp Transition Program.

Attachments:

1. Resolution No. 9143
2. Budget Change Form

☐ Check if City Council Approval required.

Meeting Date: August 09, 2022

Requested by:	Department Head: Steve Erickson	Date: August 09, 2022
Reviewed by:	Finance Director: Lauren Lai	Date: August 09, 2022
Date approved by City Council, if required:		Confirmed by:



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Approve and Authorize the City Manager to Execute a Stormwater Management Facilities Operation and Maintenance Agreement for S&B Milpitas, LLC for the Lantana at 720 Montague Expressway. (Staff Contact: Steve Erickson, Director of Engineering/City Engineer, 408-586-3301)
Category:	Consent Calendar-Community Development
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Approve and authorize the City Manager to execute a Stormwater Management Facilities Operation and Maintenance Agreement for S&B Milpitas, LLC for Lantana at 720 Montague Expressway.

BACKGROUND:

On August 2, 2016, the Property Owner, S&B Milpitas, LLC, received entitlements from the City allowing the development of the Lantana Project, located at 720 Montague Expressway including construction of a new 248,183 square foot mixed use building with 216 dwelling units; 10,555 square feet of retail space; leasing office; residential amenity space; emergency vehicle access; utilities; landscaping; stormwater treatment measures and other miscellaneous improvements to the 2.35 acre site located within the Transit Area Specific Plan area.

In accordance with State Law and the City's Municipal Regional Stormwater NPDES Permit ("MRP") issued by the Regional Water Quality Control Board ("RWQCB"), new development and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface are required to incorporate Low Impact Development ("LID") post construction stormwater control measures into the project. LID control measures include, for example, bioretention areas, flow-through planters, permeable pavement, infiltration trenches and tree well filters.

ANALYSIS:

MRP section C.3.h.ii.(1)(a) and Milpitas Municipal Code Title XI Chapter 16 require development project property owners meeting the 5,000 square foot threshold to execute and record a Stormwater Management Facilities Operation and Maintenance Agreement ("Agreement") with the City for the perpetual operation, maintenance and annual inspection of LID stormwater treatment facilities. The Lantana Apartments Project uses two types of storm water treatment devices. They are bio-retention and mechanical stormwater treatment. The Project owner will be responsible for the perpetual maintenance and operation of both storm water treatment devices. The Project owner has complied with the LID requirements and has executed the required Agreement, which has been reviewed by the City Attorney as to form and by the City Engineer as to content.

POLICY ALTERNATIVE(S):

Alternative 1: Not approve the Agreement with the City for operation, maintenance and annual inspection of stormwater treatment facilities.

Pros: None

Cons: Not approving the Agreement would cause the project to be not in compliance with the conditions of development and the City's Municipal Code and would be prohibitive by federal and state law.

Reason for Not Recommending: To be in compliance with federal and state law, including the MRP, and to allow for the on-going maintenance and annual City Inspection of the installed stormwater treatment devices staff recommends approval of the Agreement.

FISCAL IMPACT:

The developer will pay for the required annual maintenance and inspection of the private stormwater facilities that will not be owned or maintained by the City.

California Environmental Quality Act (CEQA):

The City Council's approval of the agreement was already reviewed under the California Environmental Quality Act (CEQA) at the time the City Council approved the entitlements for the project thru an initial environmental assessment. The Planning Department conducted an initial environmental assessment of the project in accordance with the California Environmental Quality Act (CEQA) and determined that the project is exempt from further environmental review pursuant to Section 15168(c)(2) of the CEQA Guidelines because of its consistency with the certified EIR for the Transit Area Specific Plan adopted on June 3, 2008 by the City Council. On this basis, the City Council relies on the previous CEQA review conducted in approving this agreement.

RECOMMENDATION:

Approve and Authorize the City Manager to execute a Stormwater Management Facilities Operation and Maintenance Agreement for S&B Milpitas, LLC for Lantana at 720 Montague Expressway.

Attachment(s):

1. Stormwater Management Facilities Operation and Maintenance Agreement
2. Operation and Maintenance Plan

Control No. 2020-_____
 Recording Requested by
 and when Recorded, return to:

CITY OF MILPITAS
 455 E. CALAVERAS BOULEVARD
 MILPITAS, CA 95035-5479

Attn: City Clerk

(SPACE ABOVE THIS LINE RESERVED FOR RECORDER'S USE)

Document Transfer Tax is \$ 0

() Computed on full value of property conveyed

() Computed on full value less value of liens and encumbrances remaining

City transfer tax is \$ 0

APN: 092-08-077

STORMWATER MANAGEMENT FACILITIES OPERATION AND MAINTENANCE AGREEMENT

This Stormwater Management Facilities Operation and Maintenance Agreement ("AGREEMENT") is made and entered into this _____ day of _____ 2022 ("Effective Date"), by and between S&B Milpitas, LLC, a California Limited Liability Company ("Property Owner") and the City of Milpitas, a municipal corporation of the State of California ("City").

RECITALS

This AGREEMENT is made and entered into with reference to the following facts:

- A. **WHEREAS**, the Property Owner is the owner of real property more particularly depicted and described on the attached as **Exhibit A** ("Property") and fully incorporated herein by reference; and
- B. **WHEREAS**, the Property Owner received entitlements from the City allowing the development of the Property as a common interest development, including the construction of a new 248,183 square foot mixed use building comprising up to 216 dwelling units with, 10,555 square feet of retail, leasing office and residential amenity space, emergency vehicle access, utilities, and associated offsite and onsite improvements landscaping, irrigation, and stormwater treatment measures on a 2.35 acre site located at 720 Montague Expressway in Milpitas and more commonly known as Lantana, Project No. PJ1382, (the "Project") on the Property; and subject to conditions set forth in the following (collectively "City Approvals"):

1. Resolution No. 8567 approving Site Development Permit No. SD15-0010,

2. Resolution No. 8567 approving Vesting Tentative Map No. MT15-0010,
3. Resolution No. 8567 approving Conditional Use Permit No. UP15-0015, and
4. Resolution No. 8567 approving Exceptions to the Milpitas Municipal Code VII-6-5.00;

C. WHEREAS, discharges to the City's municipal separate storm sewer system ("MS4") are regulated under state and federal law pursuant to Waste Discharge Requirements and National Pollutant Discharge Elimination System permit ("MS4 Permit") issued by the Regional Water Quality Control Board, San Francisco Region ("Regional Board").

D. WHEREAS, pursuant to the requirements of the MS4 Permit and the City's Stormwater and Urban Runoff Pollution Control Ordinance as codified in Milpitas Municipal Code Chapter 16 ("Ordinance"), the City Approvals require the Property Owner to install, operate and maintain, at no cost or expense to the City and as part of the common area as defined by the Davis-Stirling Common Interest Development Act, the Permanent Stormwater Pollution Prevention Measures ("BMPs") more particularly described in the City-approved Stormwater Control Operation and Maintenance Plan (sometimes referred to herein as "Plan") for the Project attached hereto as **Exhibit B** and fully incorporated herein by reference; and

E. WHEREAS, the Stormwater Control Operation and Maintenance Plan may be subsequently modified from time to time with City's written approval and such changes shall be fully incorporated as part of this Agreement by this reference; and

F. WHEREAS, the Stormwater Control Operation and Maintenance Plan includes provisions for the BMP Operation and Maintenance and an annual inspection checklist for the BMPs constructed on the Property, and

G. WHEREAS, this Agreement memorializes the Property Owner's obligations, either directly or through a property owners association, for maintenance, operations, and inspection under the City's Ordinance and the approved Stormwater Control Operation and Maintenance Plan.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

SECTION 1. Responsibility for Operation and Maintenance:

The Property Owner, at its sole cost and expense, shall construct and install the BMPs shown in Exhibit B in accordance with the plans approved by and on file with the City. Property Owner shall diligently maintain in perpetuity the BMPs in a manner assuring peak performance at all times, shall make such changes or modifications to the BMPs, subject to City's prior approval as may be reasonably necessary for the BMPs to continue to operate as designed and approved and to accomplish its intended purpose and in good repair, and in compliance with all applicable Federal, State, County and local laws and regulations, including but not limited to the Ordinance, as the same may be amended, revised, and/or replaced from time to time. The Owner shall be responsible for the costs incurred in operating, maintaining, repairing and replacing the BMPs. Property Owner shall not destroy or remove the BMPs or modify any measure in any manner that would lessen its effectiveness. Property Owner shall make available copies of the approved Stormwater Control Operation and Maintenance Plan at the site with the facility or property manager.

SECTION 2: Inspection by Property Owner:

The Property Owner, at its sole cost and expense, shall conduct annual inspections of all permanent installed BMPs per the Plan. The annual inspection report shall include completion of the checklist described in the approved Stormwater Control Operation and Maintenance Plan. The BMPs must be inspected by a qualified independent inspector who is acceptable to the City. The Property Owner shall submit the Inspection Report on these BMPs to the City Engineer no later than July 15th of each year.

SECTION 3. Facility Inspection by the City:

- (a) Right of Entry. The Property Owner, on its behalf and on behalf of its successors and assigns, grants permission to the City, the inspectors of the Regional Board, and local mosquito and vector control agency, and their authorized agents and employees, to enter the Property, and to inspect the BMPs whenever the City deems necessary to enforce provisions of the Ordinance, this Agreement, or any other local or state requirements. The City may enter the premises at any reasonable time during normal business hours and upon at least 48 hours prior written notice (except that prior written notice is not required in case of emergency) to inspect the premises related to BMPs and BMP operation and maintenance, to inspect and copy records related to storm water compliance, and to collect samples and take measurements related to BMPs. The Property Owner shall deposit and maintain a Private Job Account with the City a minimum balance of Four Thousand Dollars (\$4,000) for inspection by City Staff pursuant to this Section 3. The deposit of Four Thousand Dollars (\$4,000.00) shall be made simultaneously with the execution of this Agreement.
- (b) Security. The City may require the Owner, its successors and assigns, from time to time, to post security in a form, amount, and for a time period satisfactory to City to guarantee performance of the obligations stated herein. Should the Owner, its successors and assigns, fail to perform the obligations under this Agreement, the City may, in the case of a cash bond, act for the Owner, its successors and assigns, using the proceeds from such cash bond, or in the case of a surety bond, require the surety to perform the obligations of this Agreement.

SECTION 4. Failure to Perform Required Facility Repairs or Maintenance by the Property Owner:

- (a) Enforcement Action. If the Property Owner or its successors fail to operate and maintain the BMPs in good working order and in accordance with the approved Plan and the City's Ordinance, the City may, but is not required to, pursue any enforcement action available at law or in equity to cause the completion of all maintenance and may charge the costs of such enforcement action against the Property Owner in any manner authorized by law or in equity.
- (b) City Maintenance. In the event of Property Owner's failure to operate and maintain BMPs in accordance with the Plan and the City's Ordinance, the City may also, with prior written notice, enter the Property to return the BMPs to good working order; provided however that the Property Owner shall have 30 days after any such notice, or such other time provided by law, to cure the relevant failure and provided further that the Property Owner shall have such additional time after the initial 30 days to complete a cure so long as Property Owner commences the cure within the initial 30 days and diligently prosecutes the cure to completion. Notwithstanding the foregoing, City may in its sole discretion enter the Property to return the BMPs to good working in an emergency and take any other necessary action to mitigate an emergency without any notice to Property Owner. The City is under no obligation to maintain or repair the BMPs, and this Agreement may not be construed to impose any such obligation on the City. If the City,

under this Section 4 takes any action to return the BMPs to good working order, the Property Owner shall reimburse the City for all the reasonable costs and expenses incurred by the City. The City will provide the Property Owner with an itemized invoice of the City's costs and expenses and the Property Owner shall make full payments to the City within thirty (30) days of the date of the invoice. If the Property Owners fails to pay the invoice within thirty (30) days, the City shall be entitled to cause a lien for any such unpaid maintenance expense bill to be recorded against the Property. In addition, the City shall be entitled to have the unpaid amount of the invoice placed as a special assessment on the next regular tax bill levied against the Property, after which such assessment shall be collected in the same manner as ordinary municipal taxes are collected, and shall be subject to the same penalties and same procedures under foreclosure and sale in the case of delinquency as provided for ordinary municipal taxes. The actions described in this section are in addition to and not in lieu of other legal remedies provided by law. Notwithstanding the above, it is understood that City is under no obligation to repair or maintain the BMPs, and in no event shall this Agreement be construed to impose any such obligation on City.

- (c) Specific Performance. The provisions of this Agreement are expressly declared to be for the benefit of the City. The City may bring an action to obtain specific performance of this Agreement and may recover its costs, including attorney fees, incurred in bringing such action.

SECTION 5: Successors and Assigns:

Property Owner hereby declares that the Property shall be held, transferred, encumbered, used, conveyed, leased and occupied subject to the covenants, conditions, restrictions, easements and rights set forth herein for the use and benefit of each of the Lots. All of the limitations, easements, uses, obligations, covenants, restrictions and conditions stated herein shall run with the Property and shall be binding upon Property Owner, its successors and assigns, any and all parties having or acquiring any right, title or interest in or to the Property or any part thereof or interest therein and shall inure to the benefit of and be binding upon each successor-in-interest thereto.

Upon transfer of the property, the Property Owner shall provide the new owner with the current Plan and a copy of this Agreement and shall, in any event, be released from all obligations under this Agreement as of the effective date of the transfer of the Property.

SECTION 6. Indemnity:

The Property Owner, on Property Owner's behalf and on behalf of all successors in interest pursuant to Section 5 of this Agreement, shall indemnify, release, hold harmless, and defend the City and its authorized agents and employees from and against any and all demands, suits, liabilities, fines, losses, damages, accidents, casualties, occurrences or claims, including reasonable attorneys' fees, against the City which may in anyway arise or relate to the construction, operation, presence, existence or maintenance of the BMPs, or from any personal injury or property damage that may arise or relate from the City entering the property under Section 4. If a claim is asserted against the City, its authorized agents or employees, the City shall promptly notify the Property Owner and the Property Owner shall defend the claim and any resulting litigation at its sole cost and expense, with counsel approved by City. If any judgment is entered against the City, or its authorized agents or employees, the Property Owner must pay all costs and expenses to satisfy the judgment.

SECTION 7. Severability:

Invalidation of any one of the provisions of this Agreement shall in no way effect any other provisions, and all other provisions shall remain in full force and effect.

SECTION 8. Non-Discrimination:

The Property Owner shall not discriminate, in any way, against any person on the basis of race, sex, color, age, religion, sexual orientation, actual or perceived gender identity, disability, ethnicity, or national origin, in connection with or related to the performance of this Agreement.

SECTION 9. Governing Law:

City and Property Owner agree that the law governing this Agreement shall be that of the State of California and that Property Owner shall comply with all applicable laws, ordinances, codes and regulations of the federal, state and local governments.

SECTION 10. Recordation:

Property Owner shall, within 10 days after the effective date of this Agreement, record or cause the Agreement to be recorded in the Office of the Recorder, Santa Clara County, California, at the expense of the Property Owner, which recording shall constitute notice of the obligations herein set forth and a covenant running with the land and shall be binding upon all of the successors and assigns in title to the Property. In the event Property Owner fails to timely record this Agreement, City shall be authorized but not required to record the Agreement.

SECTION 11. Books and Records:

- A. The Property Owner shall maintain any and all ledgers, books of account, invoices, vouchers, cancelled checks, and other records or documents evidencing or relating to charges for services, or expenditures and disbursements or in anyway relating to the performance of this Agreement for a minimum period of three (3) years, or for any longer period required by law.
- B. Any records or documents required to be maintained pursuant to this Agreement shall be made available for inspection or audit at no cost to City, at reasonable any time during regular business hours, upon at least 48 hours' prior written request by the City Attorney, City Manager, or a designated representative of any of these officers. Copies of such documents shall be provided to City for inspection at City Hall when it is practical to do so. Otherwise, unless an alternative is mutually agreed upon, the records shall be available at the Property Owner's address indicated for receipt of notices in this Agreement.

SECTION 12. 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 as follows:

To CITY:

City of Milpitas
Attn: City Engineer
455 East Calaveras Blvd.
Milpitas, CA 95035

To PROPERTY OWNER: S&B Milpitas, LLC
a California Limited Liability Company
Attn: Badru Valani
555 University Avenue
Palo Alto, CA 94301

Notice shall be deemed effective on the date personally delivered or, if mailed, three (3) days after deposit in the mail.

SECTION 13 . Venue:

In the event that suit shall be brought by either party to this contract, the parties agree that venue shall be exclusively vested in the state courts of the County of Santa Clara, or if federal jurisdiction is appropriate, exclusively in the United States District Court, Northern District of California, San Jose, California.

SECTION 14 . Interpretation, Prior Agreements:

This Agreement, including all Exhibits attached hereto, represents the entire understanding of the parties as to those matters contained herein. In the event that the terms specified in any of the Exhibits attached hereto conflict with any of the terms specified in the body of this Agreement, the terms specified in the body of this Agreement shall control. No prior oral or written understanding shall be of any force or effect with respect to those matters covered hereunder. This Agreement may be modified only by a written amendment duly executed by the parties to this Agreement.

[Signatures on Next Page]

IN WITNESS WHEREOF, the Parties execute this Stormwater Management Facilities Operation and Maintenance Agreement as of the last date set forth below:

PROPERTY OWNER:

S&B Milpitas, LLC,
a California Limited Liability Company

By:

By: S&B Milpitas
Name: Badru Valani
Title: Managing Member

CITY:

**CITY OF MILPITAS,
A MUNICIPAL CORPORATION**

By: _____
Steven McHarris, City Manager

Approved as to form:

By: _____
Michael Mutalipassi, City Attorney

Approved:

By: _____
Lauren Lai, CPA, MPA
Finance Director/Risk Manager

Recommended for approval:

By: _____
Steve Erickson, PE
Director of Engineering/City Engineer

Please note that this is a placeholder for the acknowledgement. So use the most current version of the acknowledgement

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of _____)

On _____, before me, _____, a Notary Public,
personally appeared

_____,
_____ personally known to me;
_____ or _____, who 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.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing
paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

CAPACITY CLAIMED BY SIGNER:

Though statute does not require the notary to fill in the data below, doing so may prove invaluable to
persons relying on the document.

____ Individual(s)
____ Corporate Officer(s) Titles _____ and _____
____ Partner(s) _____ Limited _____ General
____ Attorney-in-Fact
____ Trustee(s)
____ Guardian/Conservator
____ Other : _____

Signer is representing: _____

ATTENTION NOTARY: Although the information requested below is optional, it could prevent fraudulent
attachment of this certificate to unauthorized document.

Title or type of document _____

Number of pages: _____ Date of document: _____

Signer(s) other than named above: _____

THIS CERTIFICATE MUST BE ATTACHED TO THE DOCUMENT DESCRIBED ABOVE

EXHIBIT A

Plat and Description for the site

EXHIBIT "A"
Legal Description

For APN/Parcel ID(s): 092-08-077

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF MILPITAS, COUNTY OF SANTA CLARA, STATE OF CALIFORNIA AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE:

PARCEL A, AS SHOWN ON THAT CERTAIN MAP ENTITLED "PARCEL MAP", WHICH MAP WAS FILED FOR RECORD IN THE OFFICE OF THE RECORDER OF THE COUNTY OF SANTA CLARA, STATE OF CALIFORNIA, ON SEPTEMBER 22, 1983 IN BOOK 518 OF MAPS AT PAGE(S) 23 AND 24.

PARCEL TWO:

A NON-EXCLUSIVE PRIVATE INGRESS AND EGRESS EASEMENT AND NON-EXCLUSIVE PRIVATE MUTUAL STORM DRAINAGE EASEMENT LYING WITHIN SAID INGRESS AND EGRESS EASEMENT FOR THE BENEFIT OF PARCEL A OVER PARCEL B AS SAID EASEMENT AND PARCELS ARE SHOWN ON PARCEL MAP RECORDED SEPTEMBER 22, 1983, IN BOOK 518 OF MAPS, AT PAGES 23 AND 24, SANTA CLARA COUNTY RECORDS.

EXHIBIT B

Operation and Maintenance Plan

EXHIBIT B

Stormwater Control Operation and Maintenance Plan

LANTANA
720 MONTAGUE EXPY
MILPITAS, CALIFORNIA

November, 2017

Prepared by:



**Carlson, Barbee
& Gibson, Inc.**

CIVIL ENGINEERS • SURVEYORS • PLANNERS

2633 CAMINO RAMON, SUITE 350 • SAN RAMON, CALIFORNIA 94583 • (925) 866-0322 • www.cbandg.com

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I. Inspection and Maintenance Log

II. Updates, Revisions and Errata

Future updates, revisions and errata shall be listed in this section.

III. **Introduction**

This Operation and Maintenance Manual (O&M) for 720 Montague Expressway is submitted to the City of Milpitas as an accompaniment to the private and public improvement plans. The Stormwater Control Plan provides recommendations on the use of permanent Best Management Practices (BMPs) for the proposed project. BMP technical requirements are presented in the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) C.3 Stormwater Handbook dated June 2016.

The Lantana project is located at the intersection of Montague Expressway and Gladding Court, as shown in Appendix A Figure 1. The project is bordered by industrial/commercial properties to the east, future BART parking garage to the west, future South Milpitas Boulevard and BART surface parking to the south, and Montague Expressway to the north. An aerial view of the surrounding area is shown in Appendix A Figure 2. The project will include a 216 unit apartment building, 5,690 sf retail space, leasing office, access driveway, and landscaped open space improvements within the 2.32± ac project boundary.

Proposed on-site drainage system:

Upon construction of the proposed improvements, approximately 1.90 acres (82%) will be covered by impervious surface and approximately 0.42 acres (18%) will be covered by pervious surface, which will be landscaping. All walkways these areas will be sloped to drain onto the surrounding landscaping.

Drainage areas 1, 3 and 4 will discharge into three adjacent flow-throw planters. Drainage area 2 will discharge into an adjacent bioretention area. Runoff from DMA 1, 3 and 4 connects into the existing 36" line in South Milpitas Boulevard after treatment, which ultimately flows through an existing outfall in to Penitencia Creek. Runoff in DMA 2 is similarly treated and connects into an existing storm drain catch basin in Montague Expressway. These areas will be treated by flow-through planters before entering the storm drain system.

The treatment BMPs used on this site include:

- Flow-Through Planters
- Bioretention Area

IV. **Responsibility for Maintenance**

A. General

1. Contact Information

Designation of Individuals Responsible for Stormwater Treatment BMP Operation and Maintenance

Date Completed:
Facility Name:
Facility Address:

Designated Contact for Operation and Maintenance

Primary Contact:

Telephone:
Alternate Telephone:
Email:

Off-Hours or Emergency Contact

Primary Contact: Emergency Line

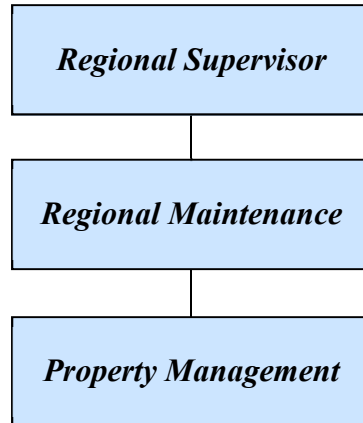
Telephone:
Alternate Telephone:
Email:

Corporate Officer (Authorized to Execute Contracts with City)

Primary Contact:

Title or Position:
Telephone:
Alternate Telephone:
Email:

2. Organization Chart



3. O&M Agreement

An operation and maintenance agreement between the Owner and City of Milpitas will be recorded with the County of Santa Clara.

Stormwater treatment facilities used for the treatment of public street runoff (South Milpitas Boulevard) are to be maintained by the City of Milpitas.

4. Maintenance Funding

- a. Sources of funds for maintenance: Maintenance funds will be paid by the Homeowner's Association.
- b. Budget category or line item: Funds for the maintenance of the BMPs will be listed under the "Maintenance Contracts" line item in the Homeowner's Association.
- c. Description of procedure and process for ensuring adequate funding for maintenance: The cost of maintenance operations shall be covered by the Homeowner's Association.

B. Staff Training Program

Employees will be trained to comply with the terms of the Operations and Maintenance Agreement to be recorded. Employees will be trained in the proper disposal of trash materials and hazardous waste. Employees will be trained to comply with the storm water inlet labels printed with the logo “No Dumping / Flows to Bay.” This educational measure is intended to prevent unlawful dumping of waste materials, such as motor oil, into the storm drain system.

C. Records

The Homeowners Association will maintain annual records of the operation and maintenance of the structural BMP units. The records will consist of annual inspection reports and certificates of compliance provided by the maintenance company contracted to service the structural BMP units. The reports will be available to the City inspector upon request.

D. Safety

Only personnel with confined space training and possessing the necessary safety equipment should enter the mechanical BMP units to perform maintenance or inspection procedures. Inspections of the internal components can, in most cases, be accomplished through observations from the ground surface. The removal of the sediment from the units’ sump should be performed by trained personnel and all debris should be disposed of per EPA standards.

V. Summary of Drainage Areas and BMPs

A. *Drainage Areas*

1. Upon construction of the proposed improvements, approximately 1.90 acres (82%) will be covered by impervious surface and approximately 0.42 acres (18%) will be covered by pervious surface.
2. Drainage areas 1-4 will discharge into four adjacent flow-through planters. Runoff from DMA 1, 3 and 4 connects into the existing 36" line in South Milpitas Boulevard after treatment, which ultimately flows through an existing outfall in to Penitencia Creek. Runoff in DMA 2 is similarly treated and connects into an existing storm drain catch basin in Montague Expressway. These areas will be treated by flow-through planters before entering the storm drain system.

B. *Treatment BMPs*

The treatment BMPs used on this site are shown in the Appendix and include:

1. *Bioretention Area:* A Bioretention area will be constructed north of the building adjacent to Montague Expressway. This treatment BMP uses a combination of ponding, permeable planting soils, infiltration materials and sub-drains systems. It is designed to filter pollutants from stormwater runoff from adjacent roof areas and other impervious surfaces.
2. *Flow-Through Planters:* Flow-Through Planters will be constructed east and west of the apartment building at the edge of the site and will treat roof runoff from the building and flows from the podium level. These planters use a combination of ponding, permeable planting soils, infiltration materials and sub-drain systems. They are designed to filter pollutants from stormwater runoff from adjacent roof areas.

VI. BMP Design Documentation

A. *"As-Built" Drawings of Each BMP*

Typical details provided at this time. As-built drawings will be provided upon completion of BMP construction.

VI. BMP Design Documentation

B. Data, Manuals, and Maintenance Documents

VII. BMP Maintenance Schedule

A. *Annual Maintenance Schedule for all BMPs*

Treatment BMPs require minimum maintenance similar to that for any landscape areas. BMPs must be regularly maintained to ensure that they continue to be effective and do not cause flooding or other harmful nuisances.

B. *Inspection and Maintenance Schedule for each BMP*

1. *Routine Inspection and Maintenance:* Regular inspections shall be made of all BMP features and any maintenance performed as needed. Any collected debris shall be removed from the feature.
 - The bioretention area and flow-through planters shall be maintained as described in TC-32 of the California Stormwater BMP Handbook prepared by CASQA.
2. *Annual Inspection and Maintenance:* Annual inspections and maintenance shall be performed as described above in the “Routine Inspection and Maintenance” Section.
3. *Inspection and Maintenance during the Rainy Season:* All BMP features shall be inspected immediately after the first rain event of the season. During the rainy season the BMP features shall be inspected at least once every 30 days and after any significant rain event.

C. *Service Agreement Information*

The frequency of cleaning the treatment BMPs will depend on the generation of trash and debris and sediment at the site. Cleanout and preventive maintenance schedules will be determined based on operating experience. The mechanical BMP units should be periodically inspected to determine the amount of accumulated pollutants and to ensure the cleanout frequency is adequate to handle the predicted pollutant load being processed by the unit.

VIII. Copy of O&M Agreement

(Final Recorded Copy to be Inserted)

Appendix A

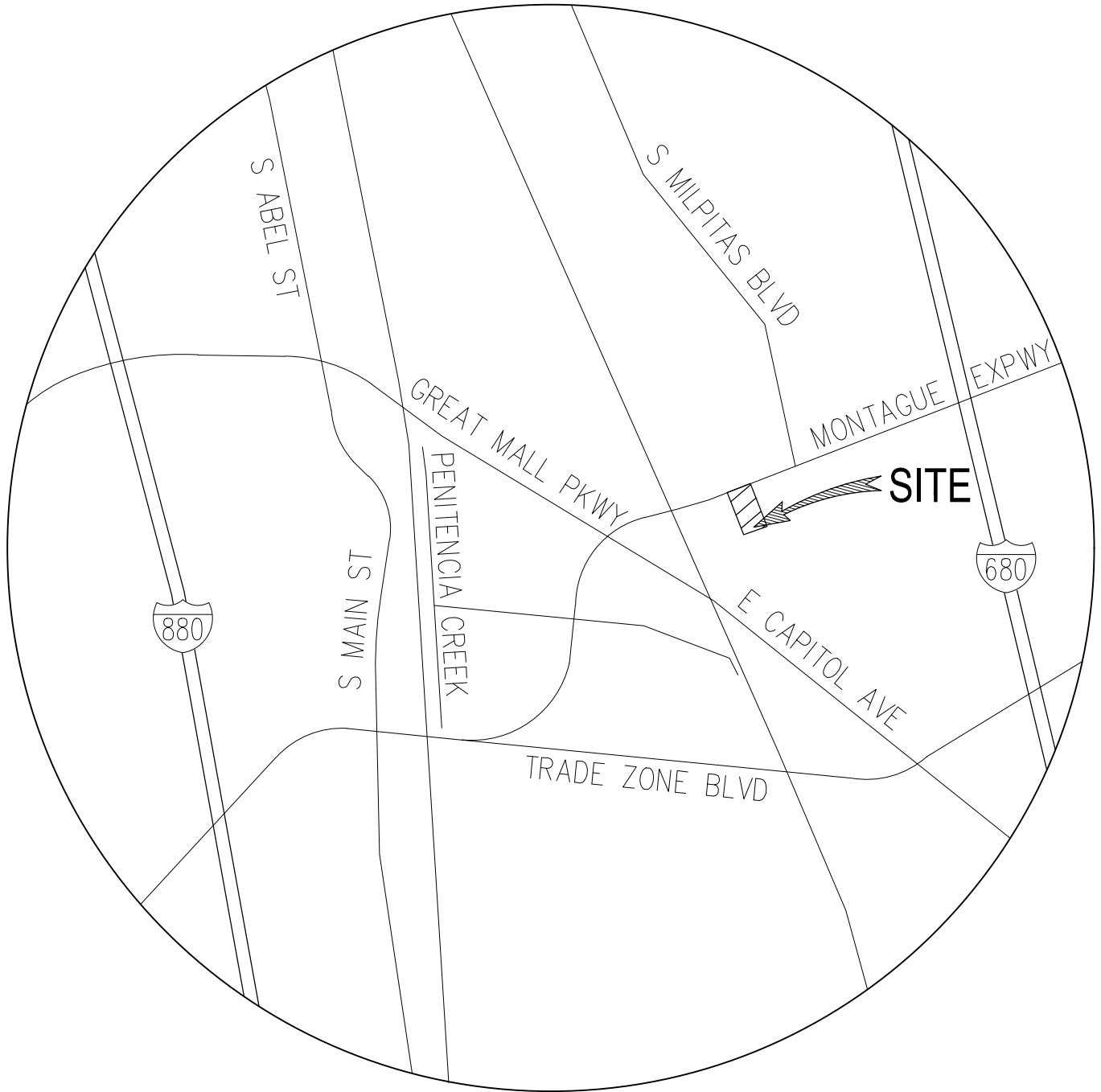
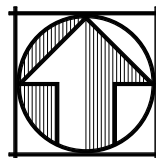


FIGURE 1 VICINITY MAP

720 MONTAGUE

CITY OF MILPITAS SANTA CLARA COUNTY CALIFORNIA

DATE: FEBRUARY 21, 2017



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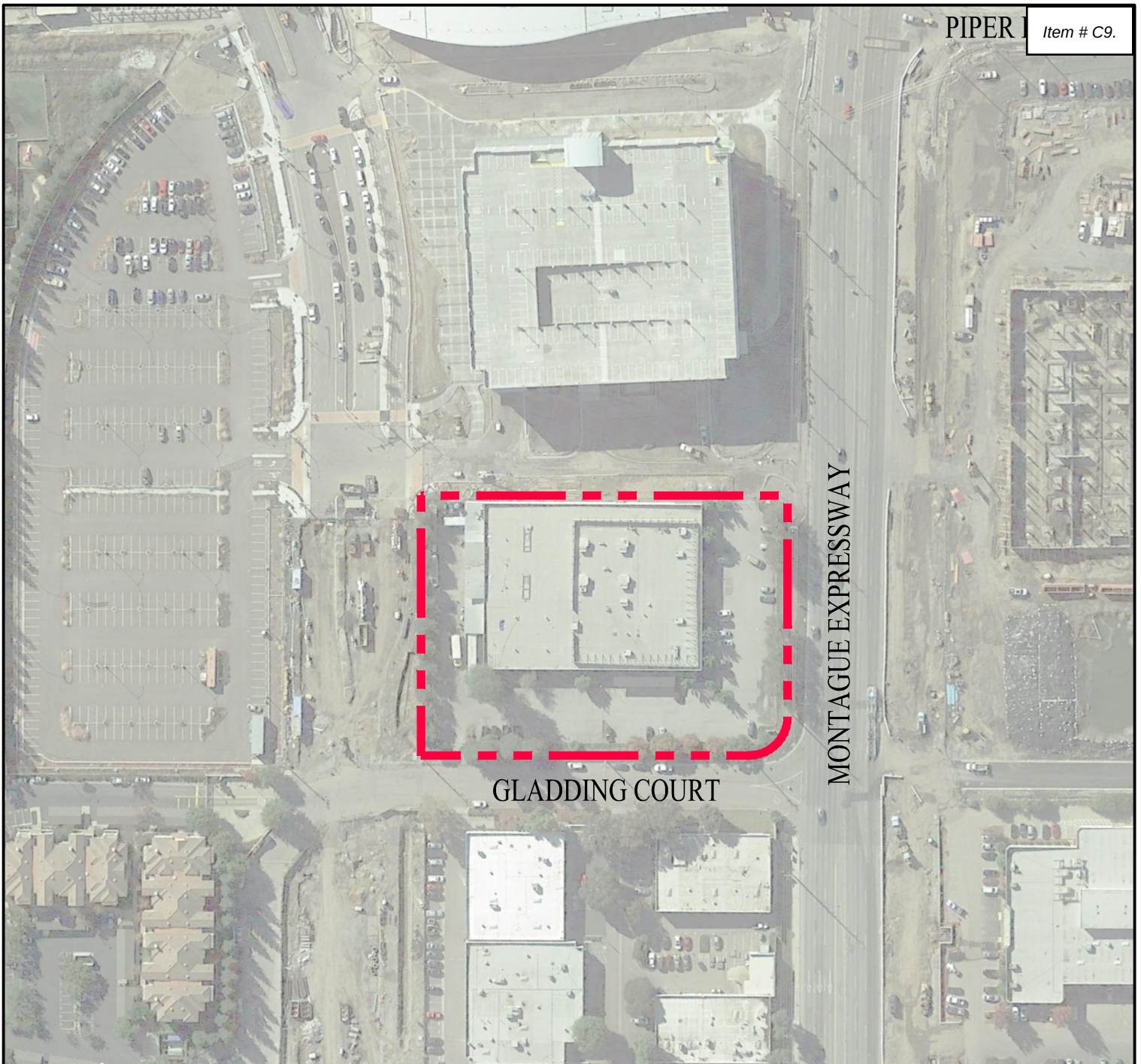


FIGURE 2

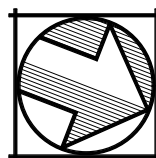
SITE AERIAL

720 MONTAGUE

CITY OF MILPITAS SANTA CLARA COUNTY CALIFORNIA

DATE: FEBRUARY 21, 2017

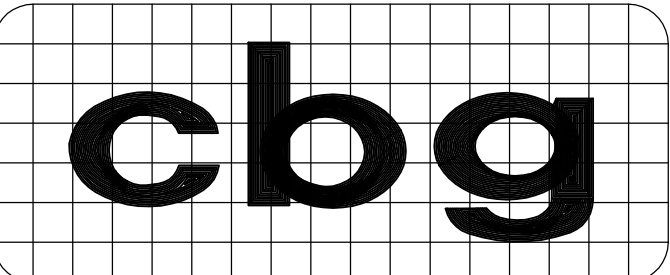
SCALE: 1" = 150'



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MONTAGUE PLACE, LLC.

LANTANA
720 MONTAGUE EXPY
MILPITAS, CA 95035

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VISUAL CONTACT WITH THE DRAWINGS OR SPECIFICATIONS SHALL CONSTITUTE CONCLUSIVE EVIDENCE OF ACCEPTANCE OF THESE RESTRICTIONS

REVISIONS

No.	Description	Date

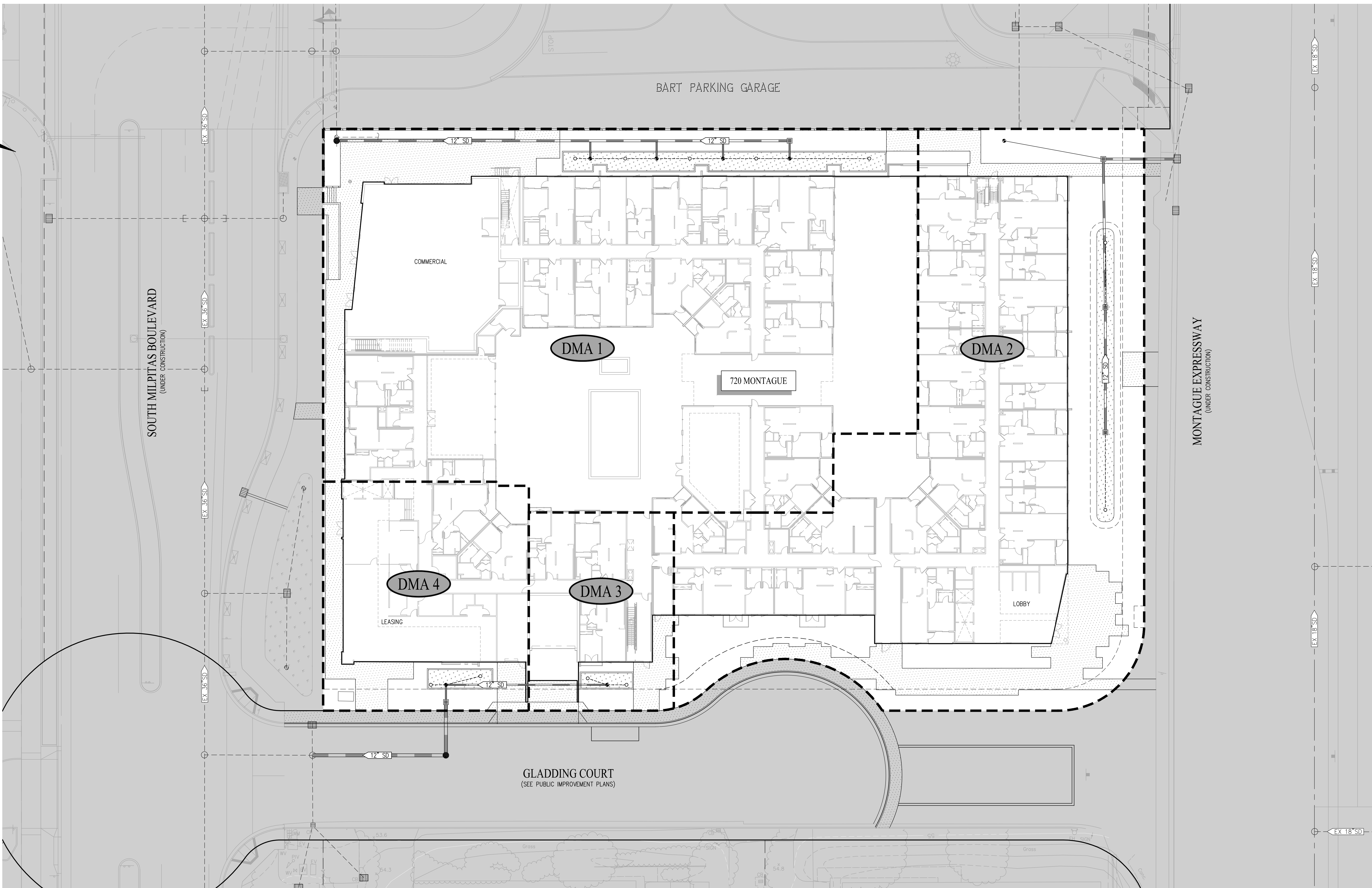


SHEET DESCRIPTION

STORMWATER CONTROL PLAN

Scale _____
Drawn By C. ALVERNAZ
Checked By C. ALVERNAZ
Date NOVEMBER 1, 2017
Project Number 2665-000

C7.0



PER STORMWATER CONTROL PLAN, SOURCE CONTROL MEASURES INCLUDE:

- COVERED DUMPSTER AREA WITH DRAIN TO SANITARY SEWER
- SANITARY SEWER CONNECTION/ACCESSIBLE CLEANOUT FOR SWIMMING POOL/SPA/FOUNTAIN
- BENEFICIAL LANDSCAPING
- MAINTENANCE
- STORM DRAIN LABELING

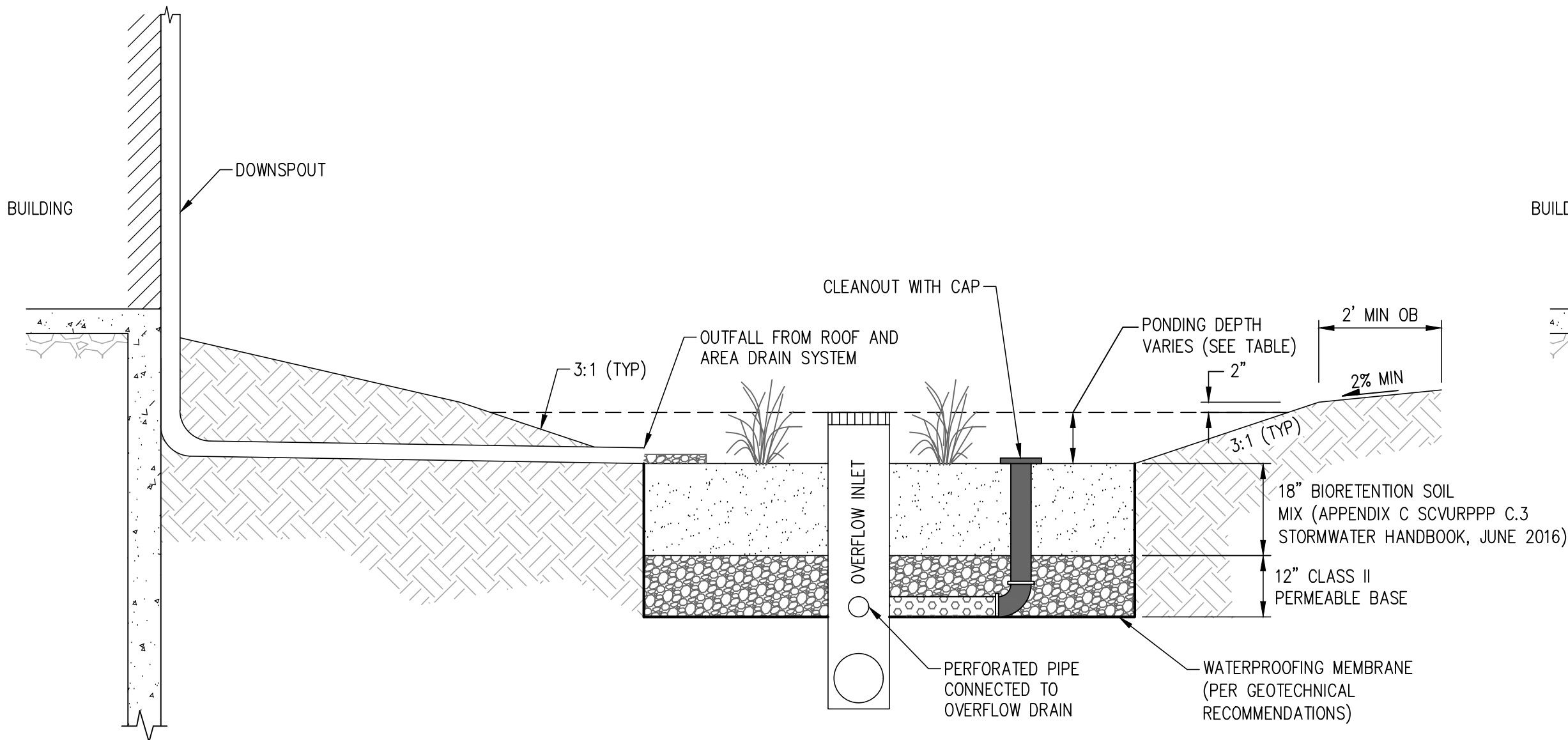
BIORETENTION AREA SUMMARY

AREA ID	TREATMENT TYPE	IMPERVIOUS AREA (SF)	TREATMENT AREA REQUIRED (SF)	PONDING DEPTH (INCH)	TREATMENT AREA PROVIDED (SF)
DMA 1	FLOW THROUGH PLANTER	43,806	1,190	10	1,230
DMA 2	BIORETENTION	24,648	1,080	6	1,080
DMA 3	FLOW THROUGH PLANTER	5,504	160	9	166
DMA 4	FLOW THROUGH PLANTER	8,853	249	10	250

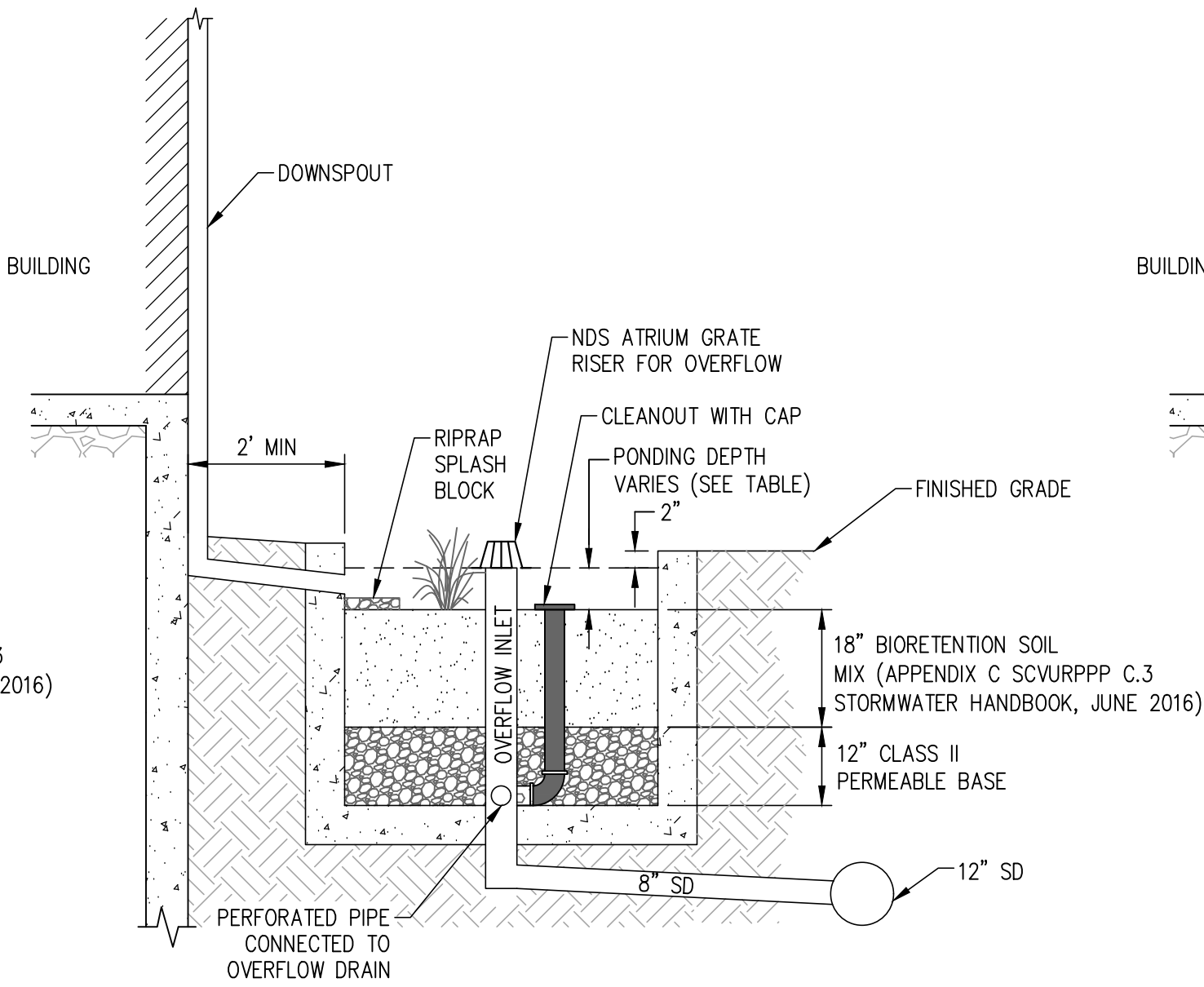
- NOTES:
- ALL TREATMENT MEASURES AND TECHNICAL REQUIREMENTS FOR THIS PROJECT ARE BASED UPON THE SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM (SCVURPPP) C.3 STORMWATER HANDBOOK DATED JUNE 2016.
 - SEE STORMWATER CONTROL PLAN REPORT FOR ALL OTHER SIZING REQUIREMENTS, CALCULATIONS, AND OTHER INFORMATION. SEE SEPARATE IMPROVEMENT PLANS FOR TREATMENT AREAS OUTSIDE THE SCOPE OF THESE PLANS.
 - ALL STORMDRAIN INLETS IN LANDSCAPE AREAS TO HAVE A GRATE AT LEAST 3" ABOVE GRADE.

LEGEND

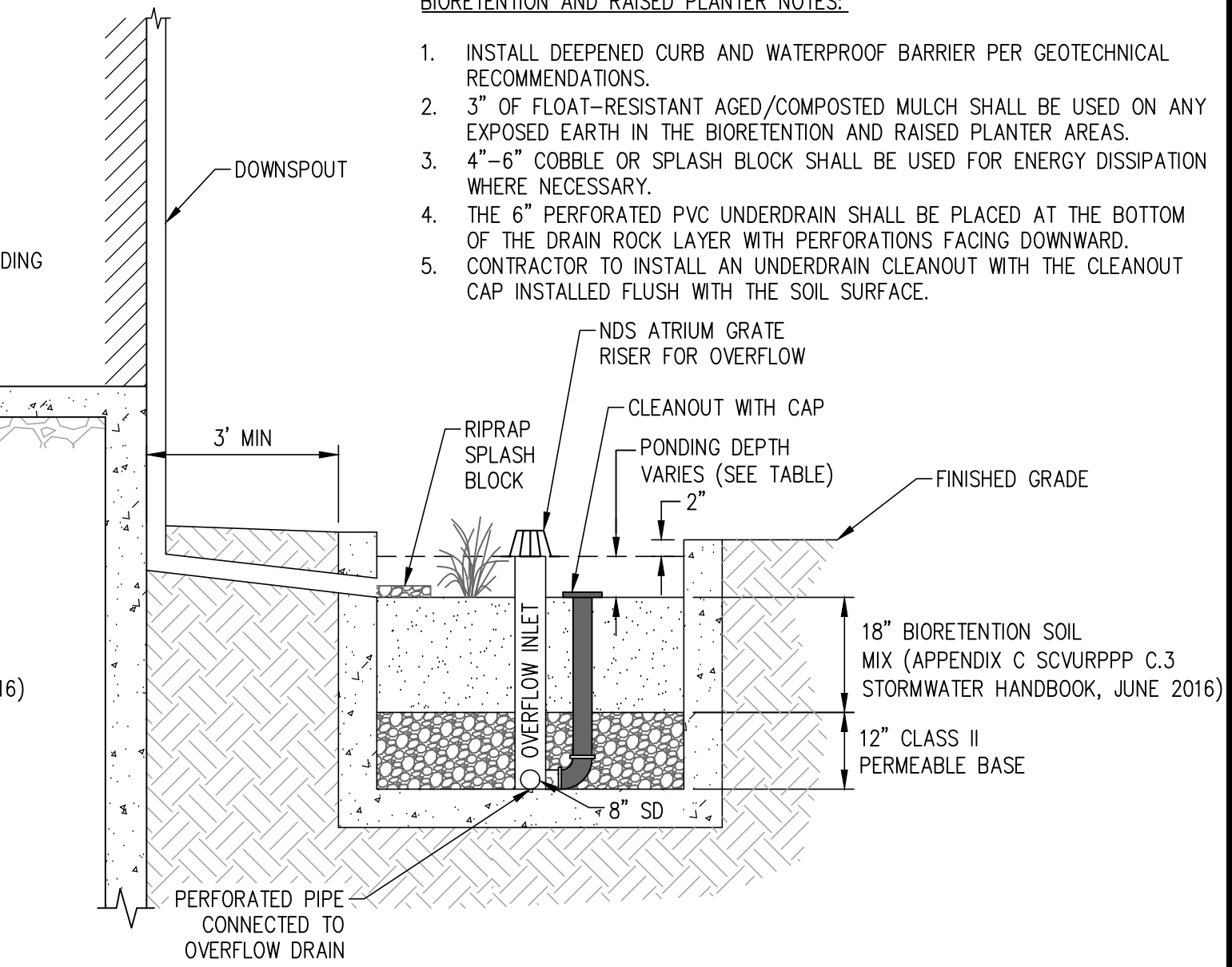
- FLOW THROUGH PLANTER
- STORM DRAIN FLOW DIRECTION
- BIORETENTION DRAINAGE MANAGEMENT AREA
- THIS AREA IS OUTSIDE THE SCOPE OF THIS PERMIT AND NOT A PART OF THESE PLANS



TYPICAL BIORETENTION (DMA 2)
(NOT TO SCALE)



TYPICAL BIORETENTION (DMA 1)
(NOT TO SCALE)



TYPICAL BIORETENTION (DMA 3 & 4)
(NOT TO SCALE)

BIORETENTION AND RAISED PLANTER NOTES:

- INSTALL DEEPENED CURB AND WATERPROOF BARRIER PER GEOTECHNICAL RECOMMENDATIONS.
- 3\"/>
- 4\"-6\" COBBLE OR SPLASH BLOCK SHALL BE USED FOR ENERGY DISSIPATION WHERE NECESSARY.
- THE 6\" PERFORATED PVC UNDERDRAIN SHALL BE PLACED AT THE BOTTOM OF THE DRAIN ROCK LAYER WITH PERFORATIONS FACING DOWNWARD.
- CONTRACTOR TO INSTALL AN UNDERDRAIN CLEANOUT WITH THE CLEANOUT CAP INSTALLED FLUSH WITH THE SOIL SURFACE.



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Consider Recommendations from Mayor Tran for Appointments to City Commissions (Staff Contact: Suzanne Guzzetta, Acting City Clerk, 408-586-3001)
Category:	Consent Calendar-Leadership and Support Services
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Receive Mayor Tran's recommendations and approve the appointments to City Commissions

BACKGROUND:

The City of Milpitas has 13 Commissions (including Measure F Oversight Committee), with the members appointed by the Mayor and confirmed by the City Council, that advise the Milpitas elected officials on a variety of community interest and policy areas. Mayor Tran is making the following recommendation for Commissions.

Art Commission

1. Appoint Cheryle Oldham to serve as a Commissioner with a short-term to expire October 2023.
2. Appoint Fernando Acevedo to serve as Alternate No. 2 with a short-term to expire October 2023.

Community Advisory Commission

1. Reappoint Oscar Leon to serve as a Commissioner with a term to expire January 2025.

Economic Development and Trade Commission

1. Reappoint Chris Norwood to serve as a Commissioner for the Milpitas School Board Member with a term to expire April 2025.
2. Appoint Cheri Romero to serve as a Commissioner for the Real Estate Seat with a short-term to expire April 2024.

Energy and Environmental Sustainability Commission

1. Move Jeff Hoggs from Alternate No. 1 to the Commissioner seat with a short-term to expire October 2022.
2. Appoint Felix Mbuga to serve as Alternate No. 1 with a short-term to expire October 2022.

Library and Education Advisory Commission

1. Reappoint Nonie McDonald to serve as a Commissioner with a term to expire June 2025.
2. Appoint Naga Venkata Satya Sannidhi to serve as Alternate No. 1 with a term to expire June 2025.

Parks, Recreation, and Cultural Resources Commission

1. Reappoint Baljit Gill to serve as a Commissioner with a short-term to expire June 2025.
2. Reappoint Voltaire Montemayor to serve as a Commissioner with a term to expire June 2024.
3. Move Rondi Jackson Thomas from Alternate No. 1 to the Commissioner seat with a short-term to expire June 2023.
4. Move Allen Roy Thomas from Alternate No. 2 to the Commissioner seat with a short-term to expire June 2024.

Public Safety & Emergency Preparedness Commission

1. Reappoint Don Clendenin to serve as a Commissioner with a term to expire June 2025.
2. Reappoint Jonathan Nakapalau to serve as a Commissioner with a term to expire June 2025.
3. Move Michael Berry Hill from Alternate No. 1 to the vacant Commissioner seat with a term to expire June 2025.

Science, Technology & Innovation Commission

1. Appoint Amrita Mukherjee to serve as a Commissioner with a term to expire January 2025.

Senior Advisory Commission

1. Reappoint Deborah Langley to serve as a Commissioner with a term to expire December 2023.

Veterans Commission

1. Move Reynaldo Lingad from Alternate No. 1 to the vacant Commissioner seat with a term to expire January 2025.

Measure F Oversight Committee

1. Appoint Madan Menon to serve as a committee member with a short-term to expire March 2024.

ANALYSIS:

Any resident interested in serving on a City Commission must complete a Commission Application and submit the form to the City Clerk. Copies of the applications are provided to the Mayor for his consideration. Per Government Code 40605, in a general law city where the office of Mayor is an elective office, the Mayor with the approval of the City Council, shall make all appointments to boards, commissions, and committees unless otherwise specifically provided by statute.

Current Commissioners may seek to be re-appointed upon the expiration of their current term. Re-appointment to a new term is not automatic. Those commissioners seeking reappointment shall contact the Mayor to express their request. Re-appointment must be recommended by the Mayor and confirmed by the City Council.

All recommended Commissioner appointments have been reviewed and confirmed by the City Clerk's office.

FISCAL IMPACT:

There is no fiscal impact associated with this item.

RECOMMENDATION:

Receive Mayor Tran's recommendations and approve the appointments to City Commissions.

Attachments:

1. Commissioners Applications and Request for Reappointments

COMMISSION/COMMITTEE APPLYING FOR: Arts Commission**Name** Cheryl D Oldham**Address Type** Residence**Address** [REDACTED]**City** Milpitas**Postal/Zip Code** 95035**Mobile Number** [REDACTED]**E-Mail Address** [REDACTED]**Present Employer** Chemical Safety Technology Inc.**Other Phone** (408) 263-0984**Business Address (Optional)** 2461 Autumnvale dr**City** San Jose**Postal / Zip code** 95131**Occupation** Adminstrator**List community organizations to which you belong or have belonged (additional information may be attached).****Name of Organization** Milpitas Youth Soccer**Member** Board**Name of Organization** Jensen School of performing Arts**Member** Board**Name of Organization** Milpitas Community Theatre**Member** yes**If application is for Veterans Commission, indicate branch and service in any U.S. military organization (retired or active duty).****Briefly describe the personal qualifications you possess which you believe would be an asset (additional information may be attached):**

I am currently and plan on continuing to be an active part of this community. I am a past performer musician and artist, raised my performing, vocal, dance, acting, instrument playing children in Milpitas for the past 20+yrs. I also help with the theatre programs including the upcoming summer classes and musicals. I am a clothing designer and seamstress as my second hobby while I am not helping in all the various programs such and dance, theatre and the various arts programs as well as volunteering and coordination of school events and programs fundraisers, etc. I also have a few producer credits on my imdb page <https://www.imdb.com/name/nm8767319/> I've coordinated beginning to end staff, talent, costuming for some programs, miniseries, and music videos.

I have been an office administrator for the past 28 years and aware of every aspect of a business environment from managing people , purchasing, billing, organizing events.

Date Apr 07, 2022

I have sufficient time to devote to this responsibility and will attend the required meetings if I am appointed to fill a future vacancy.

I hereby certify that all statements contained in this application are true.

City Clerk's Office

APR 07 2022

RECEIVED

A handwritten signature in black ink, consisting of a large, rounded initial followed by a series of loops and a trailing flourish.

Appointments to Commissions or Committees are made by the Mayor with the concurrence of the City Council. Applications not acted upon will expire after one year from the date submitted unless renewed by the applicant. Once submitted, your application will be submitted to the City Clerk.

NOTE: ALL COMMISSION APPLICATIONS ARE PUBLIC RECORD

COMMISSION/COMMITTEE APPLYING FOR:

Arts Commission

Name

Fernando Acevedo

Address**City**

Milpitas

Postal/Zip Code

95035

Mobile Number**E-Mail Address**

City Clerk's Office

MAY 09 2022

RECEIVED

Present Employer

self employed

Occupation

Graphic Artist / Photographer

Major Subject

Graphic Design

Degree

Associates of arts

List community organizations to which you belong or have belonged (additional information may be attached).**If application is for Veterans Commission, indicate branch and service in any U.S. military organization (retired or active duty).****Briefly describe the personal qualifications you possess which you believe would be an asset (additional information may be attached):**

I have been a graphic artist and photographer for over 20 years. My whole professional career has been working in the visual communications industry as well as talented artis from almost every discipline there is related to the Arts. I am very passionate about Art and all variations of it. I have a vast experience working with business which has allowed me to see the business side of art and the value of well designed creative pieces. I believe my experience and creative process can be a very valuable asset to the committed.

Date

May 09, 2022

I have sufficient time to devote to this responsibility and will attend the required meetings if I am appointed to fill a future vacancy. I hereby certify that all statements contained in this application are true.

Fernando Acevedo

Appointments to Commissions or Committees are made by the Mayor with the concurrence of the City Council. Applications not acted upon will expire after one year from the date submitted unless renewed by the applicant. Once submitted, your application will be submitted to the City Clerk.

NOTE: ALL COMMISSION APPLICATIONS ARE PUBLIC RECORD

Karen Chew

Subject: FW: CAC commissioner

From: Oscar Leon [REDACTED]

Sent: Tuesday, June 7, 2022 10:50 AM

To: Wendy Wood <wwood@milpitas.gov>

Subject: CAC commissioner

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Dear Ms. Wood,

I will again request my interest in being reappointed to the CAC commission.

Sincerely,

Oscar Leon

Karen Chew

From: Norwood, Chris [REDACTED]
Sent: Thursday, February 24, 2022 2:05 PM
To: Karen Chew; Alex Andrade
Subject: Re: EDTC Reappointment

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

I have expressed my interest to Alex Andrade and reappointed as the Committee Chair. He is cc'd on this email.

Chris

On Thu, Feb 24, 2022 at 1:51 PM Karen Chew <kchew@ci.milpitas.ca.gov> wrote:

Hello Commissioner Norwood,

I hope this email finds you well. This email is just to inform you that the term tied to your Commission seat is set to expire in April 2022. If you wish to be reappointed and have your term extended please send an email to Mayor Tran and our City Clerk, Wendy Wood, expressing your interest in continuing to serve. There will be a recruitment later next month to fill any vacant positions on the Economic Development and Trade Commission. Our office will gather all applications submitted during this recruitment process and provide them to the Mayor for his review. Your reappointment email will be included in that batch if you choose to seek reappointment. Please email the Mayor and our City Clerk at your earliest convenience.

The Mayor's email is rtran@ci.milpitas.ca.gov and Wendy's email is wwood@ci.milpitas.ca.gov.

Sincerely,



Karen Chew
Office Assistant II
Phone (408) 586-3004
Email kchew@ci.milpitas.ca.gov
455 E. Calaveras Blvd., Milpitas CA 95035
www.ci.milpitas.ca.gov



Karen Chew

From: Wendy Wood
Sent: Thursday, February 24, 2022 11:19 AM
To: Karen Chew
Subject: FW: Energy and Environment Sustainability Commission (EESC): Voting Member

FYI

From: Email | Admin [REDACTED]
Sent: Tuesday, February 15, 2022 4:35 AM
To: Evelyn Chua <echua@ci.milpitas.ca.gov>
Cc: Ashwini Kantak <akantak@ci.milpitas.ca.gov>; Wendy Wood <wwood@ci.milpitas.ca.gov>
Subject: Re: Energy and Environment Sustainability Commission (EESC): Voting Member

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hi Wendy,

I would like to start the application process for the open Commissioner position on the Energy and Environmental Sustainability Commission. Please help guide me through the steps I need to take.

Thanks in advance for your help,

Jeff

From: Evelyn Chua <echua@ci.milpitas.ca.gov>
Sent: Tuesday, February 15, 2022 2:15 AM
To: Jeffrey Hogg [REDACTED]
Cc: Ashwini Kantak <akantak@ci.milpitas.ca.gov>; Wendy Wood <wwood@ci.milpitas.ca.gov>
Subject: Energy and Environment Sustainability Commission (EESC): Voting Member

Hello Commissioner Hogg,

There is an opening for a voting member at the EES Commission. Being and Alternate Commissioner and if there is any interest, Mr. Hogg. Kindly email our City Clerk, Ms. Wood. She'll guide you on the process.

Thank you both.

Councilmember Chua

Sent from my iPad

COMMISSION/COMMITTEE APPLYING FOR: Energy and Environmental Sustainability Commission

Name Felix Mbuga

Address Type Residence

Address [REDACTED]

City Milpitas

Postal/Zip Code 95035

Mobile Number [REDACTED]

E-Mail Address [REDACTED]

City Clerk's Office
MAR 17 2022
RECEIVED

List community organizations to which you belong or have belonged (additional information may be attached).

Name of Organization Sierra Club

Member Volunteer

If application is for Veterans Commission, indicate branch and service in any U.S. military organization (retired or active duty).

Briefly describe the personal qualifications you possess which you believe would be an asset (additional information may be attached):

I am a Milpitas resident.

I care deeply about leaving our children and our grandchildren a livable planet.

I have a science education (bachelors, masters and doctorate in chemical engineering).

I worked in the solar industry 2014-2017.

I attended the last meeting of the commission and the chair and council liaison recommended I apply for the position.

I am applying for the open Commissioner vacancy.

Thank you for your consideration.

Date Mar 17, 2022

I have sufficient time to devote to this responsibility and will attend the required meetings if I am appointed to fill a future vacancy. I hereby certify that all statements contained in this application are true.

Felix Mbuga

Appointments to Commissions or Committees are made by the Mayor with the concurrence of the City Council. Applications not acted upon will expire after one year from the date submitted unless renewed by the applicant. Once submitted, your application will be submitted to the City Clerk.

NOTE: ALL COMMISSION APPLICATIONS ARE PUBLIC RECORD

Karen Chew

Subject: FW: LEAC reappointment

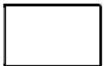
From: Nonie V McDonald [REDACTED]
Sent: Wednesday, April 20, 2022 9:34 AM
To: Rich Tran <rtran@ci.milpitas.ca.gov>
Cc: Wendy Wood <wwood@ci.milpitas.ca.gov>
Subject: LEAC reappointment

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Mayor Tran,

I would be interested in being reappointed for another term with the Library Education Advisory Commission. Please let me know if you require anything further from me.

Nonie McDonald



Virus-free. www.avast.com

COMMISSION/COMMITTEE APPLYING FOR:

Library and Education Commission

Name

Naga Venkata Satya Sannidhi

Address Type

Residence

Address

[REDACTED]

City

MILPITAS

Postal/Zip Code

95035

Mobile Number

[REDACTED]

E-Mail Address

[REDACTED]

City Clerk's Office

JUN 01 2022

RECEIVED

Present Employer

Yahoo

Other Phone

(669) 235-2664

Occupation

Software Engineer

College, Professional, Vocational, or other schools attended

San Jose State University, CA and Andhra University, India

Major Subject

Computer Science

Degree

Masters

List community organizations to which you belong or have belonged (additional information may be attached).**Name of Organization**

Contempo and Traditions HOA

Member

Secretary of Board

If application is for Veterans Commission, indicate branch and service in any U.S. military organization (retired or active duty).**Briefly describe the personal qualifications you possess which you believe would be an asset (additional information may be attached):**

I started my career as a teacher and then turned into a software engineer. I also actively run training sessions in my organization to educate teams to get an understanding of new technologies. I am also an HOA board member and continuously assess our community needs in Milpitas. The extensive user of Library services starting from book renting to Passport renewals. The library was a great asset for all the kids in Milpitas and helped my kids personally a lot with respect to education and entertainment (movies and game CDs). That said I see there are a lot more opportunities that our Milpitas library can provide for all the kids and adults in Milpitas by extending the offerings. I am an SJSU graduate and an active user of library services in Sanjose, I see a lot of learning opportunities in Sanjose libraries for kids and adults like coding, robotics, arts and crafts etc., I think we can replicate most of them in Milpitas to keep learning opportunities closer as well as more available as Sanjose library offerings are always full. I am personally open to helping train kids in Coding, Chess, and other indoor activity. I have lot more ideas that I want to brainstorm with the city to see which can be implemented within Milpitas to provide better educational services to the community here.

Date

Jun 01, 2022

I have sufficient time to devote to this responsibility and will attend the required meetings if I am appointed to fill a future vacancy. I hereby certify that all statements contained in this application are true.



Appointments to Commissions or Committees are made by the Mayor with the concurrence of the City Council. Applications not acted upon will expire after one year from the date submitted unless renewed by the applicant. Once submitted, your application will be submitted to the City Clerk.

Karen Chew

Subject: FW: PRCRC COMMISSIONER POSITION TO LAPSE

From: Voltaire Montemayor

Sent: Thursday, June 23, 2022 8:43 AM

To: Wendy Wood <wwood@milpitas.gov>; Rich Tran <rtran@milpitas.gov>

Subject: PRCRC COMMISSIONER POSITION TO LAPSE

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

THRU: Wendy Wood, City Clerk, City of Milpitas

TO: Rich Tran, Mayor of the City of Milpitas

Please Reinstate my near terminating position as a PRCRC- Parks, Commissioner. Thank you very much for the concern. I appreciate it. Regards, God Bless.

Very respectfully yours,
Voltaire Montemayor

Voltaire Montemayor

Karen Chew

Subject: FW: PRCR Commission voting member

On Jun 2, 2022, at 11:33 AM, Rondi Jackson [REDACTED] wrote:

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Dear Mayor Tran, Ms. Lorentzen, and Ms. Wood,
I am currently an alternate on this commission.
I am emailing you to let you know, I am interested in becoming
a voting member.

Thanks for your consideration,

Rondi Jackson
[REDACTED]

Karen Chew

Subject: FW: PARKS, RECREATION, AND CULTURAL RESOURCES COMMISSION opening

From: ALLEN THOMAS [REDACTED]

Sent: Saturday, June 4, 2022 11:06 AM

To: Wendy Wood <wwood@milpitas.gov>

Cc: Allen Thomas - Veterans Commission [REDACTED]

Subject: PARKS, RECREATION, AND CULTURAL RESOURCES COMMISSION opening

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hi Ms Wood

I have been made aware of the voting member position openings on the Parks, Recreation, and Cultural Resources Commission. I am currently on that commission as an alternate and would like to be considered for updating to full a full voting position. I look forward to continued work as a member of this commission.

Allen Thomas
[REDACTED]

Karen Chew

From: Donald Clendenin [REDACTED]
Sent: Friday, April 15, 2022 5:13 PM
To: Wendy Wood; Rich Tran
Cc: Karen Chew
Subject: Re: PSEPC Reappointment

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

To Mayor Rich Tran and Wendy Wood,

I would like to continue serving on the Public Safety and Emergency Commission. I have served for many years and we have made many changes and improvements over those years. Especially in getting the public informed.

Don :O) <\\><

KJ6ACE

On 2022-04-15 13:59, Karen Chew wrote:

Hello Commissioner Clendenin,

I hope this email finds you well. I just wanted to reach out to you and inform you that the term tied to your Commission seat is set to expire in June 2022. If you wish to be reappointed and have your term extended, please send an email to Mayor Tran and our City Clerk, Wendy Wood, expressing your interest in continuing to serve. There will be a recruitment this month to fill any vacant positions on the Public Safety and Emergency Preparedness Commission. Our office will gather all applications submitted during this recruitment process and provide them to the Mayor for his review. Your reappointment email will be included in that batch if you choose to seek reappointment. Please email the Mayor and our City Clerk at your earliest convenience.

The Mayor's email is rtran@ci.milpitas.ca.gov and Wendy's email is wwood@ci.milpitas.ca.gov.

Sincerely,

Karen Chew

Subject: FW: Commission Reappointment: Public Safety and Emergency Preparedness
Commission

Dear City Clerk Woods,

I am sending you this e-mail to inform you of my desire to be reappointed to the Public Safety and Emergency Preparedness Commission (PSEPC).

The past two years have been challenging; but I feel as if the PSEPC has made some real progress as far as widening the definition of what the future might hold as far as mitigated response to the broad spectrum of emergency events that California (and Milpitas) may face.

I have learned much from my fellow commissioners, and hope that I have contributed to some of the impactful issues we have been tasked with reviewing.

I have informed Mayor Tran of my desire to be reappointed.

Thanking you for your time,

Jon Nakapalau

Karen Chew

From: Mike Berryhill
Sent: Tuesday, June 14, 2022 2:38 AM
To: Rich Tran; Wendy Wood
Cc: Toni-Lynn Charlop; Karen Chew; Suzanne Guzzetta
Subject: Re: PSEPC Term Expiring

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hello Wendy,

The logical course of action when there's a vacancy on a Commission would be to first automatically move up the Alternates to Member status, then to appoint new Alternates. That's the way it was handled for many years, and there were no changes to the Commissioner Handbook to indicate that there was a change in the process, so I'm wondering why the process was changed without informing Commissioners.

I believe I already stated several times that I wish to be reappointed, but if I have not made that 100% clear yet...

"Please reappoint me as a Member to the Public Safety and Emergency Preparedness Commission for a term of 3 years, expiring on 6/1/2025."

Thanks,
Mike Berryhill

On Monday, June 13, 2022, 08:00:57 PM PDT, Wendy Wood <wwood@milpitas.gov> wrote:

Hello Mr. Berryhill,

I have reviewed the Commissioner Handbook again, and you are correct there is no language specifically stating that an alternate has to submit a request. However, it does state the following:

APPLICATION & APPOINTMENT

To apply for service on any City of Milpitas Commission, residents or interested persons shall complete a Commission Application and submit the form to the City Clerk. Form may be submitted in person, by US postal mail, or by e-mail. The form is available at the City Clerk's office and on the City website. If requested, applicants may be asked to complete a supplemental questionnaire.

COMMISSION/COMMITTEE APPLYING FOR: Science, Technology and Innovation Commission

Name Amrita Mukherjee

Address Type Residence

Address [REDACTED]

City Milpitas

Postal/Zip Code 95035

Mobile Number [REDACTED]

E-Mail Address [REDACTED]

City Clerk's Office

CCT 01 2021

RECEIVED

Present Employer Intel Corporation

Other Phone (814) 441-7556

Occupation Engineer

Education: If Youth Advisory Commission applicant, indicate your grade/school: PhD. in Energy Engineering

List community organizations to which you belong or have belonged (additional information may be attached).

If application is for Veterans Commission, indicate branch and service in any U.S. military organization (retired or active duty).

Briefly describe the personal qualifications you possess which you believe would be an asset (additional information may be attached):

I have done my PHD in Energy Engineering from Penn State University. Currently working as a Quality Engineer in Intel Corporation

Date Sep 30, 2021

Appointments to Commissions or Committees are made by the Mayor with the concurrence of the City Council. Applications not acted upon will expire after one year from the date submitted unless renewed by the applicant. Once submitted, your application will be submitted to the City Clerk.

NOTE: ALL COMMISSION APPLICATIONS ARE PUBLIC RECORD

Karen Chew

Subject: FW: Senior Advisory Commission

From: Rich Tran <rtran@milpitas.gov>
Sent: Monday, June 20, 2022 1:08 PM
To: Deborah R. Langley
Cc: Wendy Wood <wwood@milpitas.gov>
Subject: RE: Senior Advisory Commission

Hi Wendy,

Please agendize Commissioner Langley for commission re-appointment for the first City Council meeting in August. Thank you kindly.



Rich Tran
Mayor
City of Milpitas
455 East Calaveras Blvd., Milpitas CA 95035
Phone [\(408\) 755-5554](tel:(408)755-5554)
Email rtran@ci.milpitas.ca.gov
www.ci.milpitas.ca.gov

From: Deborah
Sent: Monday, June 20, 2022 10:02:06 AM
To: Rich Tran <rtran@milpitas.gov>
Subject: Senior Advisory Commission

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Sent from my iPhone
Good Morning Mayor
I am writing to request a renewal as commissioner.
I am currently Vice Chair.
Thank you for your consideration
Deborah Langley

Karen Chew

Subject: FW: Reynaldo Lingad - Veterans Commission Reappointment

On Wednesday, February 2, 2022, 10:22 PM, Reynaldo Lingad [REDACTED] wrote:

Good Evening Mayor Tran

Hope everything is well with you.

I'm still interested to continue to serve as a Veteran Commissioner.
Kindly extend my term for this year 2022. Thanks

Regards,
Rey

[Sent from Yahoo Mail for iPad](#)

COMMISSION/COMMITTEE APPLYING FOR:

Measure F Oversight Committee

Name

Madan Menon

Address Type

Residence

Address**City**

Milpitas

Postal/Zip Code

95035

Mobile Number**E-Mail Address**

City Clerk's Office
SEP 27 2021
RECEIVED

Present Employer

Frientap Inc.

Occupation

Executive leadership

Education: If Youth Advisory Commission applicant, indicate your grade/school:

University of Madras - BS Physics

College, Professional, Vocational, or other schools attended

Great Lakes institute of management

Major Subject

Marketing

Degree

MBA

List community organizations to which you belong or have belonged (additional information may be attached).

Name of Organization

Santa Clara Police Department

Member

Chiefs Advisory Commission

If application is for Veterans Commission, indicate branch and service in any U.S. military organization (retired or active duty).

Briefly describe the personal qualifications you possess which you believe would be an asset (additional information may be attached):

As an executive, I have had the fortune to be be closely involved with finances and seeing the impact taxes make - gives me first hand experience. Sitting on the other side of the table, to see the impact taxes make to a city will be both educational and give me a clearer understanding of the impact of direct taxes.

Date

Sep 27, 2021

I have sufficient time to devote to this responsibility and will attend the required meetings if I am appointed to fill a future vacancy. I hereby certify that all statements contained in this application are true.



Appointments to Commissions or Committees are made by the Mayor with the concurrence of the City Council. Applications not acted upon will expire after one year from the date submitted unless renewed by the applicant. Once submitted, your application will be submitted to the City Clerk.

NOTE: ALL COMMISSION APPLICATIONS ARE PUBLIC RECORD



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Accept Commissioner Resignations (Staff Contact: Suzanne Guzzetta, Acting City Clerk, 408-586-3001)
Category:	Consent Calendar-Leadership and Support Services
Meeting Date:	8/9/2022
	Recommendation: Accept the resignations of Aileen Zhong from the Community Advisory Commission and Cecelia Hutnick from the Arts Commission; and direct the Acting City Clerk to post the notice of unscheduled vacancies.

BACKGROUND:

In accordance with the City of Milpitas Commission By-Laws adopted as Resolution No. 7702, any member or alternate member of a Commission who is no longer available to serve, must submit a resignation in writing by sending a written communication to the Mayor and the City Clerk. The written resignation must then be accepted and confirmed by City Council via action on the consent calendar at a regularly scheduled City Council meeting. Aileen Zhong submitted a notice of resignation from the Community Advisory Commission, and Cecelia Hutnick submitted a notice of resignation from the Arts Commission.

ANALYSIS:

By state law, a Notice of an Unscheduled Vacancy must be posted by the City Clerk to advertise the vacant Commission seat. Final appointment to the board, commission, or committee for the Unscheduled Vacancy shall not be made by the legislative body for at least ten working days after the posting of the notice in the Clerk's office. The notice of the unscheduled vacancies for the Community Advisory Commission and Arts Commission will be posted Wednesday, August 10, 2022.

FISCAL IMPACT:

There is no fiscal impact associated with this item.

RECOMMENDATION:

Accept the resignations of Commissioner Aileen Zhong from the Community Advisory Commission and Cecelia Hutnick from the Arts Commission; and direct the City Clerk to post the notice of unscheduled vacancies.

Attachments:

1. Email from Commissioner Aileen Zhong
2. Email from Commissioner Cecelia Hutnick

From: [MAIN](#)
To: [City Clerk](#); [Rich Tran](#)
Cc: [Robert Musallam](#)
Subject: Commission Resignation
Date: Tuesday, July 19, 2022 3:12:46 AM

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Dear Mayor Tran and City Clerk's Office Staff:

I hope your week is going well. With much regret, I am writing because I will unfortunately have to resign from my position as commissioner. I will be moving to Oakland for work and will no longer be able to fulfill my obligations. It has been such a pleasure and I hope that I will be able to move back home to the city that I love and grew up in soon. Please do not hesitate to reach out to me if anything is needed from me to move this forward.

Thank you so much for all of the work you do - forever grateful.

My best,
Aileen

Commission Resignation

Cecelia Hutnick

Tue 7/19/2022 8:01 PM

To: Tegan McLane <tmclane@milpitas.gov>

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hi Tegan!

It is my greatest displeasure to inform you that I will be moving to Long Beach this august to earn my MBA and as such, I will have to resign from the Arts commission effective immediately.

I have truly enjoyed my time on the committee and wish I could have served for the entirety of the term I was so graciously appointed.

If there are any other steps that need to be taken, please let me know.

Kindly,

Cecelia Hutnick



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Reconfirm Findings and Determinations Under Resolution No. 9165 and Assembly Bill 361 for the Continuation of Virtual Meetings of the City Council and Legislative Bodies (Staff Contact: Michael Mutalipassi, City Attorney, 408-586-3040)
Category:	Consent Calendar-Leadership and Support Services
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Move to reconfirm findings and determinations under Resolution No. 9165 and Assembly Bill 361 for the continuation of virtual meetings of the City Council and Legislative Bodies.

Background:

On March 17, 2020, in the face of the COVID-19 pandemic, Governor Gavin Newsom issued Executive Order N-29-20 suspending certain provisions of the Ralph M. Brown Act in order to allow for local legislative bodies to conduct their meetings completely telephonically or by other electronic means.

The provisions in the Brown Act that were suspended by the Governor's Executive Order are contained at Government Code Section 54953(b)(3) and require that when teleconferencing is used, outside of a statewide emergency, that the following occur:

- An agenda is required to be posted at all locations, including any teleconference locations
- Each teleconference location must be identified on the actual agenda
- Each teleconference location shall be accessible to the public
- A quorum of the legislative body must be in the jurisdiction

With the Governor's Executive Order, the four above requirements were suspended, allowing Councilmembers to not have to post an agenda at their teleconference location, not have to identify their location on the meeting agenda, not have to ensure public accessibility at the teleconference location, and the legislative body did not need a quorum present in the jurisdiction. As the Council is well aware, this allowed all City Council meetings and other meetings of legislative bodies of the City to be conducted by Zoom with councilmembers, commission members, committee members, and staff all joining from remote virtual locations.

The suspension of certain provisions of the Brown Act was further extended by the Governor on June 11, 2021 by the issuance of Executive Order N-08-21 which continued to allow for complete virtual meetings until September 30, 2021.

With the expiration of the Governor's Executive Order and the uncertainty that surrounded the Governor's potential recall, the State Legislature also took the remote meeting issue into its own hands through the adoption of Assembly Bill 361, which is explained in more depth in the Analysis section below.

On May 17, 2022, the City Council adopted Resolution No. 9156, making findings that there is an existing State of Emergency and that state or local officials continue to recommend social distancing measures to prevent the spread of COVID-19. In particular, the resolution included reference to Cal-OSHA regulation 3205, which

recommends physical distancing in the workplace. By motion and majority vote, the City Council may reconfirm the findings of Resolution No. 9156 and continue to hold virtual meetings pursuant to AB 361.

Analysis:

On September 16, 2021, the Governor signed AB 361, which allows legislative bodies to meet virtually provided there is a state of emergency declared by the Governor, and either (1) state or local officials have imposed or recommended measures to promote social distancing; or (2) the legislative body determines by majority vote that meeting in person would present imminent risks to the health and safety of attendees. The Governor by executive order signed on September 20, 2021, suspended the effective date of AB 361 to October 1, 2021. As a result, if the City desires to have virtual meetings on or after October 1, 2021, it must do so consistent with the requirements of AB 361.

AB 361 preserves many of the provisions of the earlier executive orders, including the suspension of the four teleconferencing requirements noted above, while also adding new requirements to the management of remote and teleconference public meetings in order to better achieve the levels of transparency that the Brown Act demands. Specifically, AB 361 imposes two new rules on remote public meetings:

1. Local governments and agencies hosting teleconference meetings in lieu of traditional in-person public meetings must permit direct public comment during the teleconference and must leave open the opportunity for public comment until the comment period for a given item is closed during the ordinary course of the meeting. The opportunity to make public comment must be of a sufficient duration so as to allow actual public participation.
2. Any action by the governing body during a public teleconference meeting must occur while the agency is actively and successfully broadcasting to members of the public through a call-in option or an internet-based service option. If a technical disruption within the agency's control prevents members of the public from either viewing the meeting of the public agency or prevents members of the public from offering public comment, the agency must cease all action on the meeting agenda until the disruption ends and the broadcast is restored. Action taken during an agency-caused disruption may be challenged as a violation of the Brown Act.

In order to continue to qualify for AB 361's waiver of in-person meeting requirements, the City Council must, within thirty (30) days of its first meeting under AB 361, and every thirty (30) days thereafter, make findings that (a) state or local officials continue to recommend measures to promote social distancing, or that (b) an in-person meeting would constitute an imminent risk to the safety of attendees.

The above conditions continue to exist at this time, and staff recommends that the City Council by motion reconfirm the findings made in Resolution No. 9156 so that the City Council and all other subordinate legislative bodies may continue to meet virtually.

Lastly, it is important to note that AB 361 is optional. If the City Council wishes, it may meet in person. In addition, hybrid meetings are permissible.

Policy Alternatives:

Alternative 1: Do not by motion reconfirm the findings made in the resolution making findings and determinations under Assembly Bill 361 for the continuation of virtual meetings.

Pros: None

Cons: Many of the existing Commission, Committee, and Task Force meetings will not be able to meet virtually or through a hybrid format forcing all staff, commission or committee members, and the public to attend meetings in person.

Reason not recommended: The COVID-19 pandemic continues to be a global health issue and by forcing commission, committee, and task force meetings to be in person, public health may be put at risk.

Fiscal Impact:

The City Council's reconfirmation of the findings made in the resolution to continue with virtual meetings will maintain the status quo and no financial impact is anticipated by the reconfirmation of the findings.

California Environmental Quality Act:

The City Council's reconfirmation of the findings made in the resolution is not a project under the California Environmental Quality Act (CEQA) Guideline 15378(b)(5) as it constitutes an organizational or administrative activity of the government that will not result in direct or indirect physical changes in the environment. Further, virtual meetings are likely to reduce certain impacts associated with vehicular travel related to in-person public meetings.

Recommendation:

Move to reconfirm findings and determinations under Resolution No. 9105 and Assembly Bill 361 for the continuation of virtual meetings of the City Council and Legislative Bodies.

Attachment

1. Resolution 9165

RESOLUTION 9165

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS MAKING FINDINGS AND DETERMINATIONS UNDER AB 361 FOR THE CONTINUATION OF VIRTUAL MEETINGS

WHEREAS, the Ralph M. Brown Act (Gov. Code § 54950 *et seq.*) generally requires local agencies meeting via teleconference, including through other virtual or electronic means, to, among other things, provide public access at each location in which members of the legislative body are teleconferencing; and

WHEREAS, the Legislature recently enacted Assembly Bill 361 (AB 361), which amended Government Code section 54953 to allow local agencies to meet fully virtually, without fully adhering to the rules otherwise applicable to teleconferencing, during a proclaimed state of emergency if state or local officials have imposed or recommended measures to promote social distancing; and

WHEREAS, the Governor issued a proclamation declaring a state of emergency on March 4, 2020 due to the COVID-19 pandemic, pursuant to section 8625 of the California Emergency Services Act, and this proclaimed state of emergency currently remains in effect; and

WHEREAS, the City Council of the City of Milpitas has considered the circumstances of the state of emergency; and

WHEREAS, state or local officials continue to recommend measures to promote social distancing to prevent the spread of COVID-19, in particular, Cal-OSHA regulation 3205 recommends physical distancing in the workplace generally and regulates a “close contact” defined as being within 6 feet of another under certain circumstances; and

WHEREAS, in order to continue to impose social distancing while holding in-person meetings there is a high likelihood that members of the public would not all be able to be present in the meetings spaces; and

WHEREAS, the continuation of virtual meetings will allow for full participation by members of the public until social distancing recommendations are no longer necessary; and

WHEREAS, the City Council of the City of Milpitas desires that all City legislative bodies continue to hold virtual meetings pursuant to AB 361 and Government Code section 54953(e).

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. The City Council and all other legislative bodies of the City of Milpitas who are required to hold public meetings, shall continue to meet virtually in accordance with Government Code section 54953(e) and without compliance with section 54953(b)(3) based upon the findings and determinations hereby made by the City Council.

PASSED AND ADOPTED this 7th day of June 2022, by the following vote:

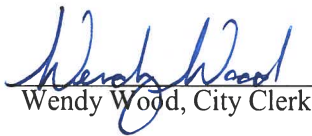
AYES: (5) Mayor Tran, Vice Mayor Montano, Councilmembers Chua, Dominguez, and Phan

NOES: (0) None

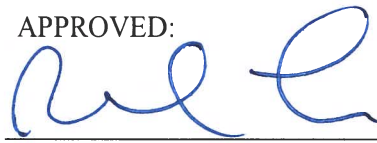
ABSENT: (0) None

ABSTAIN: (0) None

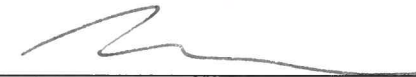
ATTEST:


Wendy Wood, City Clerk

APPROVED:


Rich Tran, Mayor

APPROVED AS TO FORM:


Michael Mutalipassi, City Attorney



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	2022 Weed Abatement Assessment Public Hearing and Adopt a Resolution to Confirm the Assessment Report (Staff Contact: Arthur Belton, Deputy Fire Chief / Fire Marshal, 408-586-3384)
Category:	Public Hearings-Public Safety
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Conduct a Public Hearing and Adopt a Resolution Confirming the 2022 Weed Abatement Assessment Report and the Assessment List to be Entered into the Tax Assessment Rolls

Background:

On February 2, 1976, an Agreement was established and approved to abate weeds by the County of Santa Clara for the City of Milpitas. The purpose of the Agreement is to promote the efficiency and economy of operations in the abatement of weeds by the City and the County.

The major procedural functions to be performed by the County and / or City shall include but not be limited to:

1. The County shall prepare the list of parcels requiring abatement of weeds in the City and transmit the said list to the City for review and approval for processing.
2. The County shall prepare the notice of weed abatement and cause such notice to be mailed to the owners of the parcels requiring weed abatement.
3. The City Council shall conduct public hearings on the proposed removal of weeds pursuant to the provisions of the City Ordinance when the City Fire Marshal presents such appropriate resolutions for adoption. The City Council may, by adoption of a resolution, declare the weeds on the respective parcels of the land as a public nuisance, and make the determination to proceed with the abatement of weeds, and authorize the performance of the service to remove the weeds in accordance with the aforementioned Agreement.
4. Upon proper authorization by the City, the County shall remove the weeds on the designated properties.
5. The County shall render to the City an itemized assessment report for the cost of the weed abatement services performed per the respective parcels.
6. Pursuant to California Health and Safety Code 14915, a copy of the report, as confirmed, shall be turned over to the auditor of the county, on or before the tenth day of August following such confirmation, and the auditor shall enter the amounts of the assessments against the respective parcels of land as they appear on the current assessment roll, (Amended by Stats. 1939, Ch. 354).

7. The City Council, after a public hearing, shall require the County Assessor's Office to include the costs of the weed abatement services performed for the City for the current year, as a special assessment on bills for taxes levied against the affected parcels. Such special assessments shall be liens on the respective properties.

Analysis:

On March 15, 2022, the City Council adopted Resolution No. 9135 declaring noxious or dangerous weeds growing upon certain described property to be a public nuisance that must be abated by the removal of the weeds. If the public nuisance was not removed from the properties by the owner, the City contracted with the County of Santa Clara Consumer and Environmental Protection Agency- Weed Abatement Program (County) to remove the weeds and abate the nuisance. In accordance with Title V, Chapter 202 of the Milpitas Municipal Code, the County filed with the City Clerk a report and assessment list on weeds abated within the City as nuisances. A notice for the public hearing was posted in the designated locations, sent by the City Clerk's Office to the local newspaper for publication, as well as mailed to the affected property owners by the Fire Marshal's Office pursuant to Milpitas Municipal Code Section V-202-9.00.

On June 21, 2022, the City Council approved and authorized the City Manager to execute and sign the Amended and Restated Weed Abatement Agreement Between City of Milpitas and the County of Santa Clara Consumer and Environmental Protection Agency – Weed Abatement Program. The intent of this updated agreement was to provide consistency with current County standards. The County typically adjusts fees annually to ensure costs of the program are fully recovered from property owners within the program. Language in the agreement included a provision for a true-up, where the City will be responsible for any potential shortfall if the amounts collected from property owners are inadequate to reimburse the County for services provided.

The City's Municipal Code requires that the City Council hear the report together with any objections of the property owners liable to be assessed and make such modifications on the proposed assessment as it deems necessary.

Following adoption by the City Council, the resolution will be recorded and charges thereon become a lien on the land involved to be collected in the same manner as property taxes. A copy of the assessment list and the proposed resolution confirming the weed abatement report are included in the Council's agenda packet.

Policy Alternative:

There are no policy alternatives other than what is outlined under the Recommendations section. Pursuant to the February 2, 1976 Agreement, the County under the provisions of the Health and Safety Code of the State of California and its ordinance has the authority to enforce the abatement of weeds. Likewise, the City under the California Fire Code and Milpitas Municipal Code, Title V, Chapter 202 has the authority to enforce the abatement of weeds.

Fiscal Impact:

At the first City Council meeting in August of each year during a public hearing, the City's municipal code provides that the City Council hear the assessment report for the list of weeds abated within the City, together with any objections of the property owners liable to be assessed, and to make such modifications on the proposed assessment as it deems necessary. Following adoption by the City Council, the resolution will be recorded, and charges thereon become a lien on the land involved to be collected in the same manner as property taxes.

If the County's costs to administer the program are not fully recovered through fees from the property owners, Section 7C of the agreement may be applied. If this true-up occurs, it would impact the General Fund via the Unanticipated Expenditure Reserve.

California Environmental Quality Act:

The proposed action is exempt from environmental review under the California Environmental Quality Act (CEQA) in accordance with CEQA Guidelines Section 15602(b)(3) (Common Sense Exemption) in that CEQA applies only to project applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.

Recommendations:

1. Open the Public Hearing for public comment and close the Public Hearing.
2. Adopt a Resolution Confirming the 2022 Weed Abatement Assessment Report and the Assessment List to be entered into the Tax Assessment Rolls.

Attachments:

1. Resolution
2. Exhibit A - 2022 Weed Abatement Assessment Report for the City of Milpitas

When Recorded Mail to:

City of Milpitas
Attention: City Clerk
455 East Calaveras Boulevard
Milpitas, CA 95035

Record without fee under
Section 6103 - Government Code
State of California

RESOLUTION NO. _____

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS CONFIRMING A WEED
ABATEMENT ASSESSMENT REPORT AND ASSESSMENT LIST TO BE ENTERED ON TAX
ASSESSMENT ROLLS**

RESOLUTION NO. _____**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS CONFIRMING A WEED ABATEMENT ASSESSMENT REPORT AND ASSESSMENT LIST TO BE ENTERED ON TAX ASSESSMENT ROLLS**

WHEREAS, on March 15, 2022, the City Council of the City of Milpitas adopted Resolution No. 9135 declaring noxious or dangerous weeds growing upon and/or the accumulation of rubbish, refuse or dirt upon certain described property to be a public nuisance that must be abated by removal; and

WHEREAS, if the public nuisance was not removed from the properties by the owner, the City contracted with the Office of Santa Clara County Agricultural and Environmental Management to remove the weeds, rubbish, refuse and/or dirt and abate the nuisance; and

WHEREAS, the Office of Santa Clara County Agricultural and Environmental Management filed a report and abatement assessment list with the City Clerk in conformance with Title V, Chapter 202 of the Milpitas Municipal Code; and

WHEREAS, notice of the report and abatement assessment list was posted in accordance with Milpitas Municipal Code, Section V-202-9.00; and

WHEREAS, on August 9, 2022 a public hearing was held on said report and assessment list, a copy of which is attached hereto as Exhibit A; and

WHEREAS, the City Council heard any objections of the property owners liable to be assessed for the abatement and found as follows.

NOW, THEREFORE, the City Council hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. The City Council hereby confirms the 2022 Weed Abatement Assessment Report and Abatement List by the County of Santa Clara for the City of Milpitas, filed by the Office of Santa Clara County Agricultural and Environmental Management, without modification.
3. The City Council orders that the cost of abating such public nuisance upon the various properties respectively referred to in the 2022 Weed Abatement Assessment Report and Assessment List shall constitute special assessments against such respective parcels of land and shall constitute a lien against such parcels for the amount of such assessments.
4. The City Manager shall cause a certified copy of this Resolution confirming the 2022 Weed Abatement Assessment Report and Assessment List to be recorded in the Office of the Santa Clara County Recorder and to be filed with the County Tax Assessor and Collector's office and the County Auditor's office in order for said assessments to be entered on the tax rolls as provided by Title V, Chapter 202 of the Milpitas Municipal Code.

PASSED AND ADOPTED this _____ day of _____, 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Suzanne Guzzetta, Acting City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney

2022 WEED ABATEMENT PROGRAM
ASSESSMENT REPORT
CITY OF MILPITAS

SITUS		APN	TAXROLL AMT
634	ABEL	022-06-010	\$1,840.10
7280	MARYLINN	022-07-007	\$596.00
549	ABEL	022-09-028	\$91.00
1735	CALIFORNIA	022-37-002	\$596.00
1301	CALIFORNIA	022-38-002	\$91.00
	DIXON	026-05-023	\$596.00
1878	MILPITAS	026-05-024	\$596.00
		026-06-012	\$596.00
1750	ARIZONA	026-07-044	\$1,146.00
	BOTHELO	028-23-017	\$1,146.00
		028-24-006	\$2,435.00
1301	CALLE ORIENTE	029-05-012	\$91.00
666	EVANS	029-06-008	\$91.00
860	EVANS	029-06-016	\$91.00
826	CALAVERAS RIDGE	029-06-031	\$596.00
898	CALAVERAS RIDGE	029-06-038	\$91.00
322	PARK VICTORIA	029-16-006	\$596.00
1220	COUNTRY CLUB	029-52-014	\$91.00
1039	CAMARILLO	029-52-015	\$91.00
673	QUINCE	029-59-014	\$596.00
517	VISTA RIDGE	042-30-009	\$91.00
519	VISTA RIDGE	042-30-010	\$596.00
529	VISTA RIDGE	042-30-015	\$91.00
410	VISTA RIDGE	042-30-024	\$596.00
350	VISTA RIDGE	042-30-025	\$91.00
531	VISTA RIDGE	042-30-029	\$91.00
	MAIN	083-07-015	\$91.00
		086-25-018	\$6,755.00
	MAIN	086-25-028	\$1,439.80
		086-25-030	\$2,051.00
	MAIN	086-25-051	\$737.08
		086-26-039	\$596.00
		086-26-040	\$91.00
		086-26-042	\$596.00
	MILPITAS	086-28-006	\$596.00
	VISTA	086-29-005	\$19,070.75
	WRIGLEY	086-29-036	\$2,675.00
	YOSEMITE	086-29-047	\$596.00
876	YOSEMITE	086-30-047	\$2,636.00
	YOSEMITE	086-30-048	\$3,648.50
	AMES	086-30-060	\$4,919.00
		086-31-003	\$7,238.00
		086-32-084	\$1,146.00

375	DEMPSEY	088-01-002	\$596.00
335	PARK VICTORIA	088-03-019	\$91.00
	PARK VICTORIA	088-04-062	\$91.00
	DEMPSEY	088-04-076	\$2,082.65
	OLD PIEDMONT	092-34-008	\$91.00
1250	PIEDMONT	092-34-014	\$91.00
2235	URIDIAS RANCH	092-37-050	\$91.00
			\$71,634.88



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Adopt a Resolution Certifying Election Results and Adding the Property Located at 150 Market Street into Community Facilities District No. 2008-1 (Annexation No. 23) (Staff Contact: Steve Erickson, Director of Engineering/City Engineer, 408-586-3301)
Category:	Public Hearings-Community Development
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Following receipt of election results from the Acting City Clerk, adopt a Resolution Certifying Election Results and Adding the Property Located at 150 Market Street into Community Facilities District No. 2008-1 (Annexation No. 23)

BACKGROUND:

On March 20, 2012, the City Council approved a Major Tentative Map (MT11-0002), and on November 17, 2015, approved an amendment to Site Development Permit (SD11-0001) and Conditional Use Permit (UP11-0037) to allow the construction of 4 mixed use buildings with 953 residential units and 98,684 square feet of commercial space on 13.33 acres (District 1); and 200 residential condominium units on 9.68 acres (District 2) located at 1315 – 1600 McCandless Drive. The development includes ancillary lots for private streets and public streets. District 1 is currently being developed in phases with multiple final maps. The current phase of The District 1, Lot 4 Project consists of 213 residential units and 3,480 square feet of commercial space on 2.29 acres located at 150 Market Street (District 1, Lot 4) will be constructed by Milpitas-District 4 Owner, LLC (Developer).

ANALYSIS:

The District 1, Lot 4 Project Tract Map 10476, was filed for record in the office of the recorder of the County of Santa Clara, California on January 24, 2020, in Book 929 of Maps, Pages 5-7). The District 1, Lot 4 Project is subject to annexation into the Community Facilities District No. 2008-1 (CFD 2008-1). The City has on file a Certificate of Registrar of Voters from the County of Santa Clara certifying that there are no registered voters residing within the boundaries of the proposed CFD Annexation No. 23 for this Project. The Developer, Milpitas-District 4- Owner, LLC is the sole property owner, and on August 4, 2022 the property owner voted to agree to the proposed Annexation No. 23 into CFD 2008-1. The resolution attached hereto documents the results of the election on annexation. Annexation into CFD 2008-1 is subject to the provisions of the Mello-Roos Community Facilities Act of 1982, commencing with Section 53311 of the Government Code. While the Act has a number of requirements for annexation and imposition of the special tax, the Developer (as the sole landowner within the annexation territory) has agreed to waive many of the formalities. A copy of the waiver executed by the Developer is on file with the City Clerk.

POLICY ALTERNATIVE(S):

Alternative 1:

Do not adopt a Resolution certifying election results and adding the property located at 150 Market Street into Community Facilities District No. 2008-1 (Annexation No. 23), thereby denying the Annexation of the Project into CFC 2008-1.

Pros: None

Cons: Denying the Annexation No. 23 of Project into the CFD No. 2008-1 would prevent the City from levying special taxes on this parcel to fund the perpetual maintenance of public services and improvements serving this Project.

Reason for Not Recommending: To provide sufficient funding for the perpetual maintenance of improvements and services within CFD No. 2008-1 serving this Project, staff recommends adoption of the resolution certifying the election results and adding Project to CFD 2008-1.

FISCAL IMPACT:

Adding the Property to the CFD No. 2008-1 would allow the City to levy special taxes on this parcel to fund public services to support the development.

California Environmental Quality Act (CEQA):

This project is covered under the scope of activities approved under the Transit Area Specific Plan Environmental Impact Report, SCH2006032091, which was certified by City Council on June 3, 2008. On October 16, 2018, the City Council found that the project is exempt from further environmental review pursuant to CEQA Guidelines Section 15183 (projects consistent with a Community Plan, General Plan or Zoning); CEQA Guidelines Section 15182 (residential projects consistent with a specific plan); and CEQA Guidelines Section 15168 (projects within the scope of a program EIR).

RECOMMENDATION:

Following receipt of election results from the City Clerk, adopt a resolution certifying election results and adding Lot 4 to Community Facilities District No. 2008-1 (Annexation No. 22)

Attachment(s):

Resolution

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS CERTIFYING THE RESULTS OF
AN ELECTION AND ADDING TERRITORY TO COMMUNITY FACILITIES DISTRICT NO. 2008-1
(PUBLIC SERVICES)**

(Annexation No. 23)

WHEREAS, the City Council of the City of Milpitas (the "City Council") has previously formed Community Facilities District No. 2008-1 (Public Services) ("CFD No. 2008-1") pursuant to the Mello-Roos Community Facilities Act of 1982 (the "Act"), as amended, for the purpose of financing certain Public Services; and

WHEREAS, acting pursuant to the Act, the City Council also authorized by the adoption of Resolution No. 8601 (the "Resolution Authorizing Future Annexation") the annexation in the future of territory to CFD No. 2008-1, such territory designated as Future Annexation Area, Community Facilities District No. 2008-1 (the "Future Annexation Area"); and

WHEREAS, at this time the unanimous consent to the annexation of certain territory located within the Future Annexation Area to CFD No. 2008-1 has been received from the property owner of such territory, and such territory has been designated as Annexation No. 23 (the "Territory"); and

WHEREAS, less than twelve (12) registered voters have resided within the Territory for each of the ninety (90) days preceding the election date established for the Territory, therefore, pursuant to the Act the qualified elector of the Territory shall be the "landowner," as such term is defined in Government Code Section 53317(f), of such Territory and such landowner who is the owner of record as of the applicable election date, or the authorized representative thereof, shall have one vote for each acre or portion of an acre of the parcel of land that landowner owns within such Territory; and

WHEREAS, the time limit specified by the Act for conducting an election to submit the levy of the special taxes on the Territory to the qualified elector thereof and the requirements for impartial analysis and ballot arguments have been waived with the unanimous consent of the qualified elector of the Territory; and

WHEREAS, the City Clerk of the City of Milpitas has caused a ballot to be distributed to the qualified elector of the Territory, has received and canvassed such ballot and made a report to the City Council regarding the results of such canvass, a copy of which is attached as **Exhibit A** hereto and incorporated herein by this reference; and

WHEREAS, at this time the measure voted upon and such measure did receive the favorable vote of the qualified elector of the Territory, and the City Council desires to declare the results of the election; and

WHEREAS, a map showing the Territory and designated as Annexation Map No. 23 (the "Annexation Map"), a copy of which is attached as **Exhibit B** hereto and incorporated herein by this reference, has been submitted to this legislative body.

NOW, THEREFORE, the City Council of the City of Milpitas, California, acting as the legislative body of Community Facilities District No. 2008-1, hereby finds, determines and resolves as follows:

1. **Recitals.** The above recitals are true and correct.
2. **Findings.** This legislative body does hereby further determine as follows:
 - A. The unanimous consent as described in the recitals hereto to the annexation of the Territory to CFD No. 2008-1 has been given by the owner of the Territory and such consent shall be kept on file in the Office of the City Clerk of the City of Milpitas.
 - B. Less than twelve (12) registered voters have resided within the Territory for each of the ninety (90) days preceding the election date established for the each of the parcels located within the Territory, therefore, pursuant to the Act the qualified elector for the Territory shall be the "landowner" of the Territory as such term is defined in Government Code Section 53317(f).

- C. The qualified elector of the Territory has voted in favor of the levy of special taxes on the Territory upon its annexation to CFD No. 2008-1.
3. Territory. The boundaries and parcels of property within the Territory and on which special taxes will be levied in order to pay for the costs and expenses of authorized Public Services are shown on the Annexation Map as submitted to and hereby approved by this legislative body.
4. Declaration of Annexation. This legislative body does hereby determine and declare that the Territory, and each parcel therein, is now added to and becomes a part of CFD No. 2008-1. The City Council, acting as the legislative body of CFD No. 2008-1, is hereby empowered to levy the authorized special tax within the Territory.
5. Notice. Immediately upon adoption of this Resolution, notice shall be given as follows:
- A. A copy of the Annexation Map as approved shall be filed in the Office of the County Recorder no later than fifteen (15) days after the date of adoption of this Resolution.
- B. An Amendment to the Notice of Special Tax Lien (Notice of Annexation) shall be recorded in the Office of the County Recorder no later than fifteen (15) days after the date of adoption of this Resolution.
6. Effective Date. This Resolution shall become effective upon its adoption.

PASSED AND ADOPTED this ____ day of _____, 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Suzanne Guzzetta, Interim City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney

EXHIBIT A

CERTIFICATE OF ELECTION OFFICIAL AND STATEMENT OF VOTES CAST

[illegible]

The undersigned, ELECTION OFFICIAL OF THE CITY OF MILPITAS, COUNTY OF SANTA CLARA, STATE OF CALIFORNIA, DOES HEREBY CERTIFY that pursuant to the provisions of Section 53326 of the Government Code and Division 12, commencing with Section 17000 of the Elections Code of the State of California, I did canvass the returns of the votes cast at the

CITY OF MILPITAS
COMMUNITY FACILITIES DISTRICT NO. 2008-1
(PUBLIC SERVICES)
SPECIAL ELECTION
ANNEXATION NO. 23

held on the election date established for each parcel located within the territory included in Annexation No. 23.

I FURTHER CERTIFY that this Statement of Votes Cast shows the whole number of votes cast in the area proposed to be annexed to Community Facilities District No. 2008-1 for or against the Measure are full, true and correct.

VOTES CAST ON PROPOSITION 1: YES _____
NO _____

WITNESS my hand this _____ day of _____, 2022.

SUZANNE GUZZETTA, INTERIM CITY CLERK
ELECTION OFFICIAL
CITY OF MILPITAS
OF THE STATE OF CALIFORNIA

EXHIBIT B
ANNEXATION MAP



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Conduct a Public Hearing, Adopt a Resolution to Adopt the Climate Action Plan Update and the Addendum to the General Plan Environmental Impact Report and Approve a related Budget Amendment (Staff Contact: Elaine Marshall, Deputy Public Works Director, 408-586-2603)
Category:	Public Hearings-Community Services and Sustainable Infrastructure
Meeting Date:	8/9/2022
	<u>Recommendation:</u> (1) Open the public hearing for comments and move to close the hearing; (2) Adopt a Resolution to Adopt the Climate Action Plan Update and the Addendum to the Milpitas General Plan 2040 EIR for the Milpitas Climate Action Plan Update; (3) Approve a Budget Appropriation in the amount of \$150,000 to CIP #3416 for near term implementation of the Climate Action Plan Update.

Background:

The City's Climate Action Plan (CAP) was adopted in May 2013 and was intended to serve as a roadmap to meeting the State's 2020 greenhouse gas (GHG) emissions reduction target (15% below 2005 baseline emissions). The CAP was designed to streamline environmental review of future development projects in the City of Milpitas, and its planning horizon only went as far as 2020.

Since 2013, new studies and reports are showing that climate change is happening faster than anticipated. Many communities, including some nearby, are experiencing extreme weather events such as flooding, prolonged drought, and wildfires. New state targets have been adopted that call for longer term GHG reductions including the most recent Executive Order B-55-18 (signed in September 2018) which sets a goal for the State to achieve carbon neutrality by 2045. Additionally, there are new requirements to increase organics diversion and ensure water is used efficiently.

The City Council approved CIP #3416 to update the CAP as part of the adoption of the 2019-2025 Capital Improvement Program. After a competitive RFP process, on August 4, 2020, the City Council approved a contract with Ascent Environmental Consultants to provide technical support for the CAP Update.

Through the development and implementation of its CAP Update, the City is joining hundreds of other communities across the nation in tackling the challenges posed by climate change. The update process began in fall 2020 with multiple community engagement points throughout 2021 including an online survey, virtual community workshop in May 2020, workshops with Milpitas High school students, and multiple meetings with the Energy and Environmental Sustainability Commission, and City's Executive Steering Committee. The CAP Update aims to meet these long term targets as approved by the State and sets a path for the City to achieve carbon neutrality by 2045. This CAP Update is primarily focused on achieving the 2030 target and aims to make substantial progress in achieving the longer-term 2040 and 2045 targets.

On April 5, 2022, the City Council received an update on the final draft of Climate Action Plan Update and provided some general feedback to staff. On May 11, 2022, the Public Review Draft of the CAP Update was released for public review and comment. The availability of the CAP Update for public review was noticed in the Milpitas Post and publicized through the City's Facebook page, Milpitas Matters, and through the Sustainability newsletter. Presentations and information on the public comment period were made to the

Energy and Environmental Sustainability Commission and the City's Community Development Roundtable. The public comment period closed on June 10, 2022.

Analysis:

During the public comment period, the City received six sets of comments on the CAP Update document, five from Milpitas residents and a letter from the Sierra Club Loma Prieta Chapter. A majority of the comments were administrative corrections or clarifications to the document and can be easily incorporated into the final, published CAP Update. Attachment 2 includes the responses to all the comments received. There are several other comments that relate to accelerating longer term goals and targets. The key emerging themes from those other comments are summarized below:

- Accelerate the 2040 and 2045 targets to achieve additional reductions sooner
- Accelerate goals to fully decarbonize existing buildings sooner
- Establish an End of Flow (of natural gas) by 2040 (or 2035 for commercial buildings and 2040 for residential buildings)
- Announce the end of sales of fossil-fuel vehicles by 2030 or Prepare for the end of sale of Internal Combustion Engine (ICE) cars by 2035 in accordance with California Executive Order N-79-20

These comments regarding accelerating the building and vehicle electrification timelines and targets are commendable, and likely justified, and consistent with some of the feedback shared by Councilmember Phan during the April 5, 2022 City Council meeting. However, the project team believes that the actions, targets, and strategies already included in the CAP Update are necessary to establish and elevate Milpitas community support and buy-in for such aggressive targets and goals. Additionally, while the more aggressive goals and targets are visionary, it is unclear how these targets can be met with current technology and infrastructure and at what costs to the City or community. For these reasons, staff recommends adopting the CAP Update as drafted and following the implementation, monitoring, and regular update process for adapting actions and targets including a review and consideration to accelerate targets and goals dates as suggested at a later time.

The City's priority actions for the next 18 months would not be adjusted even if the more aggressive targets and goals were incorporated as the priority actions are foundational to the building decarbonization/ electrification efforts (e.g., adopting Reach Codes for Electrification of New Construction and increase EV Charging Station Infrastructure Requirements for New Construction) while also raising community awareness and support for electrification of existing buildings and purchases of electric vehicles.

Key Strategies

The CAP Update identifies strategies, measures, and actions that the City will implement to reduce GHG emissions to achieve its emissions reduction targets. These locally based initiatives are organized under six emissions sectors and include descriptions of actions that can be taken for implementation, GHG reduction potential, and associated co-benefits.

The proposed strategies, measures, and actions proposed for inclusion in the CAP Update were developed based on a combination of factors, including the results of the City's GHG emissions inventories and forecasts, robust engagement with the public and stakeholders, feedback from City staff and elected officials, and the best available climate action planning guidance. Ten key strategies have been identified to address the key sources of GHG emissions in our community. The Key Strategies are:

Strategy	Emission Source/Sector
Shift to Clean and Reliable Energy	Building Energy
Maximize Building Decarbonization and Efficiency	Building Energy
Facilitate Sustainable Transportation and Land Use Planning	Transportation
Decarbonize Vehicles	Transportation
Increase Active and Public Transportation Use	Transportation
Achieve Zero Waste	Solid Waste
Shift to Clean Off Road Equipment and Vehicles	Other Sources
Promote Resilient Water Supply, Water Use, and Water Resources	Water and Wastewater
Resilient Infrastructure and Healthy Urban Forest and Natural Systems	Carbon Sequestration
Foster Green Economic Opportunities and Support Circular Economy Policies	All

2022-2025 Actions

Under each Key Strategy are specific measures and actions that define the activities, programs, policies, or projects that the City will implement or support to achieve the CAP Update's goals. This CAP Update identifies ten (10) Key Strategies (see table above), forty-five (45) Measures, and more than 130 potential actions for reducing community GHG emissions. An evaluation process was applied to the extensive list to help prioritize actions for near term implementation. These criteria included GHG emissions reduction potential, cost-effectiveness, technological/implementation feasibility, consistency with existing policies or programs, jurisdictional control, timeframe of implementation, and associated co-benefits, to generate a prioritization score. These 28 actions are further prioritized into which actions will be implemented within the first 18 months after CAP Update adoption. These immediate actions were highlighted during April 5, 2022 City Council Presentation.

Next 18 Month Actions
Adopt an updated reach code for all electric new construction and increase EV charging station standards beyond State requirements. (BE-2.1.1 and TR-2.1.2)
Promote benefits and incentives for clean energy, improved energy efficiency, and electrification of existing buildings. (BE-1.3.2 and BE-2.4.1)
Enforce the City's requirements for SB 743 and continuously Update VMT Policy and Implementation Tools to further reduce VMT (TR-1.1.1)
Incorporate Sustainable Design Measures and incentives into the City's new Zoning Ordinance Update (BE-2.3.1 and TR-1.3.1)
Improve awareness of incentives for low- and zero-emission vehicles and increase EV purchases in Milpitas (TR-2.2.1)
Implement the Milpitas OnDemand "hub-and-spoke" micro-transit pilot program (TR-3.1.1)
Implement the updated Trail, Pedestrian, and Bicycle Master Plan to enhance and expand bicycle and pedestrian infrastructure and networks (TR-3.3.5)
Implement and enforce the requirements of SB 1383 and eliminate disposal of compostable organic materials to landfills (SW-1.1.1)
Based on the recommendations from the City's Urban Forestry Management Plan, implement a tree planting program to expand the city's urban forest canopy (CS-1.1.1 and CS-1.1.2)
Work with partners offer courses/training that prepare students/workers for green jobs (GE-1.1.1)
MUNICIPAL OPERATIONS ACTIONS
Install EV charging and alternative fuel stations at appropriate City sites (MVF-1.1.1)
Update the City's Green Fleet Policy to convert the City's non-specialized fleet to all electric and identify alternative fuel options for other vehicles and equipment (MVF-1.1.3)
Pursue funding to expand solar and back up battery systems to other City facilities such as PW/PD, City Hall, Sports Center (MBL-1.2.2)

Inventory and develop strategy to retrofit existing municipal buildings and facilities to be all-electric (MBL-3.1.2)
Enhance and expand waste reduction policies and programs for City facilities (MSW-1.1.1 and MSW-2.1.3)
Use resource efficient landscaping techniques in new or renovated medians and parks (MWA-1.1.4)

Fiscal Impact:

Staff estimates that up to \$150,000 is needed to support near term CAP implementation over the next 18 months as discussed during the April 5, 2022 City Council presentation. This funding is needed to bring on a sustainability fellow to support CAP implementation and coordination as well as funding for technical consultant support to develop a municipal facilities electrification strategy. Funding is available in the Unrestricted General Fund Reserve.

Ongoing implementation of the CAP Update and associated costs will be brought forward for City Council consideration as more programs and policies are developed. Additionally, Staff will pursue grant funding opportunities to support CAP implementation as opportunities are announced. This includes recent grant funding opportunities available through Silicon Valley Clean Energy, State of California, and federal funding opportunities.

California Environmental Quality Act:

To achieve compliance with CEQA guidelines, staff prepared the California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) Addendum (Addendum) to the Milpitas General Plan Update EIR (Milpitas GP EIR; State Clearinghouse No. 2020070348). The City adopted the Milpitas GP EIR on March 9, 2021.

The General Plan 2040 EIR is a program EIR that considers the environmental effects of implementing the General Plan through the 20-year planning horizon. Among the proposed policies and actions evaluated in the General Plan 2040 EIR, Action CON-1a required the City to update the City's Climate Action Plan (CAP) to achieve the greenhouse gas (GHG) reduction targets for 2030 and 2050. This update to the CAP has been prepared and was released for public review in May of 2022.

As demonstrated in this Addendum (Attachment 3), the proposed CAP would not change any of the conclusions of the General Plan 2040 EIR. The analysis demonstrates that implementation of the proposed CAP would not result in new significant effects or a substantial increase in the severity of previously identified significant effects. Further, no new information of substantial importance has been identified that suggests the potential for the CAP to result in significant or substantially more severe effects not discussed in the General Plan 2040 EIR. A Public Hearing Notice regarding the City Council's proposal adoption of this Addendum was posted in designated locations and published in the Milpitas Post on July 29, 2022.

Recommendation:

1. Open the public hearing for comments and move to close the hearing;
2. Adopt a Resolution to Adopt the Climate Action Plan Update and the Addendum to the Milpitas General Plan 2040 EIR for the Milpitas Climate Action Plan Update;
3. Approve a Budget Appropriation in the amount of \$150,000 to CIP #3416 for near term implementation of the Climate Action Plan Update.

Attachments:

1. Summary of Response to Comments Received on the Public Review Draft of the Climate Action Plan Update
2. Addendum to the Milpitas General Plan 2040 EIR for the Milpitas Climate Action Plan Update
3. Resolution
4. [Public Review CAP Update](#)
5. Budget Change Form to Appropriation \$150,000 for CIP #3416

ADDENDUM TO THE MILPITAS GENERAL PLAN 2040 EIR FOR THE Milpitas Climate Action Plan Update



Prepared for:



City of Milpitas

June 2022

Addendum to the Milpitas General Plan 2040 EIR for the Milpitas Climate Action Plan Update

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ADDENDUM TO THE MILPITAS GENERAL PLAN UPDATE ENVIRONMENTAL IMPACT REPORT FOR THE CITY OF MILPITAS CLIMATE ACTION PLAN UPDATE

State Clearinghouse Number 2020070348

BACKGROUND AND ACTION TRIGGERING THE ADDENDUM

This document serves as an addendum to the Final Environmental Impact Report for the City of Milpitas's General Plan Update (General Plan 2040 EIR). The General Plan 2040 EIR is a program EIR that considers the environmental effects of implementing the General Plan through the 20-year planning horizon. Among the proposed policies and actions evaluated in the General Plan 2040 EIR, Action CON-1a required the City to update the City's Climate Action Plan (CAP) to achieve the greenhouse gas (GHG) reduction targets for 2030 and 2050. This update to the CAP has been prepared and was released for public review in May of 2022.

As the lead agency under the California Environmental Quality Act (CEQA), the City of Milpitas has determined that, in accordance with Section 15164 of the State CEQA Guidelines, the adoption and implementation of the proposed Climate Action Plan Update warrants the preparation of an addendum. This addendum supplements the General Plan 2040 EIR analysis and evaluates the specific GHG reduction and climate change adaptation measures and strategies in the CAP for potential to change the conclusions of the General Plan 2040 EIR.

CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES REGARDING AN ADDENDUM TO AN ENVIRONMENTAL IMPACT REPORT

Altered conditions, changes, or additions to the description of a project that occur after certification of an EIR may require additional analysis under CEQA. The legal principles that guide decisions regarding whether additional environmental documentation is required are provided in the State CEQA Guidelines, which establish three mechanisms to address these changes: a Subsequent EIR, a Supplement to an EIR, and an Addendum to an EIR.

Section 15162 of the State CEQA Guidelines describes the conditions under which a Subsequent EIR would be prepared. In summary, when an EIR has been certified for a project, no Subsequent EIR is required unless the lead agency determines, on the basis of substantial evidence in 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 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 as complete, 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 measures or alternatives; 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.

Section 15163 of the State CEQA Guidelines states that a lead agency may choose to prepare a Supplement to an EIR rather than a Subsequent EIR if:

(1) any of the conditions described above for Section 15162 would require the preparation of a Subsequent EIR; and

(2) only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation.

An addendum is appropriate where a previously certified EIR has been prepared and some changes or revisions to the project are proposed, or the circumstances surrounding the project have changed, but none of the changes or revisions would result in significant new or substantially more severe environmental impacts, consistent with CEQA (Public Resources Code [PRC]) Section 21166 and State CEQA Guidelines Sections 15162, 15163, 15164, 15168, and 15183.

This addendum includes an attachment with an environmental checklist that contains the substantial evidence supporting that the proposed CAP update would not result in any new or substantially more severe environmental impacts from those identified in the General Plan 2040 EIR. This addendum and checklist serve as the appropriate CEQA compliance document and have been prepared consistent with the requirements of Section 15162 of the State CEQA Guidelines. To ensure that all environmental topical areas are appropriately evaluated, the environmental checklist was prepared to mirror the standard organization of the sample environmental checklist presented in Appendix G of the State CEQA Guidelines. For each checklist topic, the analysis evaluates whether any "changed condition" (i.e., changed circumstances, project changes, issues that are peculiar to the project, or new information of substantial importance) that may result in a different or new environmental impact significance conclusion from the EIR would occur. The column titles of the checklist have been modified from the Appendix G presentation to help answer the questions to be addressed pursuant to PRC Section 21166 and State CEQA Guidelines Sections 15162, 15163, 15164, 15168, and 15183. Through this detailed analysis, the City has demonstrated that implementation of the proposed CAP would not result in new or substantially severe impacts than disclosed in the General Plan 2040 EIR.

SUMMARY OF FINDINGS

The environmental checklist for this Addendum provides analysis and discussion of potential environmental impacts of the proposed CAP, based on the checklist questions from Appendix G of the State CEQA Guidelines. As demonstrated in this Addendum, the proposed CAP would not change any of the conclusions of the General Plan 2040 EIR. The analysis demonstrates that implementation of the proposed CAP would not result in new significant effects or a substantial increase in the severity of previously identified significant effects. Further, no new information of substantial importance has been identified that suggests the potential for the CAP to result in significant or substantially more severe effects not discussed in the General Plan 2040 EIR.

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LIST OF ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ADWF	average dry weather flow
af/yr	acre-feet per year
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BAU	Business-as-usual
CAP Update	City of Milpitas's Climate Action Plan Update
CAP	Climate Action Plan
CBSC	California Building Standards Code
CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
EO	Executive Orders
General Plan 2040 EIR	City of Milpitas's General Plan Update
GHG	greenhouse gas
MS4	municipal separate storm sewer
MTCO _{2e}	metric tons of carbon dioxide equivalent
PM ₁₀	respirable particulate matter
PM _{2.5}	fine particulate matter
PRC	Public Resources Code
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
SOI	sphere of influence
SVCE	Silicon Valley Clean Energy
TDM	Transportation demand management
UWMP	Urban Water Management Plan
VMТ	vehicle miles traveled
WSCP	Water Shortage Contingency Plan

1 INTRODUCTION

The City of Milpitas Climate Action Plan (CAP), adopted by the City Council in May 2013, was intended to serve as a roadmap to meeting the State's 2020 greenhouse gas (GHG) emissions reduction target pursuant to Assembly Bill (AB) 32 (i.e., 15 percent below 2005 emissions levels based on available city emissions inventory data). The CAP was designed to streamline environmental review of future development projects in the city consistent with State CEQA Guidelines Section 15183.5(b) and the Bay Area Air Quality Management District's (BAAQMD's) CEQA [California Environmental Quality Act] Air Quality Guidelines.

Since adoption of the CAP, the City has implemented over half of the identified actions along with other actions that have resulted in an overall reduction in communitywide GHG emissions. Some of the contributing factors to the decrease in GHG emissions include the availability of carbon-free electricity in Milpitas through participation in Silicon Valley Clean Energy (SVCE), installation of local solar, changes in development trends, and the opening of the Milpitas Bay Area Rapid Transit (BART) station in late 2020. Through implementation of both local and state actions, the City achieved its 2020 GHG emissions reduction target ahead of schedule.

As originally adopted, the CAP was not designed to address GHG reduction targets beyond 2020, including 40 percent below 1990 levels by 2030 (consistent with Senate Bill [SB] 32) or the long-term GHG reduction targets expressed in Executive Orders (EOs) S-3-05 (i.e., 80 percent below 1990 levels by 2050) and B-55-18 (i.e., achieving carbon neutrality no later than 2045). In addition, the CAP growth projections were based on data sources that are now outdated: population and employment factors were derived from the Association of Bay Area Governments' (ABAG's) 2009 regional forecasts, and vehicle miles traveled (VMT) was derived from the Milpitas Travel Forecasting Model, which was based on land use designations included in the Transit Area Specific Plan (adopted June 2008) and the Midtown Specific Plan (amended October 2008). The specific plans and ABAG regional forecasts have all been updated since the CAP was adopted.

Additionally, the Milpitas City Council adopted an update to the General Plan on March 9, 2021 (referred to as "General Plan 2040"). General Plan 2040 identifies the community's vision for the future and provides a framework that will guide decisions on growth, development, and conservation of open space and resources in a manner that is consistent with the quality of life desired by the city's residents and businesses through the horizon year of 2040. The City prepared and certified an Environmental Impact Report (EIR) (State Clearinghouse No. 2020070348) for General Plan 2040 that evaluated the environmental impacts associated with development of land uses and implementation of planning efforts as regulated and guided by General Plan 2040. Among the proposed policies and actions evaluated in the General Plan 2040 EIR, Action CON-1a required the City to update the City's CAP to achieve the GHG reduction targets for 2030 and 2050.

The City of Milpitas's Climate Action Plan Update (CAP Update) was released for public review in May of 2022. The CAP Update outlines a pathway to achieve GHG emissions reductions of 36 percent below 2019 levels by 2030 (meeting the State's interim target) and carbon neutrality by 2045. The CAP Update identifies 11 strategies and 38 measures that specify a plan of action to reduce GHG emissions across all sectors. The strategies, measures, and actions complement the General Plan 2040 policy framework by promoting clean electricity, decarbonizing transportation and buildings, encouraging sustainable land use and resource management, enhancing community awareness, and enhancing community resilience to climate change. The City of Milpitas, as the lead agency, proposes to adopt the CAP Update, including strategies, measures, and actions that would apply to all property located within the city.

1.1 ADDENDUM ANALYSIS

The General Plan 2040 EIR (consisting of the Draft EIR and Final EIR) is a program EIR that considered the environmental effects from the 2040 buildout scenario. Consistent with PRC)Section 21083.3(b) and State CEQA Guidelines Section 15168 and 15183, the General Plan 2040 EIR can be used as the CEQA document for subsequent

projects (public and private) consistent with General Plan 2040. As projects are proposed, such as the CAP Update, they are evaluated to determine whether the actions proposed fall within the scope of the General Plan 2040, whether project impacts are addressed in the certified General Plan 2040 EIR, and whether the project incorporates all applicable performance standards and mitigation measures identified therein. Should subsequent projects not be consistent with the approved General Plan 2040, or if there are specific significant effects that are peculiar to the project and cannot be addressed by uniformly applied policies or standards, additional environmental review through the subsequent review provisions of CEQA for changes to previously reviewed and approved projects may be warranted. If an impact is not peculiar to the project, has been addressed as a significant effect in the General Plan 2040 EIR, or can be substantially mitigated by the imposition of uniformly applied policies or standards, then an additional EIR need not be prepared for the project solely based on that impact.

This Addendum supplements the General Plan 2040 EIR analysis and evaluates the specific GHG reduction and climate change adaptation measures and strategies in the CAP Update for potential to change the conclusions of the General Plan 2040 EIR. The analysis in this Addendum remains programmatic; it does not specifically analyze individual projects or actions resulting from implementation of the CAP Update because the details of such projects and actions are not available (e.g., specific location of infrastructure). Specific GHG reduction measures or strategies would require subsequent implementing action by the City. The City would implement specific activities proposed under the CAP Update (i.e., "later activities"), determining whether they are consistent with the activities identified in the CAP Update, and determining whether sufficient evaluation of the potential environmental impacts associated with these later activities has been provided in the General Plan 2040 EIR and this Addendum. These later activities would be examined to determine whether an additional environmental document must be prepared. During this examination, if the City finds pursuant to State CEQA Guidelines Section 15162 that no new significant effects would occur or no new mitigation measures would be required on a subsequent project, the activity can be approved as being within the scope of the project covered by the General Plan 2040 EIR and this Addendum. In this situation, the City must incorporate all applicable requirements from the General Plan 2040 EIR into the later activity to address significant or potentially significant effects on the environment. If a subsequent project or later activity would have significant effects that were not examined in the General Plan 2040 EIR and this Addendum, the City would prepare the appropriate environmental document. If an additional environmental document is needed, whether it is a mitigated negative declaration or a Supplement to the General Plan 2040 EIR, the General Plan 2040 EIR and this Addendum can be used to simplify the task of preparing the follow-up environmental document by allowing the City to focus on the issues that were not previously addressed in the General Plan 2040 EIR and this Addendum, as indicated in State CEQA Guidelines Section 15168(d).

1.1.1 Tiering and Streamlining the Analysis of Greenhouse Gas Emissions for Future Projects

The CAP Update meets the requirements for a GHG reduction plan set forth in Section 15183.5(b)(1) of the State CEQA Guidelines. Therefore, if adopted, it could be used to streamline the analysis of GHG emissions for future projects (known as a "qualified CAP"). As established in Section 15183.5 of the State CEQA Guidelines, a plan to reduce GHG emissions (i.e., the proposed CAP Update) may be used as the basis of future project-level analyses of GHG emissions impacts. Where subsequent projects use CAP Update compliance as the basis for the analysis of potential impacts due to GHG emissions, they would tier from and/or incorporate by reference the programmatic GHG analysis in the General Plan 2040 EIR and this Addendum.

CAP Update compliance would be determined through completion of the CAP Update Consistency Review Checklist, which provides a process for subsequent development projects to demonstrate how they would be consistent with the CAP Update (i.e., they would not hinder attainment of the City's 2030 GHG reduction target). An environmental document that relies on the CAP Update for analysis of GHG emissions impacts would be required to identify the requirements in the CAP Update that apply to the project and incorporate those requirements as mitigation measures, if not otherwise binding and enforceable. In turn, "a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the

requirements in a previously adopted plan” (State CEQA Guidelines Section 15183.5[b][2]). Streamlining the GHG analysis based on CAP Update consistency does not affect the obligation to address potential effects on other resource areas during project-level environmental review. Projects that are not consistent with the CAP Update would be subject to separate technical analysis and project mitigation.

BAAQMD encourages jurisdictions to adopt local GHG reduction strategies that meet the Section 15183.5(b)(1) criteria and recommends that cities and counties evaluate plans “based on whether they will be consistent with California’s long-term climate goal of achieving carbon neutrality by 2045. To be consistent with this goal, these plans should reduce GHG emissions in the relevant jurisdiction to meet an interim milestone of 40 percent below the 1990 emission level by 2030, consistent with SB 32, and to support the State’s goal of carbon neutrality by 2045” (BAAQMD 2022:3). This approach to local climate planning, tied to the SB 32 and carbon neutrality goals, promotes reductions on a plan level without impeding the implementation of GHG-efficient development. A qualified CAP provides the evidentiary basis for making CEQA findings that development consistent with the plan will result in feasible, measurable, and verifiable GHG reductions consistent with broad State goals such that projects approved under the plan will achieve their “fair share” of GHG emission reductions (BAAQMD 2022:21).

1.1.2 Document Organization

This Addendum is organized as follows:

- ▶ **Section 1: Introduction.** This section introduces the environmental review process. It describes the purpose and organization of the analysis and presents a summary of findings.
- ▶ **Section 2: Project Description.** This section provides a brief description of the proposed CAP Update.
- ▶ **Section 3: Environmental Checklist for Supplemental Environmental Review.** This section presents an analysis of a range of environmental issues to determine whether the environmental impacts of the CAP Update meet any of the following four conditions:
 - Are peculiar to the project or the area in which the project would be located,
 - Were not analyzed as significant effects in the General Plan 2040 EIR,
 - Are potentially significant off-site impacts and cumulative impacts which were not addressed in the General Plan 2040 EIR, or
 - Are previously identified significant effects which are determined to have a more severe adverse impact than discussed in the General Plan 2040 EIR based on substantial new information that was not known at the time the General Plan 2040 EIR was certified.
- ▶ **Section 4: References.** This section lists the references used in preparation of this Addendum.

1.1.3 Summary of Findings

The Environmental Checklist for this Addendum provides analysis and discussion of potential environmental impacts of the proposed CAP Update, based on the checklist question from Appendix G of the State CEQA Guidelines. The analysis demonstrates that implementation of the proposed CAP Update would not result in new significant effects or a substantial increase in the severity of previously identified significant effects. Further, no new information of substantial importance has been identified that suggests the potential for the CAP Update to result in significant or substantially more severe effects not discussed in the previous EIR.

2 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

The City of Milpitas's CAP Update is designed to be as a comprehensive roadmap to continue addressing the challenges of climate change and keep the City on its path to carbon neutrality by 2045. The CAP Update is the product of extensive and ongoing engagement with residents, businesses, local government, and other organizations and stakeholders. These extensive community engagement efforts have resulted in locally based and context-specific strategies, measures, and actions designed to achieve the City's climate objectives while simultaneously enhancing the quality of life for Milpitas's residents, workers, and visitors.

2.2 PROJECT LOCATION

As shown in Figure 2-1, the City of Milpitas encompasses approximately 18 square miles, extending between the south end of the San Francisco Bay and the Los Buellis Hills of the Mount Diablo Range in northern Santa Clara County. Milpitas is often called the "Crossroads of Silicon Valley" with most of its land situated between major freeways (Interstates 880 and 680), State Route 237, and a county expressway. The Planning Area for the CAP Update is the same Planning Area that was considered by General Plan 2040 EIR and includes both the area within the city and the sphere of influence (SOI).

2.3 PROJECT DESCRIPTION

Reducing GHG emissions in California has been the focus of state government for over two decades. GHG emissions targets established by the State Legislature include reducing statewide GHG emissions to 1990 levels by 2020 (Assembly Bill [AB] 32 of 2006) and to 40 percent below 1990 levels by 2030 (SB 32 of 2016). EO S-3-05 calls for reducing statewide GHG emissions to 80 percent below 1990 levels by 2050. EO B-55-18 calls for California to achieve carbon neutrality no later than 2045 and to achieve and maintain net negative GHG emissions thereafter. These targets are in line with the scientifically established levels needed in the US to limit the rise in global temperature to no more than 2 degrees Celsius, the warming threshold at which major climate disruptions, such as super droughts and rising sea levels, are projected; these targets also pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius (United Nations 2015:3).

The City of Milpitas has demonstrated an ongoing commitment to reducing GHG emissions. The City adopted a CAP in 2013; and, through implementation of both local and state actions, the City achieved its 2020 GHG emissions reduction target ahead of schedule. Key achievements since adoption of the CAP include the City's communitywide organics and food scraps diversion program; the updated the Milpitas Trail, Pedestrian, and Bicycle Master Plan; the innovative Milpitas OnDemand pilot project; and adoption of plans and guidelines to improve water security and increase urban green space. The City of Milpitas also played an integral role in the launch of SVCE, a community choice aggregator that provides carbon-free electricity to the city and surrounding communities. The City achieved a historic milestone in 2018 when nearly all residents and businesses in the city began receiving carbon-free electricity from SVCE.

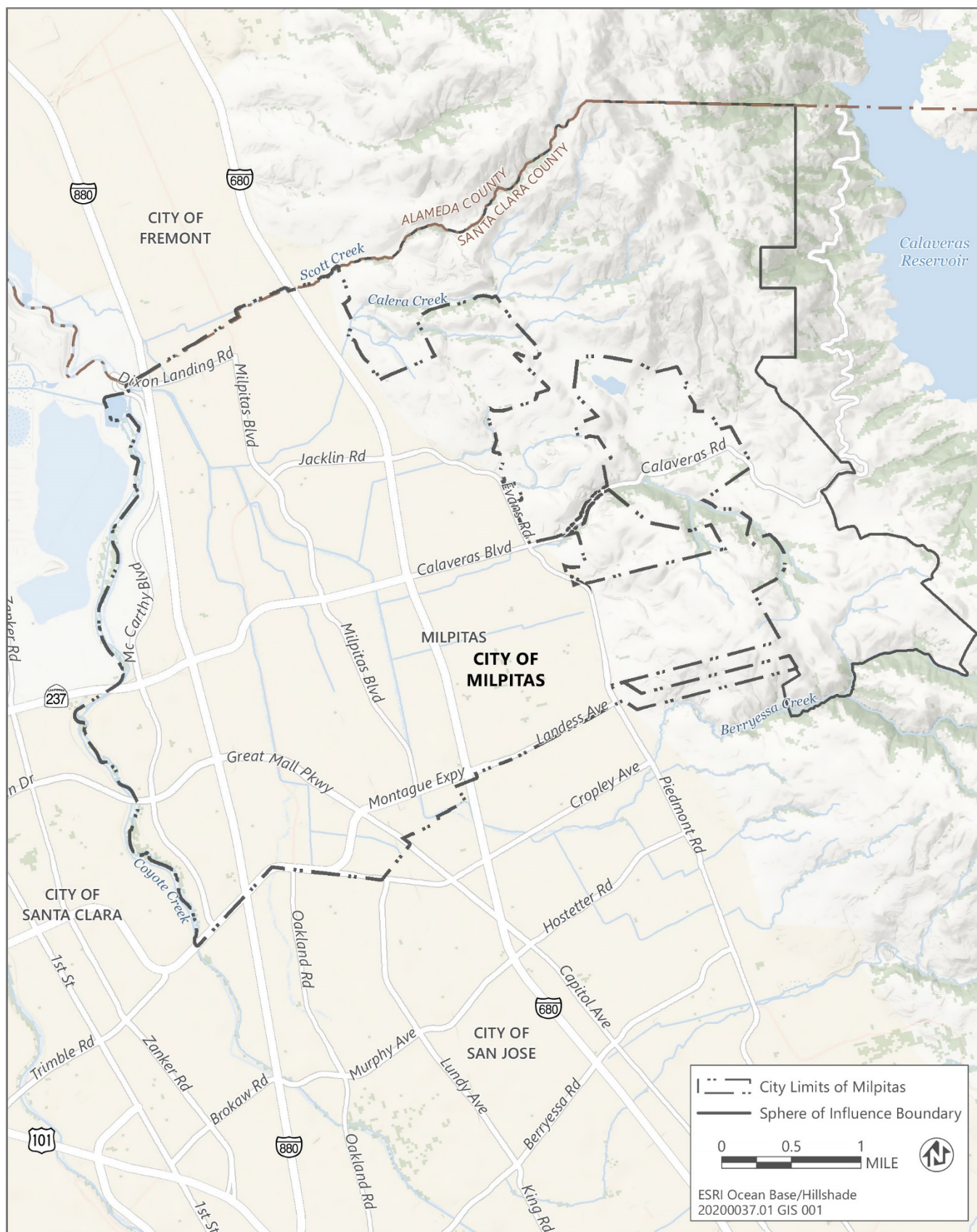


Figure 2-1 Project Area

Although the CAP helped the City exceed the State's 2020 GHG emissions reduction target, it was not designed to address State reduction targets for 2030, 2045, or 2050. As a result, General Plan 2040 (adopted by the Milpitas City Council on March 9, 2021) includes Action CON-1a, which required the City to update the City's CAP to achieve the GHG reduction targets for 2030 and 2050. The CAP Update was released for public review in May of 2022. The CAP Update outlines a pathway to achieve GHG emissions reductions of 36 percent below 2019 levels by 2030 (meeting the State's interim target) and carbon neutrality by 2045. The CAP Update identifies 11 strategies and 38 measures that specify a plan of action to reduce GHG emissions across all sectors. The strategies, measures, and actions complement the General Plan 2040 policy framework by promoting clean electricity, decarbonizing transportation and buildings, encouraging sustainable land use and resource management, enhancing community awareness, and enhancing community resilience to climate change. The City of Milpitas, as the lead agency, proposes to adopt the CAP Update, including strategies, measures, and actions that would apply to all property located within the city.

The following sections describe the project, including the contents of the CAP Update.

2.3.1 Climate Action Plan Update

The CAP Update is developed to be consistent with state legislation and policies that are aimed at reducing statewide GHG emissions. This includes:

- ▶ SB 32, which established a mid-term target of reducing statewide GHG emissions to 40 percent below 1990 levels by 2030; and
- ▶ Executive Order B-55-18, which recommends achieving statewide carbon neutrality no later than 2045, and net negative emissions thereafter.

To develop the strategies, measures, and actions in the CAP Update, the City analyzed its updated baseline 2019 GHG emissions, forecasted future emissions while accounting for growth projections aligned with General Plan 2040, modeled impacts of existing policies and programs, and determined future scenarios for GHG emissions to estimate how emissions can be reduced through climate action. Based on this analysis, the CAP Update aims to achieve the following GHG reduction targets:

- ▶ 36 percent below 2019 levels by 2030,
- ▶ 79 percent below 2019 levels by 2040, and
- ▶ Carbon neutrality by 2045.

To achieve these GHG reduction targets, the CAP Update accounts for actions taken by state and federal agencies and existing City initiatives including continued implementation of the CAP reduction measures, SVCE's carbon-free electricity supply, and the organics and food scraps diversion program. The CAP Update identifies several sector-based strategies, measures, and actions that can be implemented locally by the City or others. The City plans to begin implementing the measures and actions upon adoption, and data tracking will begin the following year. As measures are implemented, the effects on emissions trends in the city will necessitate CAP Update maintenance and updates to ensure relevancy and effectiveness.

CAP UPDATE CONTENTS

The CAP Update contains an executive summary and seven chapters, which are briefly summarized below.

- ▶ **Chapter 1. Introduction:** This chapter discusses the scientific climate change context for which the CAP Update was prepared, how the CAP Update was developed, existing initiatives at the state, regional, and local levels, and community engagement during the CAP Update development process.
- ▶ **Chapter 2. Greenhouse Gas Emissions Inventory, Forecasts, and Targets:** This chapter sets the foundation for the CAP Update by describing current and forecasted GHG emissions and reduction targets. It summarizes the City's

emissions inventories and provides a framework for evaluating and addressing the community's contribution to climate change.

- ▶ **Chapter 3. Municipal Operations Emissions:** This chapter summarizes the City's GHG inventory and forecasts for municipal operations and outlines the reduction targets.
- ▶ **Chapter 4. Greenhouse Gas Reduction Strategies and Measures:** This chapter presents the strategies and measures that the City will implement to reduce GHG emissions to achieve its reduction targets.
- ▶ **Chapter 5. Making Milpitas Climate Ready:** This chapter describes the context of climate change adaptation and resilience for the city. It summarizes the city's exposure to existing hazards, sensitivity to these hazards, and discusses potential climate-related impacts to the city's population and key resources, as well as strategies and measures to adapt to climate-related impacts.
- ▶ **Chapter 6. Implementation and Monitoring:** This chapter outlines actions the City will take to implement the CAP Update strategies and measures, and it describes the process for assessing and monitoring progress over time to ensure the CAP Update is effective in reducing emissions and improving resilience to climate change.
- ▶ **Chapter 7. References:** This chapter compiles all references used in the previous chapters of the CAP Update.

BASELINE AND FORECAST GREENHOUSE GAS EMISSIONS

Inventory

A community GHG emissions inventory is an estimate of a defined set of gases emitted to the atmosphere from local or regional sources that contribute to climate change. The CAP Update uses an emissions inventory from 2019 as the baseline. The City's 2019 GHG inventory was guided by the protocols outlined in ICLEI—Local Governments for Sustainability's *U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions*, Version 1.2 (ICLEI 2019).

In 2019, Milpitas generated approximately 441,557 metric tons of carbon dioxide equivalent (MTCO₂e), representing a 19 percent decrease from 2005 levels. Prior to the availability of carbon-free electricity from SVCE, electricity and natural gas consumption in buildings accounted for almost the same proportion of the inventory as on-road transportation, 44 percent and 47 percent, respectively (as shown in the 2015 community inventory). Following the availability of SVCE-supplied electricity in 2018, 97 percent of Milpitas's residents and businesses were purchasing carbon-free electricity through SVCE. Electricity and natural gas consumption dropped to 32 percent of the community inventory in 2019, while on-road transportation increased to 59 percent. The 2019 community GHG inventory is shown in Table 2-1.

Table 2-1 Milpitas 2019 Community Greenhouse Gas Emissions Inventory

Emissions Sector	GHG Emissions (MTCO ₂ e/year)	Percent of Total
On-Road Transportation	259,627	59
Nonresidential Building Energy	98,319	22
Residential Building Energy	42,218	10
Solid Waste	23,566	5
Off-Road Vehicles and Equipment	15,554	4
Wastewater Treatment	1,578	<1
Water Supply	694	<1
Total	441,557	100

Note: Columns may not sum to totals due to independent rounding.

MTCO₂e = metric tons of carbon dioxide equivalent

Source: City of Milpitas 2022.

Forecasts

GHG emissions forecasts provide an estimate of future GHG levels based on a continuation of current trends in activity, population and job growth, and relevant regulatory actions adopted by federal, State, and regional agencies (i.e., legislative actions). Emissions forecasts provide insight into the scale of local reductions needed to achieve GHG emissions reduction targets. The following scenarios were developed to support the CAP Update:

- ▶ **Business-as-usual (BAU) forecast:** analyzes how emissions will grow if per capita consumption trends continue and efficiencies remain at their 2019 levels, while the number of jobs, households, and people in Milpitas continues to grow. The BAU analysis incorporates the demographic projections
- ▶ **Legislative-adjusted BAU forecast:** analyzes how emissions will change under the impact of state and federal policies currently in place that are expected to significantly reduce GHG emissions in Milpitas.
- ▶ **Target reduction path:** identifies the path to meet the State's 2030 GHG reduction target of 40 percent below 1990 levels. This path shows emissions reductions over the coming decades but does not show a substantiated path to meeting the statewide carbon neutrality target by 2045.

Local Emissions Gap

The CAP Update contains strategies, measures, and actions that are designed to address the GHG gap between the legislative-adjusted BAU forecast and the target reduction path, as shown in Table 2-2 below.

Table 2-2 Milpitas Community Greenhouse Gas Local Emissions Gap (MTCO₂e)

Emissions Forecast	2019	2030	2040	2045
Business-as-Usual	441,557	502,207	534,465	555,142
Legislative-Adjusted Business-as-Usual	441,557	420,636	396,629	395,432
Target Percent Reduction below 2019 Levels	—	36%	79%	100%
Target Annual Emissions	—	283,817	994,606	0
Local Emissions Gap	—	136,819	302,023	395,432
Total Reductions from Measures	—	147,697	251,999	331,780
Remaining Gap to Target	—	(10,878) ¹	50,024	63,651
Target Met?	—	Yes	No	No

Notes: MTCO₂e/year = metric tons or carbon dioxide equivalent.

¹ Indicates target has been achieved with a surplus of reductions.

Source: City of Milpitas 2022

GREENHOUSE GAS REDUCTION AND ADAPTATION STRATEGY

The CAP Update includes a strategic framework that lays out the pathway to achieve the 2030 target and make substantial progress towards the long-term 2040 and 2045 targets. The framework includes the following elements:

- ▶ **Focus areas:** seven focus areas for GHG mitigation and six focus areas for climate adaptation.
- ▶ **Strategies:** 11 strategies organized into seven sectors: building energy, transportation and land use, waste, off-road vehicles and equipment, water and wastewater, carbon sinks, and circular and green economy.
- ▶ **Measures:** 38 measures that represent specific expressions of the broad strategies across all seven sectors.
- ▶ **Actions:** Activities, programs, policies, or projects the City will implement or support to achieve the CAP Update targets, associated with the measures.
- ▶ **Near-term actions:** 28 actions that will be implemented in the 3 to 5 years after the CAP Update is adopted, along with the actions that will be implemented in the first 18 months after adoption.

Refer to Table 2-3 for a complete set of strategies, measures, and actions included in the CAP Update. The CAP Update does not include any development proposals and would not directly result in physical environmental effects due to the construction and operation of facilities.

IMPLEMENTATION STRATEGY, MONITORING, AND UPDATES

Ensuring that the measures identified in the CAP Update result in emissions reductions and resilience improvements is central to the success of this CAP Update. The City would begin implementing CAP Update measures and actions upon adoption, and data tracking would begin in the year following. As measures are implemented, the effects on emissions trends and climate resilience in the city would necessitate CAP Update maintenance and updates to ensure relevancy and effectiveness. The CAP Update would be subject to ongoing management and oversight. The City's GHG emissions inventory and vulnerability assessment would be updated to gauge progress over time.

City staff would evaluate the performance of each GHG reduction action that has been implemented. This entails monitoring the level of community participation, costs, benefits, effectiveness, and barriers to implementation, as well as actual reductions in activities that result in GHG emissions. In addition to considering these factors, assessing the performance of CAP Update adaptation actions would be informed by resilience-related improvements in the community. By evaluating whether the implementation of an action is on track to achieve its objective, the City can identify successful actions and reevaluate or replace underperforming measures.

City staff will prepare a monitoring report annually and a GHG emissions inventory and vulnerability assessment update every 2 to 3 years. This report will provide updates on CAP Update progress, including the status of actions implemented to achieve GHG reductions and improve resilience, as well as other important milestones in the CAP Update implementation process. As technologies and markets change and the City implements the actions in the CAP Update, these reports will be used to track progress and identify actions that need to be improved, adjusted, or removed. The report will also be used for periodic presentations to the City Council and Energy and Environmental Sustainability Commission about implementation progress on actions and overall progress towards CAP Update objectives. The report would also serve to provide transparency and promote engagement with the public for CAP Update implementation. The report would be derived from the tracking metrics included on the online dashboard that the City has developed.

Finally, the City would prepare an update to the plan every 5 years, beginning in 2026. Updates would reflect the findings and recommendations of the monitoring reports and inventory updates. Future updates are necessary to account for any new State or federal legislation that may affect the CAP Update, and to focus on GHG reduction measures and actions that may have been difficult to implement previously due to a lack of available technologies or high upfront implementation costs.

CAP UPDATE CONSISTENCY REVIEW CHECKLIST

The City has prepared a CAP Update Consistency Review Checklist that provides a process and evidence by which subsequent development projects would demonstrate how they would be consistent with the CAP Update (i.e., they would not hinder attainment of the 2030 reduction target). An environmental document that relies on the CAP Update for analysis of GHG emissions impacts would be required to identify the requirements in the CAP Update that apply to the project and incorporate those requirements as mitigation measures, if not otherwise binding and enforceable. Projects that are not consistent with the CAP Update would be subject to separate technical analysis and project mitigation.

2.4 POTENTIAL PERMITS AND APPROVALS REQUIRED

The City is the CEQA lead agency responsible for adoption and implementation of the proposed CAP Update. As the lead agency, the City is responsible for considering the adequacy of the supplemental environmental review before determining if the overall project should be adopted.

Table 2-3 Milpitas CAP Update Strategies, Measures, and Actions

Measures	Actions
Strategy BE-1: Shift to Clean and Reliable Energy	
BE-1.1: Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.	▶ BE-1.1.1: Require new development to install onsite renewable energy and storage systems capable of meeting anticipated building energy consumption, or participate in a group-buy solar and storage program, or opt in to SVCE's carbon-free electricity option. ▶ BE-1.1.2: Review zoning regulations for opportunities to simplify and encourage the installation of renewable energy systems. ▶ BE-1.1.3: Conduct outreach to residents and business owners to increase awareness of SVCE's carbon-free electricity supply. ▶ BE-1.1.4: Require all newly built parking structures to have solar generation capabilities. ▶ BE-1.1.5: Collaborate with the Milpitas Chamber of Commerce and other partners to identify regional programs that could provide necessary financial arrangements to facilitate the use of PPAs for residential and nonresidential buildings. Work with SVCE to provide a cost-effective direct access program. ▶ BE-1.1.6: Require the installation of solar heaters for all new swimming pools. ▶ BE-1.1.7: Work with utility partners (e.g., PG&E, SVCE, state regulators) to improve electric grid reliability.
BE-1.2: Facilitate innovative approaches to energy generation, distribution, and storage (e.g., microgrids).	▶ BE-1.2.1: Consider opportunities for alternative energy generation, energy recapture (in-conduit hydro, co-generation), and distributed energy storage systems. ▶ BE-1.2.2: Collaborate with SVCE to encourage local schools and hospitals to develop microgrids, separate from utility-scale storage systems.
BE-1.3: Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.	▶ BE-1.3.1: Work with regional partner agencies and utilities, such as BAAQMD, PG&E, and SVCE to promote State rebates and other incentives and funding opportunities for renewable energy. ▶ BE-1.3.2: Develop and implement a comprehensive energy efficiency, energy conservation, electrification, and clean energy outreach and education campaign to support emissions reductions from building energy use.
Strategy BE-2: Maximize Building Decarbonization and Efficiency	
BE-2.1: Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.	▶ BE-2.1.1: Adopt an updated reach code for the 2022 code cycle that prohibits the installation of natural gas infrastructure in new development. Include a ban on the installation of fossil fuel-powered backup energy sources in new development by 2030. ▶ BE-2.1.2: Partner with BayREN, SVCE, PG&E, other cities, and the private sector to develop effective strategies to facilitate electrification implementation. ▶ BE-2.1.3: Increase awareness and create incentives for developers to build all-electric buildings, such as reduced permit and/or impact fees.
BE-2.2: Facilitate all-electric development projects for industrial buildings.	▶ BE-2.2.1: Build market demand for all-electric industrial buildings.

Measures	Actions
BE-2.3: Expand the City's Green Building Program.	▶ BE-2.3.1: Develop additional 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.
BE-2.4: Retrofit existing residential and nonresidential buildings and municipal facilities to improve energy efficiency and facilitate fuel switching.	▶ BE-2.4.1: Develop a comprehensive energy retrofit program to transition existing residential buildings to all-electric by 2045. Begin the program by providing education and incentives, then transition to point-of-sale and replace retrofit requirements. ▶ BE-2.4.2: Connect building owners to funding resources and financing options, such as Energy Upgrade California, for energy efficiency retrofits and improvement projects. ▶ BE-2.4.3: Develop a comprehensive energy retrofit program to transition existing nonresidential buildings to all-electric, aiming for a 60 percent conversion rate by 2045. Begin the program by providing incentives then transition to point-of-sale and replace retrofit requirements. ▶ BE-2.4.4: Eliminate the provision of fossil fuel-powered backup generator permits for existing nonresidential development by 2030.
BE-2.5: Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.	▶ BE-2.5.1: Work with PG&E, SVCE, and other agencies to provide free energy audits of existing residential and nonresidential buildings. ▶ BE-2.5.2: Encourage ongoing energy benchmarking in existing nonresidential buildings, consistent with regulatory benchmarking programs and existing green building standards to help close the energy efficiency information gap.
BE-2.6: Reduce plug loads in existing buildings.	▶ BE-2.6.1: Use partnerships to promote appliance upgrades to energy-efficient technologies and products through campaigns targeted at residents and local businesses, ENERGY STAR® appliance change-out programs and incentives (e.g., giveaways, federal/state/utility rebates etc.). ▶ BE-2.6.2: Facilitate the adoption of smart grid and other peak load reduction technologies, such as building energy management systems and smart appliances, with existing buildings.
Strategy TR-1: Facilitate Sustainable Transportation and Land Use Planning	
TR-1.1: Reduce VMT from new development in compliance with SB 743.	▶ TR-1.1.1: Enforce the City's requirements for SB 743, which mandate a 15 percent reduction in new project-generated VMT. ▶ TR-1.1.2: Continuously update the City's VMT policy and implementation tools to further reduce VMT.
TR-1.2: Reduce VMT from existing development.	▶ TR-1.2.1: Work with local employers to provide subsidies to employees for using transit or active transportation to commute to work, and encourage flexible work schedules (e.g., 9/80s and 4/10s) as well as telecommuting. ▶ TR-1.2.2: Partner with local businesses to provide discounts or rewards programs to incentivize using transit or active transportation to travel to businesses. ▶ TR-1.2.3: Require employers of 50 or more employees to implement vehicle trip reduction programs and limit car commutes to 40 percent of their workforce by 2030. ▶ TR-1.2.4: Adopt and phase a citywide TDM ordinance by 2023, building on recommendations of the Metro Specific Plan and incorporate the TDM ordinance into the Zoning Ordinance Update (anticipated in 2025). ▶ TR-1.2.5: Implement existing TDM plans, such as The District at Milpitas Lot 3A TDM Plan. ▶ TR-1.2.6: Support growth of on-demand mobility services (e.g., ride-, car-, and bike-sharing, scooter, e-hailing) in Milpitas.

Measures	Actions
TR-1.3: Continue to implement and adopt policies that support high-density, mixed-use, and transit-oriented development and housing near jobs.	▶ TR-1.3.1: Facilitate the development of complete streets and neighborhoods. ▶ TR-1.3.2: Maintain and continue to improve regional arterials within the city. ▶ TR-1.3.3: Promote and facilitate the creation of an innovation district within the Metro Specific Plan Area to provide more jobs near transit and housing. ▶ TR-1.3.4: Support high levels of ridership at the Milpitas BART station by encouraging higher density, mixed uses, and connectivity along transit corridors and at transit nodes. Promote the increase of density and mixed uses in key opportunity areas. ▶ TR-1.3.5: Promote dense development in central locations and along transportation corridors. Support redevelopment of older commercial or gateway areas (Main Street and Calaveras) to intensify development and a mix of uses along major transit corridors. Encourage development of urban plazas in new development in the Milpitas Metro Specific Plan, Midtown Specific Plan, and town center areas to encourage pedestrian activity and vibrant mixed-use centers that reduce vehicular activity. ▶ TR-1.3.6: Promote the increase of density and mixed uses in key opportunity areas. ▶ TR-1.3.7: Encourage development of urban plazas in new development in the Milpitas Metro Specific Plan, Midtown Specific Plan, and town center areas to encourage pedestrian activity and vibrant mixed-use centers that reduce vehicular activity.
TR-1.4: Explore car-free zones or shared streets in appropriate areas.	▶ TR-1.4.1: Explore car-free zones in commercial hubs such as those identified in the Midtown Specific Plan and Metro Specific Plan areas.
Strategy TR-2: Decarbonize Vehicles	
TR-2.1: Increase EV charging infrastructure.	▶ TR-2.1.1: Work with SVCE and other partners to provide incentives and increase EV charging stations in visible, accessible, shared locations such as mixed-use development or accessible to multi-family renters and provide free public charging. ▶ TR-2.1.2: With each Title 24 and CALGreen code cycle, adopt updated EV charging station standards for all new development through the City's reach codes that go beyond State requirements. Require 50 percent of parking spaces in new development to be EV-ready by 2030. ▶ TR-2.1.3: Provide rebates and other incentives to home and business owners to install EV chargers. ▶ TR-2.1.4: Ensure EV charging stations are encouraged and allowed through land use designations that currently permit gas fueling stations.
TR-2.2: Increase EV and low-carbon vehicle adoption.	▶ TR-2.2.1: Improve awareness of local, regional, and State incentives for low- and zero-emission vehicles and increase EV purchases in Milpitas through events and resource promotion such as through Climate Action Milpitas Dashboard. ▶ TR-2.2.2: Partner with BAAQMD, Joint Venture Silicon Valley, and the Silicon Valley Clean Cities Coalition to pursue funding for EV deployment projects in the city. ▶ TR-2.2.3: Include a provision in the next contract with the City's solid waste franchise hauler that they use alternative fuel vehicles for the fleet which services Milpitas. ▶ TR-2.2.4: Partner with Acterra and its GoEV Program to deploy a public outreach campaign that give the public opportunities to drive EVs and provides EV education.

Measures	Actions
	▶ TR-2.2.5: Adopt an ordinance that phases out development of new gasoline and diesel fuel stations as the market shifts to fossil fuel-free vehicles. ▶ TR-2.2.6: Provide incentives to convert vehicle fleets (e.g., rental, private, school) in the city.
TR-2.3: Reduce vehicle idling.	▶ TR-2.3.1: Adopt ordinances to limit idling at institutions and businesses to reduce the impacts of vehicle idling on adjacent uses, such as housing, schools, and health care facilities. ▶ TR-2.3.2: Discourage the construction of new drive-throughs in the Metro Specific Plan. ▶ TR-2.3.3: Require all new nonresidential development with loading docks to supply sufficient electrical power for delivery trucks and associated equipment to reduce idling when making deliveries.
TR-2.4: Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.	▶ TR-2.4.1: Revise development standards for multifamily and mixed-use developments to separate parking costs from the cost to rent, purchase, or lease residential and nonresidential buildings. ▶ TR-2.4.2: Revise development standards to eliminate or reduce the minimum parking requirements for new development and redevelopment of nonresidential buildings and mid- to higher-density residential development. ▶ TR-2.4.3: Develop and require parking maximums at new development.
Strategy TR-3: Increase Active and Public Transportation Use	
TR-3.1: Enhance and expand transit facilities and infrastructure.	▶ TR-3.1.1: Implement the Milpitas OnDemand "hub-and-spoke" micro-transit pilot program, including on-demand shuttle service for first- and last-mile connections to existing transit hubs such as the BART station and VTA light rail stops. ▶ TR-3.1.2: Ensure a pedestrian-friendly environment around the Milpitas BART and light rail stations.
TR-3.2: Increase transit ridership.	▶ TR-3.2.1: Work with transit agencies to provide free or subsidized transit to low-income residents, expanding to all residents by 2030. ▶ TR-3.2.2: Improve reliability and convenience of existing transit services through increased frequency, expanded service areas, extended service hours, and better facilities.
TR-3.3: Improve active transportation options.	▶ TR-3.3.1: Require all new development other than single family to provide short-term and long-term bicycle parking facilities to meet peak seasonal maximum demand. ▶ TR-3.3.2: Increase awareness of existing City initiatives to facilitate active transportation, including Bike Paths maps and Suggested Routes to School Program maps. ▶ TR-3.3.3: Require new nonresidential development projects to provide "end-of-trip" facilities for cyclist, including showers, secure bicycle lockers, and changing spaces. ▶ TR-3.3.4: Require new nonresidential development have adequate e-bike and e-scooter infrastructure and options. ▶ TR-3.3.5: Implement the updated Trail, Pedestrian, and Bicycle Master Plan to enhance and expand bicycle and pedestrian infrastructure networks.

Measures	Actions
Strategy SW-1: Achieve Zero Waste	
SW-1.1: Eliminate the disposal of solid waste in landfills.	▶ SW-1.1.1: Require local restaurants to increase food recovery and donate edible food, consistent with SB 1383. ▶ SW-1.1.2: Expand existing organic waste collection routes and drop-off sites to improve composting services for interested residents and businesses. ▶ SW-1.1.3: Implement and enforce the requirements of SB 1383 and eliminate disposal of compostable organic materials to landfills.
SW-1.2: Increase recycling and the diversion of other inorganic solid waste.	▶ SW-1.2.1: Partner with RecycleStuff.org to enhance awareness of local and regional recycling opportunities. ▶ SW-1.2.2: Adopt an ordinance that requires recycling and composting services, the use of only recyclable and compostable materials by vendors, and adequate staff to ensure proper disposal and recycling at events that require a City-issued permit. ▶ SW-1.2.3: Partner with waste haulers to expand the diversion of non-food, non-construction, and non-demolition solid waste.
SW-1.3: Reduce the generation of waste from residents and businesses.	▶ SW-1.3.1: Enforce the City's plastic bag and Styrofoam ban. ▶ SW-1.3.2: Encourage local businesses to reduce the use of single-use, non-biodegradable products, and support the establishment of a regional ordinance that restricts and/or limits the use of these products by local businesses. ▶ SW-1.3.3: Require organizations over 50 employees to implement organization-wide waste reduction initiatives. ▶ SW-1.3.4: Promote responsible consumption of products and materials. ▶ SW-1.3.5: Coordinate with other local jurisdictions and landfills to implement a divertible materials ban (e.g., recyclables) ban at landfills.
SW-1.4: Reduce the generation of construction and demolition waste.	▶ SW-1.4.1: Amend the building demolition permit requirements and adopt a comprehensive construction and demolition ordinance to reach a 75 percent diversion rate.
SW-1.5: Facilitate repair and reuse of consumer products.	▶ SW-1.5.1: Develop a reuse facility that makes building materials available to customers, and acts as an outlet for reusable items otherwise destined for landfill. ▶ SW-1.5.2: Create and support "fix-it clinics" at Parks and Recreation facilities and other City buildings that can build skills among local businesses and residents in innovation, repair, and reuse. ▶ SW-1.5.3: Support Extended Producer Responsibility initiatives that drive end of product life management. ▶ SW-1.5.4: Promote redesign of products so that they do not require end of life disposal, but are incorporated back into useful products.
Strategy OT-1: Shift to Clean and Off-Road Equipment and Vehicles	
OT-1.1: Reduce landscaping-related emissions.	▶ OT-1.1.1: Promote regional and State incentive programs to encourage residents and business owners to convert or replace their fossil fuel-powered gardening equipment, such as lawn mowers, leaf blowers, and edge trimmers with electric versions. ▶ OT-1.1.2: Adopt an ordinance that prohibits the sale of fossil fuel-powered landscaping equipment by 2024 to transition to zero-emission landscaping equipment.

Measures	Actions
	▶ OT-1.1.3: Require all new development to install sufficient exterior electrical outlets to charge electric-powered landscaping equipment.
OT-1.2: Reduce construction-related emissions.	▶ OT-1.2.1: Reduce idling of construction vehicles and equipment. ▶ OT-1.2.2: Prohibit the use of fossil fuel-powered generators at construction sites in all new discretionary projects. ▶ OT-1.2.3: Require all construction projects to use renewable diesel in diesel-powered construction equipment.
Strategy WA-1: Promote Resilient Water Supply, Water Use, and Water Resources	
WA-1.1: Reduce indoor water consumption in buildings.	▶ WA-1.1.1: Increase residential and nonresidential participation in the High Efficiency Clothes Washer Rebate Program and the High Efficiency Toilet Rebate Program by ensuring continued funding to the City's Water Conservation Program, operated in conjunction with resources provided by SCVWD and BAWSCA. ▶ WA-1.1.2: Collaborate with SFPUC and SCVWD to develop a retrofit program to encourage installation of water conservation measures in existing businesses and residences. ▶ WA-1.1.3: Regularly review and update the City's Water Conservation Ordinance and water conservation measures to be consistent with current best management practices and ensure effective and ongoing conservation efforts. ▶ WA-1.1.4: Continue water conservation efforts outlined in the 2021 UWMP. ▶ WA-1.1.5: Require ultra-low-flow fixtures in new residential and nonresidential development. ▶ WA-1.1.6: Continue to assess and manage distribution system losses through efforts including replacing existing meters with smart meters, implementing a SCADA system, replacing selected water pipe with upgraded design criteria to withstand seismic events, and maintaining an active cathodic protection system. ▶ WA-1.1.7: Coordinating with SFPUC and SCVWD, facilitate the development of a water auditing program for existing residential and nonresidential development.
WA-1.2: Reduce water consumption for irrigation and landscaping.	▶ WA-1.2.1: Continue to fund and operate the City's Water Conservation Program in conjunction with resources provided by SCVWD and BAWSCA, including the Irrigated Equipment Upgrades Rebate Program, Landscape Conservation Rebate Program, Water Wise Survey Program, and Water Efficient Gardening workshops. ▶ WA-1.2.2: Increase residential and nonresidential participation in the Landscape Conversion Rebate and Irrigation Equipment Upgrade programs to convert lawns to a healthy habitat with native and drought-tolerant species that use water-efficient irrigation equipment. ▶ WA-1.2.3: Implement and enforce the WELO and the Water Conservation Ordinance. ▶ WA-1.2.4: Require drought-tolerant, water-conserving, and/or native landscaping in new development and redevelopment projects.
WA-1.3: Increase the use of recycled water and support efforts to drought-proof our water supply.	▶ WA-1.3.1: Increase residential and nonresidential participation in the Rainwater Catchment Rebate and Graywater Laundry to Landscape Rebate programs to utilize rainwater and graywater for landscaping and irrigation purposes. ▶ WA-1.3.2: Continue to require all commercial and industrial development south of the Hetch Hetchy right-of-way to install recycled water lines and require conversion of landscape irrigation to recycled water, as feasible.

Measures	Actions
	▶ WA-1.3.3: Support use of recycled water as drought-proof water supply, including potential indirect potable recharge. ▶ WA-1.3.4: Encourage 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. ▶ WA-1.3.5: Encourage residents and businesses to install onsite recycled water systems (i.e., graywater systems) and rainwater harvesting systems, consistent with all State and County health codes and standards and in compliance with regional water agency requirements. ▶ WA-1.3.6: Require all new residential and nonresidential development to include a separate piping system for recycled water (i.e., "purple pipes") to be used for irrigation and other outdoor water uses, as feasible.
Strategy CS-1: Resilient Infrastructure and Health Forest and Natural Systems	
CS-1.1: Protect native trees and vegetation and enhance carbon sequestration.	▶ CS-1.1.1: Based on the recommendations from the City's Urban Forestry Management Plan, implement a tree planting program to expand the city's urban forest canopy. ▶ CS-1.1.2: Develop and implement a street tree planting program for residential neighborhoods. ▶ CS-1.1.3: Identify high priority areas for civic tree planting activities that provide the greatest benefits to the community and provides urban canopy coverage in areas of the city that are currently underserved by street trees and trees within public spaces. ▶ CS-1.1.4: Make available a list of plants and trees native to the region that are suitable for use in landscaping, consistent with the requirements of Milpitas's WELO. ▶ CS-1.1.5: Update Milpitas's Tree Protection Regulations as specified in the General Plan. ▶ CS-1.1.6: Identify thresholds for new development mitigation for the provision of parks or open space. ▶ CS-1.1.7: Identify natural areas that could be obtained and preserved through land transfers and acquisitions of undeveloped/unprotected private and public lands.
CS-1.2: Reduce the urban heat island effect to conserve energy.	▶ CS-1.2.1: Amend the Zoning Code to create tree planting standards for new and renovated development; require the planting of two trees in single-family development in the front, side, or rear yard as feasible; and create linear landscaping standards for commercial development that identify a minimum number of tree plantings based on linear frontage length. ▶ CS-1.2.2: Require all new development to install cool pavements, plant low-maintenance and drought-tolerant landscaping, and plant shade trees. ▶ CS-1.2.3: Reduce heat gain from surface parking lots in new development for a minimum of 50 percent of the site's hardscape. Develop standards to provide shade from the existing tree canopy or from appropriately selected new trees that complement site characteristics and maximize drought tolerance.
CS-1.3: Increase the use of green infrastructure.	▶ CS-1.3.1: Develop and implement a green infrastructure program for the installation and maintenance of projects and existing public resources, such as the parks system and other open spaces. ▶ CS-1.3.2: Review Capital Improvement Program projects to identify opportunities for green infrastructure. ▶ CS-1.3.3: Develop guidelines for the inclusion of green infrastructure in the design of transportation improvements. ▶ CS-1.3.4: Encourage the use of green roofs on existing and new development.

Measures	Actions
CS-1.4: Increase soil carbon content.	▶ CS-1.4.1: Develop a healthy soil strategy for the city to support urban agriculture, address carbon sequestration, and increase water capture.
CS-1.5: Use low-carbon and carbon sequestering construction materials in new development.	▶ CS-1.5.1: Adopt standards to require the use of pervious paving materials in plazas in addition to the provision of mature landscaping and other strategies that will maximize carbon sequestration. ▶ CS-1.5.2: Require building materials that store carbon (e.g., wood, calcium carbonate-based cementitious substances, synthetic limestone) in all nonresidential construction.
Strategy GE-1: Foster Green and Sustainable Economic Development Opportunities	
GE-1.1: Support and attract clean technology businesses and green jobs in Milpitas.	▶ GE-1.1.1: Partner with local and regional agencies and educational institutions to offer courses/training that prepare students/workers for green jobs, such as the Milpitas Adult School Program, South Bay Consortium for Adult Education, Center for Employment Training in San Jose, and PG&E's on-demand energy trainings. ▶ GE-1.1.2: Develop a Green Business Strategic Plan to support environmentally friendly business development in Milpitas. ▶ GE-1.1.3: Collaborate regionally to conduct outreach and training with local contractors and businesses on electrification. ▶ GE-1.1.4: Explore the feasibility of creating an eco-innovation 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.
GE-1.2: Incentivize and promote green business practices.	▶ GE-1.2.1: Promote green tenant and leasing practices for commercial businesses. Examples include the Green Tenant Toolkit developed by the Business Council on Climate Change and San Francisco Environment. ▶ GE-1.2.2: Develop and implement marketing and technical assistance to green businesses, and consider developing incentives such as reduced business license taxes/fees. ▶ GE-1.2.3: In collaboration with SVCE, develop a Clean Energy Pledge for area businesses to bring visibility to those businesses already purchasing carbon-free electricity or pledging to do so in the future.
Strategy GE-2: Support Circular Economy Policies	
GE-2.1: Engage with circular economy and zero waste policymaking at the Federal, State, and local levels.	▶ GE-2.1.1: Support regional and State legislation intended to reduce GHG emissions from waste and virgin materials use and promote recyclability and repairability of products.
Adaptation Strategy 1: Resilient Communities and Equity and Environmental Justice	
1.1: Increase community resilience to impacts from air pollution.	▶ 1.1.1: Develop an outreach program to educate vulnerable communities and residents in general on strategies to protect themselves from air pollution exacerbated by climate change, including impacts from wildfire smoke. ▶ 1.1.2: Establish or support development of community centers and/or other locations indoors for individuals experiencing homelessness or other vulnerable populations to seek refuge during periods of high air pollution. ▶ 1.1.3: Coordinate with partner organizations to communicate measures to protect residents and workers during high ozone and high particulate matter days.

Measures	Actions
1.2: Increase community resilience to respond to and recover from widespread health emergencies.	▶ 1.2.1: Consider the overall preparedness of the community to respond to and recover from widespread health emergencies and develop programs and activities designed to increase resilience and self-sufficiency. ▶ 1.2.2: Partner with the Milpitas Unified School District and other community organizations to develop programs and activities designed to help individuals, families, and community groups prepare for and respond effectively to widespread health emergencies. ▶ 1.2.3: Collaborate with federal, State, regional, and local partners to implement programs to help protect vector and waterborne diseases.
1.3: Protect populations vulnerable to extreme heat.	▶ 1.3.1: Work with City departments to identify specific locations in the city with populations vulnerable to heat-related illness (e.g., elderly populations, high rates of cardiovascular disease). ▶ 1.3.2: Develop a targeted outreach campaign with supporting materials to raise awareness about heat risks. Ensure that extreme heat preparedness and response information is available in the primary non-English languages spoken in the community.
1.4: Increase community awareness of climate change.	▶ 1.4.1: Promote community awareness of climate-resilient actions that can be implemented by homeowners, such as water conservation, on-site water collection, passive solar designs, and alternative energy strategies. ▶ 1.4.2: Collaborate with federal, State, regional, and local partners to develop a communitywide outreach program to educate diverse communities on how to prepare and recover from the various impacts of climate change likely to affect the city.
1.5: Ensure that climate impacts and climate adaptation measures aimed at reducing climate risks to not lead to disproportionately adverse effects on vulnerable populations.	▶ 1.5.1: Identify high priority areas for civic tree planting activities that provide the greatest benefits to the community and provide urban canopy coverage in areas of the city that are currently underserved by street trees and trees within public spaces.
1.6: Improve mobility and ensure basic needs are met for vulnerable populations.	▶ 1.6.1: Consider the needs of vulnerable populations and individuals with limited mobility when planning for access to safe and comfortable shelter during extreme heat events or other severe weather events. ▶ 1.6.2: Encourage and support local transit service providers to increase and expand services for people who are transit-dependent, including seniors, persons with mobility disabilities, and persons without regular access to automobiles by improving connections to regional medical facilities, senior centers, and other support systems that serve residents and businesses. ▶ 1.6.3: Support and encourage the expansion of paratransit and public transit service to neighborhood and regional medical facilities.
1.7: Ensure completeness and availability of emergency supplies and resources to all segments of the population, focusing especially on vulnerable population and individuals.	▶ 1.7.1: Explore opportunities to construct additional community facilities. The facilities should be geographically distributed to accommodate underserved areas of the city and include spaces that can be rented by residents and community groups. ▶ 1.7.2: Encourage services and programs that meet the unique needs of seniors within Milpitas, including the establishment of medical facilities, transportation options for seniors and people with mobility disabilities, senior centers, and programs that provide for in-home care and aging-in-place.

Measures	Actions
	▶ 1.7.3: Support health care facilities and services that assist underserved populations, including minorities, disabled persons, and the homeless community. ▶ 1.7.4: Recognize that not-for-profit health care providers, clinics, and permanent supportive housing provide a valuable resource and appropriate medical care for the community, including vulnerable populations. ▶ 1.7.5: Continue to promote public safety through public education programs, and ensure programs are available and accessible to all segments of the community. ▶ 1.7.6: Coordinate with local homeless services to ensure that emergency shelters are available during extreme heat events, poor air quality, severe weather events, and other highly hazardous conditions. Ensure that the local homeless population is made aware of these resources.
Adaptation Strategy 2: Resilient Transportation Systems and Resilient Energy Resources	
2.1: Integrate climate change considerations in all transportation agency planning and decision-making processes.	▶ 2.1.1: Update maintenance protocols to incorporate projected climate change effects and evaluate the potential for increased frequency or need to maintain transportation infrastructure, specifically from extreme heat and increased frequency of flooding events. ▶ 2.1.2: Use the best available science to update design standards for future development and maintenance of transportation infrastructure and capital improvement projects that incorporate future projections for more intense heat wave events. ▶ 2.1.3: Coordinate with regional transportation agencies to ensure redundancy of critical transportation routes to allow for continued access and movement in the event of an emergency.
2.2: Reduce local flooding impacts to transportation infrastructure.	▶ 2.2.1: Develop guidelines for the inclusion of green infrastructure in the design of transportation improvements. ▶ 2.2.2: Update the City's Streetscape Master Plan to require drought-tolerant plantings consistent with the requirements of Milpitas's WELO and GSI elements such as pervious pavers, bioretention areas, and stormwater tree filters, consistent with the City's GSI Plan.
2.3: Increase the resilience of existing residential and commercial development through energy efficiency upgrades and onsite energy generation and storage.	▶ 2.3.1: Transition all City-owned buildings to use 100 percent renewable sources of electricity and install onsite carbon-free backup power supplies to make City operations grid-independent during PSPS events. ▶ 2.3.2: Promote decentralization of energy supplies and energy storage capacity for residents and businesses to improve energy independence (i.e., microgrids and battery storage).
2.4: Minimize stress on the electrical grid and increase the resilience of existing residential and commercial development through energy efficiency upgrades and onsite energy generation and storage.	▶ 2.4.1: Facilitate the adoption of smart grid and other peak load reduction technologies, such as building energy management systems and smart appliances, within new and existing buildings. ▶ 2.4.2: Encourage distributed energy resources including solar, fuel cells, etc. to provide environmental benefits, as well as energy security, and the support of the grid during peak energy use periods. ▶ 2.4.3: Collaborate with utility providers to ensure that infrastructure and resource management plans account for anticipated climate change impacts.
2.5: Protect critical energy and telecommunications infrastructure and systems from climate change.	▶ 2.5.1: Require that all new power and gas lines and transformers are installed underground where feasible and promote the undergrounding of existing overhead facilities.

Measures	Actions
	▶ 2.5.2: Ensure adequate utility system redundancy and fuel is available to maintain critical facilities during emergency events. ▶ 2.5.3: Require that all new telecommunication lines are installed underground where feasible and promote the undergrounding of existing overhead facilities.
Adaptation Strategy 3: Reduced Flooding	
3.1: Minimize risks to life and property resulting from flooding and flood-induced hazards.	▶ 3.1.1: Invest in the use of pervious pavements and landscaping in developed areas to prevent localized flooding events during small and large storms. ▶ 3.1.2: Continue to maintain good standing and compliance under the National Flood Insurance Program (NFIP). This will be accomplished through implementation of floodplain management programs that will, at a minimum, meet the requirements of NFIP: ▶ Enforcement of the Flood Damage Prevention Ordinance ▶ Participate in the floodplain identification and mapping updates ▶ Provide public assistance/information on floodplain requirements and impacts. ▶ 3.1.3: Evaluate and consider increasing the design criteria for current and future flood protection projects from 100-year flood events to higher impact flood events. ▶ 3.1.4: Evaluate the need to increase pump station capacity and provide protection for pump stations.
3.2: Evaluate proposed development in areas of the city subject to flooding impacts caused by rising sea levels.	▶ 3.2.1: Require evaluation of projected inundation for development projects near San Francisco Bay or at flooding risk from local waterways which discharge to San Francisco Bay. For projects affected by increased water levels in San Francisco Bay, the City shall require incorporation of mitigation measures prior to the approval of the project.
3.3: Maintain up-to-date flood risk and hazard data.	▶ 3.3.1: Monitor information from federal, State, and regional agencies on water level rises in San Francisco Bay on an on-going basis. Use this information to determine if additional adaptive management actions are needed and implement those actions to address flooding hazards from increasing sea levels for existing or new development and infrastructure. ▶ 3.3.2: Continuously monitor local and regional efforts to track sea level rise and the associated flood risks. Consider constructing facilities, such as flood walls and additional pump stations, to protect the city from flooding associated with sea level rise.
Adaptation Strategy 4: Robust Emergency Services and Improved Disaster Recovery	
4.1: Ensure that emergency services have adequate capacity to address increased demand due to climate change-related impacts.	▶ 4.1.1: Identify community safety areas and evaluate existing locations that serve as temporary shelters or refuge during hazard events for resilience to future climate impacts. ▶ 4.1.2: Collaborate with federal, State, and regional partners to ensure coordinated evacuation planning and ensure compliance with SB 99 and AB 747 regarding evacuation route capacity and adequate egress points for subdivisions in the city. ▶ 4.1.3: Establish resilience hub locations in neighborhoods throughout the community, equipped with backup power and disaster assistance and supplies. ▶ 4.1.4: Maintain up-to-date emergency preparedness and evacuation plans and procedures in coordination with appropriate State, regional, County, and local agencies and departments.

Measures	Actions
	▶ 4.1.5: Continue to maintain the City's Emergency Operations Center and conduct regular staff training exercises to ensure that all City staff members, in addition to emergency responders, are adequately trained to fulfill their duties in the event of an emergency. ▶ 4.1.6: Conduct ongoing training for first responders and City personnel to ensure they have the necessary training and equipment to deal with climate-exacerbated hazards, including how to better serve vulnerable populations. Improve cultural competency of emergency services personnel in accordance with SB 160 in coordination with Santa Clara County Office of Emergency Management. ▶ 4.1.7: Clearly communicate to the public the City's plans, procedures, and responsibilities in the event of a disaster or emergency. Communications and information made available to the public shall be provided in multiple languages to ensure the greatest number of community members have access to this information. ▶ 4.1.8: Encourage residents to register with the Santa Clara County Emergency Alert System (AlertSCC) to ensure notification in the event of an emergency. ▶ 4.1.9: Develop Disaster Documentation Program to include tracking disasters affecting Milpitas, and tracking via photo damage incurred during and after disaster events. This data can be use for tracking and trending, and ultimately mitigation planning. ▶ 4.1.10: Develop a debris management plan to aid in post-disaster recovery.
4.2: Develop programs to improve efficiency and equity of disaster recovery.	▶ 4.2.1: Encourage residents and community leaders to participate in disaster training programs, such as the "Strategic Actions for Emergencies" (S.A.F.E.) emergency preparedness program and the CERT program. Where feasible, assist in neighborhood drills and safety exercises to increase participation and build community support.

Adaptation Strategy 5: Reduced Urban Heat Island Effect and Resilient Water Resources

5.1: Reduce urban heat island effect through cool roofs, parking lot shading, landscaping, and urban greening in new and existing private and public development.	▶ 5.1.1: Amend the Zoning Code to create tree planting standards for new and renovated development, to require the planting of two trees in single-family development in the front, side, or rear yard as feasible, and to create linear landscaping standards for commercial development that identify a minimum number of tree plantings based on linear frontage length. ▶ 5.1.2: Encourage the inclusion of additional shade trees, vegetated stormwater treatment and landscaping to reduce the "heat island effect" in development projects. ▶ 5.1.3: Encourage the installation or use of cool roof technologies, green roofs, and rooftop gardens in new and existing private and public development. ▶ 5.1.4: Support outreach and education describing benefits of cooling strategies, including promotion of the Cool California website and resources on the City website and at City Hall. ▶ 5.1.5: Reduce heat gain from surface parking lots in new development for a minimum of 50 percent of the site's hardscape. Develop standards to provide shade from the existing tree canopy or from appropriately selected new trees that complement site characteristics and maximize drought tolerance. Where feasible, use open-grid pavement systems (at least 50 percent pervious, which would also satisfy the stormwater Low Impact Development requirement).
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Measures	Actions
	▶ 5.1.6: Update City design standards to use heat-mitigating and heat resistant materials on pedestrian walkways and transit stops. ▶ 5.1.7: Collaborate with the regional transit providers to install cooling technologies/structures/design features at transit stops.
5.2: Advocate for drought-proof water supplies including recycled water systems or indirect potable recharge.	▶ 5.2.1: Work with water utilities to evaluate vulnerabilities of water supply systems and develop strategies to improve resilience. ▶ 5.2.2: Collaborate with federal, State, and local agencies and organizations to identify future water supplies, explore alternative supply sources, and improve capacity. ▶ 5.2.3: When updating master plans for infrastructure, including water supply, flood control and drainage, and critical facilities, review relevant climate change scenarios and ensure that the plans consider the potential effects of climate change and include measures that provide for resilience to climate impacts. ▶ 5.2.4: Develop, implement and manage a new city-wide water rationing and conservation plan, including community outreach and education. This project will begin the conversion of City and private-owned irrigation facilities from potable to recycled water where they are adjacent to recycled water pipelines. ▶ 5.2.5: Continue to require all commercial and industrial development south of the Hetch Hetchy right-of-way to install recycled water lines, and require conversion of landscape irrigation to recycled water as soon as available. ▶ 5.2.6: Aggressively pursue expansions to the treatment and distribution capacity of recycled water supplies and coordinate with the City of San Jose South Bay Water Recycling Program to increase recycled water supplies available to Milpitas.
Adaptation Strategy 6: Integrated Resilience Planning and Improved Biodiversity and Habitat	
6.1: Embed climate resiliency and adaptation across planning efforts.	▶ 6.1.1: Integrate climate resiliency throughout long-term planning and current development projects. ▶ 6.1.2: Participate in regional climate adaptation planning efforts. ▶ 6.1.3: Encourage and support private sector investment in climate adaptation through climate-resilient infrastructure such as onsite renewable energy, integrated stormwater management and water conservation.
6.2: Integrate findings of climate vulnerability assessment into all phases of emergency planning.	▶ 6.2.1: Ensure that emergency response plans and training programs continue to evolve and are modified to incorporate future climate projections in order to protect residents, infrastructure, and facilities during emergencies and extreme weather events.
6.3: Prioritize nature-based solutions to improve resilience while promoting biodiversity.	▶ 6.3.1: Continue the City's Tree Maintenance Program. ▶ 6.3.2: Promote tree health, removal of dead branches and trees that may become a hazard in severe weather, earthquake or a result of drought. ▶ 6.3.3: Prepare and adopt an Urban Forest Management Plan (UFMP) for Milpitas. ▶ 6.3.4: Conserve existing native trees and vegetation where possible and integrate regionally native trees and plant species into development and infrastructure projects where appropriate.

Measures	Actions
	▶ 6.3.5: Work with SCVWD to restrict future fencing, piping and channelization of creeks when flood control and public safety can be achieved through measures that preserve the natural environmental and habitat of riparian corridors; in addition, evaluate opportunities to revert some existing concrete-lined channels to more natural alternatives such as levees. ▶ 6.3.6: Collaborate with the SCVWD to support the priorities and projects of the Safe, Clean Water and Natural Flood Protection Program. Pursue grant funding opportunities from SCVWD to provide funding for water conservation, habitat restoration, and open space projects that increase community resiliency, while improving water quality and increasing flood safety throughout the community. ▶ 6.3.7: Encourage and accommodate multipurpose flood control projects that incorporate recreation, education, resource conservation, preservation of natural riparian habitat, and the scenic value of drainages, creeks, and detention ponds.

Notes: AB = Assembly Bill; BAAQMD = Bay Area Air Quality Management District; BART = Bay Area Rapid Transit; BAWSCA = Bay Area Water Supply and Conservation Agency; BayREN = Bay Area Regional Energy Network; CALGreen = California Green Building Standards; CERT = community emergency response team; EV = electric vehicle; GSI = Green Stormwater Infrastructure; PG&E = Pacific Gas and Electric Company; PPA = power purchase agreement; PSPS = public safety power shutoff; SB = Senate Bill; SCADA = Supervisory Control and Data Acquisition; SCVWD = Santa Clara Valley Water District; SFPUC = San Francisco Public Utilities Commission; SVCE = Silicon Valley Clean Energy; TDM = transportation demand management; UWMP = Urban Water Management Plan; VMT = vehicle miles traveled; VTA = Santa Clara Valley Transportation Authority; WELO= Water Efficient Landscape Ordinance

Source: City of Milpitas 2022.

3 ENVIRONMENTAL CHECKLIST FOR SUPPLEMENTAL ENVIRONMENTAL REVIEW

APPROACH TO ANALYSIS

The General Plan 2040 EIR is a program EIR consistent with the requirements of CEQA. The analysis considers the environmental impacts of policy implementation and development buildout that could occur under the General Plan 2040. As discussed in Section 1, the project is consistent with General Plan 2040 policies and is considered an implementation action of the General Plan 2040. Section 15183 of the State CEQA Guidelines dictates that in circumstances such as these a lead agency “shall not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site.” Section 15183 further indicates that an initial study or other analyses should be prepared by a lead agency to determine the scope of environmental review in light of this prohibition. The purpose of this process is to streamline the review of covered projects and reduce the need for the preparation of repetitive environmental studies.

Under Section 15183 of the State CEQA Guidelines, a checklist can be used to determine whether the following types of impacts may merit additional environmental analysis:

- ▶ Significant impacts that are peculiar to the project or area in which the project would be located;
- ▶ Significant impacts that were not analyzed in a prior EIR on the zoning action, general plan or community plan with which the project is consistent;
- ▶ Potentially significant off-site impacts and cumulative impacts which were not discussed in the prior EIR prepared for the general plan, community plan or zoning action; or
- ▶ Previously identified significant effects which, as a result of substantial new information, were not known at the time the EIR was certified, are determined to have a more severe adverse impact than discussed in the prior EIR.

Unless an environmental effect satisfies one of these criteria, the lead agency can rely upon its previously certified EIR (State CEQA Guidelines Section 15183[c]).

CHECKLIST FORMAT

The analysis in this addendum remains programmatic; it does not specifically analyze individual projects or actions resulting from implementation of the CAP Update because the details of such projects and actions are not available (e.g., specific location of infrastructure). Each of the following resource-specific subsections begins with a checklist. The purpose of this checklist is to evaluate the categories listed in Section 15183 of the State CEQA Guidelines to determine whether, in light of the General Plan 2040 EIR, there are any significant environmental effects requiring additional environmental analysis. The row titles of the checklist include the full range of environmental topics, as presented in Appendix G of the State CEQA Guidelines. The column titles of the checklist have been modified from the Appendix G presentation to help answer the questions to be addressed pursuant to PRC Section 21083.3(b) and State CEQA Guidelines Section 15183. A “no” answer does not necessarily mean that there are no potential impacts relative to the environmental category, but that there is no change in the condition or status of the impact because it was analyzed in the General Plan 2040 EIR. For instance, the environmental categories might be answered with a “no” in the checklist because the impacts associated with the project were adequately addressed in the General Plan 2040 EIR, and the environmental impact significance conclusions of the General Plan 2040 EIR remain applicable. The purpose of each column of the checklist is described below.

Where Impact was Analyzed?

This column provides a cross-reference to the pages of the General Plan 2040 EIR where information and analysis may be found relative to the environmental issue listed under each topic.

Any Peculiar Impact?

Pursuant to State CEQA Guidelines Sections 15183(b)(1) and 15183(f), this column indicates whether the project could result in a peculiar impact, including a physical change that belongs exclusively or especially to the project or that is a distinctive characteristic of the project, or the project site and that peculiar impact is not substantially mitigated by the imposition of uniformly applied development policies or standards.

Any Impact Not Analyzed as Significant in General Plan 2040 EIR?

Pursuant to State CEQA Guidelines Section 15183(b)(2), this column indicates whether the project would result in a significant effect that was not analyzed as significant in the General Plan 2040 EIR. A new EIR is not required if such a project impact can be substantially mitigated by the imposition of uniformly applied development policies or standards.

Any Significant Off-Site or Cumulative Impact Not Analyzed?

Pursuant to State CEQA Guidelines Section 15183(b)(3), this column indicates whether the project would result in a significant off-site or cumulative impact that was not discussed in the General Plan 2040 EIR. A new EIR is not required if such an off-site or cumulative impact can be substantially mitigated by the imposition of uniformly applied development policies or standards.

Any Adverse Impact More Severe Based on Substantial New Information?

Pursuant to State CEQA Guidelines Section 15183(b)(4), this column indicates whether there is substantial new information that was not known at the time the General Plan 2040 EIR was certified, indicating that there would be a more severe adverse impact than discussed in the General Plan 2040 EIR. A new EIR is not required if such an impact can be substantially mitigated by the imposition of uniformly applied development policies or standards.

Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?

The General Plan 2040 EIR does not include any mitigation measures. This column indicates whether uniformly applied development standards or policies address identified impacts. Where uniformly applied development policies or standards have been adopted by the City, CEQA allows the City to consider implementation of such standards and policies prior to determination of a potentially new or substantially more severe impact. A "yes" response is provided if the impact is addressed by a General Plan policy identified as a minimization measure or uniformly applied development standards or policies. A "no" response indicates that there are no General Plan policies or other standards identified to address this impact. If "NA" is indicated, this Environmental Checklist review concludes that there was no impact, or the impact was less-than-significant without consideration of uniformly applied policies or standards.

Discussion

A discussion of the elements of the checklist is provided under each environmental category to clarify the answers. Where appropriate, updates to the environmental setting are provided.

Mitigation Measures

The General Plan 2040 EIR does not include any mitigation measures. Rather, the EIR concludes that impacts would be mitigated to the greatest extent feasible through General Plan Policies and Actions. This discussion identifies any new mitigation measures necessary to address the potential effects of the proposed CAP Update.

Conclusions

A discussion of the conclusion relating to the need for additional environmental documentation is contained in each section.

3.1 AESTHETICS

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
I. Aesthetics.						
a) Have a substantial adverse effect on a scenic vista?	Impact 3.1-1: General Plan implementation would not have a substantial adverse effect on a scenic vista, pp. 3.1-8-3.1-10	No	No	No	No	Yes
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	Impact 3.1-2: General Plan implementation would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway, p. 3.1-11-	No	No	No	No	No
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 points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	Impact 3.1-3: Project implementation would not conflict with an applicable zoning or other regulation governing scenic quality within an urbanized area, pp. 3.1-11-3.1-12	No	No	No	No	Yes
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Impact 3.1-4: General Plan implementation could result in the creation of new sources of nighttime lighting and daytime glare, pp. 3.1-12-3.1-3.1-13	No	No	No	No	Yes

3.1.1 Discussion

No substantial change in the environmental and regulatory settings related to aesthetics, described in General Plan 2040 EIR Section 3.1, "Aesthetics," has occurred since the certification of the EIR in March 2021.

The City of Milpitas does not have any designated scenic vistas. Further, there are no officially designated state scenic highways in Milpitas, and no portion of the city encompasses the viewshed of a state scenic highway. The General Plan 2040 EIR disclosed that implementation of the General Plan 2040 would result in new development that could result in changes to the skyline throughout the Planning Area, which may obstruct or interfere with views of visual features surrounding the Planning Area.

The Planning Area is within an urbanized area and subjected to applicable zoning or other regulation governing scenic quality. Zoning and other regulations governing scenic quality applicable to the City of Milpitas include the Design Guidelines and Plan Review Checklist and the City of Milpitas Master Streetscape Master Plan, and Measures I, J, and K. Policies in the General Plan 2040 are intended to complement and further the intent of these provisions regulating scenic quality and resources, and any development occurring under the General Plan 2040 would be subject to compliance with these guidelines, as well as the applicable regulations set forth in the Milpitas Municipal Code. The General Plan 2040 EIR concludes that impacts related to aesthetic resources would be less than significant under project and cumulative conditions.

Implementation of the CAP Update would not result in the potential for adverse effects on a scenic vista or other scenic resources within a state scenic highway because, as discussed in the General Plan 2040, there are no officially designated vistas or highways in the city. Implementation of the CAP Update does not include any development proposals that would directly result in the construction and operation of facilities, including new sources of light or glare. Implementation of the CAP Update could support solar installations (Measure BE-1.1) and additional electric vehicle (EV) charging stations (Measure TR-2.1). These facilities would be constructed within the existing developed conditions of the city and would appear consistent with the existing urban conditions. Further, the development that could be associated with the CAP Update would be limited in nature and generally consistent with the scope of development evaluated in the General Plan 2040 EIR. As described above, subsequent projects would be required to demonstrate consistency with applicable regulations governing scenic quality. Therefore, the project would have no (1) peculiar impacts, (2) impacts not analyzed in the General Plan 2040 EIR (3) significant off-site impacts and cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding aesthetics remain valid and no further analysis is required.

Mitigation Measures

No significant aesthetic impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. No new impacts have occurred nor has any new information been found requiring new analysis or verification. The project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.2 AGRICULTURE AND FORESTRY RESOURCES

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
II. Agriculture and Forest Resources.						
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?	Impact 3.2-1: General Plan implementation would not result in the conversion of farmlands, including Prime Farmland and Unique Farmland, to non-agricultural use, p. 3.2-6	No	No	No	No	No
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	Impact 3.2-2: General Plan implementation would not result in conflicts with existing zoning for agricultural use, or a Williamson Act contract, pp. 3.2-6-3.2-7	No	No	No	No	No
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))?	Impact 3.2-3: Result in the loss of forest land or conversion of forest land to non-forest use, p. 3.2-7	No	No	No	No	No
d) Result in the loss of forest land or conversion of forest land to non-forest use?	Combined with impact above	No	No	No	No	No
e) Involve other changes in the existing environment, which, 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?	Impact 3.2-4: General Plan implementation would not involve other changes in the existing environment which, 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, p. 3.2-7	No	No	No	No	No

3.2.1 Discussion

No substantial change in the environmental and regulatory settings related to agriculture and forestry, described in General Plan 2040 EIR Section 3.2, "Agricultural and Forest Resources," has occurred since the certification of the EIR in March 2021.

There are no agricultural lands identified by the California Department of Conservation's Farmland Mapping and Monitoring Program within the Milpitas city limits. Lands located within Santa Clara County and within the Milpitas SOI are identified by the Department of Conservation as grazing lands, and areas identified by the County as farmlands of local importance. There are no lands within the Planning Area that are currently under a Williamson Act contract. The General Plan 2040 EIR concludes that impacts related to agricultural resources would be less than significant under project and cumulative conditions.

There are no forest lands or timber lands located within the Planning Area. Therefore, the General Plan 2040 EIR determined that implementation of the General Plan 2040 would result in no impact relative to this topic under project and cumulative conditions.

Implementation of the CAP Update could result in limited construction within the city. This new and expanded infrastructure would support existing urban development and would not result in the potential to convert Farmland to non-agricultural use. As described in the General Plan 2040 EIR, there are no designated agricultural lands, lands zoned for exclusive agricultural use, lands under Williamson Act Contract, or forest lands within the city. Therefore, the project would have no (1) peculiar impacts, (2) impacts not analyzed in the General Plan 2040 EIR, or (3) significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding agricultural and forestry resources remain valid and no further analysis is required.

Mitigation Measures

No significant agricultural impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

The proposed CAP Update would not result in any new or substantially more severe impacts, or cumulatively considerable impacts than described in the General Plan 2040 EIR. The findings of the General Plan 2040 EIR remain valid and no further analysis is required.

3.3 AIR QUALITY

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
III. Air Quality.						
Would the project:						
a) Conflict with or obstruct implementation of the applicable air quality plan?	Impact 3.3-1: General Plan implementation would not conflict with or obstruct implementation of the applicable air quality plan, or result in a cumulatively considerable net increase of criteria pollutants, pp. 3.3-21-3.3-34	No	No	No	No	Yes
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	Combined with impact above	No	No	No	No	Yes
c) Expose sensitive receptors to substantial pollutant concentrations?	Impact 3.3-2: General Plan implementation would expose sensitive receptors to substantial pollutant concentrations, pp. 3.3-34-3.3-37	No	No	No	No	Yes
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	Impact 3.3-3: General Plan implementation would not result in other emissions (such as those leading to odors adversely affecting a substantial number of people), pp. 3.3-37-3.3-59	No	No	No	No	Yes

3.3.1 Discussion

Air quality is discussed in Section 3.3, "Air Quality," of the General Plan 2040 EIR. No substantial change in the environmental setting related to air quality has occurred since certification of the General Plan 2040 EIR.

The General Plan 2040 EIR indicates that Santa Clara County has a designation of nonattainment for ozone, respirable particulate matter (PM₁₀), and fine particulate matter (PM_{2.5}) and is either unclassified or in attainment for all other criteria pollutants with regards to the California ambient air quality standards. Santa Clara County has a designation of nonattainment for ozone and PM_{2.5} and is either unclassified or in attainment for all other criteria pollutants with

regards to the national ambient air quality standards. The General Plan 2040 EIR evaluates the General Plan's consistency with BAAQMD's 2017 Clean Air Plan.

The General Plan includes numerous policies and actions intended to improve air quality that are consistent with the control measures included in BAAQMD's 2017 Clean Air Plan by promoting a compact urban development form, emphasizing infill development, and ensuring land use patterns do not expose sensitive receptors to pollutant concentrations. The implementation of the General Plan policies and actions, as well as Federal and State regulations, would address the potential for future development to result in impacts to air quality. The General Plan 2040 EIR concludes that impacts related to air quality would be less than significant under project and cumulative conditions.

The CAP Update is a policy document and, like approval of the General Plan 2040, would not result in the direct approval of any subsequent action. The CAP Update does, however, identify policies and actions that the City intends to execute to achieve GHG emission reductions and climate resiliency. The physical improvements anticipated to occur as a result of implementing the proposed CAP Update would be consistent with the types of infrastructure improvements, public services expansions, and building upgrades evaluated in the General Plan 2040 EIR and would occur within the City's Planning Area. For example, implementation of the CAP Update would support future EV infrastructure (Measure TR-2.1 and Action MVF-1.1.1), transit access improvements (Measure TR-3.1), and building retrofits (Measure BE-2.4). Potential impacts to air quality resulting from projects under the CAP Update would be consistent with impacts described in the General Plan 2040 EIR. In addition, implementation of the CAP Update would reduce emissions of toxic air contaminants and criteria air pollutants and precursors associated with off-road equipment and on-road vehicle use. These include CAP Update measures and associated actions that would reduce use of diesel-powered engines (i.e., Policy BE-2.4 and Action BE-2.4.4 to eliminate the provision of fossil fuel-powered backup generator permits for existing nonresidential development by 2030, Policy TR-2.2 to increase EV vehicle adoption, Policy OT-1.1 to reduce emissions from landscaping equipment, and Policy OT-1.2 to reduce emissions from construction equipment). All measures included in the CAP Update have co-benefits identified and many of the measures have multiple benefits, including improved air quality. Therefore, the project would have no (1) peculiar impacts, (2) impacts not analyzed in the General Plan 2040 EIR, or (3) significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding air quality remain valid and no further analysis is required.

Mitigation Measures

No significant air quality impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid, and approval of the project would not require additional environmental review.

3.4 BIOLOGICAL RESOURCES

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
IV. Biological Resources.						
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 the U.S. Fish and Wildlife Service?	Impact 3.4-1: General Plan implementation could 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, pp. 3.4-25-3.4-30	No	No	No	No	Yes
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 the U.S. Fish and Wildlife Service?	Impact 3.4-2: General Plan implementation could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service, pp. 3.4-30-3.4-33	No	No	No	No	Yes
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	Impact 3.4-3: General Plan implementation could have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means, pp. 3.4-33-3.4-36	No	No	No	No	Yes
d) Interfere substantially with the movement of any native resident or migratory fish or	Impact 3.4-4: General Plan implementation would not interfere substantially with the	No	No	No	No	Yes

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	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, pp. 3.4-36-3.4-39					
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Impact 3.4-5: The General Plan would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, p. 3.4-39	No	No	No	No	No
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?	Impact 3.4-6: General Plan implementation would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan, pp. 3.4-39-3.4-46	No	No	No	No	Yes

3.4.1 Discussion

Biological resources are discussed in Section 3.4, "Biological Resources," of the General Plan 2040 EIR. No substantial change in the environmental setting related to biological resources has occurred since certification of the General Plan 2040 EIR.

The General Plan 2040 EIR indicates that the City of Milpitas contains numerous aquatic habitats that qualify as sensitive habitat and may serve as migratory wildlife corridors. The Planning Area also includes wetlands in the northwest corner of the Planning Area adjacent to Coyote Creek and Interstate 880 north of Penitencia Creek. The General Plan 2040 EIR evaluates the potential for future development to result in impacts to protected special status plants and animals and their habitat.

The General Plan 2040 includes numerous policies and actions intended to protect sensitive natural communities, including riparian habitat, wetlands, and waters of the US, from adverse effects associated with future development and improvement projects. Although subsequent projects may disturb protected wetlands and/or jurisdictional waters, the regulatory process that is established through Section 404 of the CWA ensures that there is "no net loss" of wetlands or jurisdictional waters. The implementation of the General Plan 2040 policies and actions, as well as Federal and State regulations, would address the potential for future development to result in impacts to biological

resources. The General Plan 2040 EIR concludes that impacts related to biological resources would be less than significant under project and cumulative conditions.

The CAP Update is a policy document and, like approval of the General Plan 2040, would not result in the direct approval of any subsequent action. The CAP Update does, however, identify policies and actions that the City intends to execute to achieve GHG emission reductions and climate resiliency. The physical improvements anticipated to occur as a result of implementing the proposed CAP Update would be consistent with the types of infrastructure improvements, public services expansions, and building upgrades evaluated in the General Plan 2040 EIR and would occur within the City's Planning Area. For example, implementation of the CAP Update would support future EV infrastructure (Measure TR-2.1 and Action MVF-1.1.1), transit access improvements (Measure TR-3.1), and building retrofits (Measure BE-2.4). Further, proposed CAP Update would not re-designate any land currently designated for open space or habitat protection. Though Milpitas is not a permittee of the Santa Clara Valley Habitat Plan, future projects would be required to comply with the Santa Clara Valley Habitat Conservation Plan through the implementation of Action CON-3a. Potential impacts on biological resources resulting from projects under the CAP Update would be consistent with impacts described in the General Plan 2040 EIR. Therefore, the project would have no (1) peculiar impacts, (2) impacts not analyzed in the General Plan 2040 EIR, or (3) significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding special-status species remain valid and no further analysis is required.

Mitigation Measures

No significant biological resource impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid, and approval of the project would not require additional environmental review.

3.5 CULTURAL RESOURCES

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
V. Cultural Resources.						
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	Impact 3.5-1: General Plan implementation could cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to Section 15064.5, pp. 3.5-14-3.5-17	No	No	No	No	Yes
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	Combined with impact above					
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	Impact 3.5-2: Implementation of the General Plan could lead to the disturbance of any human remains, pp. 3.5-17-3.5-18	No	No	No	No	Yes

3.5.1 Discussion

Cultural resources are discussed in Section 3.5, "Cultural Resources," of the General Plan 2040 EIR. No substantial change in the environmental setting related to cultural resources has occurred since certification of the General Plan 2040 EIR.

As discussed in the General Plan 2040 EIR, known historic resource sites are located throughout the Planning Area and there is potential for additional undiscovered prehistoric sites to be located in various areas of the city as well. In addition, excavation and construction activities allowed under the General Plan may yield human remains that may not be marked in formal burials. The General Plan 2040 EIR indicates that future development and infrastructure projects considered by the City will be evaluated for conformance with the City's General Plan 2040, Municipal Code, and other applicable State and local regulations.

The General Plan 2040 includes policies and actions that would reduce impacts to cultural, historic, and archaeological resources, as well as policies and actions for the conservation of cultural, historic, and archaeological resources. Specifically, General Plan 2040 policies require development projects with a potential to impact archeological resources to be monitored by a relevant expert. In the event of a resource discovery, it is required that all ground disturbing activities and construction to be halted until a qualified expert is able to analyze the project site and determine appropriate mitigation. Additionally, the General Plan 2040 requires consultation with tribes that may

be impacted by proposed development, in accordance with state, local, and tribal intergovernmental consultation requirements. The General Plan 2040 EIR concludes that impacts related to cultural resources would be less than significant under project and cumulative conditions.

The CAP Update is a policy document and, like approval of the General Plan 2040, would not result in the direct approval of any subsequent action. The CAP Update does, however, identify policies and actions that the City intends to execute to achieve GHG emission reductions and climate resiliency. The physical improvements anticipated to occur as a result of implementing the proposed CAP Update would be consistent with the types of infrastructure improvements, public services expansions, and building upgrades evaluated in the General Plan 2040 EIR and would occur within the City's Planning Area. For example, implementation of the CAP Update would support future EV infrastructure (Measure TR-2.1 and Action MVF-1.1.1); innovative approaches to energy generation, distribution, and storage (Measure BE-1.2); and building retrofits (Measure BE-2.4). Infrastructure upgrades could result in ground disturbance within the Planning Area that is consistent with the types of disturbance and potential to encounter cultural resources evaluated in the General Plan 2040 EIR. Building retrofits could affect historic resources.

As described in the General Plan 2040 EIR, future discretionary projects would be subject to environmental review under CEQA, which may include project-level records review and analysis, and would result in identification of necessary avoidance or mitigation measures to reduce potential impacts. Compliance with California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097 would provide an opportunity to avoid or minimize the disturbance of human remains, and to appropriately treat any remains that are discovered. The General Plan includes policies and actions that would reduce impacts to cultural, historic, and archaeological resources, as well as policies and actions for the conservation of cultural, historic, and archaeological resources. Specifically, Policy CON 4-1 requires database review to evaluate the potential for presence of known archaeological resources and Policy CON 5-1 requires implementation of the Milpitas Cultural Resources Preservation Program and the Conceptual Historic Resources Master Plan. Potential impacts on cultural resources resulting from projects under the CAP Update would be consistent with impacts described in the General Plan 2040 EIR. The project would have (1) no peculiar impacts, (2) no significant impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts and cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid, and no further analyses is required.

Mitigation Measures

No significant cultural resource impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

The proposed CAP Update would not result in any new or substantially more severe impacts, or cumulatively considerable impacts, than described in the General Plan 2040 EIR. Therefore, findings of the General Plan 2040 EIR remain valid and no further analysis is required.

3.6 ENERGY

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
VI. Energy.						
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Impact 3.7-3: General Plan implementation has the potential to result in a significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency, pp. 3.7-36-3.7-40	No	No	No	No	Yes
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Combined with above impact	No	No	No	No	Yes

3.6.1 Discussion

Energy resources are discussed in Section 3.7, "Greenhouse Gases, Climate Change, and Energy," of the General Plan 2040 EIR. No substantial change in the environmental setting related to energy resources has occurred since certification of the General Plan 2040 EIR.

The General Plan 2040 EIR evaluates the potential for future development to result in impacts to energy use due to wasteful, inefficient, or unnecessary consumption of energy resources. The General Plan 2040 includes numerous policies and actions intended to conserve energy resources. The implementation of the General Plan 2040 policies and actions, as well as Federal and State regulations, would address the potential for future development to result in impacts to energy resources. The General Plan 2040 EIR concludes that impacts related to energy resources would be less than significant under project and cumulative conditions.

The CAP Update is a policy document and, like approval of the General Plan 2040, would not result in the direct approval of any subsequent action. The CAP Update does, however, identify policies and actions that the City intends to execute to achieve GHG emission reductions and climate resiliency. The CAP Update includes measures and actions that seek to increase energy independence and decrease reliance on the electrical grid. Measure BE-1.2 specifies ways in which the City can facilitate innovative approaches to energy generation, distribution, and storage (e.g., microgrids). The increase of onsite energy generation paired with battery storage systems reduces wasteful and unnecessary energy consumption. Measures BE-1.3, BE-2.4, BE-2.5, and BE-2.6 seek to improve energy efficiency through retrofits, enhanced community awareness, and reduced plug loads, all of which reduce inefficiency energy consumption. Potential impacts on energy resources resulting from projects under the CAP Update would be consistent with impacts described in the General Plan 2040 EIR. Therefore, the project would have no (1) peculiar impacts, (2) impacts not analyzed in the General Plan 2040 EIR, or (3) significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more

severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding energy resources remain valid and no further analysis is required.

Mitigation Measures

No significant energy impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid, and approval of the project would not require additional environmental review.

3.7 GEOLOGY AND SOILS

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
VII. Geology and Soils.						
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	Impact 3.6-1: General Plan implementation has the potential to expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides, pp. 3.6-21-3.6-24	No	No	No	No	Yes
i) 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	Combined with impact above					
ii) Strong seismic ground shaking?	Combined with impact above					
iii) Seismic-related ground failure, including liquefaction?	Combined with impact above					
iv) Landslides?	Combined with impact above					
b) Result in substantial soil erosion or the loss of topsoil?	Impact 3.6-2: General Plan implementation has the potential to result in substantial soil erosion or the loss of topsoil, p. 3.6-24	No	No	No	No	Yes
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 on-	Impact 3.6-3: General Plan implementation has the potential to result in development located on a geologic unit or soil that is	No	No	No	No	Yes

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse, pp. 3.6-25-3.6-26					
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?	Impact 3.6-4: General Plan implementation has the potential to result in development on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property, pp. 3.6-27-3.6-28	No	No	No	No	Yes
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	Impact 3.6-5: General Plan implementation does not have the potential to have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water, p. 3.6-28	No	No	No	No	No
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Impact 3.6-6: General Plan implementation has the potential to directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, pp. 3.6-28-3.6-39	No	No	No	No	Yes

3.7.1 Discussion

No substantial change in the environmental and regulatory settings related to geology, soils, or paleontological resources, described in the General Plan 2040 EIR Section 3.6, "Geology and Soils," has occurred since certification of the General Plan 2040 EIR. The setting information described in the General Plan 2040 EIR remains applicable for this analysis.

As described in the General Plan 2040 EIR, there are known, active faults within the city, including the Hayward Fault Zone and the Alquist-Priolo Earthquake Fault Zone established by the California Geological Survey. All projects would be required to comply with the provisions of the California Building Standards Code (CBSC), which requires development projects to: perform geotechnical investigations in accordance with State law, engineer improvements to address potential seismic and ground failure issues, and use earthquake-resistant construction techniques to address potential earthquake loads when constructing buildings and improvements. The General Plan 2040 would also allow development and improvement projects that would involve some land clearing, grading, and other ground-disturbing activities that could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of a substantial amount of nonrenewable topsoil and could adversely affect water quality in nearby surface waters.

As described in the General Plan 2040 EIR, unstable geologic units could be present within the Planning Area. The potential impacts of such unstable materials could include subsidence and seismically induced liquefaction, especially in areas that adjoin Coyote Creek. The General Plan 2040 EIR also discloses the presence of expansive soils in the city and evaluates the potential for direct or indirect risks to life or property. Finally, ground-disturbing construction associated with development allowed under the General Plan could uncover previously unknown fossils of potential scientific significance and other unique geologic features.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the CBSC, General Plan 2040, Zoning Ordinance, and other applicable regulations. Future development and improvement projects would be required to have a specific geotechnical study prepared and incorporated into the improvement design, consistent with the requirements of the State and City codes. In addition to the requirements associated with the CBSC and the Municipal Code, the General Plan 2040 includes policies and actions to ensure that development projects address potential geologic hazards, at-risk buildings and infrastructure is evaluated for potential risks, and site-specific studies are completed for area subject to liquefaction. Further, the Regional Water Quality Control Board requires a project-specific Storm Water Pollution Prevention Plan (SWPPP) to be prepared for each project that disturbs an area of 1 acre or larger. The SWPPPs include project-specific best management measures that are designed to control drainage and erosion. The General Plan 2040 EIR concludes that impacts related to geology and soils would be less than significant under project and cumulative conditions.

Implementation of the CAP Update would result in limited potential for ground disturbance. The physical improvements anticipated to occur as a result of implementing the proposed CAP Update would be consistent with the types of infrastructure improvements, public services expansions, and building upgrades evaluated in the General Plan 2040 EIR. For example, implementation of the CAP Update would support future EV infrastructure (Measure TR-2.1 and Action MVF-1.1.1), transit access improvements (Measure TR-3.1), and building retrofits (Measure BE-2.4). The measures in the proposed CAP Update would not generally result in the construction of structures on expansive soils that would create risks to life and property. Projects would consist of targeted infrastructure improvements and upgrade to existing structures to improve energy efficiency. As disclosed in the General Plan 2040 EIR, subsequent projects subject to the City's discretionary review will be evaluated for conformance with the CBSC, General Plan 2040, Zoning Ordinance, and other regulations, including any site-specific SWPPP. The CAP Update does not include development proposals that would require the use of septic systems. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding geology and soils remain valid and no further analysis is required.

Mitigation Measures

No significant geological or soil impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.7 GREENHOUSE GAS EMISSIONS

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
VIII. Greenhouse Gas Emissions.						
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Impact 3.7-1: General Plan implementation has the potential to generate GHG emissions that could have a significant impact on the environment, pp. 3.7-20-3.7-34	No	No	No	No	Yes
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Impact 3.7-2: General Plan implementation has the potential to conflict with adopted plans, policies, or regulations adopted for the purpose of reducing greenhouse gas emissions, pp. 3.7-35-3.7-36	No	No	No	No	Yes

3.7.1 Discussion

GHG emissions and climate change are discussed in Section 3.7, "Greenhouse Gases, Climate Change, and Energy," of the General Plan 2040 EIR. No substantial change in the environmental setting related to energy resources has occurred since certification of the General Plan 2040 EIR, however, there have been several new or updated GHG executive orders, plans, policies, or regulations issued since the certification of the General Plan 2040 EIR. The following regulations are applicable in addition to those provided in the General Plan 2040 EIR.

REGULATORY SETTING

State

Climate Change Scoping Plan

The Draft 2022 Scoping Plan lays out the framework for achieving the statewide carbon neutrality goal no later than 2045, as identified in EO B-55-18 (CARB 2022). The Draft 2022 Scoping Plan also identifies how GHGs associated with proposed projects could be evaluated under CEQA (CARB 2022:220-221). Specifically, it states that when a lead agency determines a proposed project would emit significant GHG emissions or conflict with state climate goals, lead agencies must impose feasible design features and mitigation measures to minimize the impact.

The 2022 Scoping Plan also describes an approach for detailed and adequately supported GHG reduction plans (including CAPs) to become a tool for streamlining project-level environmental review (CARB 2022:218-220). Under CEQA, individual projects that comply with the strategies and actions within an adequate local CAP can streamline the project-specific GHG analysis.

Building Efficiency Standards

The energy consumption of new residential and nonresidential buildings in California is regulated by CCR Title 24, Part 6, Building Energy Efficiency Standards (California Energy Code). The California Energy Commission updates the California Energy Code every 3 years with more stringent design requirements for reduced energy consumption, which results in the generation of fewer GHG emissions. The 2022 Building Energy Efficiency Standards, which were adopted on August 11, 2021, will go into effect starting January 1, 2023. The 2022 California Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, among other requirements (CEC 2022).

Local

Bay Area Air Quality Management District

BAAQMD updated its thresholds of significance for climate impacts in April 2022. BAAQMD recommends that cities and counties evaluate plans (which includes general plans and CAPs) “based on whether they will be consistent with California’s long-term climate goal of achieving carbon neutrality by 2045. To be consistent with this goal, these plans should reduce GHG emissions in the relevant jurisdiction to meet an interim milestone of 40 percent below the 1990 emission level by 2030, consistent with SB 32, and to support the State’s goal of carbon neutrality by 2045” (BAAQMD 2022:3).

EVALUATION OF CAP UPDATE

The General Plan 2040 EIR evaluates the potential for future development to result in impacts to climate change through the generation of significant GHG emissions or to hinder the ability of achieving adopted GHG reduction plans, policies, or regulation. The General Plan 2040 includes Action CON-1a, which calls for the update to the City’s CAP. This action states that the City’s update to the CAP should align the City’s GHG reduction targets with the State-mandated GHG reduction targets for 2030. As shown in Table 2-2, the measures included in the CAP Update will meet the City’s 2030 target, which is aligned with SB 32. The implementation of the General Plan 2040 policies and actions, as well as Federal and State regulations, would address the potential for future development to result in impacts to climate change. The General Plan 2040 EIR concludes that impacts related to climate change would be less than significant under project and cumulative conditions.

The CAP Update is a policy document and, like approval of the General Plan 2040, would not result in the direct approval of any subsequent action. The CAP Update does, however, identify policies and actions that the City intends to execute to achieve GHG emission reductions and climate resiliency. As described above, the CAP Update identifies a specific policy framework that would serve as an extension of the General Plan by establishing citywide measures and actions intended to reduce GHG emissions associated with buildout of the General Plan 2040. Through implementation of the proposed CAP Update, the City would achieve consistency with the State and local regulations adopted for the purpose of reducing GHG emissions since certification of the General Plan 2040 EIR. Therefore, the project would have no (1) peculiar impacts, (2) impacts not analyzed in the General Plan 2040 EIR, or (3) significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding energy resources remain valid and no further analysis is required.

Mitigation Measures

No significant climate change impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid, and approval of the project would not require additional environmental review.

3.8 HAZARDS AND HAZARDOUS MATERIALS

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
IX. Hazards and Hazardous Materials.						
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Impact 3.8-1: General Plan implementation has the potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, pp. 3.8-27-3.8-29	No	No	No	No	Yes
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?	Combined with impact above					
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Impact 3.8-2: General Plan implementation has the potential to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school, pp. 3.8-30-3.8-33	No	No	No	No	Yes
d) Be located on a site which 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?	Impact 3.8-3: General Plan implementation has the potential to have projects located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, pp. 3.8-33-3.8-34	No	No	No	No	Yes

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	Impact 3.8-4: General Plan implementation is not located within an airport land use plan, two miles of a public airport or public use airport, and would not result in a safety hazard for people residing or working in the project area, pp. 3.8-34-3.8-35	No	No	No	No	No
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Impact 3.8-5: General Plan implementation has the potential to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, pp. 3.8-35-3.8-37	No	No	No	No	Yes
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	Impact 3.8-6: General Plan implementation has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires, pp. 3.8-37-3.8-41	No	No	No	No	Yes

3.8.1 Discussion

No substantial change in the environmental and regulatory settings related to hazards and hazardous materials, described in General Plan 2040 EIR Chapter 3.8, "Hazards and Hazardous Materials," has occurred since certification of the General Plan 2040 EIR.

The General Plan 2040 EIR discusses the potential for accidental release of hazardous materials that are used in the construction or operation of a project. There is also the potential for accidental release of pre-existing hazardous materials associated with previous activities on a site. The use, transport, and disposal of hazardous materials is regulated and monitored by local fire departments, Certified Unified Program Agencies, the California Division of Occupational Safety and Health and the California Department of Toxic Substances Control consistent with the requirements of Federal, State, and local regulations and policies. Facilities that store hazardous materials onsite are required to maintain a Hazardous Materials Business Plan in accordance with State regulations. In the event of an accidental release of hazardous materials, the local Certified Unified Program Agency and emergency management agencies (e.g., police and fire) would respond. All future projects allowed under the General Plan 2040 would be required to comply with the provisions of Federal, State, and local requirements related to hazardous materials. Hazardous materials regulations related to the use, handling, and transport of hazardous materials are codified in Titles 8, 22, and 26 of the CCR, and their enabling legislation set forth in Chapter 6.95 of the California Health and

Safety Code. These laws were established at the state level to ensure compliance with federal regulations to reduce the risk to human health and the environment from the routine use of hazardous substances. These regulations must be implemented by employers/businesses, as appropriate, and are monitored by the state (e.g., California Division of Occupational Safety and Health in the workplace or the California Department of Toxic Substances Control for hazardous waste) and/or the County. The haulers and users of hazardous materials are listed with the Santa Clara County Fire Department and are regulated and monitored by the Santa Clara County. The City's General Plan 2040 also requires projects that may result in significant risks associated with hazardous materials to include measures to address and reduce the risks to an acceptable level such that surrounding uses are not exposed to hazardous materials in excess of adopted state and federal standards, and also requires the submittal of information regarding hazardous materials manufacturing, storage, use, transport, and/or disposal by existing and proposed businesses and developments to the Santa Clara County Fire Department. Federal and State regulations ensure that existing hazards, including those associated with known hazardous materials sites, are addressed prior to development.

The General Plan 2040 ensures 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. The General Plan 2040 includes requirements for adequate water supply and water flow availability, ensuring adequate emergency access, adequate fire protection services, fire safe design site standards, and ensuring public awareness regarding fire safety. All future projects allowed under the General Plan 2040 would be required to comply with the provisions of Federal, State, and local requirements related to wildland fire hazards, including State fire safety regulations associated with wildland-urban interfaces, fire-safe building standards, and defensible space requirements. As future development and infrastructure projects are considered by the City, each project would be evaluated for potential impacts, specific to the project, associated with wildland fire hazards as required under CEQA. There are no airport facilities located within the Planning Area. The General Plan 2040 EIR concludes that impacts related to hazards and hazardous materials would be less than significant under project and cumulative conditions.

The CAP Update does not include policies or actions that would substantially increase the use, transport, or disposal of hazardous materials in the city. Further, policies and actions in the CAP Update would not result in projects with the potential to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The CAP Update does not include policies that would increase the potential for fire, such that there would be potential to expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. As described in the General Plan 2040 EIR, weather is a key factor in the potential for wildfires. Through reduction of GHG emissions, the CAP Update would limit the City's contribution to global climate change and the potential for wildfires. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding hazards and hazardous materials remain valid and no further analysis is required.

Mitigation Measures

No significant hazards or hazardous material impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any new potentially significant impacts or cumulative impacts and there is no new information available that was not known and could not have been known at the time the General Plan 2040 EIR was certified as complete. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.9 HYDROLOGY AND WATER QUALITY

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
X. Hydrology and Water Quality.						
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	Impact 3.9-1: General Plan implementation could violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality or obstruct implementation of a water quality control plan, pp. 3.9-21-3.9-27	No	No	No	No	Yes
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	Impact 3.9-2: General Plan implementation could result in the depletion of groundwater supplies or interfere substantially with groundwater recharge or conflict with a groundwater management plan, pp. 3.9-27-3.9-34	No	No	No	No	No
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 which would:	Impact 3.9-3: General Plan implementation could alter the existing drainage pattern in a manner which would result in substantial erosion, siltation, flooding, impeded flows, or polluted runoff, pp. 3.9-34-3.9-37	No	No	No	No	Yes
i) Result in substantial on- or offsite erosion or siltation;	Combined with impact above					
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	Combined with impact above					

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
iii) 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	Combined with impact above					
iv) Impede or redirect flood flows?	Combined with impact above					
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	Impact 3.9-4: General Plan implementation would not release pollutants due to project inundation by flood hazard, tsunami, or seiche, pp. 3.9-38-3.9-43	No	No	No	No	Yes
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Combined with b) above					

3.9.1 Discussion

No substantial change in the environmental and regulatory settings related to hydrology and water quality, described in General Plan 2040 EIR Chapter 3.9, "Hydrology and Water Quality," has occurred since certification of the General Plan 2040 EIR since the certification of the EIR in March 2021.

As evaluated in the General Plan 2040 EIR, grading, excavation, and removal of vegetation cover associated with future construction activities could temporarily increase runoff, erosion, and sedimentation. Compliance with existing City and County construction and stormwater management codes and the Stormwater Master Plan would reduce these potential impacts related to stormwater quality. In addition, prior to the issuance of grading permits, each site developed under the General Plan 2040 would be required to submit a SWPPP and Stormwater Master Plan to the City for approval. The General Plan 2040 EIR concludes that the provisions of the Clean Water Act, which require preparation of a SWPPP where more than 1 acre of ground disturbance would occur, would address the potential for future development to violate water quality standards or waste discharge requirements, or otherwise obstruct implementation of a water quality control plan.

Once constructed, new development and infrastructure projects that result from implementation of the General Plan 2040 could increase the amount of impervious surfaces throughout Milpitas. Future increases in impervious surfaces could result in increased urban runoff, pollutants, and first flush roadway contaminants, as well as an increase in nutrients and other chemicals from landscaped areas. Chapter X-16 of the City's Municipal Code provides regulations and gives legal effect to certain requirements of the Waste Discharge Requirements and National Pollutant Discharge

Elimination System permit for the discharge of stormwater runoff from the City's municipal separate storm sewer (MS4), issued by the California Regional Water Quality Control Board, San Francisco Region to the City of Milpitas.

Milpitas is located in the Santa Clara Plain groundwater management area of the Santa Clara Subbasin. Potable water is purchased from two wholesalers, the San Francisco Public Utilities Commission (SFPUC) and the Santa Clara Valley Water District (SCVWD), which have sufficient water supply water to meet anticipated demand from General Plan 2040 buildout. The SCVWD actively monitors groundwater elevations to evaluate current groundwater conditions and land subsidence, optimize recharge efforts, access groundwater storage, and support groundwater management efforts. No SCVWD recharge ponds/facilities or instream recharge areas exist within the Planning Area boundaries.

Finally, the city is not at significant risk from a dam failure. Limited, isolated damage to adjacent and down-slope structures has been observed from seiches occurring in swimming pools and in small shallow lakes and ponds. Man-made lakes within the Planning Area are shallow with limited surface areas and would not generate devastating seiches. The City of Milpitas is not within a tsunami hazard area and would not be subject to substantial impacts from seiche events. The General Plan 2040 EIR concludes that impacts related to hydrology and water quality would be less than significant under project and cumulative conditions.

Construction required to implement the CAP Update could result in erosion and grading. All construction would occur within the Planning Area for the General Plan 2040 and would be subject to the requirements of State regulations (e.g., the Clean Water Act) and uniformly applied policies adopted through the General Plan. Implementation of the CAP Update would not substantially increase water demand or impervious surfaces in a manner that would interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. Implementation of the CAP Update would not result in new or expanded impervious surfaces that could impair groundwater recharge or substantially alter the existing drainage pattern. In addition, the CAP Update does not propose measures that could increase the presence of pollutants within flood hazard zones. In fact, Climate Adaptation Strategy 3 and associated Measures (3.1 through 3.3) are intended to reduce the impacts of flooding in the city. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding hydrology and water quality remain valid and no further analysis is required.

Mitigation Measures

No significant hydrology or water quality impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.10 LAND USE AND PLANNING

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
XI. Land Use and Planning.						
a) Physically divide an established community?	Impact 3.10-1: General Plan implementation would not physically divide an established community, pp. 3.10-15-3.10-16	No	No	No	No	Yes
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?	Impact 3.10-2: General Plan implementation would not 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, pp. 3.10-17-3.10-20	No	No	No	No	Yes

3.10.1 Discussion

No substantial change in the environmental or regulatory setting related to land use and planning has occurred since certification of the General Plan 2040 EIR. The conditions described in Section 3.10, "Land Use Planning and Population/Housing," of the General Plan 2040 EIR remain applicable to the following analysis.

As set forth by State law, the General Plan 2040 serves as the primary planning document for the City and subordinate documents and plans, such as the CAP Update, would be updated to be consistent with the General Plan 2040. As described in Section 3.10, "Land Use Planning and Population/Housing," of the General Plan 2040 EIR, the General Plan 2040 does not include any new areas designated for urbanization or new roadways, infrastructure, or other features that would divide existing communities. General Plan 2040 policies would ensure that future development is compatible with adjacent communities and land issues. The General Plan 2040 EIR concludes that impacts related to land use would be less than significant under project and cumulative conditions.

The CAP Update would not result in physical changes to the environment, including new infrastructure, with the potential to physically divide an established community. The CAP Update implements the provisions of the General Plan 2040, specifically fulfilling the City's obligation pursuant to General Plan Action CON-1a, which required the City to update the City's CAP to achieve the GHG reduction targets for 2030 and 2050. Through Measure TR-1.3, the City would continue to implement and adopt policies that support high-density, mixed-use, and transit-oriented development and housing near jobs. These projects would be subject to a determination of compatibility with the land use policies and actions outlined in the General Plan 2040 EIR. Subsequent development and infrastructure projects would be required to be consistent with all applicable policies, standards, and regulations, including those land use plans, policies, and regulations adopted to mitigate environmental effects by the City as well as those adopted by agencies with jurisdiction over components of future development projects. Therefore, the project would

have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding land use remain valid and no further analysis is required.

Mitigation Measures

No significant land use or planning impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. No new impacts have occurred nor has any new information been found requiring new analysis or verification. The project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.11 MINERAL RESOURCES

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
XII. Mineral Resources.						
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?	Impact 3.11-1: General Plan implementation would not 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, p. 3.11-4	No	No	No	No	No
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?	Impact 3.11-2: General Plan implementation would not 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, p. 3.11-5	No	No	No	No	No

3.11.1 Discussion

No substantial change in the environmental and regulatory settings related to mineral resources, described in the General Plan 2040 EIR Section 3.11, "Mineral Resources," has occurred since certification of the General Plan 2040 EIR.

As described in the General Plan 2040 EIR, the Planning Area contains four areas identified by the State Geologist as containing Regionally Significant Construction Aggregate Resources. These areas, located in the foothills outside of the City limits, are part of the South San Francisco Bay Production-Consumption Region and contain sandstone deposits. All the areas are being quarried. Implementation of the General Plan 2040 would not result in the loss of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan, because the proposed General Plan does not re-designate any new lands for urban development within the hillside areas within the SOI east of the city limits. The General Plan 2040 EIR concludes that impacts related to mineral resources would be less than significant under project and cumulative conditions.

Similarly, the CAP Update would not change the land use designations within the hillside areas of the SOI. No components of the CAP Update would result in the loss of availability of a known mineral resource. In addition, the CAP Update would not amend, revise, or be inconsistent with any existing regulations related to mineral resources. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. Therefore, the findings of the certified General Plan 2040 EIR regarding mineral resources remain valid and no further analysis is required.

Mitigation Measures

No significant mineral resource impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. No new impacts have occurred nor has any new information been found requiring new analysis or verification. The project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.12 NOISE

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
XIII. Noise.						
a) 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 in other applicable local, state, or federal standards?	Impact 3.12-1: General Plan implementation may result in exposure to significant traffic noise sources, pp. 3.12-22-3.12-27 Impact 3.12-2: General Plan Implementation may result in exposure to excessive railroad noise sources, pp. 3.12-27-3.12-28 Impact 3.12-3: Implementation of General Plan could result in the generation of excessive stationary noise sources, pp. 3.12-29-3.12-30 Impact 3.12-4: General Plan implementation may result in an increase in construction noise sources, pp. 3.12-30-3.12-32	No	No	No	No	No
b) Generation of excessive groundborne vibration or groundborne noise levels?	Impact 3.12-5: General Plan implementation may result in construction vibration, pp. 3.12-32-3.12-33 Impact 3.12-6: General Plan implementation may result in exposure to ground borne vibration, pp. 3.12-34-3.12-39	No	No	No	No	Yes
c) 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 two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	NA	NA	NA	NA	NA	NA

3.12.1 Discussion

No substantial changes in the environmental and regulatory settings have occurred related to noise, described in Section 3.12, "Noise," of the General Plan 2040 EIR.

Impact 3.12-1 in the General Plan 2040 EIR identified a significant and unavoidable impact with regard to traffic noise exposure, while all other impacts in Section 3.12, "Noise," of the General Plan 2040 EIR were less than significant. Implementation of the CAP Update would not exceed the City's traffic noise standards or result in significant increases in traffic noise levels at existing sensitive receptors because the CAP Update does not propose new development that would result in increased traffic levels. General Plan Policies N 1-1 through N 1-7, N 1-9, N 1-10 and Actions N 1a, N 1b, N 1e, N 1f, N 1g, N 1h, N 1i, and N 1k are intended to minimize exposure to excessive noise, including noise associated with traffic.

The CAP Update is a policy document and, like approval of the General Plan 2040, would not result in the direct approval of any subsequent action. The CAP Update does, however, identify policies and actions that the City intends to execute to achieve GHG emission reductions and climate resiliency. These subsequent projects could result in limited construction noise, but are not anticipated to increase long term, operational noise. The physical improvements anticipated to occur as a result of implementing the proposed CAP Update would be consistent with the types of infrastructure improvements, public services expansions, and building upgrades evaluated in the General Plan 2040 EIR and would occur within the City's Planning Area. Furthermore, the CAP Update includes policies and actions intended to reduce private vehicle use, which may reduce the potential traffic noise from buildout of the General Plan 2040. Potential impacts on noise resulting from projects under the CAP Update would be consistent with impacts described in the General Plan 2040 EIR. Therefore, the project would have no (1) peculiar impacts, (2) impacts not analyzed in the General Plan 2040 EIR, or (3) significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding noise remain valid and no further analysis is required.

Mitigation Measures

Impact 3.12-1 was deemed significant and unavoidable in the General Plan 2040 EIR and no feasible mitigation measure are included; however, the CAP Update does not include development proposals that would generate new construction noise and vibration not evaluated in the General Plan 2040 EIR. Therefore, there are no mitigation measures applicable to the project.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any new potentially significant impacts or cumulative impacts, and there is no new information available that was not known and could not have been known at the time the General Plan 2040 EIR was certified as complete. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.13 POPULATION AND HOUSING

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
XIV. Population and Housing.						
a) 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)?	Impact 3.10-3: General Plan implementation would not 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), pp. 3.10-20-3.10-21	No	No	No	No	No
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	Impact 3.10-4: General Plan implementation would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere, pp. 3.10-21-3.10-23	No	No	No	No	No

3.13.1 Discussion

No substantial change in the environmental or regulatory setting related to population and housing has occurred since certification of the General Plan 2040 EIR. The conditions described in Section 3.10, "Land Use Planning and Population/Housing," of the General Plan 2040 EIR remain applicable to the following analysis.

The General Plan 2040 is intended to accommodate the City's fair share of statewide housing needs. The Land Use Element and Land Use Map identify new growth that is focused on infill sites distributed throughout the city, with higher density uses focused around major transportation corridors, the Santa Clara Valley Transportation Authority's Light Rail lines, and the Milpitas Transit Center. Implementation of General Plan 2040 policies and actions intended to guide growth to appropriate areas and provide services necessary to accommodate growth, the land uses allowed under the General Plan 2040, the infrastructure anticipated to accommodate proposed land uses, and the goal and policy framework would not induce growth. The General Plan 2040 EIR concludes that impacts related to population and housing would be less than significant under project and cumulative conditions.

Implementation of the CAP Update would not induce population growth directly or indirectly, because the GHG reduction measures do not propose new housing, nor do they propose changes to policies or regulations related to land use or residential zoning. Although the City would continue to implement and adopt policies that support high-density, mixed-use, and transit-oriented development and housing near jobs through Measure TR-1.3, this pattern of development is consistent with the assumptions in the General Plan 2040 EIR and related planning documents. GHG reduction measures that would facilitate the construction of future EV infrastructure (Measures TR-2.1 and TR-2.2),

transit access improvements (Measure TR-3.1), bicycle network improvements (Actions TR-3.3.1, TR-3.3.3, and TR-3.3.5), and solar for City buildings (see Municipal Actions to support Measure BE-1.1), could require a temporary increase in the number of construction workers. These types of projects are small construction projects, which would not require a large construction crew. Furthermore, construction workers would likely be from the area and permanent, substantial relocation of workers would not be required. Implementation of the CAP Update would not displace people or housing because the GHG reduction measures do not propose new housing, nor do they propose changes to policies or regulations related to land use or residential zoning.

The General Plan 2040 accommodates future growth in Milpitas, including new businesses, expansion of existing businesses, and new residential uses. Infrastructure and services would need to be extended to accommodate future growth. The CAP Update is another component of the City's approach to planning for environmentally conscious growth. There are no components of the CAP Update that would result in substantial unplanned population growth. Implementation of the CAP Update would no result in projects with the potential to displace people or housing. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding population and housing remain valid and no further analysis is required.

Mitigation Measures

No significant population or housing impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

No new circumstances or project changes have occurred nor has any new information been found requiring new analysis or verification. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The conclusions of the General Plan 2040 EIR pertaining to population and housing remain valid and no further analysis is required.

3.14 PUBLIC SERVICES

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
XV. Public Services.						
a)	Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 public services:					
Fire protection?	Impact 3.13-1: General Plan implementation could result in adverse physical impacts on the environment associated with the need for new governmental facilities or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts and the provision of public services, pp. 3.13-17-3.13-20	No	No	No	No	No
Police protection?	Combined with impact above					
Schools?	Combined with impact above					
Parks?	See Section 3.14, "Recreation"					
Other Public Facilities?	Combined with impact above					

3.14.1 Discussion

No substantial change in the settings related to public services, described in General Plan 2040 EIR Section 3.13, "Public Services and Recreation," has occurred since certification of the General Plan 2040 EIR.

Development accommodated under the General Plan 2040 would result in additional residents and businesses in the city. This would result in increased demand for public services, including fire protection, law enforcement, schools, parks, libraries, and other public and governmental services. The General Plan 2040 includes policies and actions to ensure that public services are provided at acceptable levels and that the City will maintain and implement public facility master plans, in collaboration with appropriate outside service providers and other agencies, to ensure compliance with appropriate regional, state, and federal laws and to provide efficient public facilities and services to Milpitas.

As the demand for services increases, there will likely be a need to address acceptable service ratios, response times, and other performance standards. New or expanded service structures (e.g., offices, maintenance and administrative buildings, schools, parks, fire facilities, libraries) will be needed to provide for adequate staffing, equipment, and

appropriate facilities to serve growth in the city. Existing facilities may be expanded at their current location. New facilities may also be constructed. The facilities will be primarily provided on sites with land use designations that allow such uses and the environmental impacts of constructing and operating the governmental facilities would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the General Plan. These impacts are described in the relevant chapters (Chapters 3.1 through 3.16, and 4.0) of the General Plan 2040 EIR. Any future development under the General Plan 2040 would be required to comply with regulations, policies, and standards included in the General Plan. The General Plan 2040 EIR concludes that impacts related to public services would be less than significant under project and cumulative conditions.

As discussed above in Section 3.13, "Population and Housing," the CAP Update would not result in population growth. Implementation of the CAP Update would not increase the demand for public services or result in the relocation or expansion of public services such that new significant environmental effects could result. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding public services remain valid and no further analysis is required.

Mitigation Measures

No significant public service impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

No new circumstances or project changes have occurred nor has any new information been found requiring new analysis or verification. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The conclusions of the General Plan 2040 EIR pertaining to public services remain valid and no further analysis is required.

3.15 RECREATION

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
XVI.Recreation.						
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?	Impact 3.13-2: General Plan implementation may result in adverse physical impacts associated with the deterioration of existing parks and recreation facilities or the construction of new parks and recreation facilities, pp. 3.13-21-3.13-31					
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	Combined with impact above					

3.15.1 Discussion

No substantial change in the regulatory settings related to public services, described in General Plan 2040 EIR Section 3.13, "Public Services and Recreation," has occurred since certification of the General Plan 2040 EIR.

Growth accommodated under the General Plan 2040 would result in increased demand for parks and recreation facilities. Development under the General Plan 2040 would indirectly lead to the construction of new parks and recreation facilities to serve new growth and to meet existing parks and recreation needs. New facilities would be provided at a pace and in locations appropriate to serve new development, as required to maintain the City's adopted standard for park space acreage at 5 acres for every 1,000 residents (as required by General Plan 2040 Policy PROS-1.4). New parks or recreational facilities constructed in the future would be primarily provided on sites with land use designations that allow such uses and the environmental impacts of constructing and operating the parks and recreational facilities would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the General Plan 2040. These impacts are described in the relevant chapters (Chapters 3.1 through 3.16, and 4.0) of the General Plan 2040 EIR. Because any future development under the General Plan 2040 would be required to comply with regulations, policies, and standards included in the General Plan, the General Plan 2040 EIR concludes that impacts related to recreational facilities would be less than significant under project and cumulative conditions.

As discussed above in Section 3.13, "Population and Housing," the CAP Update would not result in population growth. Implementation of the CAP Update would not increase the demand for parks or result in the construction of new recreational facilities. The CAP Update does include Action CS-1.1.6 through which the City would identify new development mitigation for the provision of parks or open space to enhance carbon sequestration and Action CS-

1.3.1 to develop and implement a green infrastructure program that would support the maintenance of the existing parks system. Implementation of the CAP Update may also result in minor modifications to existing parks, such as upgrading facility lighting to LEDs and installation of upgraded irrigation systems and drought-tolerant landscaping. These actions would not result in the potential for new, adverse physical effects on the environment that would be inconsistent with the development evaluated in the General Plan 2040 EIR. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding recreation remain valid and no further analysis is required.

Mitigation Measures

No significant recreation impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

No new circumstances or project changes have occurred nor has any new information been found requiring new analysis or verification. Therefore, the project would have (1) no peculiar impacts, (2) no impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts and cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The conclusions of the General Plan 2040 EIR pertaining to parks and recreation remain valid and no further analysis is required.

3.16 TRANSPORTATION/TRAFFIC AND CIRCULATION

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
XVII. Transportation.						
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	Impact 3.14-1: General Plan implementation would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities, pp. 3.14-30-3.14-34	No	No	No	No	Yes
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	Impact 3.14-2: General Plan implementation would conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (a), pp. 3.14-34-3.14-36	No	No	No	No	No
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Impact 3.14-3: General Plan implementation would not substantially increase hazards due to a geometric design feature or incompatible use, p. 3.14-37	No	No	No	No	Yes
d) Result in inadequate emergency access?	Impact 3.14-4: General Plan implementation would not result in inadequate emergency access, pp. 3.14-37-3.14-47	No	No	No	No	Yes

3.16.1 Discussion

Transportation and circulation are discussed in Section 3.14, "Transportation and Circulation," of the General Plan 2040 EIR. No substantial change in the environmental setting related to transportation and circulation has occurred since certification of the General Plan 2040 EIR, however, the City has adopted new policies related to transportation since the certification of the General Plan 2040 EIR. The following policies are applicable in addition to those provided in the General Plan 2040 EIR.

REGULATORY SETTING

Local

The Milpitas City Council adopted a VMT policy on May 18, 2021, pursuant to the requirements of SB 743, which requires local jurisdictions to use VMT instead of Level of Service to analyze transportation impacts under CEQA. The VMT policy aligns with the goals and policies of the General Plan and other City-adopted plans, and supports new development in suitable areas near transit, mixed-use neighborhoods, and other amenities.

EVALUATION OF CAP UPDATE

Impact 3.14.-2 in the General Plan 2040 EIR identified a significant and unavoidable impact with regard to employment-based VMT generation, while all other impacts in Section 3.14, "Transportation and Circulation," of the General Plan 2040 EIR were less than significant. Implementation of the CAP Update would not exceed the City's VMT thresholds because the CAP Update does not propose new development that would result in increased VMT. The General Plan's land use patterns and intensities, as well as its policies, include a multitude of components that will reduce VMT. Transportation demand management (TDM) strategies are included in General Plan 2040 policies and CAP Update strategies and measures.

The CAP Update is a policy document and, like approval of the General Plan 2040, would not result in the direct approval of any subsequent action. The CAP Update does, however, identify policies and actions that the City intends to execute to achieve GHG emission reductions and climate resiliency. These subsequent projects would be required to complete VMT analyses based on the City's adopted VMT policy. The physical improvements anticipated to occur as a result of implementing the proposed CAP Update would be consistent with the types of infrastructure improvements evaluated in the General Plan 2040 EIR and would occur within the City's Planning Area. For example, implementation of the CAP Update would reduce VMT from new and existing development through TDM strategies (Measures TR-1.1 and TR-1.2), transit access improvements (Measure TR-3.1), and bicycle and pedestrian infrastructure improvements (Measure TR-3.3). Potential impacts on transportation resulting from projects under the CAP Update would be consistent with impacts described in the General Plan 2040 EIR. Therefore, the project would have no (1) peculiar impacts, (2) impacts not analyzed in the General Plan 2040 EIR, or (3) significant off-site impacts or cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. The findings of the certified General Plan 2040 EIR regarding transportation and circulation remain valid and no further analysis is required.

Mitigation Measures

Impact 3.14-2 was deemed significant and unavoidable in the General Plan 2040 EIR and no feasible mitigation measure are included; however, the CAP Update does not include development proposals that would generate new VMT or traffic impacts not evaluated in the General Plan 2040 EIR. Therefore, there are no mitigation measures applicable to the project.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.17 TRIBAL CULTURAL RESOURCES

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
XVIII. Tribal Cultural Resources.						
Has a California Native American Tribe requested consultation in accordance with Public Resources Code section 21080.3.1(b)?						
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)?	Impact 3.5-3: General Plan implementation could cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to Section 15064.5, pp. 3.5-19-3.5-21	No	No	No	No	Yes
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?	Combined with impact above					

3.17.1 Discussion

Tribal cultural resources are discussed in Section 3.5, "Cultural Resources," of the General Plan 2040 EIR. No substantial change in the environmental setting related to cultural resources has occurred since certification of the General Plan 2040 EIR.

As discussed in the General Plan 2040 EIR, future development could result in the discovery of previously undocumented archaeological resources, including Native American artifacts and human remains. Compliance with the General Plan policies and actions, as well as State and local guidelines, would provide an opportunity to identify, disclose, and avoid or minimize the disturbance of and impacts to a tribal resource. The General Plan 2040 EIR concludes that impacts related to tribal cultural resources would be less than significant under project and cumulative conditions.

The CAP Update is a policy document and, like approval of the General Plan 2040, would not result in the direct approval of any subsequent action. The CAP Update does, however, identify policies and actions that the City intends to execute to achieve GHG emission reductions and climate resiliency. The physical improvements anticipated to

occur as a result of implementing the proposed CAP Update would be consistent with the types of infrastructure improvements evaluated in the General Plan 2040 EIR and would occur within the City's Planning Area. For example, implementation of the CAP Update would support future EV infrastructure (Measure TR-2.1 and Action MVF-1.1.1) and innovative approaches to energy generation, distribution, and storage (Measure BE-1.2). Infrastructure upgrades could result in ground disturbance within the Planning Area that is consistent with the types of disturbance and potential to encounter cultural resources evaluated in the General Plan 2040 EIR.

As described in the General Plan 2040 EIR, future discretionary projects would be subject to environmental review under CEQA, which may include project-level records review and analysis and would result in identification of necessary avoidance or mitigation measures to reduce potential impacts. The CAP Update would be consistent with the development anticipated in the General Plan 2040 EIR and would not increase the potential severity of impacts to tribal cultural resources. The project would have (1) no peculiar impacts, (2) no significant impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts and cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid, and no further analyses is required.

3.18 UTILITIES AND SERVICE SYSTEMS

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
XIX. Utilities and Service Systems.						
a) Require or result in the relocation or construction of construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?	Impact 3.15-2: General Plan implementation may require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects, p. 3.15-14 Impact 3.15-4: General Plan implementation may require or result in the relocation or construction of new or expanded wastewater facilities, the construction or relocation of which could cause significant environmental effects, p. 3.15-23 Impact 3.15-5: General Plan implementation may require or result in the relocation or construction of new or expanded storm water drainage facilities, the construction or relocation of which could cause significant environmental effects, pp. 3.15-29-3.15-31	No	No	No	No	Yes
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	Impact 3.15-1: General Plan implementation would result in sufficient water supplies available to serve the City and reasonably foreseeable future development during normal, dry and multiple dry years, pp. 3.15-11-3.15-13	No	No	No	No	No
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	Impact 3.15-3: General Plan implementation has the potential to result in a determination by the wastewater treatment provider which serves or may serve the Project that it	No	No	No	No	No

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/Resolve Impacts?
projected demand, in addition to the provider's existing commitments?	has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments, pp. 3.15-21-3.15-22					
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?	Impact 3.15-6: General Plan implementation would comply with federal, state, and local management and reduction statutes and regulations related to solid waste, and would not 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, pp. 3.15-36-3.15-43	No	No	No	No	No
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Combined with impact above					

3.18.1 Discussion

No substantial change in the settings related to utilities and services systems, described in General Plan 2040 EIR Section 3.15, "Utilities and Service Systems," has occurred since certification of the General Plan 2040 EIR in March 2021. Although the Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) were officially adopted subsequently (on June 15, 2021, by the Milpitas City Council), the data from these studies informed the analysis in the General Plan 2040 EIR.

The General Plan 2040 EIR discloses that infrastructure and facilities necessary to serve new growth could involve development of facilities within new development projects, on appropriately designated land, and improvements to existing facilities and disturbance of existing rights-of-way. As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the General Plan 2040, Municipal Code, and other applicable regulations.

Implementation of the General Plan 2040 would result in increased population and employment growth within the Planning Area, and a corresponding increase in the demand for additional water supplies. For the purpose of the analysis in the General Plan 2040 EIR, potable water demands were estimated based on water use factors recommended in the 2020 WMPU. These water use factors represent typical water use for each General Plan Land Use designation and were developed from actual consumption data for calendar year 2019. The result is a total water demand of approximately 13.1 million gallons per day (mgd) (14,700 acre-feet per year (af/yr)) at buildout. This

includes an 8 percent adjustment for unaccounted-for water, which is consistent with the 2020 WMPU. For comparison, the 2020 WMPU projects buildout potable water demands to be slightly higher, approximately 13.7 mgd.

The General Plan 2040 includes a range of policies designed to ensure an adequate water supply for development and to minimize the potential adverse effects of increased water use. Given that projected water demands associated with General Plan 2040 buildout would not exceed the projected available water supplies, and that the proposed General Plan includes a comprehensive set of goals and policies to ensure an adequate and reliable source of clean potable water, the City determined that there will be adequate water supply to serve the buildout. Implementation and buildout of the General Plan 2040 would not result in the need to construct or expand water supply and treatment facilities that have not already been described and accounted for in the relevant water master plans.

Wastewater treatment capacity is also anticipated to be adequate to serve buildout. Applying Use Factors from the 2009 Sewer Master Plan Update factors to the General Plan 2040 buildout projections yields a buildout average dry weather flow (ADWF) of approximately 11.8 mgd. This projected ADWF is below the City's current capacity rights of 14.25 mgd.

In addition, future projects within the Planning Area would be required to comply with applicable State and local requirements, including those pertaining to solid waste, construction waste diversion, and recycling. While there is adequate permitted landfill capacity to accommodate future growth, the General Plan 2040 includes actions to further reduce the project's impact on solid waste services. The General Plan 2040 EIR concludes that impacts related to utilities would be less than significant under project and cumulative conditions.

The CAP Update includes measures focused on the water, wastewater, and solid waste sectors to minimize GHG emissions while improving community resilience and energy reliability and protecting natural resources. The CAP Update includes proposed measures to further reduce water consumption and demand for wastewater treatment. Measure WA-1.1 would reduce indoor water consumption in buildings and is supported by Actions WA-1.1.1 through WA-1.1.7, which would encourage water conservation. Measure WA-1.2 would reduce water consumption for irrigation and landscaping. Measure WA-1.3 would increase the use of recycled water through Actions WA-1.3.1 through WA-1.3.6 that continue requirements to include recycled water infrastructure in new development and encourage use of recycled water for industrial uses and landscape irrigation. Measures related to solid waste aim to eliminate the disposal of organic solid waste in landfills (Measure SW-1.1), increase recycling and the diversion of other inorganic solid waste (Measure SW-1.2), reduce generation of waste from residents and businesses (Measure SW-1.3) and construction and demolition (Measure SW-1.4), and facilitate repair and reuse of consumer products (Measure SW-1.5). These measures would serve to reduce the demand for utilities and service systems and decrease the potential that either the capacity of existing service providers would be exceeded or new facilities would be required. As described in Section 3.9, "Hydrology and Water Quality," implementation of the CAP Update is not anticipated to increase impervious surfaces or runoff more than the effects anticipated from buildout of the General Plan and evaluated in the General Plan 2004 EIR. For these reasons, the project would have (1) no peculiar impacts, (2) no significant impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts and cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid, and no further analyses is required.

Mitigation Measures

No significant utilities or service system impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. As discussed above, the project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

3.19 WILDFIRE

ENVIRONMENTAL ISSUE AREA	Where Impact Was Analyzed in the GP EIR.	Any Peculiar Impact?	Any Impact Not Analyzed as Significant Effect in GP EIR?	Any Significant Off-Site or Cumulative Impact Not Analyzed?	Any Adverse Impact More Severe Based on Substantial New Information?	Do Uniformly Applied Development Policies or Standards Address/ Resolve Impacts?
XX. Wildfire.						
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?	Impact 3.16-1: General Plan implementation could substantially impair an adopted emergency response plan or emergency evacuation plan, pp. 3.16-6-3.16-9	No	No	No	No	No
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?	Impact 3.16-2: General Plan implementation would not exacerbate wildfire risks, or thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire, pp. 3.16-9-3.16-11	No	No	No	No	Yes
c) Require the installation 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?	Impact 3.16-3: 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, p. 3.16-11-3.16-13	No	No	No	No	Yes
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?	Impact 3.16-4: 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, pp. 3.16-13-3.16-17					

3.19.1 Discussion

No substantial change in the environmental and regulatory settings related to hazards and hazardous materials, described in General Plan 2040 EIR Chapter 3.16, "Wildfires," has occurred since certification of the General Plan 2040 EIR.

The City of Milpitas does not contain any areas determined to have either a high or very high fire threat to people within the City limits. Future projects are not anticipated to remove or impede evacuation routes, and the General Plan 2040 does not include land uses, policies, or other components that conflict with adopted emergency response or evacuation plans. The General Plan 2040 ensures that the City maintains adequate emergency access as well as staffing, training, station locations, emergency response. Important new critical facilities would also be located to ensure resiliency and functionality in the event of a natural disaster.

Any future projects contemplated under the General Plan 2040 would be required to comply with the provisions of Federal, State, and local requirements related to wildland fire hazards, including State fire safety regulations associated with wildland-urban interfaces, fire-safe building standards, and defensible space requirements as part of the project's approval process. Infrastructure required to serve development allowed under the General Plan 2040 would generally be located in and along established City roadways and would be located in areas that are already urbanized and are currently served by infrastructure. As such, implementation of the General Plan 2040 would not exacerbate wildfire risks. The General Plan 2040 includes requirements for adequate water supply and water flow availability, emergency access, fire protection services, fire safe design site standards, and ensuring public awareness regarding fire safety. All future development projects would be required to be consistent with the City's municipal code standards related to the California Fire Code. The General Plan 2040 EIR concludes that impacts related to wildfire would be less than significant under project and cumulative conditions.

The proposed CAP Update is intended to provide a roadmap to make Milpitas resilient to climate change and the associated effects, such as increased potential for wildfire. The developed areas of the city, where specific projects like EV charger installation would occur, are not in state responsibility areas or lands classified as very high fire hazard severity zones. In addition, although the area east of the city in the SOI is an area of elevated wildfire risk, implementation of the CAP Update would not interfere with implementation of an adopted emergency response plan, exacerbate wildfire risk, or expose people or structures to significant risks, as a result of runoff, post-fire slope instability, or drainage changes. Although new electrical infrastructure may result from implementation of the CAP Update, the increase in electrical demand would be within the scope of the utility provider's integrated resources plans. The potential for upgraded and modified infrastructure is within the overall scope of the upgrades contemplated in the General Plan 2040 EIR and would not require the installation 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. For these reasons, the project would have (1) no peculiar impacts, (2) no significant impacts not analyzed in the General Plan 2040 EIR, (3) no significant off-site impacts and cumulative impacts not discussed in the General Plan 2040 EIR, and (4) there is no substantial new information indicating that an impact would be more severe than discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid, and no further analyses is required.

Mitigation Measures

No significant wildfire impacts were identified in the General Plan 2040 EIR, and no mitigation measures were required.

CONCLUSION

There are no significant impacts that are peculiar to the project. The project would not have any potentially significant impacts or cumulative impacts that were not discussed in the General Plan 2040 EIR. Therefore, the conclusions of the General Plan 2040 EIR remain valid and approval of the project would not require additional environmental review.

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RESOLUTION NO. _____

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS ADOPTING
THE MILPITAS CLIMATE ACTION PLAN UPDATE AND THE ADDENDUM TO THE
GENERAL PLAN ENVIRONMENTAL IMPACT REPORT**

WHEREAS, the initial Climate Action Plan was adopted by the City Council in May 2013; and

WHEREAS, Project No. 3146 Climate Action Plan Update was approved as part of the Capital Improvement Program 2019-2025; and

WHEREAS, climate change poses an imminent threat to the city and the world at large and the City must act swiftly on climate change to ensure a livable, healthy, and prosperous planet for generations to come.; and

WHEREAS, the City of Milpitas, as lead Agency, prepared the General Plan 2040 Environmental Impact Report which is a program EIR that considers the environmental effects of implementing the General Plan through the 20-year planning horizon. Among the proposed policies and actions evaluated in the General Plan 2040 EIR, Action CON-1a required the City to update the City's Climate Action Plan (CAP) to achieve the greenhouse gas (GHG) reduction targets for 2030 and 2050 and the City adopted the Milpitas GP EIR on March 9, 2021; and

WHEREAS, the City of Milpitas, as lead Agency, prepared the California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) Addendum (Addendum) to the Milpitas General Plan Update EIR (Milpitas GP EIR; State Clearinghouse No. 2020070348) which demonstrates that the proposed CAP would not change any of the conclusions of the General Plan 2040 EIR; and

WHEREAS, the Climate Action Plan Update was made available for Public Review on May 11, 2022 and notice of its availability was posted on the City website, social media, newsletter publications, and Milpitas Post with the comment period closing on June 10, 2022. The City received comments from community members and the Sierra Club Loma Prieta Chapter; and

WHEREAS, the City acknowledges receipt of these comments and recommends future consideration of accelerating long-term targets and goals and incorporation of all other administrative corrections and clarifications;

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. The City Council hereby adopts a resolution to adopt the Climate Action Plan Update and the Addendum to the General Plan EIR for the Climate Action Plan Update.

PASSED AND ADOPTED this _____ day of _____ 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Wendy Wood, City Clerk

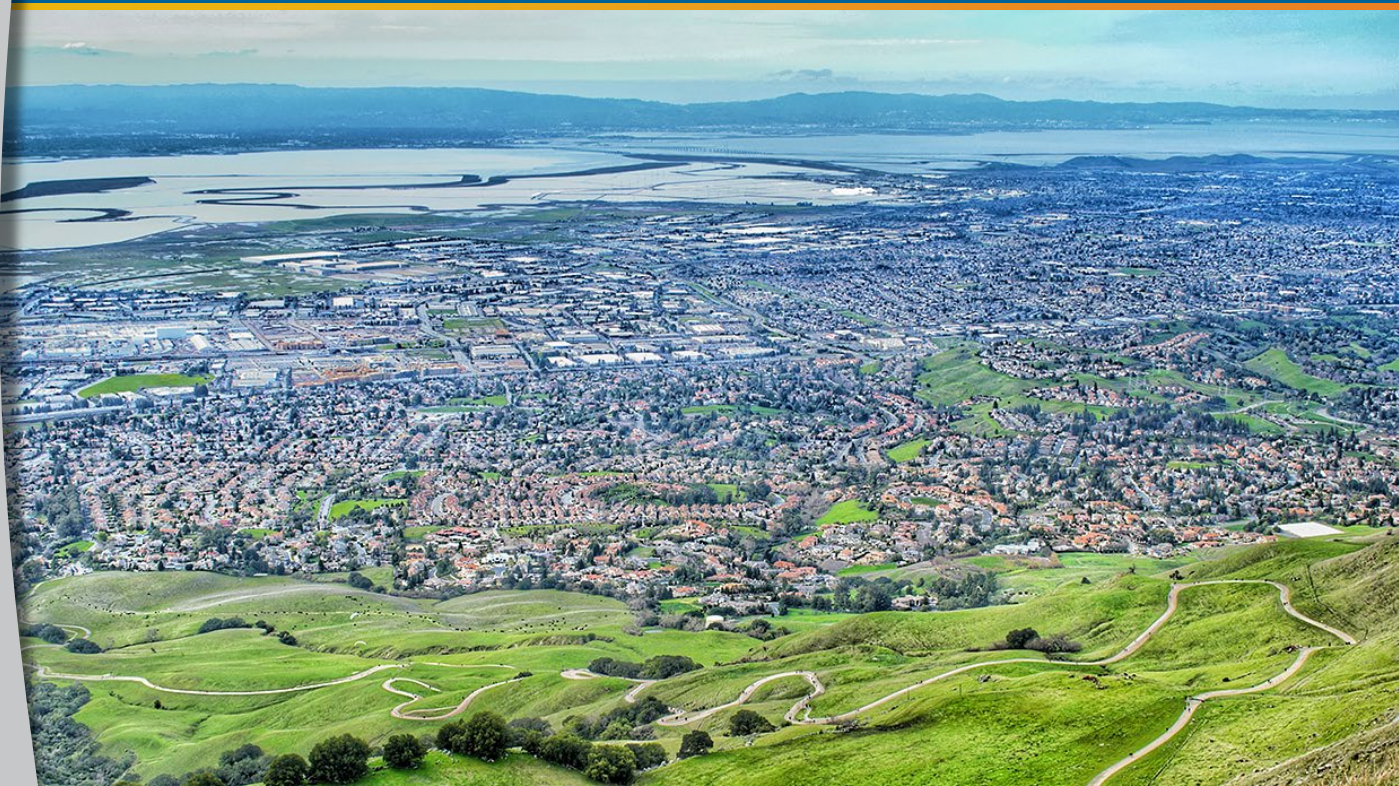
Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney

PUBLIC DRAFT

Milpitas Climate Action Plan Update



Prepared for:



City of Milpitas

May 2022

PUBLIC DRAFT

Milpitas Climate Action Plan Update

Prepared for:



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May 2022

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List of Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
2008 Scoping Plan	<i>Climate Change Scoping Plan: A Framework for Change</i>
2017 Scoping Plan	<i>California's 2017 Climate Change Scoping Plan Update</i>
AB	Assembly Bill
BAU	"business-as-usual"
Bay Area	San Francisco Bay Area
BayCAN	Bay Area Climate Adaptation Network
BayREN	Bay Area Regional Energy Network
CAP Update	Climate Action Plan Update
CAP	Climate Action Plan
CARB	California Air Resources Board
CBEI	"consumption-based" emissions inventory
CEQA	California Environmental Quality Act
CH ₄	methane
city	City of Milpitas
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
Community Protocol	<i>U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions</i>
Delta	Sacramento-San Joaquin River Delta
EO	Executive Order
EOP	City of Milpitas Emergency Operations Plan
GHG	greenhouse gas
GWP	global warming potential
ICLEI	ICLEI – Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change

LGOP	<i>Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories</i>
Milpitas OES	Milpitas Emergency Services
MTC/ABAG	Metropolitan Transportation Commission/Association of Bay Area Governments
MTCO ₂ e	metric tons of CO ₂ e
N ₂ O	nitrous oxide
NO _x	oxides of nitrogen
OAHMP	Operational Area Hazard Mitigation Plan
OPR	California Governor's Office of Planning and Research
PG&E	Pacific Gas and Electric
PM	particulate matter
ppm	parts per million
PSPS	power shutoff events
RCP	Representative Concentration Pathway
RWF	San Jose-Santa Clara Regional Wastewater Facility
SB	Senate Bill
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
SVCE	Silicon Valley Clean Energy
UC Berkeley	University of California, Berkeley

Executive Summary

The City of Milpitas lies in the northeastern corner of the Santa Clara Valley, 45 miles south of San Francisco. Set within a warm Mediterranean climate zone, Milpitas has historically enjoyed warm, sunny weather with few extreme temperatures. Before the arrival of the Spanish in the late 1700s, this attractive climate supported the native Tamien population for thousands of years. The city is now home to just over 80,000 residents – up from 66,790 in 2010 – and serves as a vital hub for the region’s tech economy.

In the context of the worsening climate crisis, however, Milpitas’s favorable climate is increasingly under threat. At a regional level, average annual temperatures in the San Francisco Bay Area region are projected to increase significantly by mid-century under multiple greenhouse gas (GHG) emissions scenarios, leading to increased frequency and duration of heatwaves. This is demonstrated in Table ES-1. Increasingly variable and volatile precipitation patterns and events are projected to result in more frequent and intense droughts. Combined with accelerated sea-level rise, these changes are expected to adversely impact transportation infrastructure, energy systems, human health and safety, and economic prosperity in the region.

Table ES-1 Increases in Extreme Heat in Milpitas

Average Annual	Historic Average Annual (1961-1990)	Mid-Century (2035-2064)		End of Century (2070-2099)	
		Medium Emissions	High Emissions	Medium Emissions	High Emissions
Number of Extreme Heat Days	4	17	15	20	38
Number of Heat Waves	1	1	1.4	1.3	3.2

Notes: °F = degrees Fahrenheit; Extreme Heat Day = Maximum daily temperature of 91.6 °F;

Heat Waves = four or more consecutive extreme heat days.

Source: CEC 2021a; CEC 2021b.

While climate change is a global issue, local governments have an essential role in reducing GHG emissions and preparing for the impacts of climate change in their communities. The City of Milpitas has a longstanding commitment to enhancing community resilience and promoting sustainability. In 2013, the City adopted a Climate Action Plan (CAP) to create a more sustainable community by reducing GHG emissions. In 2018, the City achieved a historic milestone when nearly all residents and businesses in the city (97 percent) began receiving carbon-free electricity from Silicon Valley Clean Energy (SVCE). To date, the City has implemented over half of the actions directed by the CAP, while undertaking additional initiatives to further reduce GHG emissions from food waste and transportation while improving water security and increasing urban green space.

The City's efforts have allowed the community to reduce its contributions to climate change while preparing for impacts. However, the acceleration of global and regional climate change rapidly presents unprecedented risks to safety, quality of life, and prosperity in the city. April 4, 2022, the Intergovernmental Panel on Climate Change's (IPCC's) Report *Climate Change 2022: Mitigation of Climate Change* was released and sounded the alarm that the world was not on track to meet climate change commitments. It also emphasized that technology exists to turn the tide and to do so the world must decarbonize and move away quickly from fossil fuels.

In response to these risks and to accelerate local action, the City has developed this Climate Action Plan Update (CAP Update) to serve as a comprehensive roadmap to continue addressing the challenges of climate change. The CAP Update forms a crucial element of ongoing City and regional climate change planning efforts, including updating the City's General Plan, Transit Area Specific Plan, and the 2017 Santa Clara County Operational Area Hazard Mitigation Plan. The CAP Update is consistent with and complementary to State climate legislation and regulatory mandates and aligns with the State's and the region's approach to addressing climate change at the local level. The CAP Update also includes actions that the City should take to emissions from its municipal operations. This ensures that the City continues to lead by example and bring more visibility to key climate actions.

The CAP Update is the product of extensive and ongoing engagement with residents, businesses, local government, and other organizations and stakeholders. The City hosted public workshops to engage residents, stakeholders, and other interested organizations and individuals and provide an opportunity to participate in the CAP Update planning process. These extensive community engagement efforts have resulted in locally based and context-specific strategies, measures, and actions designed to achieve the City's climate objectives while simultaneously enhancing the quality of life for Milpitas's residents, workers, and visitors.

The CAP Update has two overarching objectives: (1) to reduce GHG emissions from local activities to achieve GHG reduction targets and (2) to build community resilience to prepare for and adapt to the impacts of climate change. **Figure ES-1** shows the community emissions by sector for 2019 and the GHG reductions to be achieved by CAP Update measures. Figure ES-1 displays the City's achievement of the 2030 target with the GHG reduction measures and demonstrates progress toward the City's target of achieving carbon neutrality by 2045.

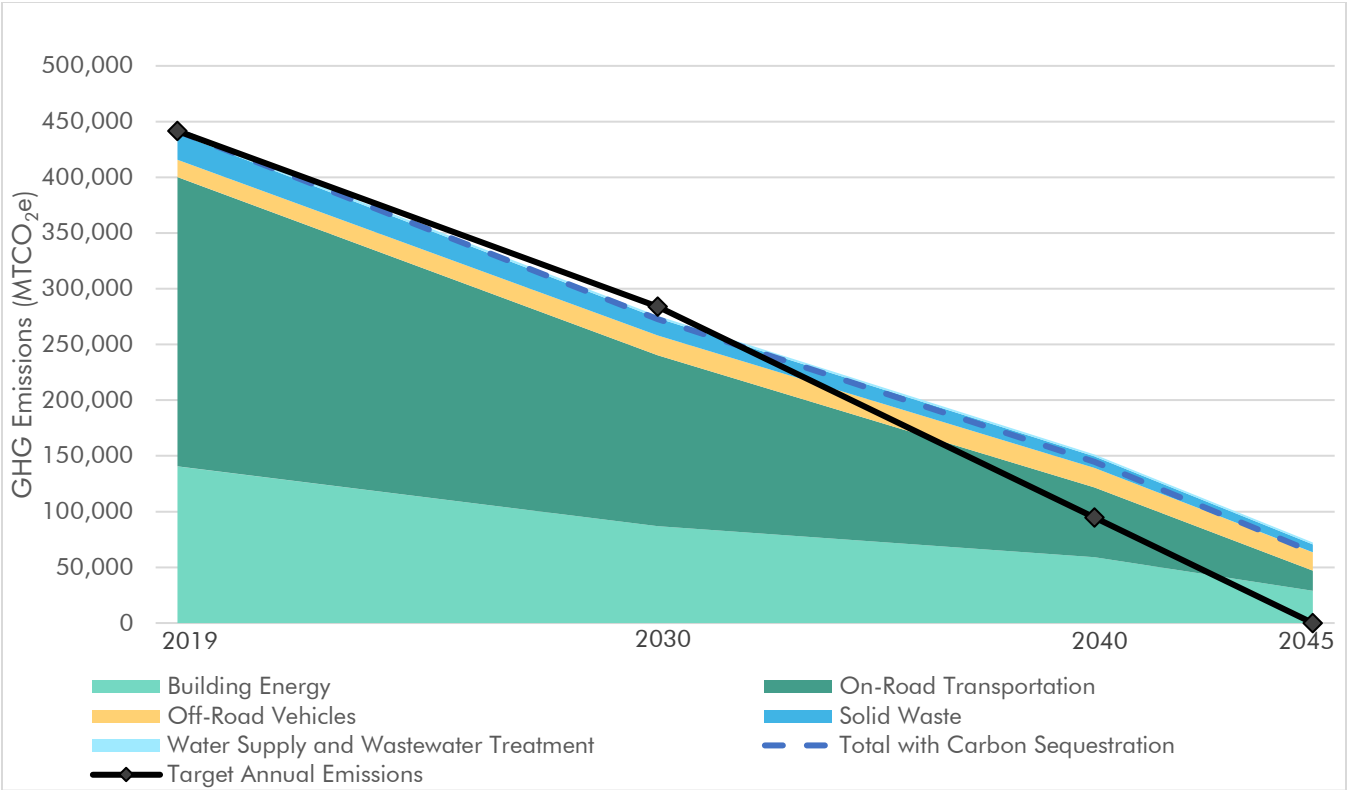


Figure ES-1 Milpitas Community Greenhouse Gas Emissions Reduction Measures Analysis

Source: Ascent Environmental 2021.

In addition to reducing GHG emissions, it is equally important for communities to prepare for the impacts of climate change and improve resilience through adaptation planning. As part of the development of the CAP Update, a climate change vulnerability assessment was developed to understand which hazards are going to be most affected by climate change, as well as what the potential impacts of their worsening hazards may be. The results of the vulnerability assessment were then used to develop and prioritize a set of adaptation strategies for the CAP Update.

While the CAP Update is primarily geared towards reducing GHG emissions and addressing climate change-related vulnerabilities within the city, it will also result in numerous “co-benefits” to residents and businesses. Co-benefits result from the implementation of CAP actions and are additional valuable outcomes that are not the primary intent of climate change mitigation or adaptation actions, such as improvements to local air quality and water supply, increases in local green jobs and cost savings, and benefits to public health and improved mobility options (Figure ES-2). For example, implementation of an action to weatherize older buildings to improve energy efficiency will reduce GHG emissions and strengthen resilience to extreme weather conditions, but it will also provide the co-benefit of financial savings to building owners through reduced energy costs.



Figure ES-2 Co-Benefits

Source: Ascent Environmental 2021.

The climate change mitigation and adaptation strategies are organized into seven sectors: building energy, transportation and land use, waste, off-road vehicles and equipment, water and wastewater, carbon sinks, and circular and green economy. Each sector presents strategies that serve as the foundation for reducing GHG emissions in the city. CAP strategies are outlined in the Plan-at-a-Glance section below.

Plan-at-a-Glance

The following tables provide a summary of the strategies and measures developed for each of the seven focus areas for GHG mitigation and the six focus areas for climate adaptation. For GHG mitigation measures, the range of GHG reduction potential on a scale of low to high is included. For climate adaptation measures, the range of climate resilience benefits is included on a scale of low to high. Additional details regarding the strategies and measures are provided in **Chapter 4** and **Chapter 5** for GHG mitigation and adaptation, respectively, and specific implementation actions are presented in **Chapter 6**.

MITIGATION		
STRATEGY	MEASURES	GHG REDUCTION POTENTIAL
BUILDING ENERGY		
BE-1 Shift to Clean and Reliable Energy		Measure BE-1.1: Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.
		Measure BE-1.2: Facilitate innovative approaches to energy generation, distribution, and storage (e.g., microgrids).
		Measure BE-1.3: Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.
BE-2 Maximize Building Decarbonization and Efficiency		Measure BE-2.1: Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.
		Measure BE-2.2: Facilitate all-electric development projects for industrial buildings.
		Measure BE-2.3: Expand the City's Green Building Program.
		Measure BE-2.4: Retrofit existing residential and nonresidential buildings and municipal facilities to improve energy efficiency and facilitate fuel switching.

MITIGATION		
STRATEGY	MEASURES	GHG REDUCTION POTENTIAL
	Measure BE-2.5: Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.	
	Measure BE-2.6: Reduce plug loads in existing buildings.	
TRANSPORTATION AND LAND USE		
TR-1 Facilitate Sustainable Transportation and Land Use Planning		Measure TR-1.1: Reduce VMT from new development in compliance with SB 743.
		Measure TR-1.2: Reduce VMT from existing development.
		Measure TR-1.3: Continue to implement and adopt policies that support high-density, mixed-use, and transit-oriented development and housing near jobs.
		Measure TR-1.4: Explore car-free zones or shared streets in appropriate areas.
TR-2 Decarbonize Vehicles		Measure TR-2.1: Increase EV charging infrastructure.
		Measure TR-2.2: Increase EV and low-carbon vehicle adoption.
		Measure TR-2.3: Reduce vehicle idling.
		Measure TR-2.4: Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.

MITIGATION

STRATEGY		MEASURES	GHG REDUCTION POTENTIAL
TR-3 Increase Active and Public Transportation Use		Measure TR-3.1: Enhance and expand transit facilities and infrastructure.	
		Measure TR-3.2: Increase transit ridership.	
		Measure TR-3.3: Improve active transportation options.	
WASTE			
SW-1 Achieve Zero Waste		Measure SW-1.1: Eliminate the disposal of organic solid waste in landfills.	
		Measure SW-1.2: Increase recycling and the diversion of other inorganic solid waste.	
		Measure SW-1.3: Reduce the generation of waste from residents and businesses.	
		Measure SW-1.4: Reduce the generation of construction and demolition waste.	
		Measure SW-1.5: Facilitate repair and reuse of consumer products.	
OFF-ROAD VEHICLES AND EQUIPMENT			
OT-1 Shift to Clean Off-Road Equipment and Vehicles		Measure OT-1.1: Reduce landscaping-related emissions.	
		Measure OT-1.2: Reduce construction-related emissions.	

MITIGATION

STRATEGY		MEASURES	GHG REDUCTION POTENTIAL
WATER AND WASTEWATER			
WA-1 Promote Resilient Water Supply, Water Use, and Water Resources		Measure WA-1.1: Reduce indoor water consumption in buildings.	
		Measure WA-1.2: Reduce water consumption for irrigation and landscaping.	
		Measure WA-1.3: Increase the use of recycled water and support efforts to drought-proof our water supply.	
CARBON SINKS			
CS-1 Resilient Infrastructure and Healthy Forest and Natural Systems		Measure CS-1.1: Protect native trees and vegetation and enhance carbon sequestration.	
		Measure CS-1.2: Reduce the urban heat island effect to conserve energy.	
		Measure CS-1.3: Increase the use of green infrastructure.	
		Measure CS-1.4: Increase soil carbon content.	
		Measure CS-1.5: Use low-carbon and carbon sequestering construction materials in new development.	
CIRCULAR AND GREEN ECONOMY			
GE-1 Foster Green and Sustainable Economic Development Opportunities		Measure GE-1.1: Support and attract clean technology businesses and green jobs in Milpitas.	
		Measure GE-1.2: Incentivize and promote green business practices.	

MITIGATION

STRATEGY	MEASURES	GHG REDUCTION POTENTIAL
CG-2 Support Circular Economy Policies		
	Measure GE-2.1: Engage with circular economy and zero waste policymaking at the Federal, State, and local levels.	

ADAPTATION

STRATEGY	MEASURES	CLIMATE RESILIENCE BENEFIT
1. Resilient Communities and Equity and Environmental Justice	Measure 1.1: Increase community resilience to impacts from air pollution.	
	Measure 1.2: Increase community resilience to respond to a recover from widespread health emergencies.	
	Measure 1.3: Protect populations vulnerable to extreme heat.	
	Measure 1.4: Increase community awareness of climate change.	
	Measure 1.5: Ensure that climate impacts and climate adaptation measures aimed at reducing climate risks to not lead to disproportionately adverse effects on vulnerable populations.	
	Measure 1.6: Improve mobility and ensure basic needs are met for vulnerable populations.	
	Measure 1.7: Ensure completeness and availability of emergency supplies and resources to all segments of the population, focusing especially on vulnerable populations and individuals.	

ADAPTATION		
STRATEGY	MEASURES	CLIMATE RESILIENCE BENEFIT
2. Resilient Transportation Systems and Resilient Energy Resources	Measure 2.1: Integrate climate change considerations in all transportation agency planning and decision-making processes.	
	Measure 2.2: Reduce local flooding impacts to transportation infrastructure.	
	Measure 2.3: Increase the resilience of existing residential and commercial development through energy efficiency upgrades and onsite energy generation and storage.	
	Measure 2.4: Minimize stress on the electrical grid and increase the resilience of existing residential and commercial development through energy efficiency upgrades and onsite energy generation and storage.	
	Measure 2.5: Protect critical energy and telecommunications infrastructure and systems from climate change.	
3. Reduced Flooding	Measure 3.1: Minimize risks to life and property resulting from flooding and flood-induced hazards.	
	Measure 3.2: Evaluate proposed development in areas of the city subject to flooding impacts caused by rising sea levels.	
	Measure 3.3: Maintain up-to-date flood risk and hazard data.	
4. Robust Emergency Services and Improved Disaster Recovery	Measure 4.1: Ensure that emergency services have adequate capacity to address increased demand due to climate change-related impacts.	
	Measure 4.2: Develop programs to improve efficiency and equity of disaster recovery.	

ADAPTATION

STRATEGY	MEASURES	CLIMATE RESILIENCE BENEFIT
5. Reduced Urban Heat Island Effect and Resilient Water Resources	Measure 5.1: Reduce urban heat island effect through cool roofs, parking lot shading, landscaping, and urban greening in new and existing private and public development.	
	Measure 5.2: Advocate for drought-proof water supplies including recycled water systems or indirect potable recharge.	
6. Integrated Resilience Planning and Improved Biodiversity and Habitat	Measure 6.1: Embed climate resiliency and adaptation across planning efforts.	
	Measure 6.2: Integrate findings of climate vulnerability into all phases of emergency planning.	
	Measure 6.3: Prioritize nature-based solutions to improve resilience while promoting biodiversity.	

MUNICIPAL OPERATIONS

STRATEGY	MEASURES	GHG REDUCTION POTENTIAL
Employee Commute		
MEC-1. Sustainable Employee Commutes	Measure MEC-1.1: Reduce employee commute VMT and support low-carbon alternatives.	
Vehicle Fleet		
MVF-1. Zero- and Low-Emission Fleet Vehicles and Equipment	Measure MVF-1.1: Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel.	
Buildings and Public Lighting		
MBL-1. Clean Energy	Measure MBL-1.1: Continue to use SVCE-supplied 100 percent renewable electricity.	
	Measure MBL-1.2: Transition to 100 percent clean energy for municipal operations.	
	Measure MBL-2.1: Reduce lighting-related energy consumption.	
MBL-2. Energy Efficiency and Conservation	Measure MBL-2.2: Increase energy efficiency.	
	Measure MBL-2.3: Implement conservation best practices to reduce energy use.	
MBL-3. Electrification	Measure MBL-3.1: Transition municipal buildings and facilities to be all-electric.	

MUNICIPAL OPERATIONS

STRATEGY	MEASURES	GHG REDUCTION POTENTIAL
Solid Waste		
MSW-1. Zero Waste	Measure MSW-1.1: Increase waste diversion and achieve zero waste by 2030.	
MSW-2. Responsible Consumption	Measure MSW-2.1: Implement an environmentally preferable purchasing policy.	
Water		
MWA-1. Water Efficiency and Conservation	Measure MWA-1.1: Reduce municipal water consumption.	

The Plan-at-a-Glance summary of the strategies and measures for GHG mitigation and climate adaptation provides a high-level overview of the scope of the CAP Update. Within these strategies and measures are specific implementation actions, which are presented in **Chapter 6**. The actions included in **Chapter 6** are those considered “near-term” for implementation (i.e., will be implemented within the next 3-5 years). These 28 actions are further prioritized into which actions will be implemented within the first 18 months after CAP Update adoption. These immediate actions were considered during a City Council Study Session in April 2022 and are shown in the table below, as well as in **Chapter 6**.

ACTIONS	
Adopt an updated reach code for all electric new construction and increase EV charging station standards beyond State requirements. (BE-2.1.1 and TR-2.1.2)	
Promote benefits and incentives for clean energy, improved energy efficiency, and electrification of existing buildings. (BE-1.3.2 and BE-2.4.1)	
Enforce the City's requirements for SB 743 and continuously Update VMT Policy and Implementation Tools to further reduce VMT (TR-1.1.1)	
Incorporate Sustainable Design Measures and incentives into the City's new Zoning Ordinance Update (BE-2.3.1 and TR-1.3.1)	
Improve awareness of incentives for low- and zero-emission vehicles and increase EV purchases in Milpitas (TR-2.2.1)	
Implement the Milpitas OnDemand "hub-and-spoke" micro-transit pilot program (TR-3.1.1)	
Implement the updated Trail, Pedestrian, and Bicycle Master Plan to enhance and expand bicycle and pedestrian infrastructure and networks (TR-3.3.5)	
Implement and enforce the requirements of SB 1383 and eliminate disposal of compostable organic materials to landfills (SW-1.1.1)	
Based on the recommendations from the City's Urban Forestry Management Plan, implement a tree planting program to expand the city's urban forest canopy (CS-1.1.1 and CS-1.1.2)	
Work with partners offer courses/training that prepare students/workers for green jobs (GE-1.1.1)	
MUNICIPAL OPERATIONS ACTIONS	
Install EV charging and alternative fuel stations at appropriate City sites (MVF-1.1.1)	
Update the City's Green Fleet Policy to convert the City's non-specialized fleet to all electric and identify alternative fuel options for other vehicles and equipment (MVF-1.1.3)	
Pursue funding to expand solar and back up battery systems to other City facilities such as PW/PD, City Hall, Sports Center (MBL-1.2.2)	
Inventory and develop strategy to retrofit existing municipal buildings and facilities to be all-electric (MBL-3.1.2)	
Enhance and expand waste reduction policies and programs for City facilities (MSW-1.1.1 and MSW-2.1.3)	
Use resource efficient landscaping techniques in new or renovated medians and parks (MWA-1.1.4)	

An aerial photograph of Milpitas, California, showing a dense urban area with residential neighborhoods, commercial districts, and green spaces. In the foreground, there are rolling green hills. The word "Introduction" is overlaid in large white text on the left side of the image. In the bottom right corner of the image, the text "Mission Peak" is visible.

Introduction

Mission Peak

The City of Milpitas (hereafter referred to as “city”) has a longstanding commitment to enhancing community resilience and promoting sustainability. Recognizing the threats posed by climate change and the responsibility to act, the City of Milpitas government (hereafter referred to as “City”) developed its first Climate Action Plan (CAP) in 2013 to reduce locally generated greenhouse gas (GHG) emissions. Over half of the actions directed by the CAP have been implemented since its adoption, and the City has undertaken a multitude of additional initiatives to further reduce GHG emissions from local activities. The City achieved a historic milestone in 2018 when nearly all residents and businesses in the city began receiving carbon-free electricity from Silicon Valley Clean Energy (SVCE). Additionally, the City launched a communitywide organics and food scraps diversion program; updated the Milpitas Trail, Pedestrian, and Bicycle Master Plan; developed its innovative Milpitas OnDemand pilot project; and adopted plans and guidelines to improve water security and increase urban green space. These efforts have allowed the community to reduce its contributions to climate change while preparing for impacts, but the acceleration of global climate change is rapidly presenting unprecedented risks to safety, quality of life, and prosperity in the city.

In response to these risks, the City has developed this Climate Action Plan Update (CAP Update) to serve as a comprehensive roadmap to continue addressing the challenges of climate change. The overarching objectives of the CAP Update are two-fold: (1) to reduce GHG emissions from local activities to achieve GHG reduction targets and (2) to build community resilience to prepare for and adapt to the impacts of climate change. The CAP Update establishes locally based strategies, measures, and actions that will serve to achieve these objectives and simultaneously enhance the quality of life for residents, workers, and visitors of the city. The CAP Update is consistent with and complementary to State climate legislation and regulatory mandates and aligns with the State’s and the region’s approach to addressing climate change at the local level in communities across California.

Code Red for Climate

Immediately after the August 2021 release of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report—the IPCC’s most recent, comprehensive report outlining the scientific community’s latest information on climate change, its causes, and potential impacts—the United Nations Secretary-General António Guterres issued a statement. For his opening remark, he declared, “[the] Report is a code red for humanity. The alarm bells are deafening, and the evidence is irrefutable: greenhouse gas emissions from fossil fuel burning and deforestation are choking our planet and putting billions of people at immediate risk. Global heating is affecting every region on Earth, with many of the changes becoming irreversible.”

The combustion of fossil fuels and other anthropogenic (i.e., human-caused) activities since the Industrial Revolution in the 19th century have introduced GHGs into the atmosphere at an increasingly accelerated rate. These significantly elevated levels of GHGs above natural ambient concentrations have intensified the greenhouse effect. This phenomenon, illustrated in **Figure 1-1** below, is a natural process that insulates the Earth and helps regulate its temperature. After absorbing sunlight, the Earth emits infrared radiation (i.e., heat), which is reabsorbed by a collection of naturally occurring atmospheric gases called GHGs. These gases, which consist mainly of water vapor, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), all act as effective global insulators by absorbing some of the infrared radiation that is emitted by Earth and re-emitting it back down towards the planet. This process, where some heat is prevented from escaping out of the atmosphere, is what keeps temperatures on Earth conducive to life.

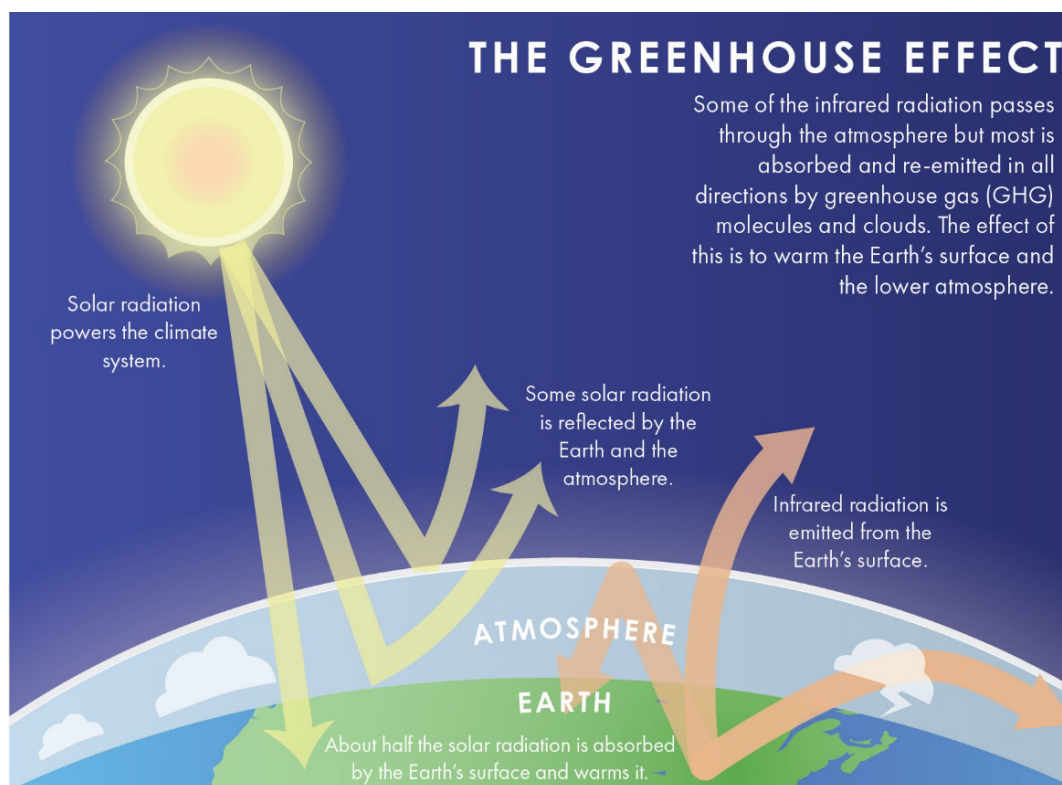


Figure 1-1 The Greenhouse Effect

Source: Ascent Environmental 2021.

The greenhouse effect supports life on Earth as we know it, but it is also responsible for causing the planet's climate to warm at an unnatural and unprecedented rate, an impact known as global climate change. This consequence is the driver behind changes in more extreme weather patterns, rapid melting of the polar ice caps, an increase in sea level, and other impacts on biological resources and humans.

According to the Sixth Assessment Report, there is scientific consensus that observed increases in atmospheric GHG concentrations and the consequential warming of Earth's atmosphere, oceans, and lands have "unequivocally" been caused by human activities and influence. The report states that human activities are estimated to have caused over 2 degrees Fahrenheit (°F) of warming across the globe compared to pre-industrial era levels (i.e., before the year 1900), and global average temperature is expected to increase by up to approximately 8 °F by the end of the century unless additional efforts to reduce GHG emissions are made (IPCC 2021). The Sixth Assessment Report also contains the IPCC's strongest warnings to date on the impacts of climate change, highlighting key insights into the importance of global climate "tipping points," or thresholds (e.g., global temperatures) that, when exceeded, can result in large changes in the state of the climate system leading to a rapid series of cascading events with vast repercussions.

As California continues to experience rising average temperatures, more severe storms, and intense drought, it has become evident that the effects of global climate change are already occurring. The impacts of climate change in California vary across the state due to its diverse biophysical setting, climate, and community characteristics, but even modest changes in temperature and precipitation regimes could have significant effects on the state's ecosystems (OPR, CEC, and CNRA 2018a). At a regional level, average annual temperature in the San Francisco Bay Area region is projected to increase significantly by mid-century, and precipitation patterns and events are expected to exhibit high year-to-year variability, with volatile swings between very wet years and very dry years. These changes are anticipated to result in increased frequency and duration of heat waves, more frequent and intense drought, and accelerated sea level rise, resulting in adverse impacts on transportation infrastructure, energy systems, human health and safety, and economic prosperity in the region (OPR, CEC, and CNRA 2018b).

Climate change poses an imminent threat to the city and the world at large, but it is not too late for the global community to put the brakes on climate change and ensure a livable, healthy, and prosperous planet for generations to come. After outlining the dire consequences projected due to climate change, the Secretary-General ended his statement with the following:

If we combine forces now, we can avert climate catastrophe. But, as today's report makes clear, there is no time for delay and no room for excuses. I count on government leaders and all stakeholders to ensure COP26¹ is a success.

¹ The 2021 United Nations Climate Change Conference, also known as COP26, is the 26th United Nations Climate Change conference. The COP26 summit will bring together almost every country on Earth to accelerate action towards the goals of the Paris Agreement and the United Nations Framework Convention on Climate Change.

Planning for a Sustainable Future

While climate change is a global issue, local governments have an important role to play in reducing GHG emissions and preparing for the impacts of climate change in their communities. To help achieve these objectives, public agencies develop action plans, which serve as long-term strategic planning frameworks that outline specific strategies, measures, and actions an agency can take to mitigate GHG emissions and strengthen resilience to climate change. CAPs also contain specific guidance for governments to effectively implement emissions reduction and adaptation measures and monitor progress over time. Through the development and implementation of its CAP Update, the City is joining hundreds of other communities across the nation in tackling the challenges posed by climate change.

Climate Change Mitigation and Adaptation



Addressing climate change requires an integrated approach that targets both its sources and impacts. Efforts that focus on reducing the sources of climate change are commonly known as climate change mitigation, GHG mitigation, or climate action. The focus of climate change mitigation planning is to reduce communities' generation of GHG emissions and, therefore, minimize their contributions to climate change. Climate change adaptation or climate change resilience efforts are those that serve to prepare for and reduce harm from future

effects of a changing climate. Climate change adaptation planning aims to analyze local climate-related vulnerabilities and enhance community resilience to climate change through developing strategies to respond to and prepare for its impacts. **Figure 1-2** illustrates the relationship between these two facets of climate change planning. State law requires communities to address climate change mitigation in local planning and environmental review processes and climate change adaptation in local long-range planning processes, such as general plans (CalOES 2020).

Climate change mitigation and adaptation are both crucial components of comprehensive climate change planning. While mitigation and adaptation are often separate planning efforts, it is important to consider both components within the overall climate action planning process. Many initiatives that focus on climate mitigation and reducing GHG emissions include co-benefits for adaptation, and vice versa. For example, renewable energy installations combined with battery storage systems will reduce reliance on fossil fuel-generated grid electricity and thus reducing GHG emissions, but will also improve energy independence and resilience in the face of climate hazards that threaten energy services. Consequently, this initiative would yield adaptation benefits as well as GHG emissions reductions. On the flip side, increasing urban tree canopy will help to combat extreme heat events and decrease risks to humans of heat-related

illnesses, but will also reduce buildings' cooling demands and thus reduce GHG emissions through energy savings. This dynamic has contributed to the increasingly common approach of combining climate change mitigation and adaptation in the climate action planning process. Recognizing the importance and benefits of this relationship, the City's CAP Update focuses on both climate change mitigation and adaptation to address climate change.

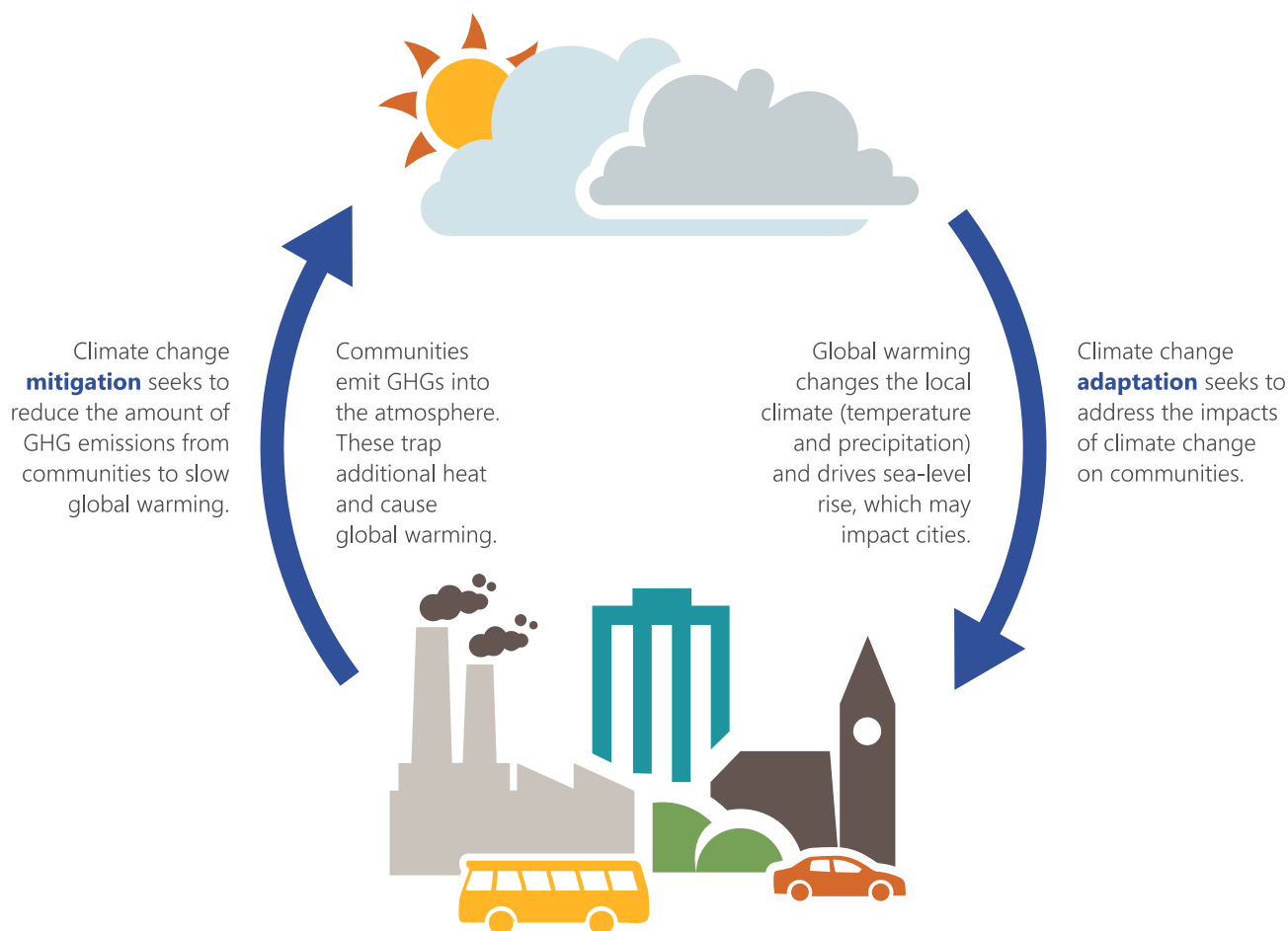


Figure 1-2 Relationship between Climate Mitigation and Adaptation

Source: CalOES 2020; adapted by Ascent Environmental in 2021.

Solutions Across Agencies

In response to the increase in anthropogenic GHG emissions and the threat of global climate change, federal, State, regional, and local governments and other agencies have already taken several steps to reduce GHG emissions and build resilience to climate change impacts. These efforts, and the legislative background summarized in the following sections, provide important policy direction and context for this CAP Update.

California Climate Legislation

Mitigation Legislation

Executive Order (EO) S-3-05 was signed in 2005, which directed California to reduce statewide GHG emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. A year later, the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) was passed, establishing regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions. AB 32 put a cap on GHGs and set a target of reducing statewide emissions to 1990 levels by 2020. In 2008, the California Air Resources Board (CARB) developed the *Climate Change Scoping Plan: A Framework for Change* (2008 Scoping Plan) as part of its role in implementing AB 32 and EO S-3-05 (CARB 2008). The 2008 Scoping Plan, along with its update in 2014, describes the approach California will take to reduce GHG emissions to achieve reduction targets and goals. In 2016, California achieved the AB 32 target of reducing GHG emissions to 1990 levels, 4 years ahead of schedule, based on its reported statewide 2016 inventory (CARB 2020). The annual statewide GHG inventories for 2017, 2018, and 2019 have shown that the state continues to achieve the AB 32 target.

In September 2016, Senate Bill (SB) 32 codified into statute the midterm 2030 target of 40 percent below 1990 levels by 2030. The 2030 GHG emissions reduction target places California on a trajectory toward meeting the goal of reducing statewide emissions to 80 percent below 1990 levels by 2050.

In November 2017, CARB published *California's 2017 Climate Change Scoping Plan Update* (2017 Scoping Plan) (CARB 2017), which lays out the framework for achieving the 2030 target as established in SB 32. The 2017 Scoping Plan identifies GHG reductions by emissions sector to achieve a statewide emissions level that is 40 percent below 1990 levels by 2030.

EO B-55-18, signed in September 2018, furthers California's efforts to reduce GHG emissions by setting a goal to achieve carbon neutrality no later than 2045 and to achieve net negative GHG emissions thereafter. CARB is currently drafting the 2022 Scoping Plan that will lay out the pathway to meeting the carbon neutrality goal.

Adaptation Legislation

In 2009, the State released its first climate adaptation strategy, *Safeguarding California*. The passing of AB 1482 in 2015 required the California Natural Resources Agency (CNRA) to update the State's climate adaptation strategy by July 1, 2017, and every 3 years thereafter. The most recent update of the strategy, now called the *Safeguarding California Plan*, contains implementation measures and specific actions and responsibilities for State agencies to carry out those policies. AB 1482 also required CNRA, in collaboration with the Strategic Growth Council, to oversee and coordinate these State agency adaptation actions. It mandated that State agencies maximize specified objectives, including promoting the use of *Safeguarding California* to inform planning decisions and ensure that State investments consider climate change impacts.

SB 246, signed in 2015, directed the California Governor's Office of Planning and Research (OPR) to establish the Integrated Climate Adaptation and Resilience Program. The program has two components: the State Adaptation Clearinghouse and the Technical Advisory Council. The

goal of these initiatives is to coordinate regional and local efforts with State climate adaptation strategies to improve resilience to the impacts of climate change across California. This bill also required OPR to review and update, as needed, the *California Adaptation Planning Guide*.

Also adopted in 2015, SB 379 required cities and counties within California to integrate climate change vulnerability, adaptation strategies, and emergency response strategies into the safety element of their general plans. The bill requires the preparation of a vulnerability assessment, which must identify the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, using federal, state, regional, and local climate vulnerability documentation. Adaptation policies, goals, and objectives are to be developed based on findings from the vulnerability assessment, and jurisdictions are required to create a set of feasible implementation measures to reduce climate change impacts on new or proposed land uses. Lastly, SB 379 states that jurisdictions that have adopted a CAP or climate adaptation plan separate from the general plan may reference that document to comply with SB 379 requirements.

Regional and Local Climate Planning Efforts

The City has a longstanding commitment to climate planning at the local level through the development, implementation, and periodic updating of planning documents, partnerships with other agencies and stakeholders, and outreach and educational efforts. These activities provide the foundation for sustainability activities occurring at the municipal and communitywide levels and are complementary to the CAP Update. Some of the major efforts that provide context for and support this CAP are described below.



2013 Climate Action Plan

In 2013, the City adopted its first CAP, which was developed to serve as a roadmap for meeting a GHG emissions reduction target of 15 percent below 2005 baseline emissions by 2020, consistent with State targets. The CAP included a GHG emissions inventory, forecasted emissions in the future, and identified strategies and measures for reducing local GHG emissions. Additionally, the CAP was designed to streamline environmental review of future development projects in the city. Since its adoption, over half of the GHG mitigation measures included in the CAP have been implemented, resulting in significant GHG emissions reductions.

Milpitas 2040 General Plan Update

Following a multi-year process that involved extensive community outreach, the City adopted its *General Plan 2040* in 2021. The *General Plan 2040* provides the long-term vision and policy direction guidance for residents, city staff, decision-makers, and the broader community. The *General Plan 2040* serves as the foundation for most City regulatory documents and addresses land use, circulation, community design, economic development, conservation and sustainability, utilities and community services, safety, noise, parks and recreation, and community health and wellness. The Conservation and Sustainability Element includes Goal CON-1: Climate Action, which contains climate change-related policies and actions, including a directive to develop this CAP Update. The Safety Element provides information pertaining to the natural hazards that have historically affected the city including earthquakes, flooding, and hillside wildfire, as well as climate resiliency and adaptation policies consistent with SB 379.

Specific Plans

The City regularly develops and updates its specific plans, which are comprehensive planning and zoning documents for a defined geographic region that implement the goals and policies of the City's General Plan. The City is in the process of developing the Milpitas Metro Specific Plan to serve as an update to the Transit Area Specific Plan, which will guide the redevelopment of an approximately 437-acre area in the southern portion of the City that currently includes a number of industrial uses near the Great Mall shopping center. The Milpitas Midtown Specific Plan, released in 2010, provides the vision for an approximately 1,000-acre area of land which is currently undergoing changes related to its growing role as a housing and employment center in Silicon Valley. The City is beginning the process of updating this document through the development of a new Main Street-Gateway Specific Plan.

Santa Clara Operational Area Hazard Mitigation Plan

The County of Santa Clara Office of Emergency Services updated its Operational Area Hazard Mitigation Plan (OAHMP) in 2017. The OAHMP is intended to enhance public awareness and understanding, create a decision tool for management, promote compliance with State and federal program requirements, enhance local policies for hazard mitigation, provide inter-jurisdictional coordination of mitigation-related programming, and achieve regulatory compliance. The OAHMP update includes an assessment of risk and vulnerability associated with hazards including wildfire/structure fires, flooding, coastal storms/erosion/tsunamis, earthquakes/liquefaction, rain-induced landslides, dam failures, drought, hazardous materials incidents, terrorism, and emerging risks from climate change. The OAHMP specifically targets climate change resiliency as a component of emergency preparedness.

Partnerships and Collaboration

Strategic partnerships and active collaboration with regional agencies and organizations have been a key component to the City's success in reducing GHG emissions and improving climate resilience. The City's partnership with SVCE—a public, not-for profit community choice energy provider that was formed to serve the communities of Silicon Valley—has contributed to

significant emissions reductions since the community began receiving clean electricity in 2018. The City has also supported a number of SVCE-led regional efforts, such as the Building Decarbonization Joint Action Plan and Electric Vehicle Infrastructure Joint Action Plan. The City also participates in the Bay Area Regional Energy Network (BayREN), a regional collaborative that provides energy efficiency programs, services, and resources to members. Collaboration with many other agencies and organizations, such as the County of Santa Clara Office of Emergency Services and the Bay Area Climate Adaptation Network (BayCAN), has helped the City advance its climate-related goals.

Reducing Emissions and Preparing for Changes

The City has developed this CAP Update to achieve GHG emissions reduction targets and minimize contributions to climate change while building resilience to climate change impacts. For climate change mitigation, this involves:

- establishing an updated baseline inventory of GHG emissions,
- projecting future GHG emissions,
- setting GHG emissions reduction targets, and
- identifying strategies, measures, and actions to reduce GHG emissions.

For climate change adaptation, this involves preparing a vulnerability assessment and adaptation strategies, which consists of:

- evaluating the city's exposure to climate change-related hazards,
- analyzing sensitivity to these hazards and identifying vulnerabilities and potential impacts,
- determining the city's existing adaptive capacity to prepare for and adapt to these impacts, and
- developing adaptation strategies to improve community resilience.

This CAP Update also includes an implementation strategy, which will be key to achieving the City's climate-related goals. As part of CAP Update implementation, GHG reduction and adaptation efforts will be tracked and monitored over time to ensure the City is making progress toward achieving its GHG reduction targets and climate resilience objectives.

This CAP Update will serve as a living document that will require periodic updates, including reporting on the status of implementation and conducting updates to the GHG emissions inventory, vulnerability assessment, and climate change mitigation and adaptation measures. These updates will help ensure that this CAP Update is being effectively implemented and supporting the City in addressing climate change. Ultimately, the overarching goals of this CAP Update will remain the same: to reduce GHG emissions and build resilience to the effects of climate change.

Co-Benefits

While the CAP Update is primarily geared towards reducing GHG emissions and addressing climate change-related vulnerabilities within the city, it will also result in numerous “co-benefits” to residents and businesses. Co-benefits result from the implementation of CAP actions and are additional valuable outcomes that are not the primary intent of climate change mitigation or adaptation actions, such as improvements to local air quality and water supply, increases in local green jobs and cost savings, and benefits to public health and improved mobility options. For example, implementation of an action to weatherize older buildings to improve energy efficiency will reduce GHG emissions and strengthen resilience to extreme weather conditions, but it will also provide the co-benefit of financial savings to building owners money through reduced energy costs.

Co-benefits identified in this CAP Update, as shown in **Figure 1-3**, include enhanced equity, air pollution prevention, benefits to health and well-being, improved reliability of critical infrastructure and services, strengthened climate resilience, economic development, and resource preservation.



Figure 1-3 Co-Benefits

Source: Ascent Environmental 2021.

Development Process

The City has implemented a suite of climate action and adaptation initiatives over the past decade, and while significant progress has been made, the City recognizes the importance of developing a CAP Update to continue reducing GHG emissions and achieving reduction targets in line with State objectives. Additionally, the City desires to develop a comprehensive plan that considered climate change resilience, which was not included in the 2013 CAP. These goals were used to inform the scope, vision, and objectives of the project and guided the CAP Update development process.

As shown in **Figure 1-4** below, the City initiated a scoping phase for the project in early 2020. After project kickoff in October 2020, the City prepared GHG emissions inventories and forecasts, set GHG reduction targets, and conducted a climate change vulnerability assessment. These tasks were completed by mid-2021, and then the City developed GHG emissions reduction and adaptation strategies, measures, and actions to be included in the CAP Update. These efforts created the foundation for developing the planning document, which occurred in Fall 2021. Details regarding CAP Update implementation are provided in **Chapter 6**.



Figure 1-4 Project Timeline

Source: Ascent Environmental 2021.

Engagement with City staff, members of the public, government officials, and other stakeholders was conducted throughout the entirety of the project. Outreach and engagement efforts are described in the following section.

Community Input and Response

Local community engagement and participation with climate action and adaptation efforts is an essential element of the planning and development process. Local action on climate change cannot be achieved solely by one agency; it requires active and ongoing partnerships between residents, businesses, local government, and other organizations and stakeholders. By meaningfully engaging a cross-section of the community, the City strengthened its ability to effectively implement local climate change solutions. The following sections summarize the engagement efforts for the CAP Update.

Community Engagement



The City hosted public workshops to engage residents, stakeholders, and other interested organizations and individuals and provide an opportunity to participate in the CAP Update planning process. Due to the COVID-19 pandemic, most public workshops and CAP Update events were held virtually. The workshops served to inform attendees about the project scope and goals and solicited input to gain a better understanding of the community's climate change concerns and priorities. The first workshop, held on May 6, 2021, provided an overview of the purpose and objectives of the CAP, outlined the results

of the City's GHG emissions inventories, presented the City's GHG emissions forecasts and reduction targets, and offered an opportunity for attendees to comment on proposed GHG reduction strategies and measures.

The City hosted a pop-up booth at the Milpitas Farmers' Market on July 25, 2021, to gauge public perception of the proposed GHG reduction strategies and measures and to identify barriers to personal climate action choices.

In May 2021, the City hosted a workshop with students from Milpitas High School to discuss climate change concerns and proposed GHG reduction strategies and measures to be included in the CAP Update.

The second workshop was held on June 1, 2022, and focused on the Draft CAP Update document, and attendees provided feedback that was used to refine the final document. These events played a key role in determining the City's approach to climate change mitigation and adaptation through ground-truthing the technical analyses conducted for the CAP Update.

Steering Committee and Energy and Environmental Sustainability Commission

A Steering Committee was formed to help guide the CAP Update development process. This group consisted of representatives from various City departments, including Public Works, Engineering, Recreation Services, and Planning, as well as the Office of the City Manager. In addition to regularly meeting with the Steering Committee, City staff also provided project milestone updates and solicited feedback on an ongoing basis with the Energy and Environmental Sustainability Commission at their monthly public meetings throughout the project. Members of the public were encouraged to attend all public meetings.

Project Websites and Press Releases

To provide project information and resources to the community and stakeholders, the City developed *Climate Action Milpitas*, an interactive online dashboard dedicated to the CAP Update (located at <https://www.climateactionmilpitas.org/home>) and shown in **Figure 1-5**. The dashboard includes an overview of the project, GHG emissions- and adaptation-related information, news and updates, and supporting documents and materials. This webpage was kept up-to-date and supported public participation throughout the project. Additionally, the dashboard hosted a series of short surveys that were used to gather feedback on proposed GHG reduction and adaptation strategies and measures. Public engagement was also facilitated by a series of press releases and newsletters, which were used to disseminate information regarding CAP Update progress and engagement events, such as the public workshops.

Dashboard

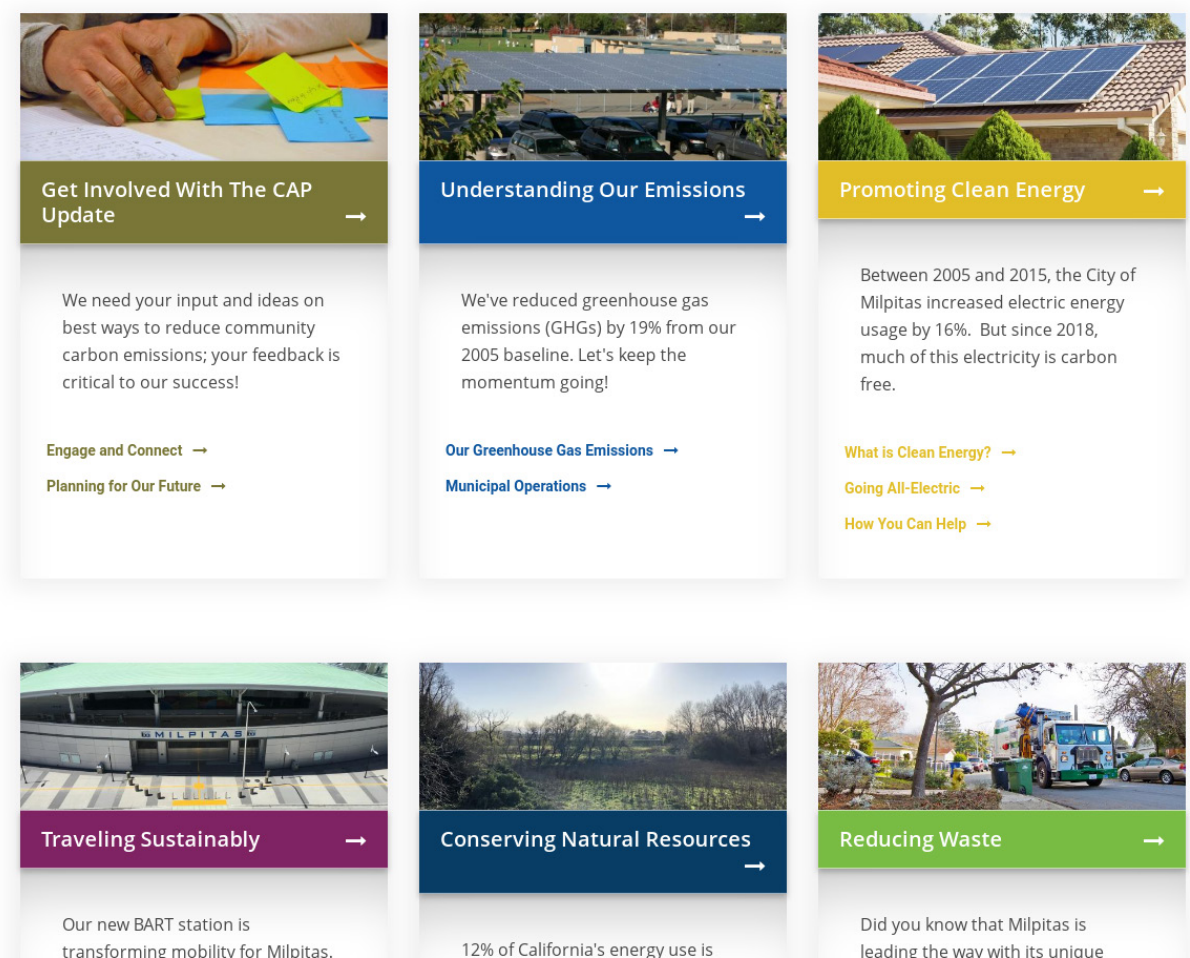


Figure 1-5 Climate Action Milpitas Website Screenshot

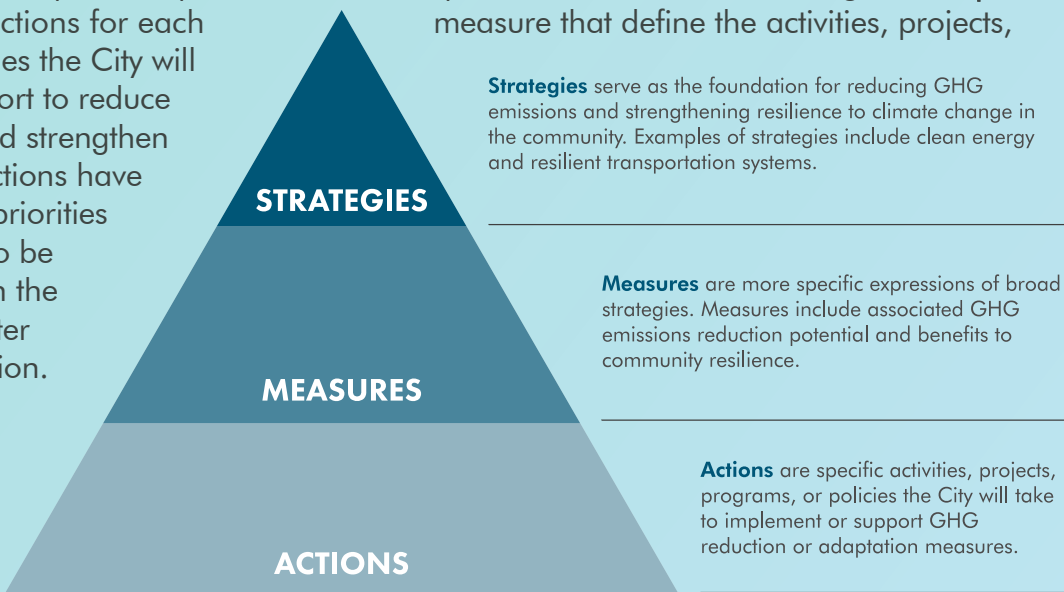
How to Read This Plan

Organization

This CAP Update is divided into six main chapters. This chapter, **Chapter 1**, introduces the city, outlines the context and purpose of the CAP Update, describes existing legislation and efforts aimed at addressing climate change, and summarizes the proposed mitigation and adaptation initiatives. **Chapter 2** describes the community’s GHG emissions inventories, presents a forecast of future emissions in the city, and identifies community emissions reduction targets. The City’s municipal operations GHG emissions inventories, forecasts, and reduction targets, along with strategies and measures to reduce GHG emissions, are included in **Chapter 3**. GHG emissions reduction strategies and measures are included in **Chapter 4**, organized into seven sectors: Building Energy, Transportation and Land Use, Waste, Water and Wastewater, Off-Road Vehicles and Equipment, Carbon Sinks, and Consumption-Based Emissions that generally align with the emissions sectors used in the City’s GHG inventories. **Chapter 5** presents an overview of the climate adaptation planning process and a summary of the city’s climate change vulnerability assessment along with adaptation strategies and measures that the City will implement to strengthen community resilience to climate change. Lastly, **Chapter 6** provides a framework for implementing and monitoring the CAP Update and includes guidance for future climate action and adaptation planning efforts.

GHG Reduction and Adaptation Framework

The GHG emissions reductions initiatives included in **Chapter 4** and the adaptation and resilience efforts in **Chapter 5** are presented under the same framework. Each chapter presents **strategies** that serve as the foundation for addressing the ways in which GHG emissions can be reduced and resilience can be improved in the community. Within each strategy are one or more **measures** that represent specific expressions of the broad strategies. **Chapter 6** includes detailed actions for each programs, or policies the City will implement or support to reduce GHG emissions and strengthen resilience. These actions have been identified as priorities and are intended to be implemented within the first 3 to 5 years after CAP Update adoption. This framework is outlined in **Figure 1-5**.



Greenhouse Gas Emissions Inventory, Forecasts, and Targets

Nighttime View of Milpitas

This chapter sets the foundation for the CAP Update by describing current and forecasted GHG emissions and reduction targets. It summarizes the City's standard emissions inventories; presents the anticipated change in emissions if local actions are not taken; and establishes targets for reducing emissions consistent with statewide GHG reduction targets and goals for the years 2030, 2040, and 2045. Lastly, it provides an additional framework for evaluating and addressing the community's contribution to climate change.

Why Prepare a Greenhouse Gas Emissions Inventory?

The critical first step in the overall climate action planning process is to prepare a GHG emissions inventory. To develop and implement a CAP that will effectively reduce GHG emissions, local governments must first have a comprehensive understanding of the emissions that are generated by activities within their jurisdictions. GHG emissions inventories not only serve to provide this knowledge, but they also act as the basis for measuring progress and provide agencies with a framework to track emissions over time and assess the effectiveness of CAP implementation.

The standard GHG emissions inventory used in the climate action planning process, known as a "production-based" inventory, estimates GHG emissions generated within a defined geographic boundary during a single year. It identifies the sources, activities, and sectors that are producing these emissions and the relative contribution of each, while also providing a baseline used to forecast emissions trends into the future. This information is used to set reduction targets that are consistent with State objectives and then to create solutions for reducing GHG emissions locally through the creation of a CAP.

In addition to traditional production-based emissions inventories, it is becoming increasingly common for local governments to prepare a "consumption-based" emissions inventory (CBEI). A CBEI evaluates GHG emissions generated by the production, use, and disposal of goods and services consumed by residents of a community within a given year. While there is some overlap

with the production-based inventory, the CBEI evaluates emissions that are not accounted for in the traditional approach, so this additional lens through which to view community-generated GHG emissions provides further opportunities for a community to reduce its contribution to climate change (e.g., purchasing decisions). Additional information regarding consumption-based emissions and the City's CBEI are presented in the final section of this chapter. Throughout this CAP Update, information and data associated with the consumption-based approach will be stated and labeled explicitly; any other references to the city's GHG emissions and emissions inventories refer to the production-based methodology and data.

Community Inventories

The City has developed several GHG emissions inventories over the past decade, which provide a detailed accounting of the sources and quantities of GHG emissions generated from activities within the community for different years. Three primary GHGs are quantified: CO₂, CH₄, and N₂O. Emissions of these gases are converted to a comparable unit by multiplying each non-CO₂ gas by their global warming potential (GWP), enabling the reporting of emissions in terms of carbon dioxide equivalent (CO₂e). This conversion allows consideration of all gases in a single unit and makes it easier to communicate how various sources and types of GHG emissions contribute to climate change. Emissions are reported in metric tons of CO₂e (MTCO₂e), the standard measurement for the amounts of GHG emissions produced and released into the atmosphere. GWP values for CH₄ and N₂O included in the IPCC Fifth Assessment Report are used for calculating emissions estimates (IPCC 2013). In August 2021, IPCC released its Sixth Assessment Report, which includes updated GWP values. Because these values were not available at the time the GHG inventory and forecasts were prepared, the GWP values from the Fifth Assessment Report were used.

ICLEI – Local Governments for Sustainability (ICLEI) develops protocols for local-scale accounting of emissions that have become the industry standard for local governments developing GHG emissions inventories. The most recent guidance for community-scale emissions inventories is ICLEI's July 2019 publication, *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions* (Community Protocol), Version 1.2 (ICLEI 2019). State agencies, including CARB and OPR, recommend that jurisdictions prepare GHG emissions inventories using the guidelines included in the Community Protocol. Consistent with these recommendations and industry best practices, the City's community GHG emissions inventories have been prepared according to the Community Protocol.

2005 Baseline Inventory

As described in **Chapter 1**, the City's 2013 CAP included a 2005 baseline GHG emissions inventory. Since the 2005 inventory was prepared, protocols for estimating community GHG emissions in various sectors have been updated and expanded (see Appendix A for additional details). These changes reflect refinements in the planning process that have resulted from research in the field and shared knowledge from local governments engaged in climate action planning.

Because methods to calculate GHG emissions change regularly, past GHG inventories often need to be recalibrated based on current methodologies. For this CAP Update, the 2005 baseline GHG emissions inventory was revised using methodologies and guidance provided by ICLEI in the most recent Community Protocol. The revised 2005 baseline inventory incorporated updated GWP values, additional emissions sources, and refined data and emissions factors.

The revised 2005 baseline inventory estimates community emissions in seven sectors: on-road transportation, nonresidential building energy, residential building energy, solid waste, off-road vehicles and equipment, wastewater treatment, and water supply. **Table 2-1** describes each GHG emissions sector.



South San Francisco Bay Area

Table 2-1 Milpitas Community Greenhouse Gas Emissions Inventory Sectors	
Emissions Sector	Description
On-Road Transportation	On-road transportation emissions are associated with gasoline and diesel fuel consumption from motor vehicles on local and regional roadways.
Nonresidential Building Energy	Nonresidential building energy emissions are associated with the consumption of electricity, natural gas, and diesel in nonresidential buildings within the city.
Residential Building Energy	Residential building energy emissions are associated with the consumption of electricity and natural gas in homes within the city.
Solid Waste	Solid waste emissions are associated with the decomposition of community-generated mixed and organic waste in landfills.
Off-Road Vehicles and Equipment	Off-road emissions are associated with gasoline and diesel fuel use from construction and mining, entertainment, industrial, lawn and garden, commercial, and recreational equipment, as well as railyard operations and transportation refrigeration units.
Wastewater Treatment	Wastewater treatment emissions include process and fugitive emissions, stationary emissions from the combustion of digester gas, and energy-related emissions.
Water Supply	Water emissions are associated with the electricity used to supply, convey, treat, and distribute water in the city.

Source: Ascent Environmental 2021.

Based on the modeling conducted for the revised baseline inventory, community activities in the city generated approximately 547,972 MTCO₂e in 2005. The largest emissions-generating sectors included on-road transportation, nonresidential building energy, and residential building energy. The city’s 2005 baseline emissions by sector are presented under the “Inventories Comparison” section in **Table 2-3** and **Figure 2-3**.

Updated 2019 Baseline Inventory

In preparation of the CAP Update, the City developed an updated baseline inventory, which evaluated community emissions in 2019 using the same seven emissions sectors in the revised 2005 inventory. The updated 2019 baseline inventory estimated that community emissions were approximately 441,557 MTCO₂e in 2019. Emissions from on-road transportation, which include emissions from fossil fuel (i.e., gasoline and diesel) combustion in vehicles, accounted for approximately 59 percent of community emissions. The second-largest emissions sector, nonresidential building energy, contributed approximately 22 percent of community GHG emissions in 2019, and the residential building energy sector generated approximately 10 percent of the city's emissions. The solid waste and off-road vehicles and equipment sectors accounted for 5 percent and 4 percent, respectively, and wastewater treatment and water supply each contributed less than 1 percent of total emissions. The 2019 baseline inventory serves as the City's updated GHG emissions baseline for the CAP Update.

Table 2-2 Milpitas 2019 Community Greenhouse Gas Emissions Inventory

Emissions Sector	GHG Emissions (MTCO ₂ e)	Percent of Total
On-Road Transportation	259,627	59%
Nonresidential Building Energy	98,319	22%
Residential Building Energy	42,218	10%
Solid Waste	23,566	5%
Off-Road Vehicles and Equipment	15,554	4%
Wastewater Treatment	1,578	< 1%
Water Supply	694	< 1%
Total	441,557	100%

Note: Columns may not sum exactly due to independent rounding. MTCO₂e = metric tons of carbon dioxide equivalent.

Source: Ascent Environmental 2021.

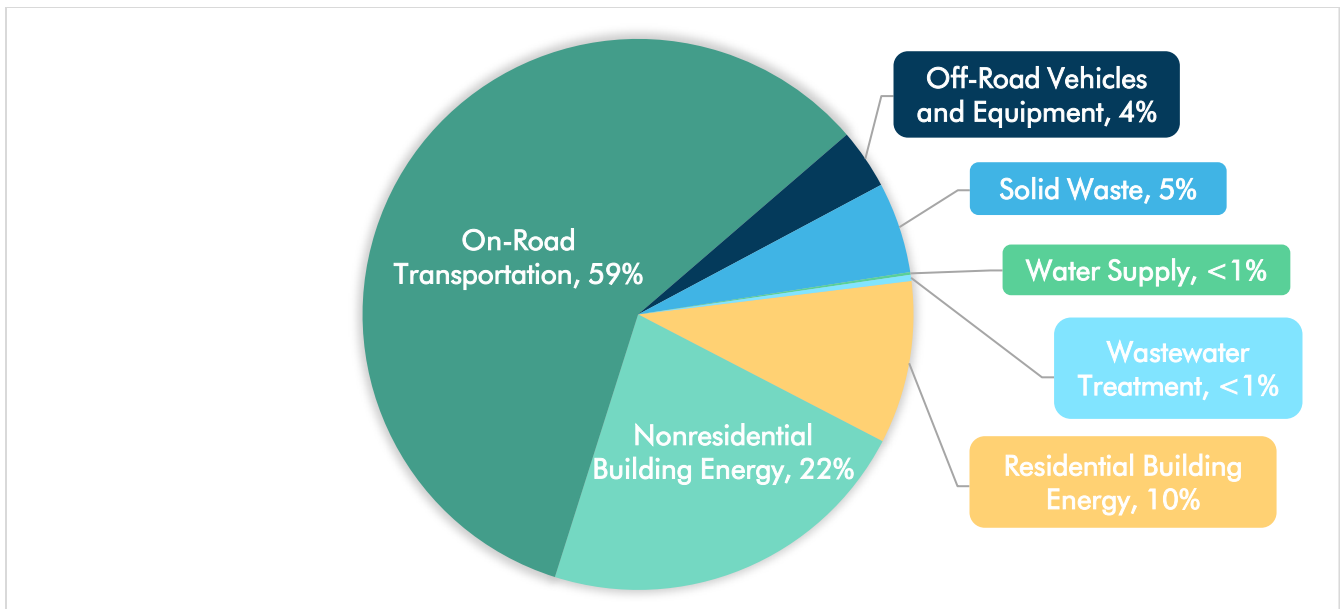


Figure 2-1 Milpitas 2019 Community Greenhouse Gas Emissions Inventory

Source: Ascent Environmental 2021.

As shown in **Figure 2-2**, community emissions in 2019 of approximately 441,557 MTCO₂e are equivalent to combusting 50 million gallons of gasoline, or the total combustion from 96,000 passenger vehicles driving continuously for one year (EPA 2021).

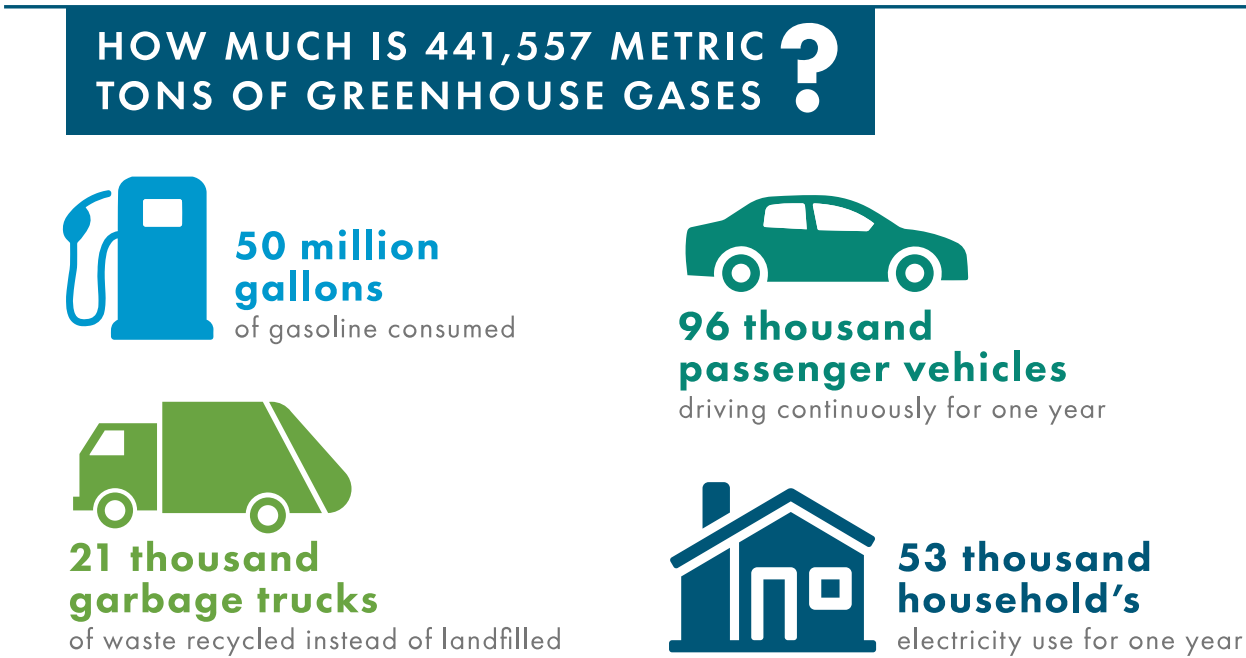


Figure 2-2 Milpitas 2019 Community Greenhouse Gas Emissions Equivalencies

Source: EPA 2021; adapted by Ascent Environmental in 2021.

Inventories Comparison

Evaluating community GHG emissions over time is a crucial element of climate action planning. Tracking and comparing emissions levels allows jurisdictions to assess where progress has been made and which emissions sources and sectors should be prioritized in planning.

In addition to preparing the City's revised 2005 and updated 2019 baseline inventories, a 2015 inventory was developed as a representative interim year to measure changes in the city's emissions levels. A comparison of the city's GHG emissions by sector in 2005, 2015, and 2019 is presented in **Table 2-3** and illustrated in **Figure 2-3**.

Table 2-3 Comparison of Milpitas Community Greenhouse Gas Emissions Inventories

Emissions Sector	Revised 2005 Inventory (MTCO ₂ e)	2015 Inventory (MTCO ₂ e)	2019 Inventory (MTCO ₂ e)	Percent Change 2005 – 2019
On-Road Transportation	252,864	278,061	259,627	+3%
Nonresidential Building Energy	183,424	202,368	98,319	-46%
Residential Building Energy	64,108	57,581	42,218	-34%
Solid Waste	26,998	28,984	23,566	-13%
Off-Road Vehicles and Equipment	15,034	16,511	15,554	+3%
Wastewater Treatment	1,078	1,935	1,578	46%
Water Supply	4,466	2,974	694	-84%
Total	547,972	588,414	441,557	-19%

Notes: Totals may not sum exactly due to independent rounding. MTCO₂e = metric tons of carbon dioxide.

Source: Ascent Environmental 2021.

Community GHG emissions increased by approximately 7 percent above the revised 2005 baseline in 2015 as a result of population and employment growth in the city. In 2019, community GHG emissions decreased by approximately 19 percent below the revised 2005 baseline. Although population and employment continued to rise in 2019, the reduction in emissions between the revised 2005 inventory and the 2019 inventory can be explained by:

- improvements in vehicle and equipment fuel efficiency due to State and federal regulations,
- reductions in the carbon intensity of grid electricity due to State regulations, and
- the supply of near-zero-emissions grid electricity from SVCE to the Milpitas homes, businesses, and city facilities starting in 2018.

Further details regarding differences between the inventories are included in Appendix A.

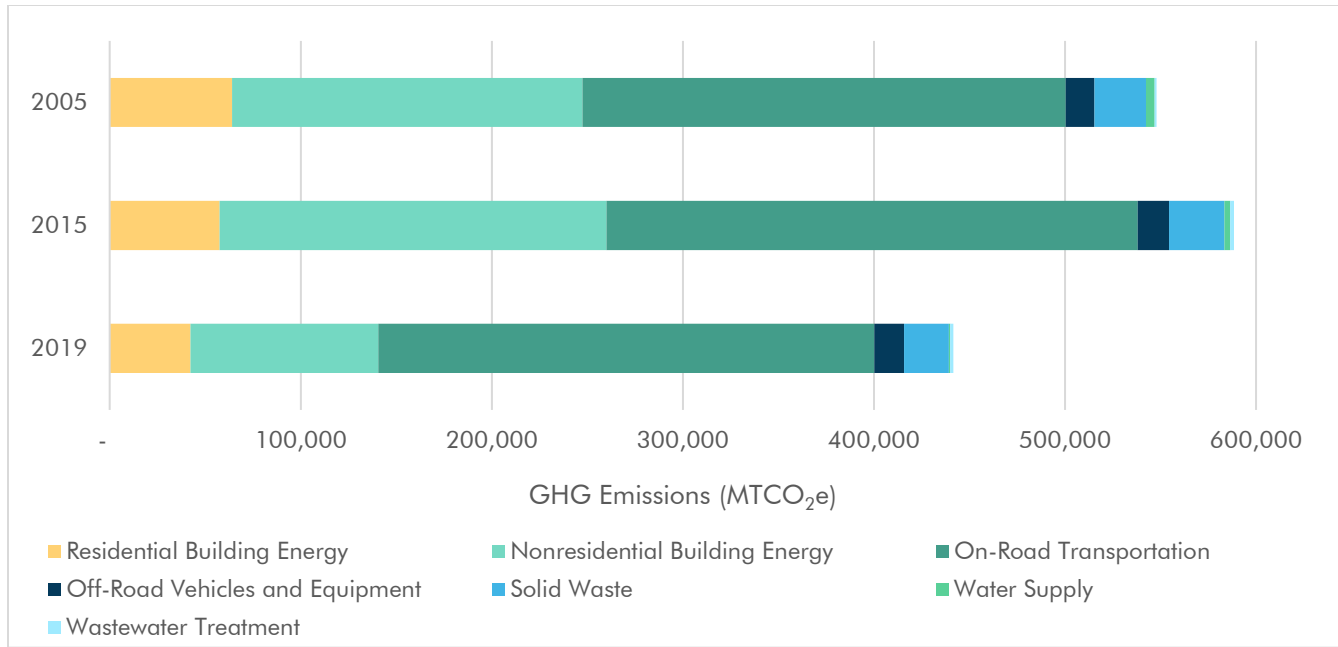


Figure 2-3 Comparison of Milpitas Community Greenhouse Gas Emissions Inventories
Source: Ascent Environmental 2021.

Community Forecasts

GHG emissions forecasts provide a modeled estimate of future emissions levels based on a continuation of current trends in activity, population, and job growth, while also accounting for known regulatory actions by State and federal agencies (i.e., “legislative” actions) that are expected to reduce emissions in the future. Emissions forecasts provide insights into the scale of local reductions needed to achieve GHG emissions reduction targets after applying anticipated reductions from regulatory actions.

This CAP Update includes two forecast scenarios: a “business-as-usual” (BAU) scenario, and a legislative-adjusted BAU scenario. The BAU scenario is based on a variety of scaling factors for each sector (or activities that occur within the sector[s]) in the city and assumes no additional State or federal actions will occur after 2019 (the updated baseline inventory year). In the legislative-adjusted BAU scenario, the BAU forecast is “adjusted” to account for the effects of State and federal laws and regulatory requirements on the city’s forecasted emissions. The forecasts estimate emissions for the years 2030, 2040, and 2045, which align with the State’s GHG reduction target years established in key legislation and policies, including SB 32 and Executive Order (EO) B-55-18, as well as the City’s General Plan Update horizon year. The long-term target year of 2045 was chosen to better align with newer State GHG targets such as the statewide carbon neutrality goal, rather than the previously issued 2050 goal of an 80 percent reduction from 1990 levels.

Details on how the forecasts were developed and the activity data used to forecast emissions in each sector can be found in Appendix A.

Business-as-Usual Forecasts

The BAU forecast estimates GHG emissions based on predicted growth in existing demographic forecasts, including population and employment changes. These forecasts assume the continuation of current behaviors and activities within the city and that no additional efforts or legislative actions beyond what have already been implemented will be made to reduce GHG emissions in the future.

Based on 2019 GHG emissions levels, the city’s BAU forecast estimates annual GHG emissions to increase steadily and rise approximately 26 percent in 2045. This projected increase in BAU emissions is due to anticipated growth in demographics and vehicle activity within the city. Community BAU emissions are shown in **Figure 2-4**.

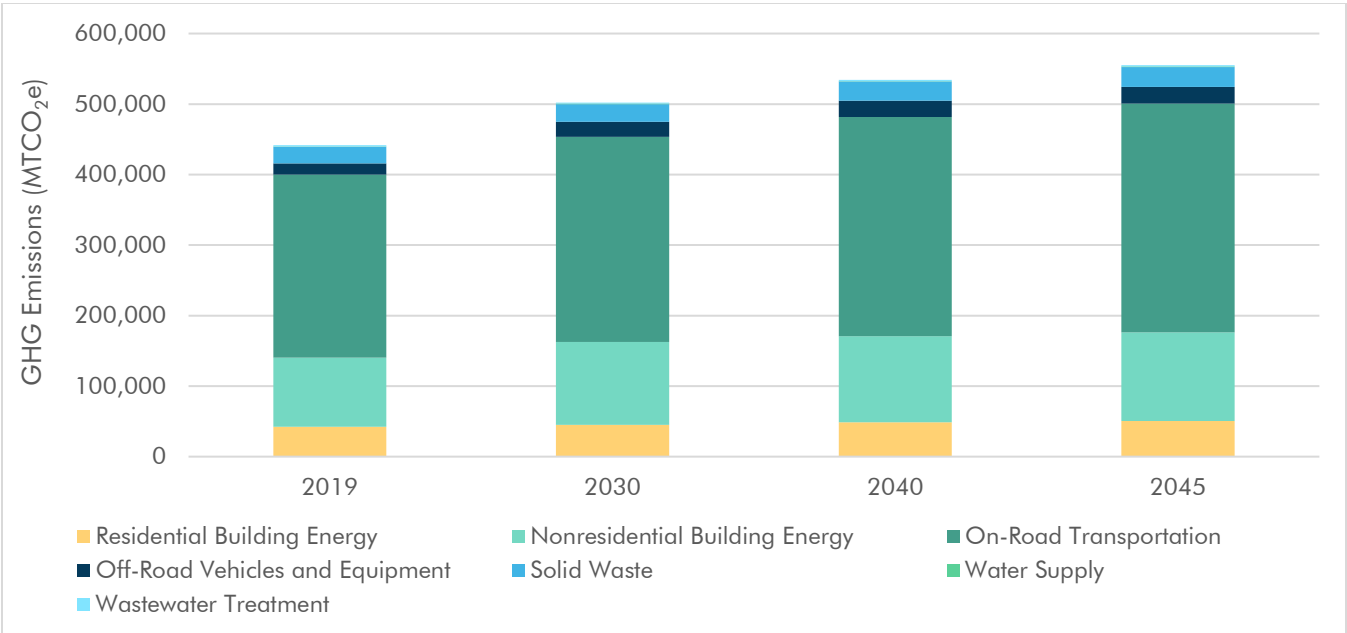


Figure 2-4 Milpitas Community Business-as-Usual Greenhouse Gas Emissions Forecasts
Source: Ascent Environmental 2021.

Legislative-Adjusted Business-as-Usual Forecasts

Legislative-adjusted BAU emissions forecasts evaluate how the city’s GHG emissions would change over time accounting for legislative actions at the State and federal levels, such as regulatory requirements to increase vehicle fuel efficiency. This forecast provides the City with the information needed to focus efforts on certain emissions sectors and sources that have the most GHG reduction opportunities. A summary of the legislative reductions applied is provided in **Table 2-4**. Detailed descriptions of the specific legislative reductions can be found in Appendix A.

Table 2-4 Legislative Reductions Summary

Source	Legislative Reduction	Sectors Applied
State	SB 100 (Renewables Portfolio Standard)	Building Energy, Water
State	California's Building Energy Efficiency Standards (Title 24, Part 6)	Building Energy
State	Advanced Clean Car Standards	On-Road Vehicles
State	Truck and Bus Regulation	On-Road Vehicles
Federal	Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles	On-Road Vehicles
Federal	EPA Off-Road Compression-Ignition Engine Standards	Off-Road Vehicles and Equipment

Notes: EPA = U.S. Environmental Protection Agency; SB = Senate Bill.

Source: Table compiled by Ascent Environmental in 2021.

Accounting for the reductions outlined above, the city's forecasted legislative-adjusted emissions are expected to decrease by 5 percent in 2030 and 10 percent in 2045 from 2019 levels. **Table 2-5** and **Figure 2-5** below illustrate the anticipated gradual decline of GHG emissions through 2045, and **Figure 2-5** also shows the emissions trend that would occur without legislative reductions (i.e., BAU emissions).

Table 2-5 Milpitas Community Legislative-Adjusted Business-as-Usual Greenhouse Gas Emissions Forecasts (MTCO₂e)

Emissions Sector	2019	2030	2040	2045
On-Road Transportation	259,627	236,310	218,898	221,388
Nonresidential Building Energy	98,319	93,467	82,288	77,177
Residential Building Energy	42,218	42,660	43,399	43,658
Solid Waste	23,566	25,026	27,215	28,074
Off-Road Vehicles and Equipment	15,554	21,139	22,984	23,421
Water Supply	694	421	153	0
Wastewater Treatment	1,578	1,612	1,692	1,713
Total	441,557	420,636	396,629	395,432
<i>Percent change from 2019</i>	—	-5%	-10%	-10%

Notes: Total may not sum exactly due to independent rounding. MTCO₂e = metric tons of carbon dioxide.

Source: Ascent Environmental 2021.

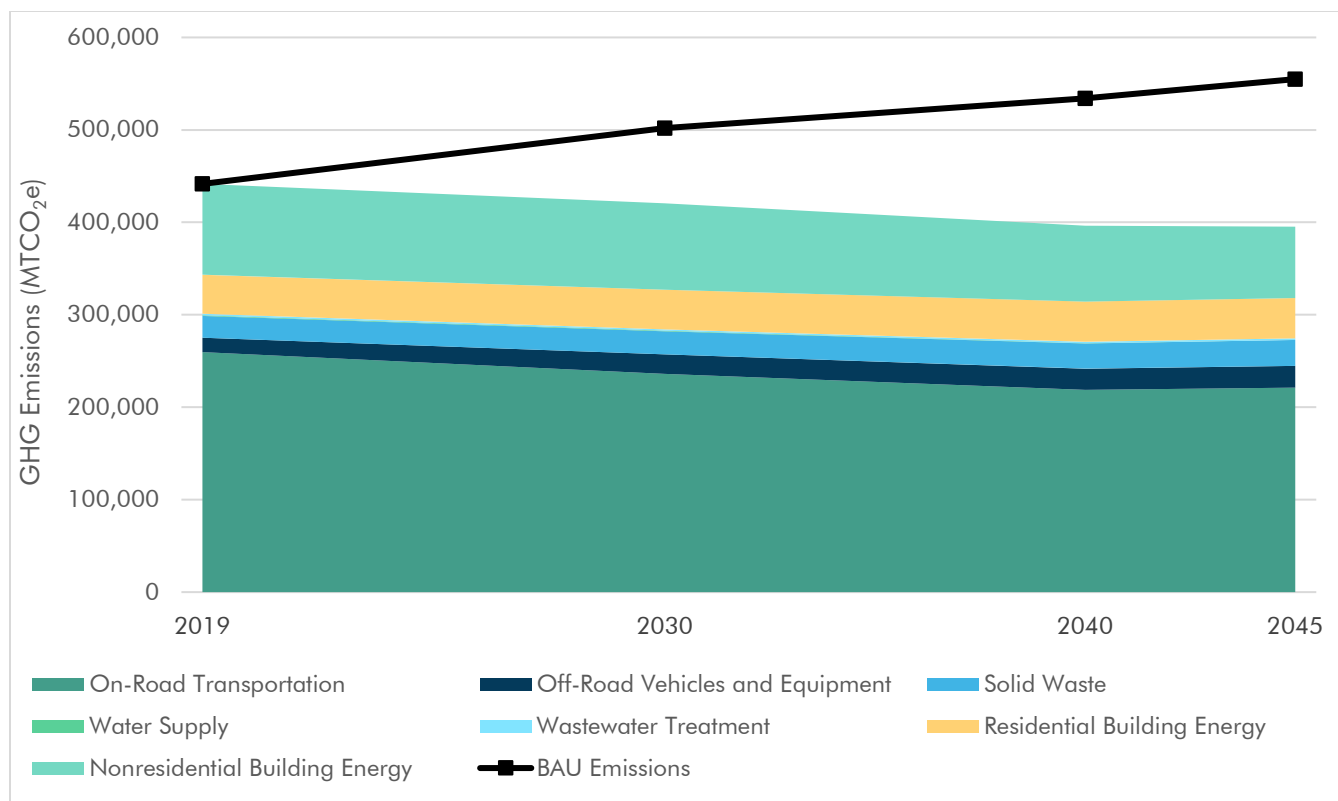


Figure 2-5 Milpitas Community Legislative-Adjusted Business-as-Usual Greenhouse Gas Emissions Forecasts

Source: Ascent Environmental 2021.

Community Reduction Targets

The emissions reduction targets in this CAP Update have been established to be consistent with statewide GHG emissions targets. As directed in SB 32, EO B-55-18, and EO S-3-05, the State aims to reduce annual GHG emissions to:

- 40 percent below 1990 levels by 2030,
- 80 percent below 1990 levels by 2050, and
- carbon neutrality by 2045.

The State's 2030 and 2050 targets are in line with the scientifically established levels needed to limit the rise in global temperature to no more than 2 degrees Celsius (°C), the warming threshold at which major climate disruptions, such as super droughts and rising sea levels, are projected. These targets also pursue efforts to limit the global temperature increase even further to no more than 1.5 °C (United Nations 2015:3).

In addition to these targets, California set a new statewide GHG reduction goal in 2018 through EO B-55-18. The order directs the State to achieve carbon neutrality no later than 2045 and to achieve net negative emissions thereafter. The carbon neutrality goal is separate from and complements existing statewide targets and goals for reducing GHG emissions. EO B-55-18 is

the first California executive order or legislative action to explicitly mention the use of carbon sequestration to achieve GHG reduction targets and goals; therefore, it is distinct from other State reduction targets and goals and does not compete or conflict with existing policies.

The City aims to reduce GHG emissions in proportion to the State's targets and goals. Community emissions levels from 1990 are not available, which is the case for most local jurisdictions in California. Therefore, community GHG reduction targets for the City's CAP Update were developed relative to the city's revised 2005 baseline emissions inventory, consistent with guidance provided by CARB. Detailed descriptions of the associated calculations and estimates are provided in Appendix B.

The targets developed relative to 2005 emissions levels were used to calculate equivalent reductions needed from the updated 2019 baseline inventory.

The city's community GHG reduction targets are as follows:

- 2030 target: 36 percent below 2019 levels;
- 2040 target: 79 percent below 2019 levels; and
- 2045 target: carbon neutrality.

The city's 2030 target requires GHG emissions to be reduced to 283,817 MTCO₂e in 2030. The 2040 target, which the City has set based upon the trajectory necessary to meet the 2045 goal, requires community emissions to be reduced to 94,606 MTCO₂e in 2040. The 2040 goal is intended to align with the General Plan 2040 horizon year. The City has chosen to adopt a target to achieve carbon neutrality no later than 2045, consistent with the State's goal under EO B-55-18. **Table 2-6** and **Figure 2-6** in the following section present the city's emissions reductions targets.

Community Local Emissions Gap

State and federal regulations alone will not be sufficient to achieve the City's GHG emissions reduction targets. The City needs to implement additional actions to close the remaining "local emissions gap" and achieve its reduction targets. **Table 2-6** and **Figure 2-6** display the city's forecasted emissions and targets.

Table 2-6 Milpitas Community Greenhouse Gas Local Emissions Gap (MTCO₂e)				
Emissions Sector	2019	2030	2040	2045
Business-as-Usual Emissions	441,557	502,207	534,465	555,142
Legislative-Adjusted Business-as-Usual Emissions	441,557	420,636	396,629	395,432
Target Percent Reduction below 2019 Levels	—	36%	79%	100%
Target Annual Emissions	—	283,817	94,606	0
Local Emissions Gap	—	136,819	302,023	395,432

Notes: MTCO₂e = metric tons of carbon dioxide equivalent.

Source: Ascent Environmental 2021.

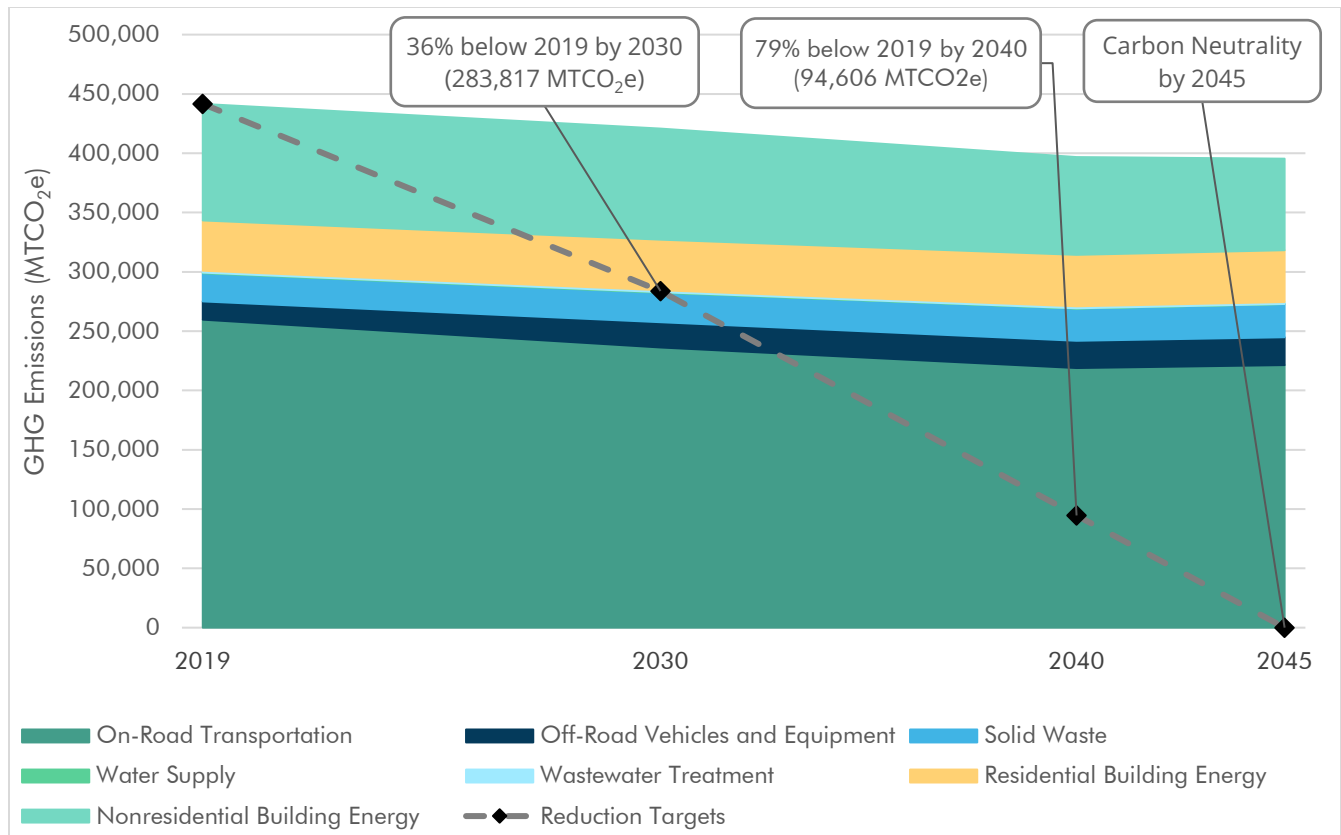


Figure 2-6 Milpitas Community Local Emissions Gap

Source: Ascent Environmental 2021.

This CAP Update is primarily focused on achieving the 2030 target and aims to make substantial progress in achieving the longer-term 2040 and 2045 targets. Achievement of the 2030 target and the longer-term 2040 and 2045 targets will require the implementation of locally enacted GHG reduction measures, along with updates to CARB's Scoping Plan and future State and federal actions.

Consumption-Based Emissions Inventory

To understand the full impact of community activities and the city's contribution to global climate change, the City has prepared a Consumption-Based Emissions Inventory (CBEI). A CBEI accounts for the total quantity of GHG emissions associated with the production (e.g., extraction of raw materials, manufacturing, and transportation), use, and disposal of products and services consumed by residents of a community within a given year. Unlike production-based inventories, which only estimate GHG emissions generated from activities that occur within specific geographic boundaries, CBEIs account for indirect lifecycle GHG emissions, or "embedded" emissions, and attribute them to residents of a jurisdiction, regardless of where the emissions are released into the atmosphere, as shown in **Figure 2-7**. For example, if a resident of California purchases a car that was made in Japan, the emissions embedded within the supply chain of producing and shipping that car are allocated to the Californian consumer, rather than to Japan.

(as they would be in a production-based approach). In addition to these embedded GHG emissions, all emissions produced from the resident driving the car – both within and outside of the community – are accounted for in the consumption-based inventorying approach.

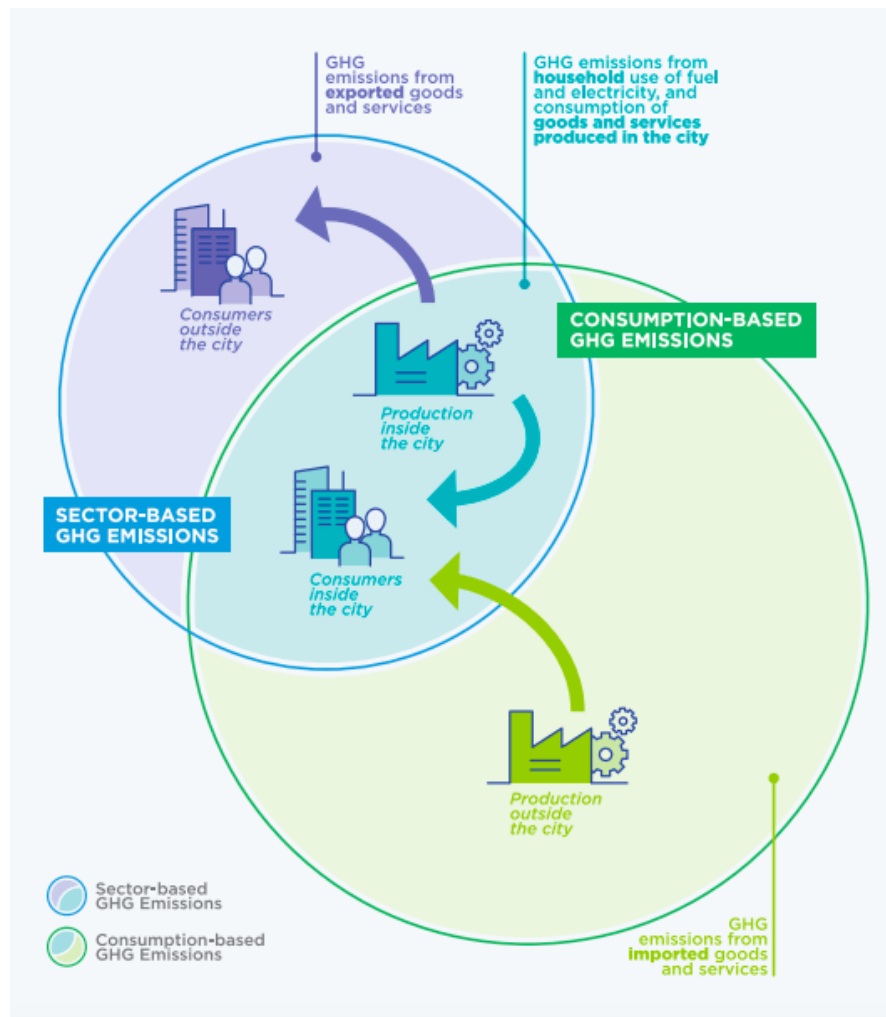


Figure 2-7 Overlap Between Consumption-Based and Production-Based GHG Inventories

Source: C40 Cities 2018

By accounting for lifecycle emissions generated outside of a community's boundaries, CBEIs capture a different subset of emissions than those included in production-based inventories. Therefore, CBEIs complement the findings of traditional production-based inventories and provide an additional lens through which local governments and individuals can view the responsibility to reduce local GHG emissions and mitigate impacts to climate change. In particular, the information on communities' carbon footprints (i.e., the amount of GHG emissions attributable to a community) associated with the consumption of food, goods, and services offers additional opportunities for GHG mitigation, as these sectors are unique to the consumption-based inventorying approach. CBEIs typically report emissions at the household level, although they are often scaled to jurisdiction levels using per capita metrics.

2013 CBEI Inventory

In the first effort to comprehensively explore household carbon footprints at a fine geospatial resolution, University of California, Berkeley (UC Berkeley) developed CBEIs for all census block groups, cities, and counties within the San Francisco Bay Area (Bay Area), including Milpitas. Using local consumption and emissions data wherever possible, researchers calculated GHG emissions for the year 2013 and published their results in *A Consumption-Based Greenhouse Gas Inventory of San Francisco Bay Area Neighborhoods, Cities and Counties: Prioritizing Climate Action for Different Locations* (hereafter referred to as “the study”) (UC Berkeley 2015). The study provides consumption-based emissions estimates for six emissions sectors: transportation, food, goods, services, housing, and composting.

The study and its findings are commonly referenced by other CBEI protocols and guidance, including ICLEI’s Community Protocol and Stockholm Environment Institute’s *Estimating Consumption-Based Greenhouse Gas Emissions at the City Scale: A Guide for Local Governments* (ICLEI 2019; SEI 2019). These protocols recommend that Bay Area communities seeking to gain an understanding of local consumption-based emissions utilize the study’s data and results. The researchers published jurisdiction-specific consumption and carbon footprint data for each emissions sector, which were used to prepare the City’s CBEI. It is important to note that the City does not have a production-based inventory for the same year as the study (i.e., 2013). However, the City’s main objective in preparing a CBEI is to gain a better understanding of consumption-based emissions in the community, and it is unlikely that the overall picture of the city’s consumption-based emissions changed significantly between 2013 and 2015 (the production-based inventory year closest to 2013). Therefore, this CAP Update uses the data, methods, and results of the study to address the community’s consumption-based emissions.

Consumption by Milpitas residents generated approximately 988,496 MTCO₂e in 2013, equivalent to **approximately 15 MTCO₂e per person or 50 MTCO₂e per household**, which is slightly higher than the California household average of 45.7 MTCO₂e. Major emissions sectors included transportation, food, goods, and services. **Table 2-7** and **Figure 2-8** present the results of the City’s 2013 CBEI by sector and source.

Table 2-7 2013 Milpitas Consumption-Based Emissions Inventory by Sector and Source

Sectors/Sources	MTCO ₂ e/ person	MTCO ₂ e/ household	Total MTCO ₂ e	Percent of Total
Transportation	5.2	17.3	339,023	34%
Vehicle Fuel Direct	2.9	9.6	189,149	19%
Vehicle Fuel Indirect	0.7	2.2	43,506	4%
Vehicle Manufacturing/Repair	0.5	1.8	35,066	4%
Air Travel	1.1	3.6	70,414	7%
Public Transit	0.01	0.05	888	<1%
Food	3.1	10.4	204,686	21%
Meat	0.9	3.1	60,308	6%
Dairy	0.5	1.7	33,012	3%
Fruits/Vegetables	1.0	3.4	67,468	7%
Cereals	0.3	1.0	19,587	2%
Other Food	0.4	1.2	24,310	2%
Goods	2.6	8.6	168,983	17%
Small Appliances/Equipment	0.7	2.4	46,790	5%
Clothing	0.6	2.1	40,971	4%
Furnishings/Appliances	0.5	1.7	34,230	3%
Other Goods	0.7	2.4	46,992	5%
Services	2.6	8.6	168,956	17%
Housing	1.7	5.8	114,608	12%
Natural Gas	0.6	1.9	37,979	4%
Electricity	0.3	1.0	19,718	2%
Fuel Oil/Other Fuel	0.0	0.1	1,565	<1%
Energy Indirect	0.2	0.5	10,332	1%
Water	0.1	0.2	4,371	<1%
Waste	0.2	0.8	15,984	2%
Construction	0.4	1.3	24,659	2%
Composting	(0.1)	(0.4)	(7,759)	(1%)
Total	15.1	50.4	988,496	100%

Notes: Totals may not sum exactly due to independent rounding. Values in parentheses represent net negative emissions, or emissions reductions. MTCO₂e = metric tons of carbon dioxide equivalent.

Source: UC Berkeley 2015; adapted by Ascent Environmental in 2021.

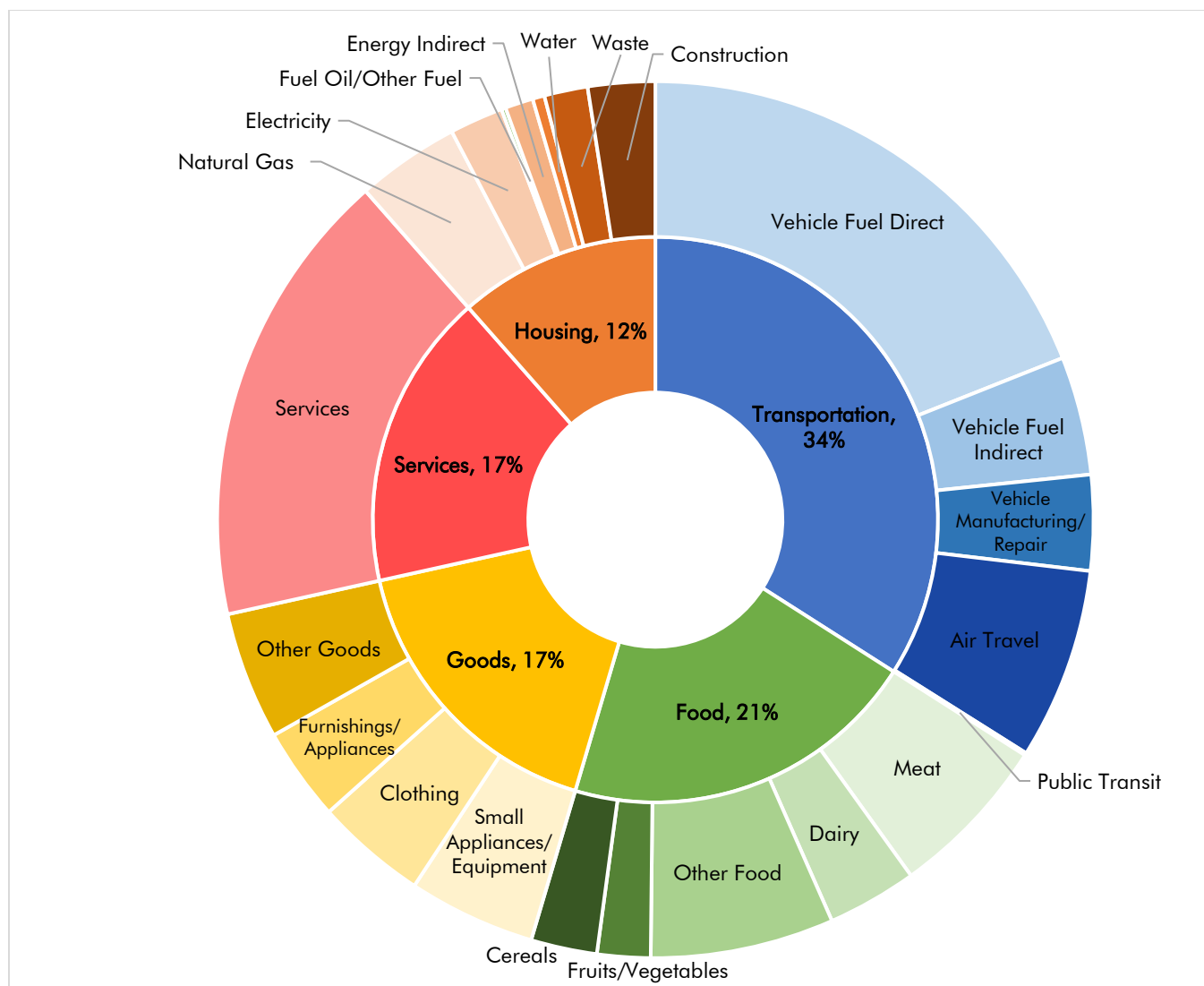


Figure 2-8 2013 Milpitas Consumption-Based Emissions Inventory by Sector and Source¹

¹ Consumption-based emissions estimates for composting are not shown in the chart, as these are emissions reductions (or avoided emissions) and cannot be represented in the chart type.

Source: Ascent Environmental 2021.

As shown above, transportation represented the city's largest consumption-based emissions sector in 2013, accounting for 34 percent of the CBEI. Transportation sector emissions result primarily from the consumption of vehicle fuel, which includes both direct emissions from the combustion of fuel as well as indirect emissions from fuel production. Transportation emissions also include embedded emissions associated with vehicle manufacturing and repair, as well as emissions from air travel and public transit. The second-largest emissions-generating sector was food, which contributed 21 percent of the city's consumption-based emissions in 2013. Meat and dairy products contribute significantly to this sector, producing nearly half of all food-related emissions, with the remaining emissions generated from fruits, vegetables, cereals, and other food. The goods and services sectors were also substantial contributors, with each sector accounting for 17 percent of the city's CBEI. The goods sector consists of embedded emissions

from small appliances and equipment, clothing, furnishings and large appliances, and other goods, and the services sector includes GHG emissions embedded in the services consumed by Milpitas residents, including health care, education, financial services, communication, and entertainment. The housing sector, which consists of emissions from household energy use, construction, water, and wastewater, contributed the smallest proportion of the city’s consumption-based emissions, accounting for 12 percent in 2013. Composting in the city accounted for a net negative contribution to the city’s CBEI, reducing GHG emissions per household by 0.4 MTCO₂e in 2013. **Figure 2-9** below presents the city’s CBEI by household.

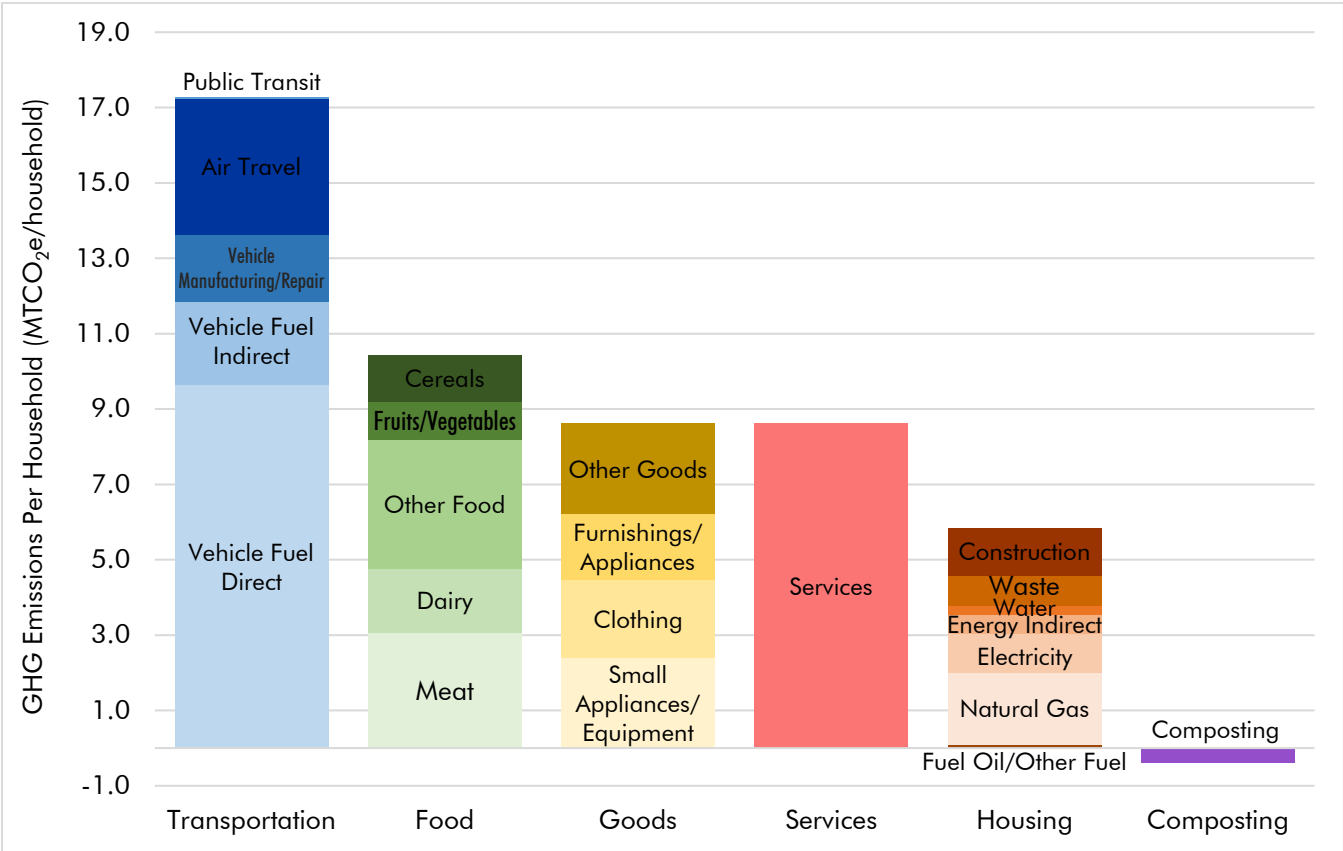


Figure 2-9 2013 Milpitas Consumption-Based Emissions Inventory by Household

Source: Ascent Environmental 2021.

Consumption-Based and Production-Based Comparison

The city’s consumption-based emissions in 2013 are 68 percent higher than its production-based emissions in 2015. Certain emissions sectors are accounted for in both inventories, including direct emissions from vehicle transportation fuels, household energy use, and waste disposal. The CBEI captures emissions not included in the production-based inventory, such as embedded lifecycle emissions from the production of fuel, food, goods, services, and construction. These indirect emissions represent over two-thirds of the city’s CBEI. The inclusion of these additional GHG emissions provides new opportunities for the City and Milpitas community to reduce emissions and mitigate their overall impact to climate change. **Table 2-8**

presents a comparison of the city’s 2013 consumption-based emissions and 2015 production-based emissions, and **Figure 2-10** illustrates the two inventories by sector.

Table 2-8 Comparison of Milpitas Greenhouse Gas Emissions Inventories (MTCO ₂ e)			
Emissions	Production-Based Emissions Inventory	Consumption-Based Emissions Inventory	Percent Difference
Total	588,414	988,496	68%

Notes: MTCO₂e = metric tons of carbon dioxide equivalent.
 Source: Production-based emissions inventory prepared by Ascent in 2021. Consumption-based emissions inventory prepared by UC Berkeley in 2015; adapted by Ascent Environmental in 2021.

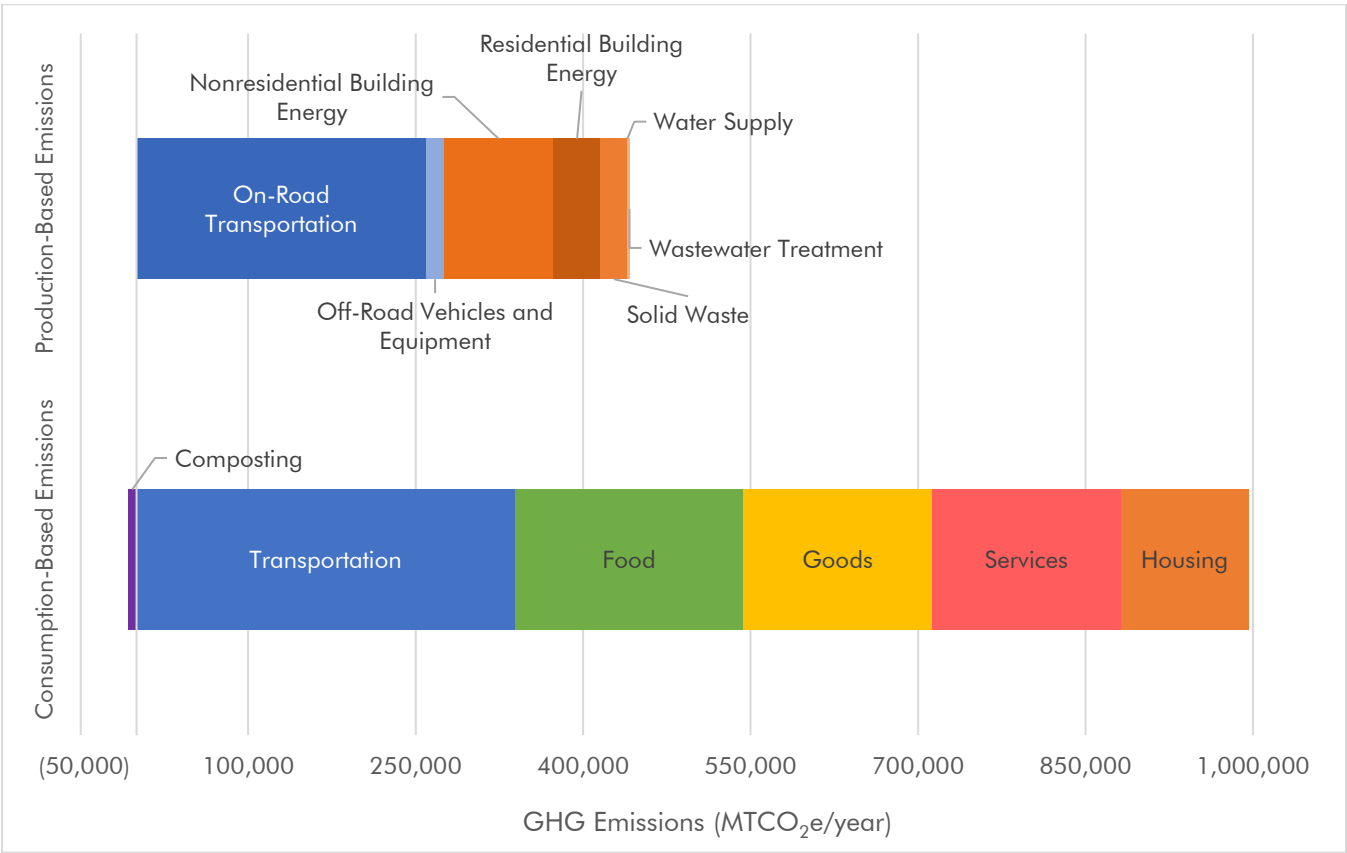


Figure 2-10 Comparison of Milpitas Production-Based and Consumption-Based Greenhouse Gas Emissions Inventories

Source: Ascent Environmental 2021.



Municipal Operations Emissions

Milpitas Senior Center
Microgrid Project

This chapter summarizes the City's greenhouse gas (GHG) inventories and forecasts for municipal operations and outlines its GHG reduction targets. This chapter also presents the strategies and measures that the City will implement to reduce GHG emissions from municipal operations.

Climate Action Planning for Municipal Operations

In addition to taking action at the community-level, the City of Milpitas (City) is furthering its commitment to addressing climate change for this Climate Action Plan Update (CAP Update) through climate action planning for its municipal operations. Local governments have an important role to play in influencing GHG reductions throughout their communities, and by taking steps to reduce contributions to climate change from its municipal operations, the City is demonstrating its commitment and setting an example for the community at large. The inclusion of municipal operations in this CAP Update builds on over a decade of action taken by the City to reduce its GHG emissions, and provides an opportunity to strengthen the City's operations and ability to positively impact the community.

The City has prepared GHG emissions inventories, forecasted future emissions, and established reduction targets for municipal operations. These steps set the foundation for developing GHG reduction strategies and measures that the City will take to reduce emissions from municipal operations.

Municipal Operations Inventories

Like community GHG emissions inventories, ICLEI has developed guidance to assist local governments in conducting municipal operations inventories. The most recent standardized guidance for municipal operations-scale emissions inventories is ICLEI's May 2010 publication, *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas*

Emissions Inventories (LGOP) (ICLEI 2010). Using the guidance provided by ICLEI in the LGOP, the City has prepared municipal operations inventories for 2015 and 2019. These inventories were conducted consistent with the accounting methodologies used for the City's community inventories, which are described in detail in **Chapter 2**.

The 2015 and 2019 municipal operations GHG emissions inventories estimate emissions in seven sectors: buildings and facilities, employee commute, vehicle fleet, streetlights and traffic signals, solid waste, water supply, and wastewater treatment. **Table 3-1** describes each GHG emissions sector.

Emissions Sector	Description
Buildings and Facilities	Buildings and facilities emissions are associated with the consumption of electricity, natural gas, and diesel in City-owned and leased buildings, as well as other infrastructure such as park buildings, park lighting and irrigation controllers, and other facilities.
Employee Commute	Employee commute emissions are associated with gasoline and diesel fuel consumption from municipal employees' motor vehicles while commuting to and from work.
Vehicle Fleet	Vehicle fleet emissions are associated with gasoline and diesel fuel consumption in on-road vehicles and off-road vehicles and equipment owned and operated by the City.
Streetlights and Traffic Signals	Streetlights and traffic signals emissions are associated with electricity consumption to power City-owned and operated streetlights and traffic signals, including road and highway lights.
Solid Waste	Solid waste emissions are associated with the decomposition of municipal operations-generated mixed and organic waste in landfills.
Water Supply	Water emissions are associated with the electricity used to supply, convey, treat, and distribute water for municipal operations.
Wastewater Treatment	Wastewater treatment emissions include process and fugitive emissions, stationary emissions from the combustion of digester gas, and energy-related emissions associated with treating municipal operations-generated wastewater.

Source: Ascent Environmental 2021.

Based on the modeling conducted, the City's municipal operations generated approximately 5,019 metric tons of carbon dioxide equivalent (MTCO₂e) in 2015 and 3,252 MTCO₂e in 2019. Major emissions sectors included buildings and facilities, employee commute, and vehicle fleet. **Table 3-2** presents the City's 2015 and 2019 municipal operations GHG emissions inventories by sector, and **Figure 3-1** illustrates the 2019 municipal operations inventory. The 2019 municipal operations inventory serves as the municipal operations GHG emissions baseline for the CAP Update.

Table 3-2 Milpitas 2015 and 2019 Municipal Operations Greenhouse Gas Emissions Inventories

Sector	2015 Inventory		2019 Inventory	
	MTCO ₂ e	Percent of Total	MTCO ₂ e	Percent of Total
Buildings and Facilities	2,001	40%	870	27%
Employee Commute	1,304	26%	1,195	37%
Vehicle Fleet	1,017	20%	1,081	33%
Streetlights and Traffic Signals	564	11%	3	<1%
Solid Waste	52	1%	53	2%
Water Supply	70	1%	41	1%
Wastewater Treatment	11	<1%	9	<1%
Total	5,019	100%	3,252	100%

Notes: Totals may not sum exactly due to independent rounding. MTCO₂e = metric tons of carbon dioxide equivalent.
Source: Ascent Environmental 2021.

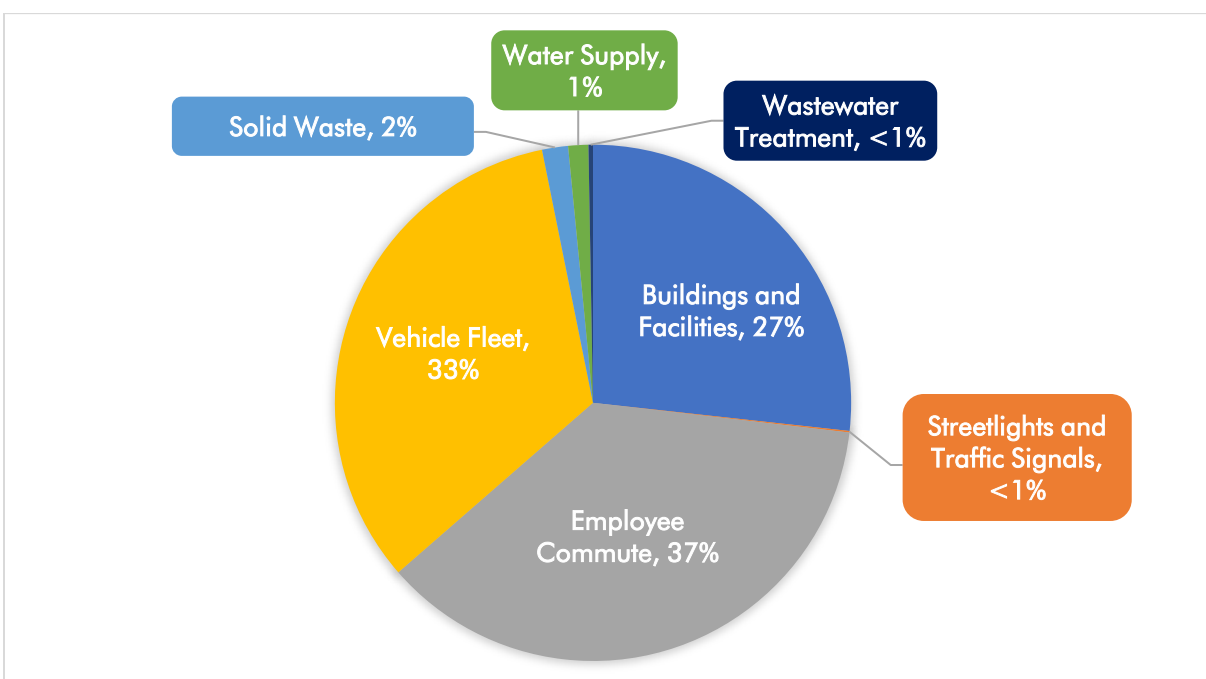


Figure 3-1 Milpitas 2019 Municipal Operations Greenhouse Gas Emissions Inventory

Source: Ascent Environmental 2021.

GHG emissions from municipal operations decreased by approximately 35 percent between 2015 and 2019. These reductions can be explained primarily by the supply of near-zero-emissions grid electricity from SVCE for municipal operations beginning in 2018. Additional information regarding the City's municipal operations inventories can be found in Appendix A.

Municipal Operations Forecasts

The City prepared a “business-as-usual” (BAU) and legislative-adjusted BAU forecasts of municipal operations GHG emissions for this CAP Update. Using 2019 emissions levels as the baseline, the municipal operations forecasts estimate emissions for the years 2030, 2040, and 2045. The forecasts were prepared using the same methodologies as described in **Chapter 2** for the community forecasts, and further details on how the forecasts were developed and the activity data used to forecast emissions in each sector can be found in Appendix A.

Business-as-Usual Forecasts

The BAU forecasts estimate GHG emissions for all sectors based on predicted growth in municipal employment. These forecasts assume the continuation of current behaviors and activities within City operations and that no additional efforts or legislative actions beyond what have already been implemented will be made to reduce GHG emissions in the future. As illustrated in **Figure 3-2** below, BAU emissions are projected to rise approximately 10 percent above 2019 levels in 2045.

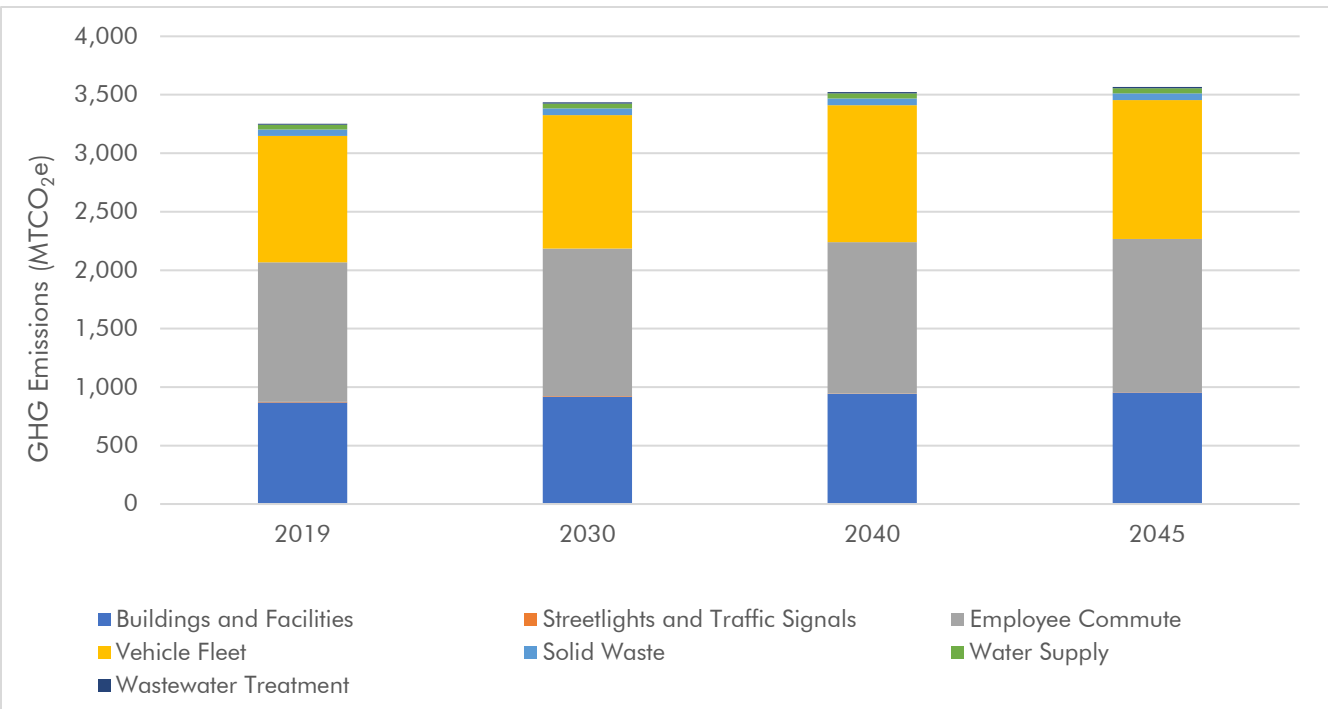


Figure 3-2 Milpitas Municipal Operations Business-as-Usual Greenhouse Gas Emissions Forecasts

Source: Ascent Environmental 2021.

Legislative-Adjusted BAU Forecast

Legislative-adjusted BAU emissions forecasts project municipal operations GHG emissions accounting for municipal employment growth and legislative actions at the State and federal levels (a summary of the legislative reductions applied can be found in **Chapter 2** in **Table 2-4**). These forecasts allow the City to identify emissions sectors and sources that can be prioritized when developing GHG reduction strategies and measures.

Accounting for legislative reductions, municipal operations GHG emissions are expected to decline steadily over time, with a 10 percent reduction and 15 percent reduction below 2019 levels anticipated in 2030 and 2045, respectively. These forecasts are presented in **Figure 3-3** and **Table 3-3** below, and **Figure 3-3** also shows the emissions trend that would occur without legislative reductions (i.e., BAU emissions).

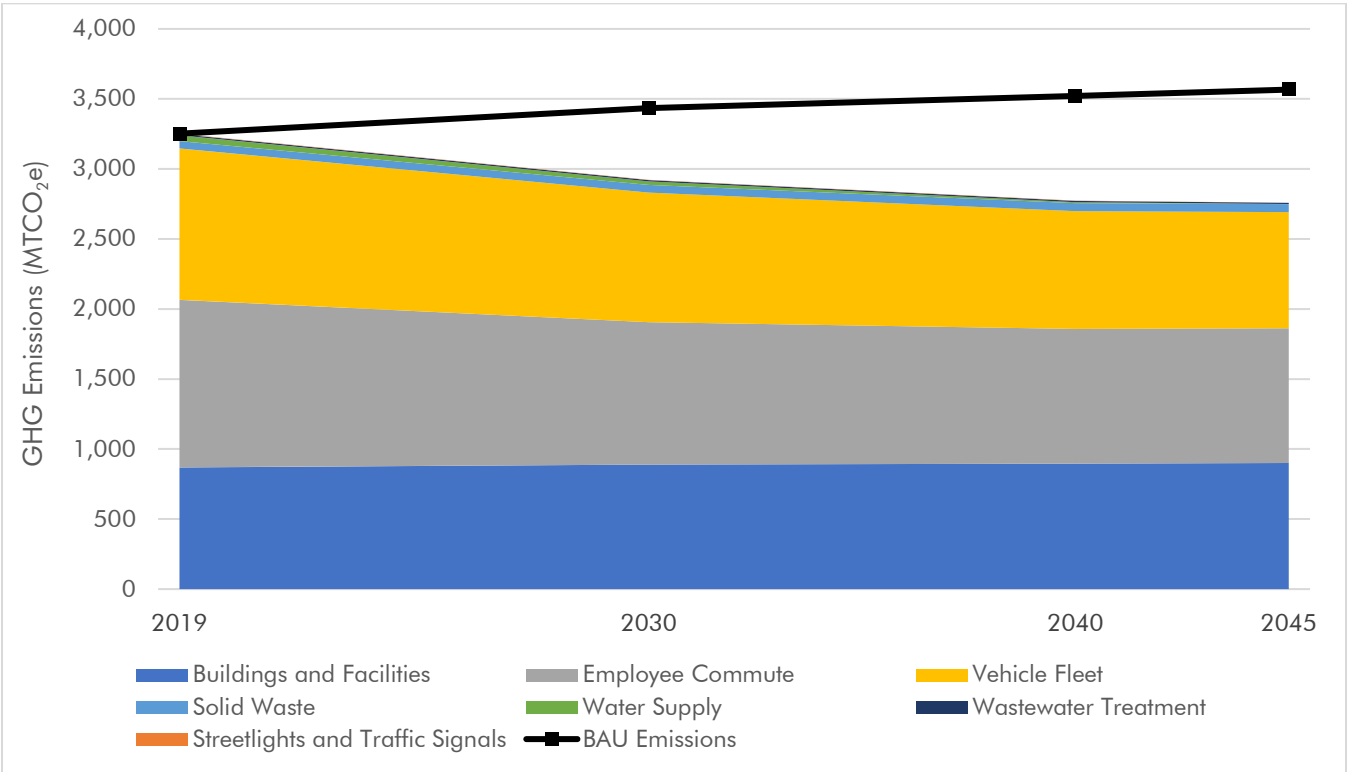


Figure 3-3 Milpitas Municipal Operations Legislative-Adjusted Business-as-Usual Greenhouse Gas Emissions Forecasts

Source: Ascent Environmental 2021.

Table 3-3 Milpitas Municipal Operations Legislative-Adjusted Business-as-Usual Greenhouse Gas Emissions Forecasts (MTCO₂e)

Sector	2019	2030	2040	2045
Buildings and Facilities	870	889	897	900
Employee Commute	1,195	1,017	961	961
Vehicle Fleet	1,081	925	840	830
Streetlights and Traffic Signals	3	2	1	0
Solid Waste	53	56	57	58
Water Supply	41	25	8	0
Wastewater Treatment	9	9	9	9
Total	3,252	2,923	2,773	2,759

Notes: Total may not sum exactly due to independent rounding. BAU = business-as-usual; MTCO₂e = metric tons of carbon dioxide equivalent.

Source: Ascent Environmental 2021.

Municipal Operations Reduction Targets

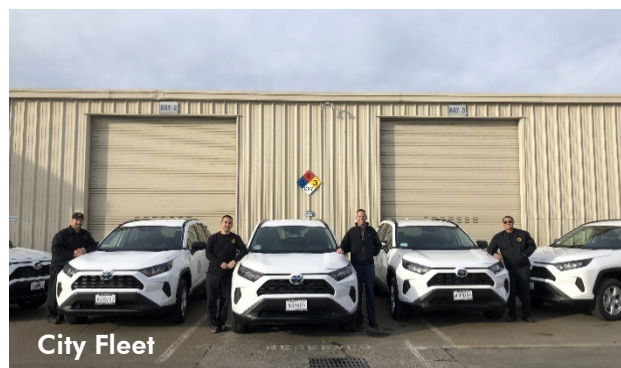
The City aims to reduce its municipal operations emissions in proportion to the State's targets and goals (outlined in **Chapter 2**). Like most local public agencies in California, municipal operations emissions levels for 1990 are not available, so GHG reduction targets for the City's municipal operations were developed relative to the City's municipal operations 2019 emissions inventory, consistent with CARB guidance. The methodology used to calculate the City's

municipal operations emissions reduction targets for 2030, 2040, and 2045 is consistent with the methodology used to calculate community targets described in **Chapter 2**.

Municipal operations GHG emissions in 2019 were 3,252 MTCO₂e. Therefore, **the City's municipal operations GHG reduction targets are as follows, consistent with State targets and goals:**

- **2030 target: 36 percent below 2019 levels;**
- **2040 target: 79 percent below 2019 levels; and**
- **2045 target: carbon neutrality.**

The 2030 target requires municipal operations GHG emissions to be reduced to 2,090 MTCO₂e in 2030. The 2040 target, which the City has set based upon the trajectory necessary to meet the 2045 goal, requires municipal operations emissions to be reduced to 697 MTCO₂e in 2040. The City has chosen to adopt a target to achieve carbon neutrality across municipal operations no later than 2045, consistent with the State's goal under EO B-55-18.



Actions at the State and federal levels will reduce GHG emissions associated with the City's municipal operations. However, the City will need to implement local actions in addition to State and federal regulations to close the "local emissions gap" and achieve its municipal operations GHG reduction targets. Municipal operations emissions and targets are summarized in **Figure 3-4** below.

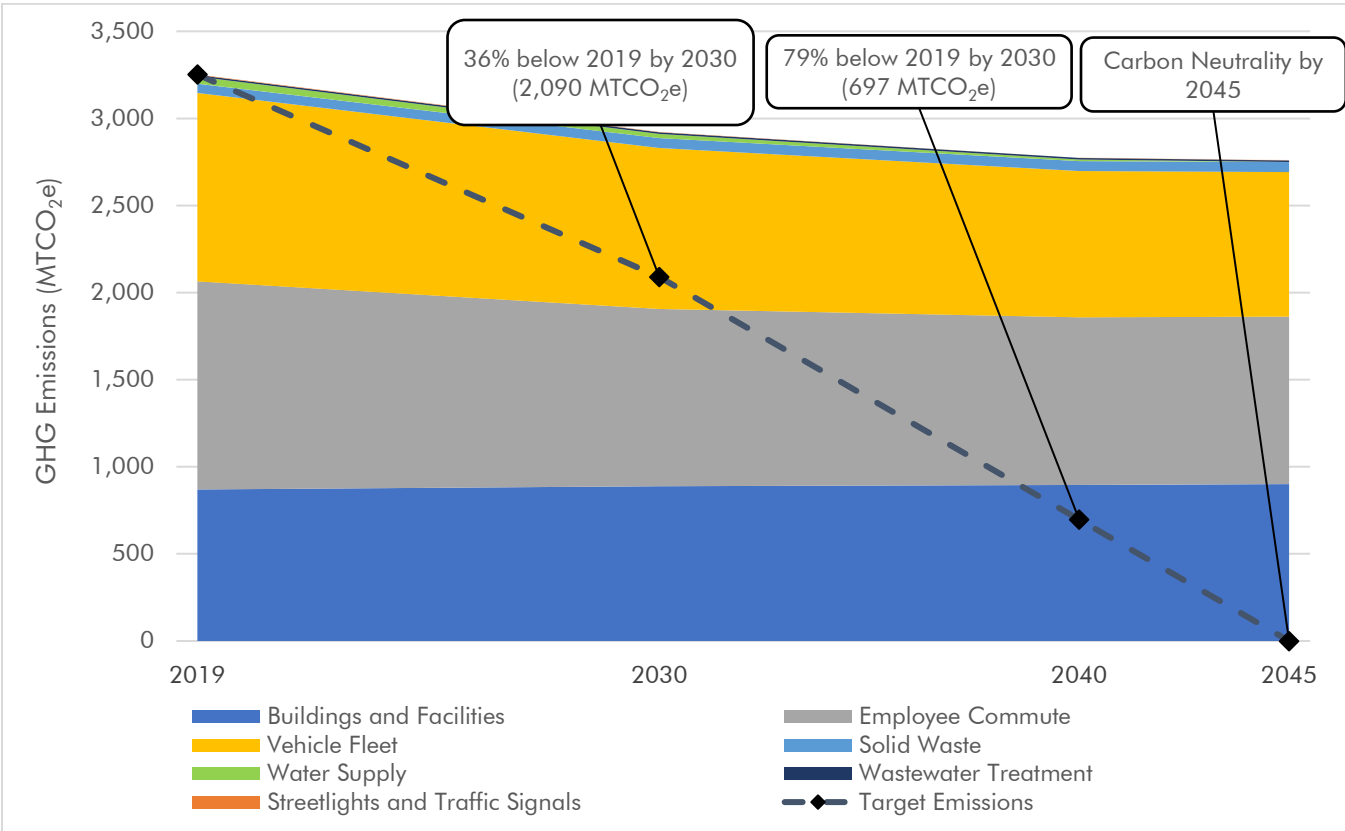


Figure 3-4 Milpitas Municipal Operations Local Emissions Gap

Source: Ascent Environmental 2021.

Municipal Operations GHG Emissions Reduction Quantification Analysis

In preparation of the CAP Update, the City conducted a GHG quantification analysis to estimate potential emissions reductions associated with municipal operations measures, which are discussed in **Chapter 4**. The total estimated GHG emissions reductions from all municipal operations measures quantified would be 1,703 MTCO₂e in 2030; 2,158 MTCO₂e in 2040; and 2,520 MTCO₂e in 2045. The total estimated reductions from all proposed GHG reduction measures would be **sufficient to meet the 2030 and 2040 targets**. The results of the quantification analysis are shown in **Table 3-4** below.

Table 3-4 Milpitas Municipal Operations Greenhouse Gas Emissions Quantification Analysis (MTCO₂e)				
Emissions	2019	2030	2040	2045
Legislative-Adjusted Business-as-Usual Emissions	3,252	2,923	2,773	2,759
Target Percent Reduction below 2019 Levels	—	36%	79%	100%
Reduction Needed to Meet Target	—	832	2,076	2,759
Total Reductions from Measures	—	1,703	2,158	2,520
Remaining Gap to Target		(862) ¹	(68) ¹	239
Target Met?	—	Yes	Yes	No

Notes: Totals may not sum exactly due to independent rounding. MTCO₂e = metric tons of carbon dioxide equivalent.

¹ Indicates target has been achieved with a surplus of reductions.

Source: Calculations conducted by Ascent Environmental in 2021.

Figure 3-5 shows the GHG reductions achieved by CAP Update measures, organized by the sectors used for the municipal operations inventory and forecasts. **Figure 3-5** displays the City's achievement of the 2030 and 2040 targets with the GHG reduction measures and demonstrates progress toward the 2045 carbon neutrality target.

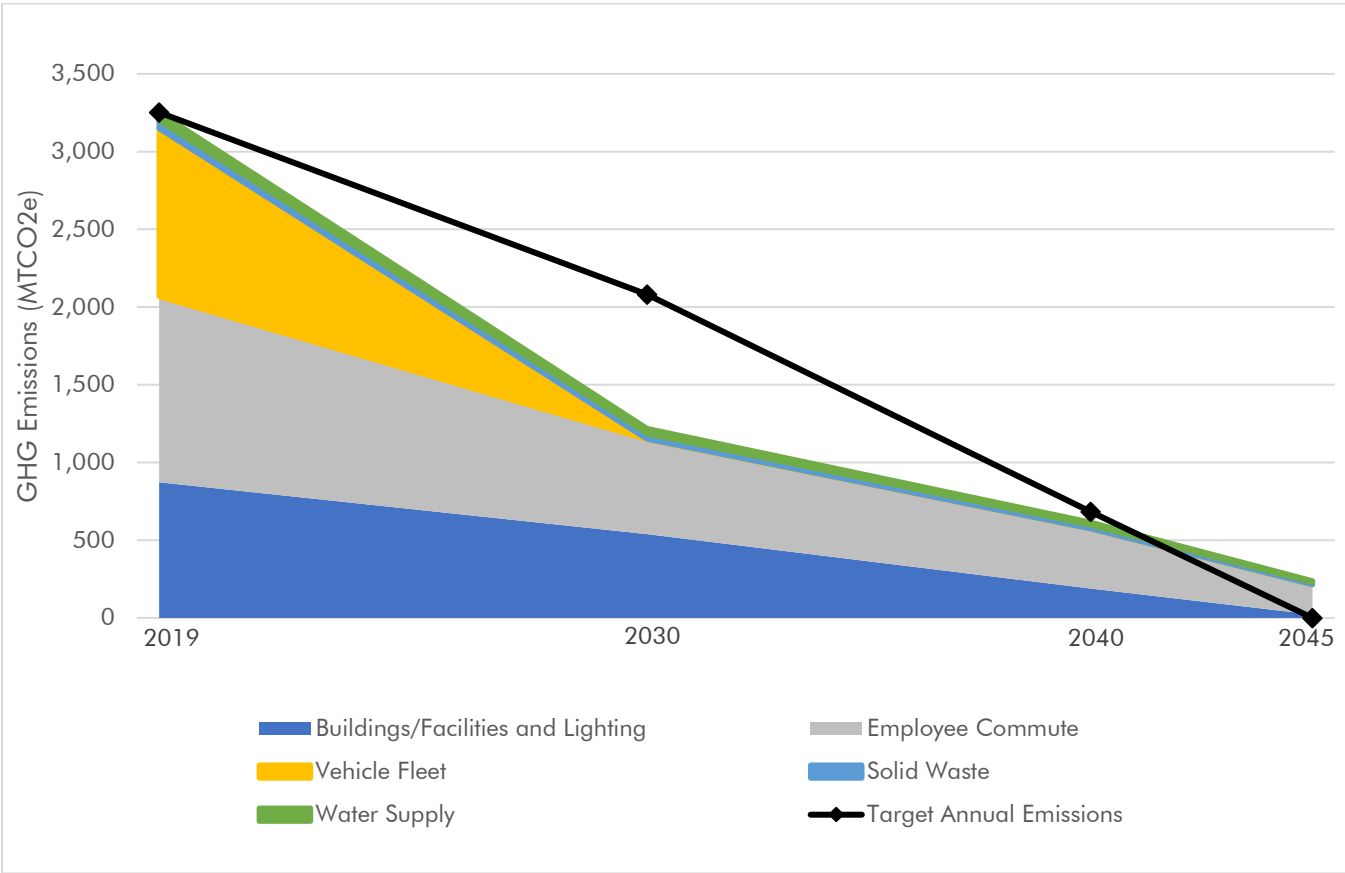


Figure 3-5 Milpitas Municipal Operations Greenhouse Gas Emissions Reduction Measures Analysis

Source: Ascent Environmental 2021.

A photograph of Milpitas City Hall at night. The building is a modern, curved structure with large glass windows and balconies, illuminated from within. It is situated behind a body of water, which reflects the building's lights. Several American flags are visible on poles to the left of the building. The sky is a deep blue, and some trees are visible in the background.

Greenhouse Gas Reduction Strategies and Measures

This chapter presents the strategies and measures that the City will implement to reduce greenhouse gas (GHG) emissions to achieve its emissions reduction targets. These locally based initiatives are organized under six emissions sectors and include descriptions of actions that can be taken for implementation, GHG reduction potential, and associated co-benefits.

Overview

This Climate Action Plan Update (CAP Update) includes **11 strategies and 38 measures** that will reduce GHG emissions in the community. The strategies are organized into seven sectors: building energy, transportation and land use, waste, off-road vehicles and equipment, water and wastewater, carbon sinks, and circular and green economy. Each sector presents strategies that serve as the foundation for addressing GHG emissions reductions in the city. Within each strategy are one or more measures that represent specific expressions of the broad strategies. Measures are further evaluated in **Chapter 6** with specific actions that define the activities, programs, policies, or projects that the City will implement or support to achieve the CAP Update's goals. While the initiatives included in this chapter are primarily intended to reduce emissions, they will also result in co-benefits, such as air pollution prevention, health and well-being improvements, and resource preservation.

The strategies and measures discussed in this chapter were developed based on a combination of factors, including the results of the City's GHG emissions inventories and forecasts, robust engagement with the public and stakeholders, feedback from City staff and elected officials, and the best available climate action planning guidance. The following sections provide background information and context for each sector and present the GHG emissions reduction strategies and measures. Measures provide a description of actions that the City will take for effective implementation as well as the associated GHG emissions reduction potential estimated in the City's GHG emissions reduction quantification analysis (discussed further below; see Appendix B for additional details). GHG emissions reductions were quantified for measures

wherever substantial evidence and reasonable assumptions were available to support calculations. Measures that were not quantifiable because of lack of available data or quantification methods but would still be expected to reduce GHG emissions are also included. Co-benefits that will result from implementation of each measure are also identified. Further explanation of these metrics and full descriptions of each action are included in **Chapter 6**.

This chapter also contains measures for reducing consumption-based emissions. While emissions reduction quantifications were not conducted for these measures, they still provide opportunities for the City and community to reduce contributions to climate change. Consumption-based emissions reduction measures are presented at the end of the chapter.

GHG Emissions Reduction Quantification Analysis

In preparation of the CAP Update, the City conducted a GHG quantification analysis to estimate potential emissions reductions associated with all measures. **The total estimated GHG emissions reductions from all community measures quantified would be 147,697 MTCO₂e in 2030; 251,999 MTCO₂e in 2040; and 331,780 MTCO₂e in 2045.** The total estimated reductions from all proposed GHG reduction measures would be **sufficient to meet the 2030 target**. The results of the quantification analysis are shown in **Table 4-1** below.

Table 4-1 Milpitas Community Greenhouse Gas Emissions Quantification Analysis (MTCO₂e)				
Emissions	2019	2030	2040	2045
Legislative-Adjusted Business-as-Usual Emissions	441,557	420,636	396,629	395,432
Target Percent Reduction below 2019 Levels	—	36%	79%	100%
Reduction Needed to Meet Target	—	136,819	302,023	395,432
Total Reductions from Measures	—	147,697	251,999	331,780
Remaining Gap to Target		(10,878) ¹	50,024	63,651
Target Met?	—	Yes	No	No

Notes: Totals may not sum exactly due to independent rounding. MTCO₂e = metric tons of carbon dioxide equivalent.

¹ Indicates target has been achieved with a surplus of reductions.

Source: Calculations conducted by Ascent Environmental in 2021.

The scale of reductions required to achieve the 2040 target and the carbon neutrality target for 2045 would require significant improvements in the availability and/or cost of near-zero- and zero-emission technologies, as well as potential increased reductions from ongoing State and federal legislative actions that are currently unknown. Progress toward meeting future targets that could be set by the State would be part of the ongoing monitoring and updates to the CAP Update as new legislation or future updates to the State's Climate Change Scoping Plan are adopted.

Figure 4-1 shows the GHG reductions achieved by CAP Update measures, organized by the sectors used for the inventories and forecasts (note: the nonresidential and residential building energy sectors have been combined, as have the water supply and wastewater treatment sectors). The chart shows the estimated GHG reductions due to carbon sequestered through Measure CS-1.1 as a dashed line that is not associated with an emissions sector included in the community inventory. **Figure 4-1** displays the City’s achievement of the 2030 target with the GHG reduction measures and demonstrates progress toward the 2045 carbon neutrality target.

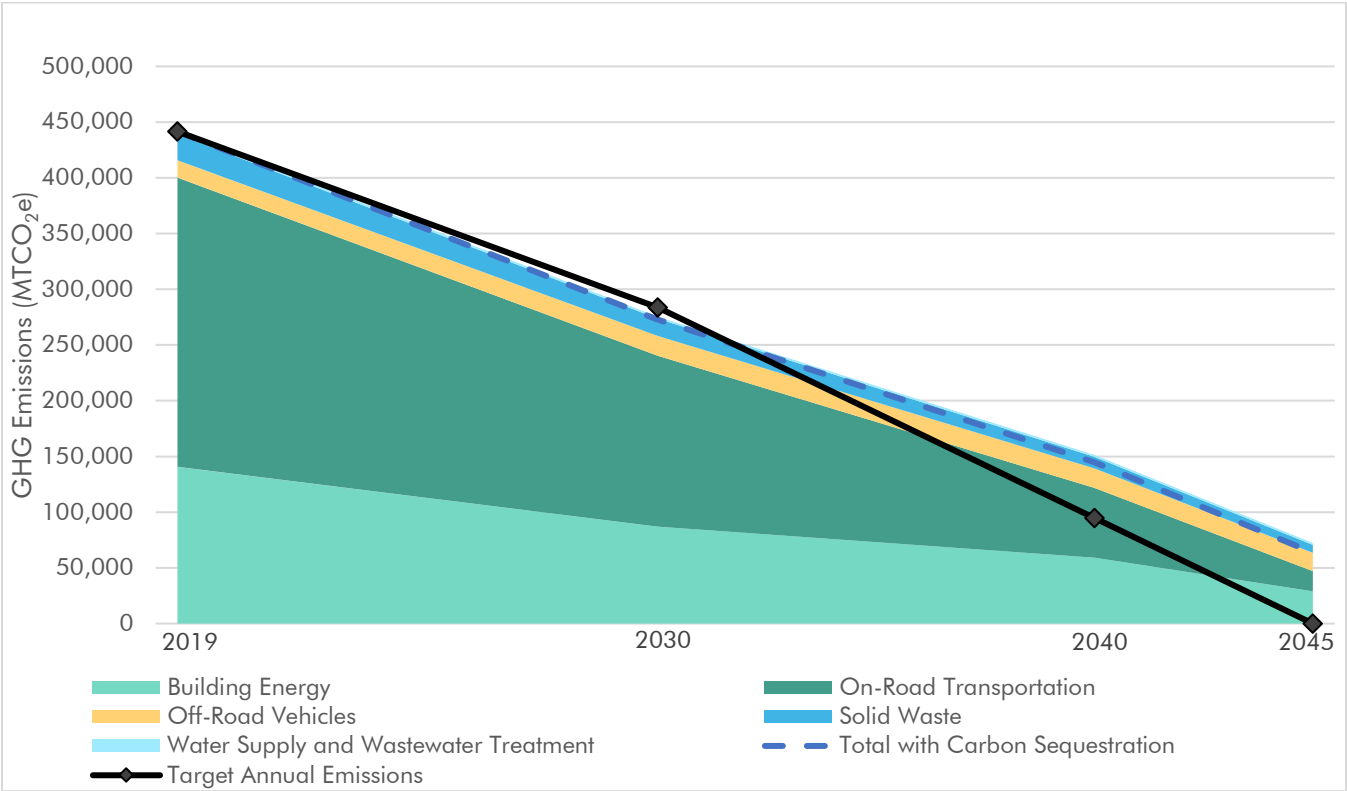


Figure 4-1 Milpitas Community Greenhouse Gas Emissions Reduction Measures Analysis

BUILDING ENERGY

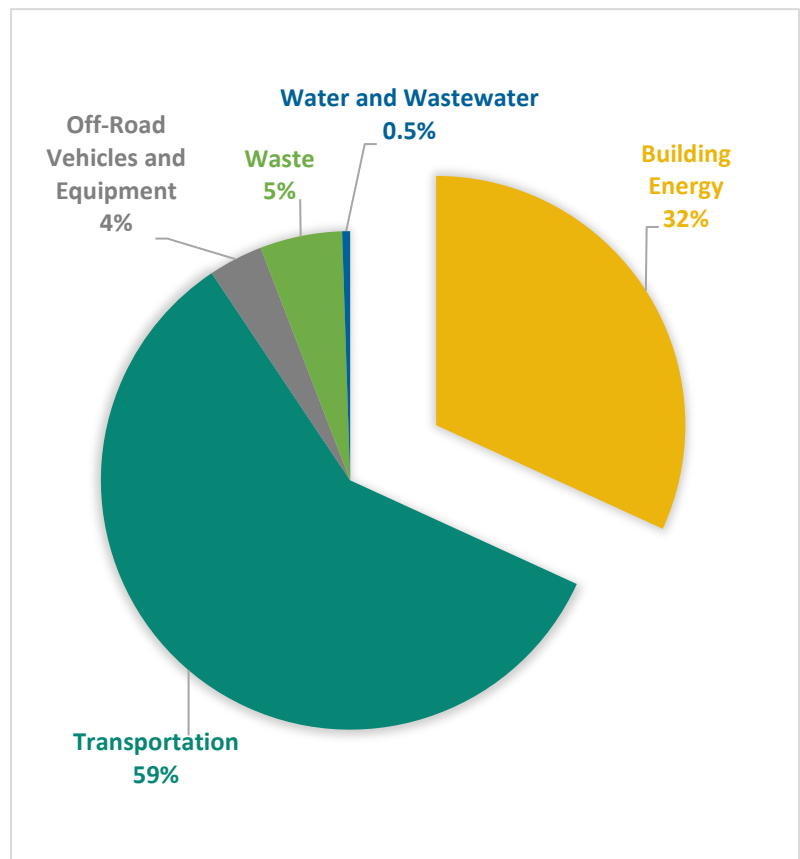


STRATEGY BE-1 Shift to Clean and Reliable Energy



STRATEGY BE-2 Maximize Building Decarbonization and Efficiency

The energy used in buildings and facilities throughout the city, including residences and businesses, is a significant contributor to community GHG emissions. Building-related GHG emissions accounted for **32 percent of total GHG emissions in the city in 2019**. Importantly, **natural gas consumption was responsible for 78 percent of building energy emissions**. Although legislative reductions from adopted State actions will help reduce building energy emissions by 4 percent by 2030, additional reductions through local action are needed for the City to reach its GHG emissions reduction targets.



Strategies and Measures

The building energy sector offers one of the greatest opportunities to achieve emissions reductions. This section outlines strategies and measures the City will implement to reduce building energy-related GHG emissions. Building energy measures are classified into three strategies that focus on adopting carbon-free energy throughout the city, improving energy efficiency and transitioning to electrification in all buildings, and reducing GHG emissions associated with new development.



BE-1: Shift to Clean and Reliable Energy



In 2019, electricity consumption generated approximately 7 percent of community GHG emissions due to the City's participation in Silicon Valley Clean Energy since 2018. While participation in SVCE has been high, a small portion of electricity use is not yet carbon-free, developing renewable energy systems, and improving awareness of clean energy throughout the city will further reduce emissions associated with building energy use.

Co-Benefits:



Measure BE-1.1: Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.

2030 Target	2040 Target	2045 Target
100% Carbon-Free Electricity in All Buildings Continuation of 100% Carbon-Free Electricity in Municipal Buildings 22,581 MTCO _{2e}	Continuation of 100% Carbon-Free Electricity in All Buildings Continuation of 100% Carbon-Free Electricity in Municipal Buildings 8,691 MTCO _{2e}	Continuation of 100% Carbon-Free Electricity in All Buildings Continuation of 100% Carbon-Free Electricity in Municipal Buildings 0 MTCO _{2e}

ACTIONS

Action BE-1.1.1: Require new development to install onsite renewable energy and storage systems capable of meeting anticipated building energy consumption, or participate in a group-buy solar and storage program, or opt in to SVCE's carbon-free electricity option.

Action BE-1.1.2: Review zoning regulations for opportunities to simplify and encourage the installation of renewable energy systems.

Action BE-1.1.3: Conduct outreach to residents and business owners to increase awareness of SVCE's carbon-free electricity supply.

Action BE-1.1.4: Require all newly built parking structures to have solar generation capabilities.

Action BE-1.1.5: Collaborate with the Milpitas Chamber of Commerce and other partners to identify regional programs that could provide necessary financial arrangements to facilitate the use of PPAs for residential and nonresidential buildings. Work with SVCE to provide a cost-effective direct access program.

Action BE-1.1.6: Require the installation of solar heaters for all new swimming pools.

Action BE-1.1.7: Work with utility partners (e.g., PG&E, SVCE, state regulators) to improve electric grid reliability.

MUNICIPAL ACTIONS

- Continue participate in SVCE whereby City-owned facilities, parks, and streetlights will be supplied with carbon-free electricity.
- Install solar photovoltaic systems at the Senior Center, Community Center, City Hall, and Sports Center. Pursue funding to expand installations of solar systems to the Public Works Administration Building/Facility, Corp Yard, Vehicle Shop, Police Department, and other City facilities such as fire stations.



Measure BE-1.2: Facilitate innovative approaches to energy generation, distribution, and storage (e.g., microgrids).

ACTIONS

Action BE-1.2.1: Consider opportunities for alternative energy generation, energy recapture (in-conduit hydro, co-generation), and distributed energy storage systems.

Action BE-1.2.2: Collaborate with SVCE to encourage local schools and hospitals to develop microgrids, separate from utility-scale storage systems.

MUNICIPAL ACTIONS

- Install battery electric storage microgrid systems at Public Works facilities, City Hall, Senior Center, Sports Center, and Community Center. Pursue funding to expand microgrid systems to the Public Works Administration Building/Facility, Corp Yard, Police Department, and other City facilities such as fire stations.
- Eliminate fossil fuel-powered backup generator usage by 2040 and replace with zero-emission alternatives to ensure energy resilience at municipal facilities.

Measure BE-1.3: Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.

ACTIONS

Action BE-1.3.1: Work with regional partner agencies and utilities, such as BAAQMD, PG&E, and SVCE to promote State rebates and other incentives and funding opportunities for renewable energy.

Action BE-1.3.2: Develop and implement a comprehensive energy efficiency, energy conservation, electrification, and clean energy outreach and education campaign to support emissions reductions from building energy use.

MUNICIPAL ACTIONS

- Develop and enforce energy conservation guidelines for municipal employees to implement at facilities and in day-to-day operations.



BE-2: Maximize Building Decarbonization and Efficiency

Nearly 80 percent of the city’s building energy GHG emissions are associated with natural gas use. Improving energy efficiency in homes and businesses will reduce natural gas consumption, which will result in GHG emissions reductions.

Transitioning away from natural gas-powered heating and appliances and electrifying the building stock will further reduce emissions in the community. While most of the city’s building energy-related GHG emissions in the future will be generated by existing buildings (i.e., those that are already built today), new development will contribute to community GHG emissions. Improving the energy efficiency of new buildings, increasing renewable energy installations, and maximizing all-electric development will reduce emissions associated with new development.



Residential Development

Measure BE-2.1: Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.

2030 Target	2040 Target	2045 Target
100% All-Electric New Residential and Nonresidential Buildings 100% All-Electric New Municipal Buildings 4,445 MTCO _{2e}	Continuation of All-Electric New Residential and Nonresidential Buildings 100% All-Electric New Municipal Buildings 7,016 MTCO _{2e}	Continuation of All-Electric New Residential and Nonresidential Buildings 100% All-Electric New Municipal Buildings 8,961 MTCO _{2e}

ACTIONS

Action BE-2.1.1: Adopt an updated reach code for the 2022 code cycle that prohibits the installation of natural gas infrastructure in new development. Include a ban on the installation of fossil fuel-powered backup energy sources in new development by 2030.

Action BE-2.1.2: Partner with BayREN, SVCE, PG&E, other cities, and the private sector to develop effective strategies to facilitate electrification implementation.

Action BE-2.1.3: Increase awareness and create incentives for developers to build all-electric buildings, such as reduced permit and/or impact fees.

MUNICIPAL ACTIONS

- Require all new municipal development to be all-electric by 2030.
- Require all new municipal facility lighting to be LEDs (or other high-efficacy lighting where LEDs are infeasible).

Measure BE-2.2: Facilitate all-electric development projects for industrial buildings.

ACTION

Action BE-2.2.1: Build market demand for all-electric industrial buildings.

Measure BE-2.3: Expand the City's Green Building Program.

ACTION

Action BE-2.3.1: Develop additional 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.

Measure BE-2.4: Retrofit existing residential and nonresidential buildings and municipal facilities to improve energy efficiency and facilitate fuel switching.

2030 Target	2040 Target	2045 Target
36% of Existing Residential Buildings will be All-Electric	72% of Existing Residential Buildings will be All-Electric	100% of Existing Residential Buildings will be All-Electric
13% of Existing Nonresidential Buildings will be All-Electric	36% of Existing Nonresidential Buildings will be All-Electric	60% of Existing Nonresidential Buildings will be All-Electric
40% of Existing Municipal Buildings will be All-Electric	80% of Existing Municipal Buildings will be All-Electric	100% of Existing Municipal Buildings will be All-Electric
60% of Existing Municipal Buildings with Diesel Backup Generators will be Replaced with Carbon-Free Alternatives	100% of Existing Municipal Buildings with Diesel Backup Generators will be Replaced with Carbon-Free Alternatives	100% of Existing Municipal Buildings with Diesel Backup Generators will be Replaced with Carbon-Free Alternatives
22,462 MTCO_{2e}	51,613 MTCO_{2e}	82,945 MTCO_{2e}

ACTIONS

Action BE-2.4.1: Develop a comprehensive energy retrofit program to transition existing residential buildings to all-electric by 2045. Begin program providing education and incentives, then transition to point-of-sale and replace retrofit requirements.

Action BE-2.4.2: Connect building owners to funding resources and financing options, such as Energy Upgrade California, for energy efficiency retrofits and improvement projects.

Action BE-2.4.3: Develop a comprehensive energy retrofit program to transition existing nonresidential buildings to all-electric, aiming for a 60 percent conversion rate by 2045. Begin program providing incentives then transition to point-of-sale and replace retrofit requirements.

Action BE-2.4.4: Eliminate the provision of fossil fuel-powered backup generator permits for existing nonresidential development by 2030.

MUNICIPAL ACTIONS

- Retrofit existing municipal buildings and facilities to be all-electric by 2045.
- Retrofit all municipal facility lighting with LEDs (or other high-efficacy lighting where LEDs are infeasible) by 2025.
- Continue to retrofit all City-owned streetlights and park/sport facility lighting to LEDs.
- Replace outdated electricity transformers with new, high-efficiency models at the Sports Center, Police Department, Public Works, and City Hall.
- Replace current Energy Management Systems at municipal buildings with Automated Logic building management/automation systems.
- Replace outdated HVAC equipment at municipal facilities based on City's 2019 Facility Condition Assessment.

Measure BE-2.5: Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.

ACTIONS

Action BE-2.5.1: Work with PG&E, SVCE, and other agencies to provide free energy audits of existing residential and nonresidential buildings.

Action BE-2.5.2: Encourage ongoing energy benchmarking in existing nonresidential buildings, consistent with regulatory benchmarking programs and existing green building standards to help close the energy efficiency information gap.

MUNICIPAL ACTIONS

- Conduct energy audits of City facilities to identify cost-effective energy efficiency upgrades.

Measure BE-2.6: Reduce plug loads in existing buildings.

ACTIONS

Action BE-2.6.1: Use partnerships to promote appliance upgrades to energy-efficient technologies and products through campaigns targeted at residents and local businesses, ENERGY STAR® appliance change-out programs, and incentives (e.g., give-a-ways, federal/state/utility rebates, etc.).

Action BE-2.6.2: Facilitate the adoption of smart grid and other peak load reduction technologies, such as building energy management systems and smart appliances, within existing buildings.

TRANSPORTATION AND LAND USE



STRATEGY TR-1 Facilitate Sustainable Transportation and Land Use Planning



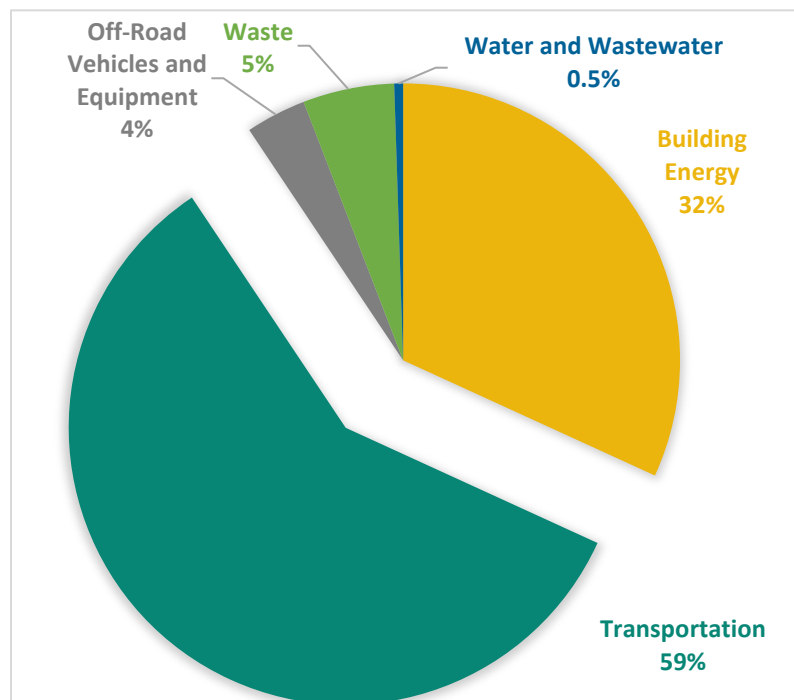
STRATEGY TR-2 Decarbonize Vehicles



STRATEGY TR-3 Increase Active and Public Transportation Use

The majority of GHG emissions from activities occurring in the city are associated with the on-road transportation sector. These emissions are generated by the combustion of fossil fuels (i.e., gasoline and diesel) in motor vehicles, and in 2019, this sector accounted for **59 percent of total community GHG emissions**.

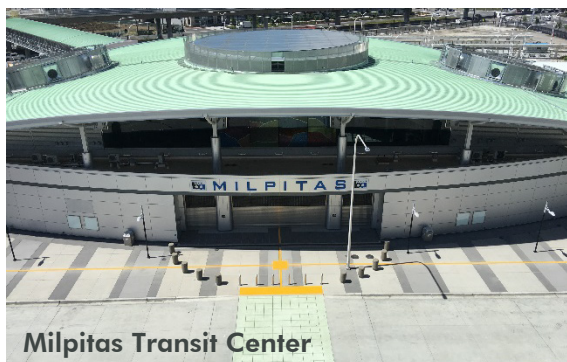
The amount of vehicle miles traveled (VMT) in the city, or the distance of travel by residents and visitors, is the primary factor that determines on-road transportation emissions. VMT in the city is impacted by factors such as accessibility of alternative



transportation options (e.g., transit) and land use planning. Vehicle fuel efficiency and fuel carbon intensity standards also affect GHG emissions generated by on-road transportation.

Adopted State and federal regulatory actions will help to reduce community transportation-related GHG emissions 9 percent by 2030. However, the City will need to implement additional local actions to achieve its GHG emissions reduction targets.

Strategies and Measures



Milpitas Transit Center

Because the transportation sector represents the largest source of community GHG emissions, it presents the most significant opportunities to achieve emissions reductions. This section outlines transportation and land use-related strategies and measures the City will implement to help meet its emissions reduction targets. Transportation and land use measures are organized under five strategies that aim to utilize development and planning processes to reduce contributions to climate change, increase the

use of electric vehicles (EVs) and other low-emission vehicles, improve the accessibility of transit and active transportation options, and implement initiatives to reduce passenger vehicle usage, all of which will result in substantial GHG emissions reductions.



TR-1 Facilitate Sustainable Transportation and Land Use Planning

Development projects and other land use changes directly impact VMT within the city. Incorporating climate change considerations into the transportation and land use planning processes will reduce VMT and



Multi-family Housing

GHG emissions from the on-road transportation sector and generate a

multitude of co-benefits. Transportation demand management (TDM) initiatives complement and support other strategies and measures in this sector by facilitating the use of transit, active transportation, and other mobility options such as ridesharing to reduce VMT. Implementing TDM measures and balancing transportation modes will result in GHG emissions reductions and improved flexibility for residents and workers in the city.

Co-Benefits:



Measure TR-1.1: Reduce VMT from new development in compliance with SB 743.

2030 Target	2040 Target	2045 Target
15% Reduction in New Passenger and Commercial VMT 3,852 MTCO₂e	20% Reduction in New Passenger and Commercial VMT 7,029 MTCO₂e	25% Reduction in New Passenger and Commercial VMT 10,714 MTCO₂e

ACTIONS

Action TR-1.1.1: Enforce the City's requirements for SB 743, which mandate a 15 percent reduction in new project-generated VMT.

Action TR-1.1.2: Continuously update the City's VMT policy and implementation tools to further reduce VMT.

MUNICIPAL ACTIONS

- Require all new municipal development to be all-electric by 2030.
- Require all new municipal facility lighting to be LEDs (or other high-efficiency lighting where LEDs are infeasible).

Measure TR-1.2: Reduce VMT from existing development.

2030 Target	2040 Target	2045 Target
15% Reduction in Passenger VMT 40% Reduction in City Employee Commute VMT 10,597 MTCO₂e	25% Reduction in Passenger VMT 60% Reduction in City Employee Commute VMT 11,412 MTCO₂e	30% Reduction in Passenger VMT 80% Reduction in City Employee Commute VMT 11,469 MTCO₂e

ACTIONS

Action TR-1.2.1: Work with local employers to provide subsidies to employees for using transit or active transportation to commute to work, and encourage flexible work schedules (e.g., 9/80s and 4/10s) as well as telecommuting.

Action TR-1.2.2: Partner with local businesses to provide discounts or rewards programs to incentivize using transit or active transportation to travel to businesses.

Action TR-1.2.3: Require employers of 50 or more employees to implement vehicle trip reduction programs and limit car commutes to 40 percent of their workforce by 2030.

Action TR-1.2.4: Adopt and phase a citywide TDM ordinance by 2023, building on recommendations of the Metro Specific Plan and incorporate the TDM ordinance into the Zoning Ordinance Update (anticipated in 2025).

Action TR-1.2.5: Implement existing TDM plans, such as The District at Milpitas Lot 3A TDM Plan.

Action TR-1.2.6: Support growth of on-demand mobility services (e.g., ride-, car- and bike-sharing, scooter- e-hailing) in Milpitas.

MUNICIPAL ACTIONS

- Expand and improve existing incentives for City employees to choose alternatives to single-occupant auto commuting, such as flexible work schedules, telecommuting, transit incentives and subsidies, and ridesharing and carpooling services and subsidies.
- Provide secure bicycle parking, showers, lockers, and other amenities at City facilities.

Measure TR-1.3: Continue to implement and adopt policies that support high-density, mixed-use, and transit-oriented development and housing near jobs.

2030 Target	2040 Target	2045 Target
6.5% Reduction in Existing Passenger VMT 7,496 MTCO _{2e}	Continue achieving 6.5% Reduction in Existing Passenger VMT 6,626 MTCO _{2e}	Continue achieving 6.5% Reduction in Existing Passenger VMT 6,350 MTCO _{2e}

ACTIONS

Action TR-1.3.1: Facilitate the development of complete streets and neighborhoods.

Action TR-1.3.2: Maintain and continue to improve regional arterials within the City.

Action TR-1.3.3: Promote and facilitate the creation of an innovation district within the Metro Specific Plan Area to provide more jobs near transit and housing.

Action TR-1.3.4: Support high levels of ridership at the Milpitas BART station by encouraging higher density, mixed uses, and connectivity along transit corridors and at transit nodes. Promote the increase of density and mixed uses in key opportunity areas.



Action TR-1.3.5: Promote dense development in central locations and along transportation corridors. Support Redevelopment of older commercial or gateway areas (Main Street and Calaveras) to intensify development and a mix of uses along major transit corridor. Encourage development of urban plazas in new development in the Milpitas Metro Specific Plan, Midtown Specific Plan, and town center areas to encourage pedestrian activity and vibrant mixed-use centers that reduce vehicular activity.

Action TR-1.3.6: Promote the increase of density and mixed uses in key opportunity areas.

Action TR-1.3.7: Encourage development of urban plazas in new development in the Milpitas Metro Specific Plan, Midtown Specific Plan, and town center areas to encourage pedestrian activity and vibrant mixed-use centers that reduce vehicular activity.

Measure TR-1.4: Explore car-free zones or shared streets in appropriate areas.

ACTIONS

Action TR-1.4.1: Explore car-free zones in commercial hubs such as those identified in the Midtown Specific Plan and Metro Specific Plan areas.

TR-2 Decarbonize Vehicles

The consumption of gasoline and diesel in internal combustion engine vehicles produces over half of all GHG emissions in the city. Increasing EV charging infrastructure to facilitate EV adoption and supporting other low-emission alternative fuels, such as renewable diesel, will significantly reduce GHG emissions and improve local air quality and public health.



Co-Benefits:

While most vehicle-related GHG emissions are emitted during travel, vehicle idling also contributes to community emissions. Idling can occur in proximity to sensitive populations, such as at schools or health care facilities. Limiting vehicle idling will reduce GHG emissions and improve public health. Additionally, parking standards impact how often and where vehicles are driven. Minimizing parking standards helps change travel behavior and requires less space in desirable areas like commercial centers, which encourages the use of active transportation and transit, reducing VMT that generate emissions while benefitting quality of life.

Measure TR-2.1: Increase EV charging infrastructure.

2030 Target	2040 Target	2045 Target
36% of Passenger Vehicles are EVs 26% Increase in Commercial EV Usage 70% of Municipal Vehicles and Equipment are Zero Emission 47,065 MTCO ₂ e	59% of Passenger Vehicles are EVs 102% Increase in Commercial EV Usage 85% of Municipal Vehicles and Equipment are Zero Emission 115,567 MTCO ₂ e	85% of Passenger Vehicles are EVs 127% Increase in Commercial EV Usage 100% of Municipal Vehicles and Equipment are Zero Emission 156,570 MTCO ₂ e

ACTIONS

- Action TR-2.1.1:** Work with SVCE and other partners to provide incentives and increase EV charging stations in visible, accessible, shared locations such as mixed-use development or accessible to multi-family renters and provide free public charging.
- Action TR-2.1.2:** With each Title 24 and CALGreen code cycle, adopt updated EV charging station standards for all new development through the City's reach codes that go beyond State requirements. Require 50 percent of parking spaces in new development to be EV-ready by 2030.

- Action TR-2.1.3:** Provide rebates and other incentives to home and business owners to install EV chargers.
- Action TR-2.1.4:** Ensure EV charging stations are encouraged and allowed through land use designations that currently permit gas fueling stations.

MUNICIPAL ACTIONS

- Install EV charging and alternative fuel stations at appropriate sites throughout the city, including the Senior Center, Sports Center, City Hall, and Public Works, to service the fleet's alternative fuel vehicles.
- Provide preferential parking, free EV charging, and/or other benefits for carpool and EVs and alternative fuel vehicles at City facilities.

Measure TR-2.2: Increase EV and low-carbon vehicle adoption.

ACTIONS

Action TR-2.2.1: Improve awareness of local, regional, and State incentives for low- and zero-emission vehicles and increase EV purchases in Milpitas through events and resource promotion such as through Climate Action Milpitas Dashboard.

Action TR-2.2.2: Partner with the BAAQMD, Joint Venture Silicon Valley, and the Silicon Valley Clean Cities Coalition to pursue funding for EV deployment projects in the city.

Action TR-2.2.3: Include a provision in the next contract with the City's solid waste franchise hauler that they use alternative fuel vehicles for the fleet which services Milpitas.

Action TR-2.2.4: Partner with Acterra and its GoEV Program to deploy a public outreach campaign that gives the public opportunities to drive EVs and provides EV education.

Action TR-2.2.5: Adopt an ordinance that phases out development of new gasoline and diesel fuel stations as the market shifts to fossil fuel free vehicles.

Action TR-2.2.6: Provide incentives to convert vehicle fleets (e.g., rental, private, school) in the city.



City-Owned Electric Vehicle

MUNICIPAL ACTIONS

- Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel.
- Where practical, utilize bicycles and low- or zero-emissions vehicles for City employees traveling between facilities and for park maintenance and operations.



Bicycle Parking

Measure TR-2.3: Reduce vehicle idling.**ACTIONS**

Action TR-2.3.1: Adopt ordinances to limit idling at institutions and businesses to reduce the impacts of vehicle idling on adjacent uses, such as housing, schools, and health care facilities.

Action TR-2.3.2: Discourage the construction of new drive-throughs in the Metro Specific Plan.

Action TR-2.3.3: Require all new nonresidential development with loading docks to supply sufficient electrical power for delivery trucks and associated equipment to reduce idling when making deliveries.

Measure TR-2.4: Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.**ACTIONS**

Action TR-2.4.1: Revise development standards for multifamily and mixed-use developments to separate parking costs from the cost to rent, purchase, or lease residential and nonresidential buildings.

Action TR-2.4.2: Revise development standards to eliminate or reduce the minimum parking requirements for new development and redevelopment of nonresidential buildings and mid- to higher-density residential development.

Action TR-2.4.3: Develop and require parking maximums at new development.



TR-3 Increase Active and Public Transportation Use



While transitioning the community to less fossil fuel-intensive vehicles will be the most effective strategy to reduce transportation GHG emissions, increasing the use of transit and active transportation options (e.g., biking, walking) will further reduce GHG emissions and will provide significant benefits to quality of life and public health.

Co-Benefits:



Measure TR-3.1: Enhance and expand transit facilities and infrastructure.

2030 Target	2040 Target	2045 Target
10.3% Reduction in Existing Passenger VMT 14,418 MTCO ₂ e	12.5% Reduction in Existing Passenger VMT 16,124 MTCO ₂ e	14.8% Reduction in Existing Passenger VMT 18,852 MTCO ₂ e

ACTIONS

Action TR-3.1.1: Implement the Milpitas OnDemand "hub-and-spoke" micro-transit pilot program, including on-demand shuttle service for first- and last-mile connections to existing transit hubs such as the BART Station and VTA light rail stops.

Action TR-3.1.2: Ensure a pedestrian-friendly environment around the Milpitas BART and light rail transit stations.

Measure TR-3.2: Increase transit ridership.

2030 Target	2040 Target	2045 Target
10.3% Reduction in Existing Passenger VMT 14,418 MTCO ₂ e	12.5% Reduction in Existing Passenger VMT 16,124 MTCO ₂ e	14.8% Reduction in Existing Passenger VMT 18,852 MTCO ₂ e

ACTIONS

Action TR-3.2.1: Work with transit agencies to provide free or subsidized transit to low-income residents, expanding to all residents by 2030.

Action TR-3.2.2: Improve reliability and convenience of existing transit services through increased frequency, expanded service areas, extended service hours, and better facilities.

Measure TR-3.3: Improve active transportation options.**2030 Target**

50 miles of new bikeways
 25 miles of new pedestrian paths
 55 MTCO_{2e}

2040 Target

70 miles of new bikeways
 35 miles of new pedestrian paths
 99 MTCO_{2e}

2045 Target

80 miles of new bikeways
 40 miles of new pedestrian paths
 128 MTCO_{2e}

ACTIONS

Action TR-3.3.1: Require all new development other than single family to provide short-term and long-term bicycle parking facilities to meet peak season maximum demand.

Action TR-3.3.2: Increase awareness of existing City initiatives to facilitate active transportation, including Bike Paths maps and Suggested Routes to School Program maps.

Action TR-3.3.3: Require new nonresidential developments projects to provide "end-of-trip" facilities for cyclists, including showers, secure bicycle lockers, and changing spaces.

Action TR-3.3.4: Require new nonresidential developments have adequate e-bike and e-scooter infrastructure and options.

Action TR-3.3.5: Implement the updated Trail, Pedestrian, and Bicycle Master Plan to enhance and expand bicycle and pedestrian infrastructure and networks.

MUNICIPAL ACTIONS

- Provide secure bicycle parking, showers, lockers, and other amenities at City facilities.

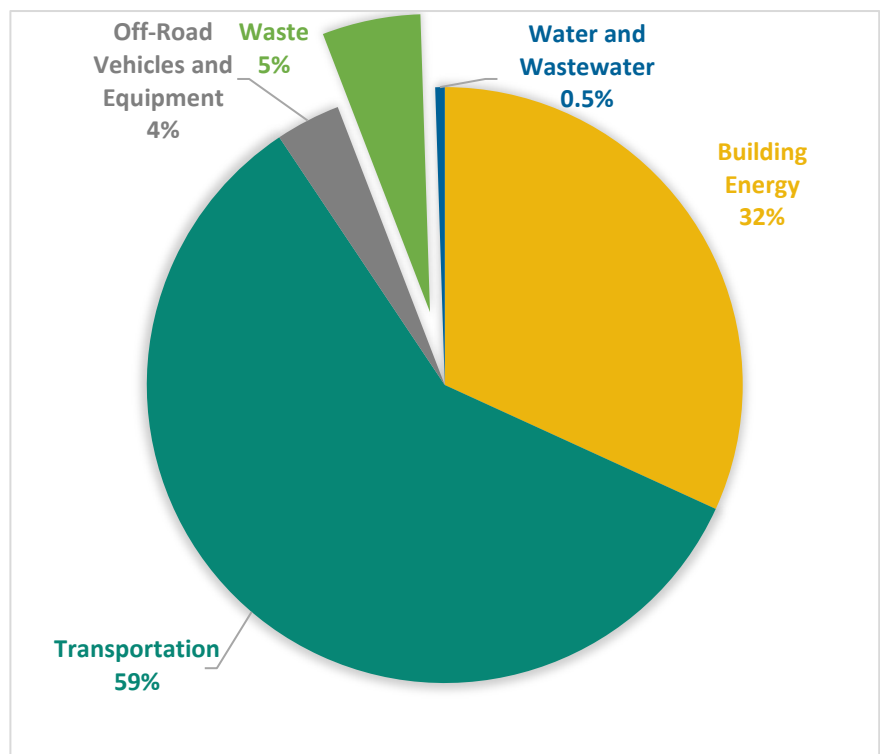


WASTE



STRATEGY SW-1 Achieve Zero Waste

Emissions in the solid waste sector are associated with the decomposition of community-generated organic waste in landfills. In 2019, this sector contributed a total of 5 percent of the city's GHG emissions. Without additional local action, community GHG emissions from solid waste are anticipated to rise steadily into the future and increase by nearly 20 percent in 2045. The State has adopted a variety of legislative actions aimed at reducing GHG emissions from organic waste, but the City will need to take steps at the local level to effectively reduce waste emissions and achieve its emissions reduction targets.



Strategies and Measures



Implementing strategies and measures to reduce waste generation, increase the reuse of products, and improve waste diversion programs will serve to protect natural resources while minimizing contributions to climate change. This section outlines the strategies and measures the City will implement to support these objectives. Waste measures are organized within three strategies that focus on achieving zero waste, improving the sustainability of landfills, and supporting relevant regional and State policy efforts.



SW-1

Achieve Zero Waste



The decomposition of organic waste releases emissions of CH₄, a potent GHG, into the atmosphere.

Achieving “zero waste,” which entails diverting at least 90 percent of community-generated waste from landfills through efforts such as recycling and composting, will nearly eliminate GHG emissions from this sector and benefit the natural environment.

Co-Benefits:



Measure SW-1.1: Eliminate the disposal of organic solid waste in landfills.

2030 Target	2040 Target	2045 Target
75% of waste is diverted from landfills citywide, including at municipal facilities 9,385 MTCO ₂ e	85% of waste is diverted from landfills, including at municipal facilities 17,010 MTCO ₂ e	90% of waste is diverted from landfills, including at municipal facilities 21,055 MTCO ₂ e

ACTIONS

Action SW-1.1.1: Require local restaurants to increase food recovery and donate edible food, consistent with SB 1383.

Action SW-1.1.2: Expand existing organic waste collection routes and drop-off sites to improve composting services for interested residents and businesses.

Action SW-1.1.3: Implement and enforce the requirements of SB 1383 and eliminate disposal of compostable organic materials to landfills.

MUNICIPAL ACTIONS

- Increase on-site composting organics diversion/composting at City facilities.

Measure SW-1.2: Increase recycling and the diversion of other inorganic solid waste.

ACTIONS

Action SW-1.2.1: Partner with RecycleStuff.org to enhance awareness of local and regional recycling opportunities.

Action SW-1.2.2: Adopt an ordinance that requires recycling and composting services, the use of only recyclable and compostable materials by vendors, and adequate staff to ensure proper disposal and recycling at events that require a City-issued permit.

Action SW-1.2.3: Partner with waste haulers to expand the diversion of non-food, non-construction, and non-demolition solid waste.

MUNICIPAL ACTIONS

- Increase the amount of recycling at City facilities.



Measure SW-1.3: Reduce the generation of waste from residents and businesses.**ACTIONS**

Action SW-1.3.1: Enforce the City's plastic bag and Styrofoam ban.

Action SW-1.3.2: Encourage local businesses to reduce the use of single-use, non-biodegradable products, and support the establishment of a regional ordinance that restricts and/or limits the use of these products by local businesses.

Action SW-1.3.3: Require organizations over 50 employees to implement organization-wide waste reduction initiatives.

Action SW-1.3.4: Promote responsible consumption of products and materials.

Action SW-1.3.5: Coordinate with other local jurisdictions and landfills to implement a divertible materials (e.g., recyclables) ban at landfills.

MUNICIPAL ACTIONS

- Continue to increase the percentage of recycled content in purchases made through City purchasing policies and other efforts, such as 100 percent recycled content paper, other office supplies, and transportation supplies.
- Enhance and expand waste reduction policies and programs for City facilities, such as the environmentally preferable purchasing policy.

Measure SW-1.4: Reduce the generation of construction and demolition waste.**ACTIONS**

Action SW-1.4.1: Amend the building demolition permit requirements and adopt a comprehensive construction and demolition ordinance to reach a 75 percent diversion rate.

MUNICIPAL ACTIONS

- Require 75 percent of construction and demolition debris to be recycled and reused from municipal projects by 2030.

Measure SW-1.5: Facilitate repair and reuse of consumer products.**ACTIONS**

Action SW-1.5.1: Develop a reuse facility that makes building materials available to customers, and acts as an outlet for reusable items otherwise destined for landfill.

Action SW-1.5.2: Create and support "fix-it clinics" at Parks and Recreation facilities and other City buildings that can build skills among local businesses and residents in innovation, repair, and reuse.

Action SW-1.5.3: Support Extended Producer Responsibility initiatives that drive end of product life management.

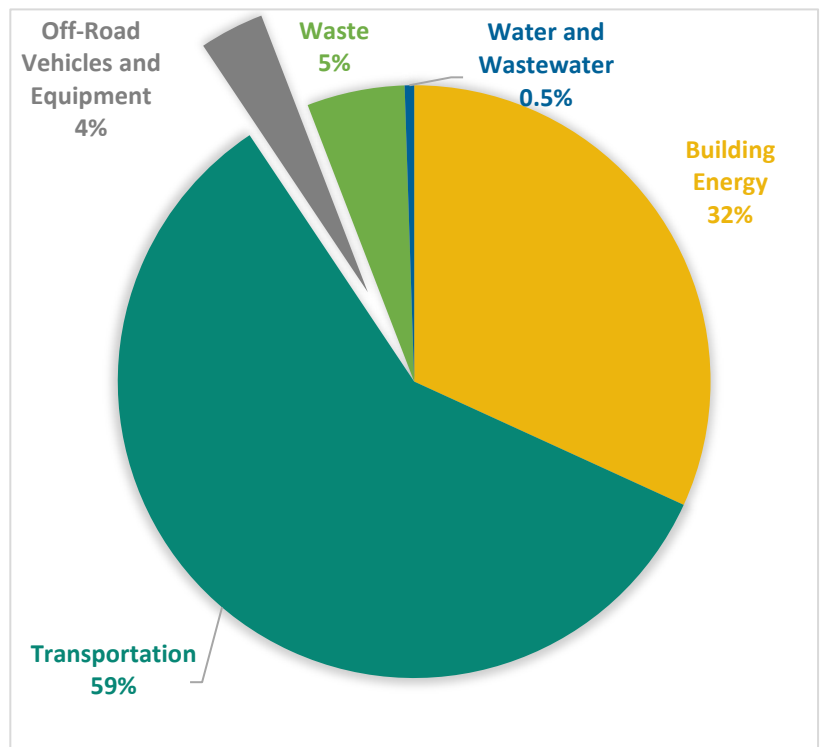
Action SW-1.5.4 Promote redesign of products so that they do not require end of life disposal, but are incorporated back into useful products.

OFF-ROAD VEHICLES AND EQUIPMENT



STRATEGY OT-1 Shift to Clean Off-Road Equipment and Vehicles

The operation of off-road vehicles and equipment, such as construction vehicles and landscaping equipment, generates GHG emissions through the combustion of fossil fuels, primarily diesel. These sources accounted for approximately 4 percent of emissions in the city in 2019. Without local efforts to reduce GHG emissions from this sector, emissions are expected to rise over 50 percent by 2045.



Historically, reducing GHG emissions from the off-road vehicles and equipment sector has been challenging. However, with technological improvements and new State objectives in recent years, emissions reduction from this sector have become more feasible. The City can implement actions that will effectively reduce emissions from off-road vehicles and equipment to help meet its GHG reduction targets.

Strategies and Measures

As other sectors in the city are decarbonized in the future, the off-road vehicles and equipment sector will become an increasingly important focus for local emissions reductions. Off-road vehicles and equipment measures are organized under one strategy that focuses on transitioning fossil fuel-powered vehicles and equipment to electric and other low-carbon alternatives while reducing GHG emissions from idling.



SW-1 Shift to Clean Off-Road Equipment and Vehicles

Diesel burned to operate off-road vehicles and equipment generates GHG emissions and degrades local air quality. Reducing the use of and electrifying vehicles and equipment will result in significant emissions reductions in this sector while improving public health and natural resources.

Co-Benefits:

A box containing the text "Co-Benefits:" followed by five circular icons arranged in two rows. The top row contains icons for a house, a family of three, and a leaf. The bottom row contains icons for a heart and a water drop.

Measure OT-1.1: Reduce landscaping-related emissions.

2030 Target	2040 Target	2045 Target
60% of fossil fuel-powered landscape equipment is replaced with zero-emission alternatives 962 MTCO₂e	100% of fossil fuel-powered landscape equipment is replaced with zero-emission alternatives 1,681 MTCO₂e	Continued achievement of 100% of zero-emission landscape equipment 1,759 MTCO₂e

ACTIONS

- Action OT-1.1.1: Promote regional and State incentive programs to encourage residents and business owners to convert or replace their fossil fuel-powered gardening equipment, such as lawn mowers, leaf blowers, and edge trimmers, with electric alternatives.
- Action OT-1.1.2: Adopt an ordinance that prohibits the sale of fossil fuel-powered landscaping equipment by 2024 to transition to zero-emission landscaping equipment.
- Action OT-1.1.3: Require all new development to install sufficient exterior electrical outlets to charge electric-powered landscaping equipment.

MUNICIPAL ACTIONS

- Use electric-powered landscape equipment at City facilities and parks.



Measure OT-1.2: Reduce construction-related emissions.

2030 Target	2040 Target	2045 Target
40% of fossil fuel-powered construction equipment uses renewable diesel or is replaced with zero-emission alternatives 2,361 MTCO ₂ e	60% of fossil fuel-powered construction equipment uses renewable diesel or is replaced with zero-emission alternatives 3,746 MTCO ₂ e	80% of fossil fuel-powered construction equipment uses renewable diesel or is replaced with zero-emission alternatives 5,176 MTCO ₂ e

ACTIONS

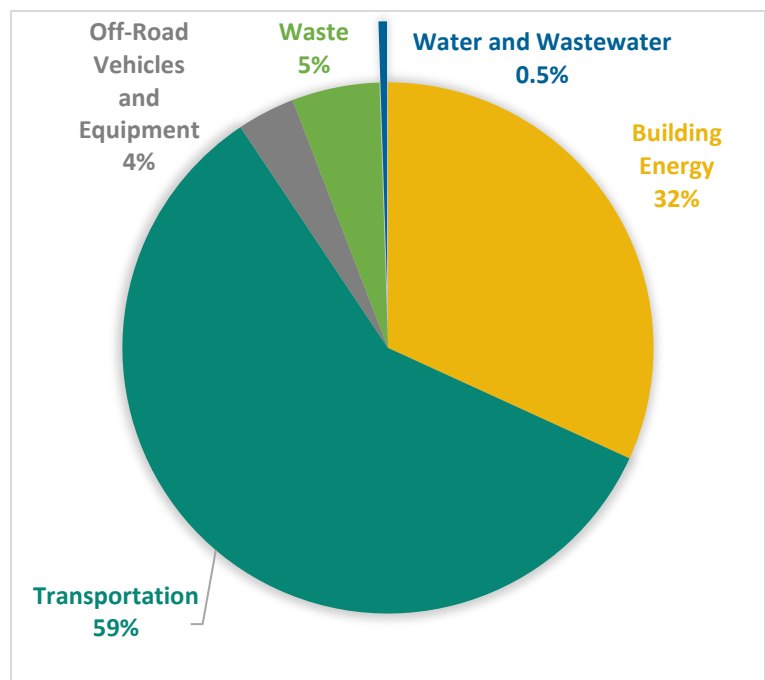
- Action OT-1.2.1: Reduce idling of construction vehicles and equipment.
- Action OT-1.2.2: Prohibit the use of fossil fuel-powered generators at construction sites in all new discretionary projects.
- Action OT-1.2.3: Require all construction projects to use renewable diesel in diesel-powered construction equipment.

WATER AND WASTEWATER



STRATEGY WA-1 Promote Resilient Water Supply, Water Use, and Water Resources

The water supply and wastewater treatment sectors represent the city's smallest emissions-generating sectors. Together, water and wastewater activities represented roughly 1 percent of community GHG emissions in 2019. State legislative actions (i.e., SB 100 [Renewables Portfolio Standard]) will eliminate water supply-related emissions in 2045, but wastewater treatment emissions will continue to grow over time. Although emissions from water supply will be eliminated and wastewater



treatment will account for a minimal proportion of the city's emissions in the future, implementing local actions focused on these sectors will increase the pace of GHG emissions reductions while improving community resilience and energy reliability.

Strategies and Measures

GHG emissions from the water supply and wastewater treatment sectors can be reduced through strategies and measures that will simultaneously provide co-benefits to the city’s residents and businesses. This section outlines water supply and wastewater treatment strategies and measures the City will implement to help meet its emissions reduction targets. Measures are organized under three strategies that aim to conserve water, increase the use of recycled water, and realize benefits from wastewater treatment facilities.



WA-1 Promote Resilient Water Supply, Water Use, and Water Resources

GHG emissions from water supply are minimal in the city—but not nonexistent—and water supply reliability is threatened by climate change. Implementing water conservation measures will contribute to community emissions reductions and improve the resilience of the city to climate change while providing additional benefits to residents, businesses, and the natural environment. Water supply in the city consists primarily of water imported and treated from rivers and reservoirs, but the city also receives recycled water that is used for irrigation and other applications (e.g., industrial). Increasing the supply of recycled water will improve resilience and align with City and State goals.

Co-Benefits:



Measure WA-1.1: Reduce indoor water consumption in buildings.

2030 Target	2040 Target	2045 Target
20% reduction in water consumption from existing buildings 25% reduction in water consumption from new buildings 3% reduction in water consumption from municipal facilities 85 MTCO ₂ e	25% reduction in water consumption from existing buildings 30% reduction in water consumption from new buildings Continued achievement of 3% reduction in water consumption from municipal facilities 39 MTCO ₂ e	30% reduction in water consumption from existing buildings 35% reduction in water consumption from new buildings Continued achievement of 3% reduction in water consumption from municipal facilities 0 MTCO ₂ e

ACTIONS

Action WA-1.1.1: Increase residential and nonresidential participation in the High Efficiency Clothes Washer Rebate Program and the High Efficiency Toilet Rebate Program by ensuring continued funding to the City's Water Conservation Program, operated in conjunction with resources provided by SCVWD and BAWSCA.

Action WA-1.1.2: Collaborate with San Francisco Public Utilities Commission (SFPUC) and Santa Clara Valley Water District (SCVWD) to develop a retrofit program to encourage installation of water conservation measures in existing businesses and residences.

Action WA-1.1.3: Regularly review and update the City's Water Conservation Ordinance and water conservation measures to be consistent with current best management practices and ensure effective and ongoing conservation efforts.

Action WA-1.1.4: Continue water conservation efforts outlined in the 2021 Urban Water Management Plan (UWMP).

Action WA-1.1.5: Require ultra-low-flow fixtures in new residential and nonresidential development.

Action WA-1.1.6: Continue to assess and manage distribution system losses through efforts including replacing existing meters with smart meters, implementing a Supervisory Control and Data Acquisition (SCADA) system, replacing selected water pipe with upgraded design criteria to withstand seismic events, and maintaining an active cathodic protection system.

Action WA-1.1.7: Coordinating with SFPUC and SCVWD, facilitate the development of a water auditing program for existing residential and nonresidential development.

MUNICIPAL ACTIONS

- Develop and implement a "water neutrality program" that requires new municipal development not increase the City's total municipal water demand.

Measure WA-1.2: Reduce water consumption for irrigation and landscaping.

2030 Target	2040 Target	2045 Target
25% reduction in outdoor water consumption from existing buildings	30% reduction in outdoor water consumption from existing buildings	35% reduction in outdoor water consumption from existing buildings
60% reduction in outdoor water consumption from new buildings	70% reduction in outdoor water consumption from new buildings	75% reduction in outdoor water consumption from new buildings
59 MTCO _{2e}	28 MTCO _{2e}	0 MTCO _{2e}

ACTIONS

Action WA-1.2.1: Continue to fund and operate the City's Water Conservation Program in conjunction with resources provided by SCVWD and BAWSCA, including the Irrigation Equipment Upgrades Rebate Program, Landscape Conversion Rebate Program, Water Wise Survey Program, and Water Efficient Gardening workshops.

Action WA-1.2.2: Increase residential and nonresidential participation in the Landscape Conversion Rebate and Irrigation Equipment Upgrades programs to convert lawns to a healthy habitat with native and drought-tolerant species that use water-efficient irrigation equipment.

Action WA-1.2.3: Implement and enforce the Water Efficient Landscape Ordinance and the Water Conservation Ordinance.

Action WA-1.2.4: Require drought-tolerant, water-conserving, and/or native landscaping in new development and redevelopment projects.

MUNICIPAL ACTIONS

- Plant drought-tolerant, water-conserving, and/or native landscaping in City facilities and parks.
- Ensure that all of the City's irrigation systems in parks and other spaces are controlled by computer systems that tie watering cycles to soil moisture.

Measure WA-1.3: Increase the use of recycled water and support efforts to drought-proof our water supply.

ACTIONS

Action WA-1.3.1: Increase residential and nonresidential participation in the Rainwater Catchment Rebate and Graywater Laundry to Landscape Rebate programs to utilize rainwater and graywater for landscaping and irrigation purposes.

Action WA-1.3.2: Continue to require all commercial and industrial development south of the Hetch Hetchy right-of-way to install recycled water lines and require conversion of landscape irrigation to recycled water, as feasible.

Action WA-1.3.3: Support use of recycled water as drought proof water supply including potential indirect potable recharge.

Action WA-1.3.4: Encourage 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.



Irrigated Lawn

Action WA-1.3.5: Encourage residents and businesses to 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.

Action WA-1.3.6: Require all new residential and nonresidential development to include a separate piping system for recycled water (i.e., “purple pipes”) to be used for irrigation and other outdoor water uses, as feasible.

CARBON SINKS



STRATEGY CS-1 Resilient Infrastructure and Healthy Forest and Natural Systems

The opposite of emissions sources, emissions sinks (i.e., any reservoir, natural or otherwise, that accumulates and stores GHG emissions) are expected to play an important role in addressing the challenge of climate change. The Earth's largest and most effective carbon sink is the ocean, which stores enormous amounts of carbon, but **natural lands and open space are also key emissions sinks, as they effectively sequester carbon in soils and vegetation.** This is shown in Figure 4-2 below.

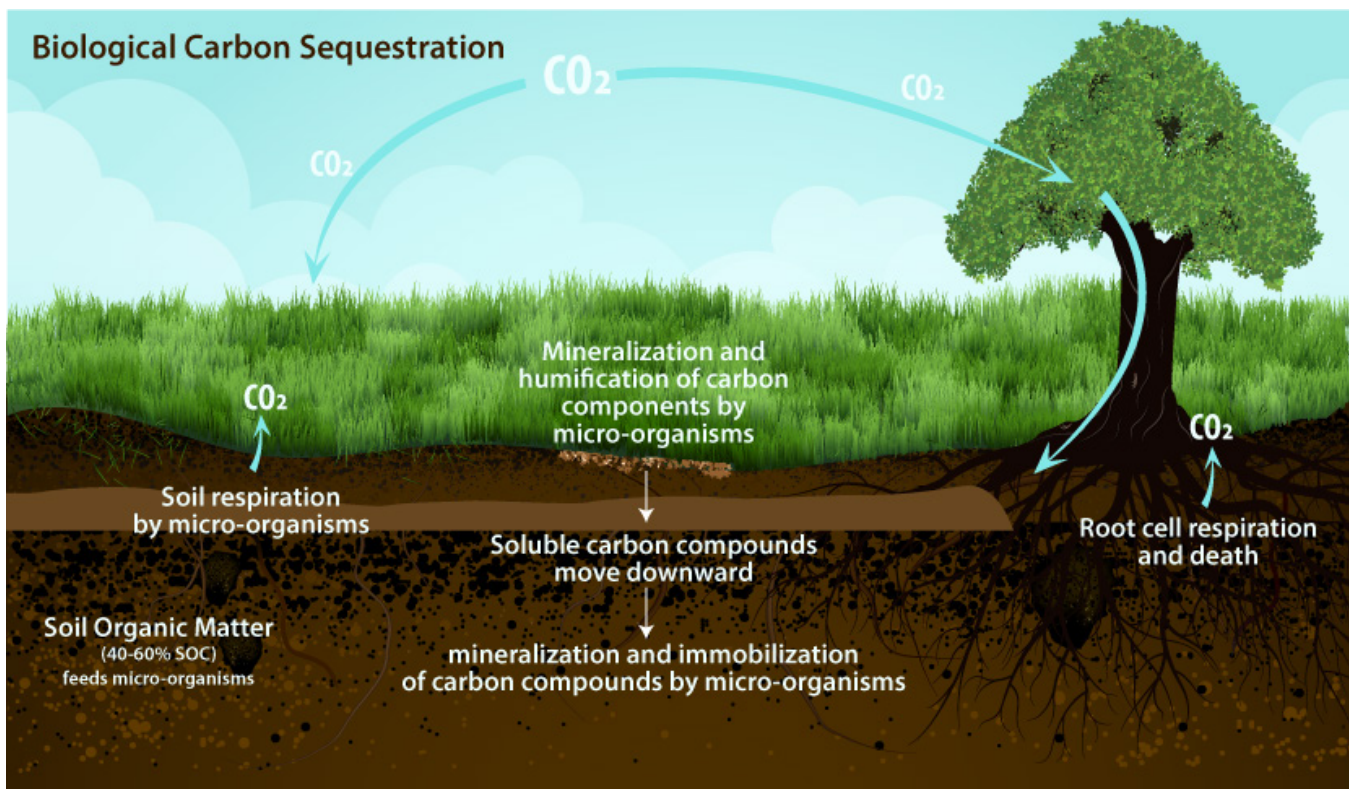


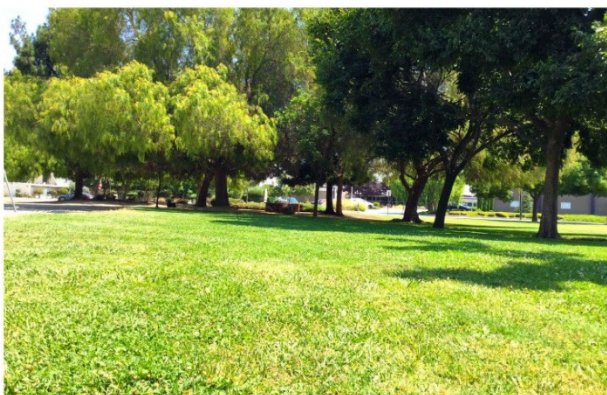
Figure 4-2 Biological Carbon Sequestration Process

Source: CalRecycle 2020

Although carbon sinks were not evaluated in the City's GHG emissions inventory, incorporating them into climate action and adaptation planning efforts will help the City to achieve its climate change-related objectives. The City can take steps to enhance carbon sinks while improving climate change resilience and enhancing quality of life in the community.

Strategies and Measures

Implementing carbon sinks strategies and measures will help to remove local emissions from the air and will provide a variety of co-benefits in the city. Additionally, as climate action planning evolves, the City may be able to quantify further GHG emissions reductions from this sector. This section outlines strategies and measures the City will implement to enhance local carbon sinks while building community resilience to climate change. Measures are organized under five strategies that aim to increase urban forestry and open space, utilize green infrastructure and other climate change natural solutions, create green jobs, and increase carbon sequestration.



Parks and Trees



CS-1 Resilient Infrastructure and Healthy Forest and Natural Systems

Climate change is expected to result in increased temperatures in the city. Rising average temperature is exacerbated by the urban heat island effect, which increases risks to the community such as heat-related illnesses. Reducing the urban heat island effect will mitigate risks associated with increased temperatures and enable energy conservation, reducing GHG emissions. Green infrastructure is an effective and economical approach to water management that protects, restores, or mimics the natural water cycle while enhancing community safety through reduced flooding risk. Green infrastructure is an alternative to “gray infrastructure” (i.e., systems of gutters, pipes, and tunnels) that filters and absorbs stormwater where it falls through assets such as rain barrels, green roofs, and protected open space. Implementing green infrastructure will improve the community’s resilience to extreme storm impacts and sequesters carbon. Sequestering carbon in plants and soils is an effective climate change mitigation strategy.

Co-Benefits:





Measure CS-1.1: Protect native trees and vegetation and enhance carbon sequestration.

2030 Target	2040 Target	2045 Target
50% increase in tree coverage citywide 2,632 MTCO ₂ e	124% increase in tree coverage citywide 6,601 MTCO ₂ e	35% increase in tree coverage citywide 8,586 MTCO ₂ e

ACTIONS

- Action CS-1.1.1:** Based on the recommendations from the City's Urban Forestry Management Plan, implement a tree planting program to expand the city's urban forest canopy.
- Action CS-1.1.2:** Develop and implement a street tree planting program for residential neighborhoods.
- Action CS-1.1.3:** Identify high priority areas for civic tree planting activities that provide the greatest benefits to the community and provides urban canopy coverage in areas of the city that are currently underserved by street trees and trees within public spaces.
- Action CS-1.1.4:** Make available a list of plants and trees native to the region that are suitable for use in landscaping, consistent with the requirements of Milpitas’ Water Efficient Landscape Ordinance (WELO).

- Action CS-1.1.5:** Update Milpitas's Tree Protection Regulations as specified in the General Plan.
- Action CS-1.1.6:** Identify thresholds for new development mitigation for the provision of parks or open space.
- Action CS-1.1.7:** Identify natural areas that could be obtained and preserved through land transfers and acquisitions of undeveloped/unprotected private and public lands.

Measure CS-1.2: Reduce the urban heat island effect to conserve energy.**ACTIONS**

Action CS-1.2.1: Amend the Zoning Code to create tree planting standards for new and renovated development; require the planting of two trees in single-family development in the front, side, or rear yard as feasible; and create lineal landscaping standards for commercial development that identify a minimum number of tree plantings based on lineal frontage length.

Action CS-1.2.2: Require all new development to install cool pavements, plant low-maintenance and drought-tolerant landscaping, and plant shade trees.

Action CS-1.2.3: Reduce heat gain from surface parking lots in new development for a minimum of 50 percent of the site's hardscape. Develop standards to provide shade from the existing tree canopy or from appropriately selected new trees that complement site characteristics and maximize drought tolerance.

**Measure CS-1.3:** Increase the use of green infrastructure.**ACTIONS**

Action CS-1.3.1: Develop and implement a green infrastructure program for the installation and maintenance of projects and existing public resources, such as the parks system and other open spaces.

Action CS-1.3.2: Review Capital Improvement Program projects to identify opportunities for green infrastructure.

Action CS-1.3.3: Develop guidelines for the inclusion of green infrastructure in the design of transportation improvements.

Action CS-1.3.4: Encourage the use of green roofs on existing and new development.

Measure CS-1.4: Increase soil carbon content.**ACTIONS**

Action CS-1.4.1: Develop a healthy soil strategy for the city to support urban agriculture, address carbon sequestration, and increase water capture.

MUNICIPAL ACTIONS

- Require new municipal development and redevelopment projects to use locally produced compost for various applications, including landscaping and erosion control.

Measure CS-1.5: Use low-carbon and carbon sequestering construction materials in new development.**ACTIONS**

Action CS-1.5.1: Adopt standards to require the use of pervious paving materials in plazas, in addition to the provision of mature landscaping and other strategies that will maximize carbon sequestration.

Action CS-1.5.2: Require building materials that store carbon (e.g., wood, calcium carbonate-based cementitious substances, synthetic limestone) in all nonresidential construction.

CIRCULAR AND GREEN ECONOMY

STRATEGY 1 Foster Green and Sustainable Economic Development Opportunities

STRATEGY 2 Support Circular Economy Policies

Economic strategies, measures, and actions included in this section seek to advance economic development opportunities in a way that includes green jobs and supports a just transition. This section also supports circular economy: a systemic approach to how we think about consumption and waste from a linear model to one that is regenerative by design. Circular economy policies aim to reduce material consumption and redesign materials and products to be less resource intensive. Figure 4-3 shows the flow of technical and biological materials in a circular economy.

Although economic development and circular economy measures are not quantifiable from a GHG perspective, incorporating them into climate action and adaptation planning efforts will help the City to achieve its climate change-related objectives. The City can take steps to foster green and sustainable economic development opportunities and support a circular economy.



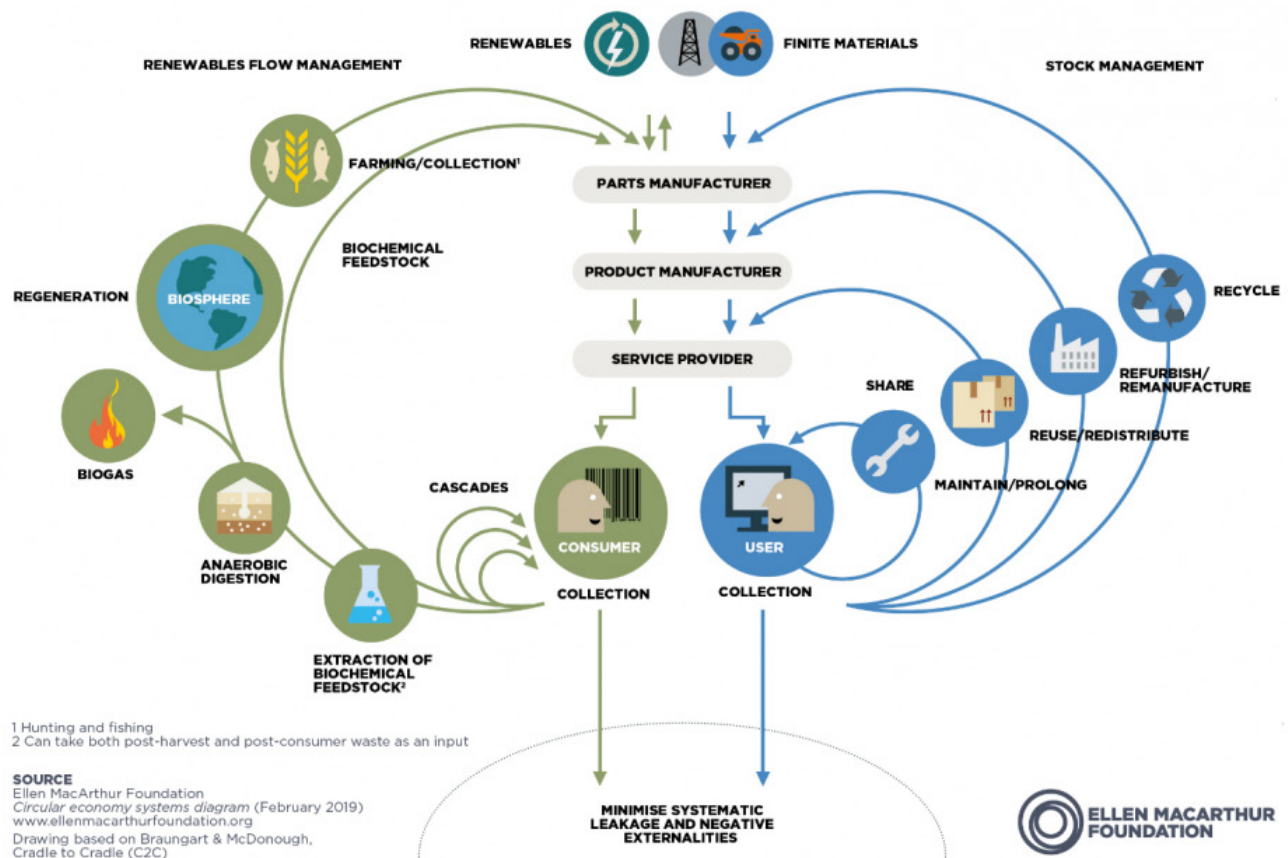


Figure 4-3 Circular Economy Systems Diagram

Source: Ellen MacArthur Foundation 2019

Strategies and Measures

This section outlines measures the City could implement to foster green and sustainable economic development opportunities and support circular economy policies.

GE-1 Foster Green and Sustainable Economic Development Opportunities



Enabling new economic development opportunities within the city that are in green and sustainable industries can boost the

local economy while positioning Milpitas as a leader in clean technologies and manufacturing. Providing training opportunities, strategic plans, and incentive programs can foster this type of economic growth.

Co-Benefits:



Measure GE-1.1: Support and attract clean technology businesses and green jobs in Milpitas.**ACTIONS**

Action GE-1.1.1: Partner with local and regional agencies and educational institutions to offer courses/training that prepare students/workers for green jobs, such as the Milpitas Adult School Program, South Bay Consortium for Adult Education, Center for Employment Training in San Jose and PG&E's on-demand energy trainings.

Action GE-1.1.2: Develop a Green Business Strategic Plan to support environmentally friendly business development in Milpitas.

Action GE-1.1.3: Collaborate regionally to conduct outreach and training with local contractors and businesses on electrification.

Action GE-1.1.4: Explore the feasibility of creating an eco-innovation 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.

Measure GE-1.2: Incentivize and promote green business practices.**ACTIONS**

Action GE-1.2.1: Promote green tenant and leasing practices for commercial businesses. Examples include the Green Tenant Toolkit developed by the Business Council on Climate Change and San Francisco Environment.

Action GE-1.2.2: Develop and implement marketing and technical assistance to green businesses, and consider developing incentives such as reduced business license taxes/fees.

Action GE-1.2.3: Develop a Clean Energy Pledge for area businesses to bring visibility to those businesses already purchasing carbon-free electricity or pledging to do so in the future. In collaboration with SVCE.

GE-2 Support Circular Economy Policies

Not only do we need to evaluate how we can reduce our waste generation and consumption of virgin materials, the City can be a leader through support policies that drive a circular economy. This can be at the local, regional, State, or Federal levels to drive more recyclability, reusability, and repairability of the goods and products that we use.

Measure GE-2.1: Engage with circular economy and zero waste policymaking at the Federal, State, and local levels.**ACTIONS**

Action GE-2.1.1: Support regional and State legislation intended to reduce GHG emissions from waste and virgin materials use and promote recyclability and repairability of products.

MUNICIPAL ACTIONS

- Continue to increase the percentage of recycled content in purchases made through City purchasing policies and other efforts, such as 100 percent recycled content paper, other office supplies, and transportation supplies.
- Enhance and expand waste reduction policies and programs for City facilities, such as the environmentally preferable purchasing policy.



Making Milpitas Climate Ready

Sunset over the Bay Area

This chapter describes the context of climate change adaptation and resilience for the city. It summarizes the city's exposure to existing hazards, sensitivity to these hazards, and discusses potential climate-related impacts to the city's population and key resources. This chapter serves as a summary of the City's Community Preparedness and Resiliency Plan, which was developed in preparation of the Climate Action Plan Update (CAP Update). Additional information, data, and methodologies can be found in the report included in Appendix C.

Climate Change Effects on Milpitas

The effects of climate change are already occurring at global and regional scales and will continue to worsen existing hazards in the city. The primary effects of climate change include increased temperatures and changes in precipitation patterns. Alterations to these climate variables are expected to heighten and exacerbate risks posed by secondary climate effects, including extreme heat events, wildfires, drought, and large storms. While many of these hazards have existed historically in the city, the frequency and intensity of many of these hazards are projected to increase as a result of global climate change.

While it remains imperative that global GHG emissions be reduced to combat climate change, it is equally important for communities to prepare for the impacts of climate change and improve resilience through adaptation planning. Regional and local efforts are critical in building climate resilience—the capacity of a community to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience related to climate change—and can lead to a greater understanding of climate risks and strategies to reduce their impacts.

There are many plans, policies, and programs already in place at the local and regional levels that address existing hazards. In some cases, these may be sufficient to address the potential for climate change to worsen existing hazards. In other cases, gaps exist where novel climate-related hazards are projected to impact the city, and new policies are needed. This CAP Update aims to identify and address those gaps.

Vulnerability Assessment Summary

As part of the development of the CAP Update, a climate change vulnerability assessment was developed to understand which hazards are going to be most affected by climate change, as well as what the potential impacts of their worsening hazards may be. The results of the vulnerability assessment were then used to develop and prioritize a set of adaption strategies for the CAP Update. The full climate change vulnerability assessment, including detailed data, additional information, and references, can be found in the Community Preparedness and Resiliency Plan in Appendix C. Provided below is a summary of the findings of the vulnerability assessment, specifically projected changes in key climate variables (e.g., precipitation, extreme heat) and a summary projected impacts on the city.

Climate and Geography

The city encompasses an area of approximately 18 square miles (35 kilometers), extending between the south end of the San Francisco Bay and the Los Buellis Hills of the Mount Diablo Range in northern Santa Clara County. The city spans across a diverse topographic area with elevations ranging from sea level to about 2,600 feet near Monument Peak. The topography can be divided into two distinct sub-areas referred to as the Valley Floor and the Hillside, each characterized by landscapes that are prone to specific hazards.

During winter, temperatures in the city range from 31 °F to 59 °F. Showers and cloudy days come and go during this season and produce most of the city's annual 15 inches (380 millimeters) of precipitation, with precipitation tapering off in the spring. The summer months are dry and warm but cooler than other parts of the Bay Area. Temperatures can reach over 100 °F with most days in the mid- to high-70s. From June to September, the city experiences little rain, and as autumn approaches, the temperature gradually cools down.

Vulnerable Populations

In general, historically marginalized communities and communities of color are more susceptible to climate change-related hazards due to limited access to financial resources, health challenges or disabilities, living or working conditions, or historical and current marginalization. Appendix C provides an overview of key demographic information, highlighting the need to prioritize historically marginalized and disadvantaged communities during climate adaptation planning efforts.

Hazard Exposure

This section includes a summary of the existing hazards within the city and how changes in climate variables (e.g., average temperature, precipitation) are projected to affect these hazards. Existing hazards that can be worsened by the effects of climate change are identified and described, based on historical data from sources such as the County of Santa Clara Office of Emergency (OAHMP). Climate projection data are used to develop projections for how existing hazards are expected to change by mid-century (2035–2064) and late-century (2065–2099).

Though the precise extent of future climate change effects is uncertain, historical climate data and forecasted GHG emissions can be used to project climate change effects for the mid-century (2035-2064) and late-century (2065-2099) periods. To assess the potential effects of climate change, the California Adaptation Planning Guide recommends using Cal-Adapt, a tool developed by the California Energy Commission and the University of California, Berkeley's Geospatial Innovation Facility that uses global climate simulation model data to identify how climate change might affect various geographies in California.

Cal-Adapt addresses the uncertainty in future GHG emissions by using Representative Concentration Pathways (RCPs) developed by the IPCC. The RCP scenarios used in the Cal-Adapt tool are the RCP 8.5 scenario (High Emissions), which represents a business-as-usual future emissions scenario that would result in atmospheric CO₂ concentrations exceeding 900 parts per million (ppm) by 2100, and the RCP 4.5 (Medium Emissions) scenario, which represents a lower GHG emissions future and likely the best-case scenario for climate impacts, under which GHG emissions would peak in 2040 and then decline through the rest of the century, resulting in a CO₂ concentration of about 550 ppm by 2100. The emissions scenarios depend on global GHG emissions trends in the future and the efficacy of global GHG reduction strategies proposed by the international community. Because the efficacy of the GHG reduction strategies and the likelihood that a certain RCP scenario will occur is uncertain, a discussion of both emissions scenarios and their subsequent impacts are included in this analysis.

Changes in Temperature and Extreme Heat



The historic (1961-1990) annual average maximum temperature for the city was 68.3 °F, and the historic annual average minimum temperature was 48.2 °F. As shown in **Table 5-1**, both annual average maximum and minimum temperatures are projected to increase by mid-century and further increase by the end of the century under both emissions scenarios. The annual average maximum temperatures in the city are projected to be 72.8 °F by mid-century (2035–2064) and 73.7 °F by the late-century period (2065–2099) under the medium-emissions scenario. Under the high-emissions scenario, the annual average maximum temperature in the city is

projected to be 73.7 °F by mid-century (2035–2064) and 77.1 °F by the late-century period (2065–2099) (CEC 2021a). This equates to an increase in temperature of approximately 1.5 to 4.3 °F by the end of the century, depending on a medium- or high-emissions scenario (CEC 2021a).

The Cal-Adapt tool provides estimates of future instances of extreme heat events. Extreme heat events represent extreme heat days and heat waves. Extreme heat days occur when the daily maximum/minimum temperature exceeds the 98th historical percentile of the daily maximum/

minimum temperatures between April and October. Heat waves are characterized as periods of sustained extreme heat over multiple days (i.e., four or more consecutive extreme heat days).

Based on historical data, the extreme heat day threshold in the city is defined as 91.6 °F. Historically, the city has experienced an average of four extreme heat days per year. As a result of rising annual average maximum temperatures from climate change, the city is projected to experience up to 17 extreme heat days annually by mid-century and 20 extreme heat days by late-century under the medium-emissions scenario. Under the high-emissions scenario, the city is projected to experience up to 15 extreme heat days annually by mid-century and 38 extreme heat days by late-century (CEC 2021b).

Heat wave events (i.e., four or more consecutive extreme heat days) have historically been infrequent in the city, with fewer than one recorded per year. Based on projections, heat waves will likely continue to be infrequent in the future. Under the medium-emissions scenario, the city is projected to experience 1.3 heat waves per year by late century. Under the high emissions scenario, the city is projected to experience 1.4 heat waves per year by mid-century and 3.2 heat waves per year by late-century (CEC 2021b).

Table 5-1 Changes in Average Annual Temperatures and Increases in Extreme Heat in Milpitas

Average Annual	Historic Average Annual (1961-1990)	Mid-Century (2035-2064)		End of Century (2070-2099)	
		Medium Emissions	High Emissions	Medium Emissions	High Emissions
Maximum Temperature (°F)	68.3	72.8	73.7	73.6	77.1
Minimum Temperature (°F)	48.2	52.4	53.5	53.3	56.9
Number of Extreme Heat Days	4	17	15	20	38
Number of Heat Waves	1	1	1.4	1.3	3.2

Notes: °F = degrees Fahrenheit; Extreme Heat Day = Maximum daily temperature of 91.6 °F;

Heat Waves = four or more consecutive extreme heat days.

Source: CEC 2021a; CEC 2021b.

Changes in Precipitation and Flooding

The historic annual average (1961–1990) precipitation in the city has been 15.6 inches. As shown in Table 4-2, the total annual precipitation in the city is projected to be 17.6 inches by mid-century (2035–2064) and 17.7 inches by the late-century period (2065–2099) under the medium-emissions scenario. Under the high-emissions scenario, the annual average precipitation in the city is projected to be 17.8 inches by mid-century (2035–2064) and 19.4 inches by the late-century period (2065–2099) (CEC 2021a).

The city is projected to experience increases in the size of large storm events under both the Medium and High Emissions scenarios. As shown in **Table 5-2**, the historic total 2-day rainfall during a 50-year storm event (i.e., a large storm that has a 2 percent chance of occurring in

any given year) in the city is 10.7 inches. Under the medium-emissions scenario, this rainfall is projected to decrease slightly to 10.2 inches by mid-century (2035–2064) but increase to 11.3 inches by the late-century period (2065–2099). Under the high-emissions scenario, the rainfall during these events is projected to remain at 10.7 inches by mid-century (2035–2064) and increase significantly to 14.1 inches by the late-century period (2065–2099) (CEC 2021c).

Notably, while annual precipitation is projected to increase, increases in annual rainfall will largely occur during larger storm events rather than gradual increases in rainfall throughout the year. In current practice, the stormwater management systems in urban areas are modeled to manage large storm events based on characteristics of rainfall specific to the region from observed historical data. If these historic rainfall intensities are exceeded, as is projected in the future, stormwater management systems can be compromised and affect the performance of the City’s stormwater management and flood protection systems.

Table 5-2 Changes in Average Annual Precipitation and Increases in Large Storm Events in Milpitas					
Average Annual Precipitation	Historic Period (1961-1990)	Mid-Century (2035-2064)		End of Century (2070-2099)	
		Low Emissions	High Emissions	Low Emissions	High Emissions
Average Annual Precipitation (inches)	42	17.6	17.8	17.7	19.4
50-Year Storm Event ¹	10.7	10.2	10.7	11.3	14.1

¹ = 2-day rainfall in the Lower Coyote Creek-Frontal San Francisco Bay Estuaries Watershed
Source: CEC 2021a; CEC 2021c.

Changes in Wildfire Risk

Wildfire risk is determined by several factors: wind speeds, drought conditions, available wildfire fuel (i.e., dry vegetation), past wildfire suppression activity, and expanding wildland-urban interface, defined as areas of human development in or near high wildfire risk areas (Westerling 2018). Climate change is expected to worsen many of the factors that contribute to wildfire risk by increasing the intensity of drought events and creating hotter and drier landscapes more susceptible to burning.



As discussed above, climate change will result in changes in precipitation patterns, increased temperature, and drought conditions. Wetter months may lead to increased vegetative growth followed by periods of drought causing the vegetative growth to dry up, creating greater amounts of fuel for fires.

Wildfire events not only cause direct physical damage to humans, structures, and biological and hydrological resources, but also contribute to global climate change and air quality degradation. The incomplete combustion of vegetation releases smoke composed of carbon monoxide (CO); particulate matter (PM); hydrocarbons; oxides of nitrogen (NO_x) and reactive organic gases, which combine to produce ground-level ozone; and thousands of other compounds. CO emissions are highest during the smoldering stages of a fire and NO_x emissions are produced primarily from oxidation of the nitrogen deposits in vegetation (Ahuja and Proctor 2018:439).

City residents will likely face future conditions where air quality is severely degraded due to wildfire activity within the state. For instance, during the 2020 fire season, air quality in the Bay Area was rated the worst globally due to three major wildfire complexes in the East Bay, North Bay, and southern Peninsula burning concurrently (ABC News 2020).

Air quality impacts related to wildfire smoke are disproportionately felt by low-income residents, and particularly, individuals experiencing homelessness.

Low-income residents may not be equipped with sufficient filtration systems to provide respite from the smoke in their homes. Moreover, individuals experiencing homelessness face challenges in finding indoor areas that could shelter them from exposure to high concentrations of air pollution. Additionally, outdoor laborers may be required by their employers to continue working even during periods of dangerous levels of air pollution. While regulatory mechanisms implemented by the federal Occupational Safety and Health Administration and the California Division of Occupational Safety and Health (better known as Cal/OSHA) exist, enforcement of these protocols is uncertain, particularly in industries that employ undocumented individuals, who are less likely to request compliance with such protocols.

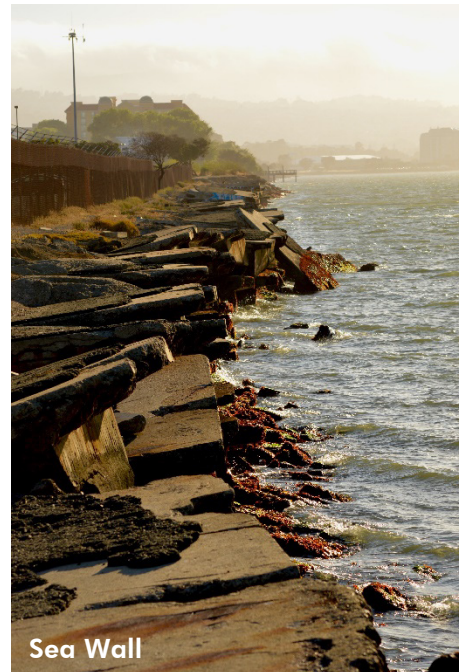


Sea Level Rise

Rising sea levels are considered a secondary effect of climate change due to warming ocean temperatures and melting glacial ice sheets. The California coast has already seen a rise in sea level of 4 to 8 inches over the 20th century due to climate change (DWR 2021). Sea-level rise poses the greatest risk during coastal storms which increase tidal elevations. The large waves associated with storm surges can cause flooding in low-lying areas, loss of coastal wetlands, saltwater contamination of drinking water, impacts on roads and bridges, and increased stress on levees (DWR 2021). In addition, rising sea levels result in coastal erosion as shoreline

sediment is re-deposited back into the ocean. A portion of the city's water supply is obtained from SCVWD, which sources its groundwater from the Santa Clara and Llagas groundwater subbasins. The Santa Clara subbasin, located in northern Santa Clara County, borders the San Francisco Bay. However, due to the Santa Clara subbasin's characteristic steep upward gradient, saltwater intrusion to the aquifer is minimized (SCVWD 2016).

The Bay Area will be particularly susceptible to sea-level rise in the 21st century. Cal-Adapt uses global models to indicate where California will see a substantial sea-level rise, with the exact magnitude depending on a variety of factors including global GHG emissions, the rate at which oceans absorb heat, melting rates, and movements of land-based ice sheets, and local coastal land subsidence or upshift. Cal-Adapt presents data in the form of a mapping tool that identifies where inundation may occur from varying degrees of sea-level rise ranging from 0 to 1.41 meters. While the region and neighboring communities to the city will directly experience the sea-level rise and its impacts, the city is not located within an area that Cal-Adapt predicts inundation from up to 1.41 meters of sea-level rise combined with flooding from the 100-year storm event.



Changes in Drought and Water Supply

The city's water supply is generated from multiple locations and sources. The city is supplied by two potable water wholesalers, the San Francisco Public Utilities Commission (SFPUC) and the Santa Clara Valley Water District (SCVWD). SFPUC receives its water from an intricate water system sourced by waters of the Hetch Hetchy Reservoir in Yosemite National Park. The water flows through the San Joaquin Valley where it is distributed to the users of San Francisco, San Mateo, and Santa Clara counties, including the city. SCVWD provides water from a combination of surface and groundwater resources. A large percentage of SCVWD's water supply is supplied by the Sacramento River and its tributaries, which flow into the Sacramento-San Joaquin River Delta (Delta). Approximately 15 percent of SCVWD's water supply is sourced from groundwater with plans to increase groundwater extraction in the future. Additionally, a small, but growing portion of SCVWD's water supply is recycled water (SCVWD 2016). The city also receives some recycled water from South Bay Water Recycling, which originates from the San Jose-Santa Clara Regional Wastewater Facility (RWF).

Snowpack in the Sierra Nevada Mountains of Northern California plays a critical role in water supply for the region, including the city, replenishing the watersheds and reservoirs used as water resources throughout the state. Due to increases in climate variability and rising temperatures, California has already seen signs of decreased snowmelt in Northern California: snowpack in the Sierra Nevada is expected to decline by as much as 33 percent by mid-century and 66 percent by end of century, relative to historic baseline snowpack (OPR, CEC, and CNRA 2018b). Warmer temperatures have also caused California snowpack to melt faster and earlier

in the year. This change in California's snowpack disrupts the normal timing of groundwater and surface water recharge and makes it harder to store and use during hotter times of the year or during drought conditions. Reduced snowpack and earlier snowmelt will lead to more frequent water shortages and less water available in the Delta and other water supply systems. This lack of a reliable imported water supply may place stress on the city's water supply resources as these waters are equitably distributed throughout the state (City of Milpitas 2016).

In addition to the surface water derived from the Hetch Hetchy Reservoir and the Delta, the city relies on a portion of its water supply from local sources such as groundwater. As stated above, of the SCVWD's water supply portfolio, groundwater makes up about 15 percent, and could be affected by projected changes in annual precipitation. The Sustainable Groundwater Management Act regulates groundwater and requires governments and water agencies of high- and medium-priority basins to develop



groundwater sustainability plans. These plans are intended to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge by 2040 for critically overdrafted basins and by 2042 for the remaining high- and medium-priority basins. SCVWD, the district that supplies groundwater to the city, pumps its groundwater from the Santa Clara (medium-priority) and Llagas (high-priority) subbasins, which are both located entirely in Santa Clara County. Future periods of drought may result in a greater overdraft of these basins.

As shown in **Table 5-2** above, under both the medium- and high-emissions scenarios, the city is not expected to experience significant overall changes in average precipitation. However, the city will experience increased variability in precipitation. The city and state have a highly variable climate that is susceptible to prolonged periods of drought. Recent research suggests that extended drought occurrence (a "mega-drought") could become more pervasive in future decades (CEC 2021d). An extended drought scenario is predicted for all of California from 2051 to 2070 under the HadGEM2-ES simulation and high-emissions scenario. The extended drought scenario is based on the average annual precipitation over 20 years. This average value equates to 78 percent of the historic median annual precipitation averaged for the North Coast and Sierra regions. The city's observed historical average annual rainfall accumulation is 15.6 inches. Under the anticipated drought scenario between 2051 and 2070, the city's average annual rainfall accumulation would decrease to 13.4 inches (CEC 2021d). Predicted drought conditions due to climate change will result in stress on reliable water supply and will likely result in water shortages. During extended drought periods, alternative local water storage methods will increasingly be relied upon.

Vulnerability Scoring for Key Impact Areas

This section provides a summary of the city’s sensitivity to climate-related hazards and summarizes potential impacts from these hazards. Climate change effects will impact the city differently, such that some population groups and physical assets will be affected much more severely than others. Key populations and assets identified in the city are organized into the following overarching categories: populations, transportation, energy, water, and emergency services.

The city’s vulnerability to each identified climate change impact has been assessed based on the magnitude of risk posed to populations and assets, and the City’s adaptive capacity, which refers to a community’s current and future ability to address climate-related impacts. Potential impacts and adaptive capacity are rated on a qualitative scale from Low to High based on guidance from the APG. A description of each qualitative rating for both factors is provided in **Table 5-3**.

Table 5-3 Potential Impacts and Adaptive Capacity Rating Criteria		
Rating	Potential Impacts Rating Description	Adaptive Capacity Rating Description
Low	Impact is unlikely based on projected exposure; would result in minor consequences to public health, safety, and/or other metrics of concern.	The population or asset lacks the capability to manage climate impact; major changes would be required.
Medium	Impact is somewhat likely based on projected exposure; would result in some consequences to public health, safety, and/or other metrics of concern.	The population or asset has some capacity to manage climate impact; some changes would be required.
High	Impact is highly likely based on projected exposure; would result in substantial consequences to public health, safety, and/or other metrics of concern.	The population or asset has high capacity to manage climate impact; minimal to no changes are required.

Source: CalOES 2020.

After rating potential impacts and adaptive capacity, an overall vulnerability score is determined for each climate change impact. This scoring can help the City understand which effects pose the greatest threats and should be prioritized in future planning efforts. **Table 5-4** presents the rubric used to determine the overall vulnerability scores based on the ratings for potential impacts and adaptive capacity.

Vulnerability scoring for key climate-related impacts is discussed below and organized by the following overarching categories: populations, transportation, energy, water, and emergency services. Some similar impacts have been combined to reduce redundancy.

Table 5-4 Vulnerability Scoring Rubric

Vulnerability Score				
Adaptive Capacity	Low	3	4	5
	Medium	2	3	4
	High	1	2	3
		Low	Medium	High
Potential Impacts				

Source: CalOES 2020; adapted by Ascent Environmental in 2021.

Impacts on the City's Populations

In general, historically marginalized communities and communities of color are more susceptible to climate change-related hazards due to limited access to financial resources, health challenges or disabilities, living or working conditions, or historical and current marginalization. These factors, among others, can lead to increased susceptibility to, and disproportionate harm from climate impacts. Vulnerable populations in the city include low-income persons, communities of color, linguistically isolated persons, senior citizens, persons with disabilities, and persons experiencing homelessness, among others.

Climate change affects human health through environmental changes, such as more frequent extreme heat events, more frequent and powerful wildfires, degradation of air quality, heightened growth and dispersal of allergens, and enhanced prevalence of infectious diseases. The resulting human health impacts include, but are not limited to, increases in the risk of asthma, allergies, and other respiratory illnesses, cardiovascular diseases, vector-borne diseases, mental health impacts, civil conflicts and migrations, malnutrition, injuries, health-related illness, heatstroke, and death (Bell et al. 2016). While all persons in the city are anticipated to experience some level of health impacts from climate change, the populations most vulnerable to these health impacts are the same communities that experience health inequities or systemic differences in health status under current conditions (CDPH 2019). The vulnerable communities described below face climate change impacts that compound and exacerbate existing public health sensitivities and vulnerabilities.

Data from California Office of Environmental Health Hazard Assessment's California Environmental Health Screening Tool 3.0 (CalEnviroScreen 3.0) and Public Health Alliance of Southern California's California Healthy Places Index indicate that there are several locations in the city where populations are at increased risk of climate impacts due to sociodemographic characteristics or environmental exposure. These include the neighborhood directly south of Calaveras Boulevard and east of Interstate 680 (Census Tract 5044.18) as well as the neighborhood directly south of Scott Creek Road and west of Interstate 680 (Census Tract 5044.22). Additionally, the residents in the northeastern and southwestern parts of the city are proportionally healthier, in general, than other California census tracts, whereas the residences of the central part of the city are comparatively less healthy (OEHHA 2020, PHASC 2021).

Adaptive Capacity: Populations

The Santa Clara County Public Health Department provides resources for the prevention and treatment of infectious diseases, heat-related illnesses, and mental health concerns. SCVWD also provides flood management planning in its E2, Emergency Response Planning project, which allows SCVWD to coordinate with local municipalities, including the City, to clearly identify roles and responsibilities for floodplain management and flood emergency management. The E2 program is a continually evolving project. The City's Water Infrastructure Risk and Resilience Assessment evaluates the risk of the city's water-related infrastructure and has concluded that the infrastructure is of high resiliency. SCVWD's Water Supply Master Plan also looks forward to a future affected by climate change and accounts for water planning in future extended drought conditions.

Santa Clara County provides residents with real-time information regarding flooding events, among other emergency events, through their AlertSCC notification system, which administers notifications through cell phone calls and SMS text messages. The Milpitas Fire Department Office of Emergency Services (Milpitas OES) keeps its Emergency Operations Center in a constant state of readiness to manage and respond to emergencies affecting residents and the business community of the city. The structure of command supports the state-mandated Standardized Emergency Management System and the federal-mandated National Incident Management System.

To address impacts to people during power shutoff events (PSPS) events, Pacific Gas and Electric (PG&E) partners with the City to operate Community Resource Centers. Community resource centers provide information, resources, and necessities to customers in the city. Historically, the Milpitas Sports Center has been used as a Community Resource Center during PSPS events and will likely be used during future events. The following policies from the General Plan 2040 Safety Element address climate-change-related impacts to the city's vulnerable populations:

- **Policy SA 6-5:** Ensure that climate impacts and climate adaptation measures aimed at reducing climate risks do not lead to disproportionately adverse effects on vulnerable populations.
- **Policy SA 6-6:** Consider the needs of vulnerable populations and individuals with limited mobility when planning for access to safe and comfortable shelter during extreme heat events or other severe weather events.

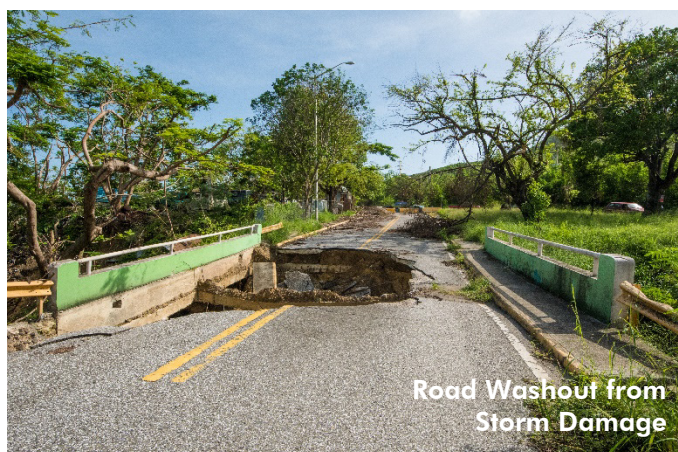
Table 5-5 provides a summary of the vulnerability scores for the potential climate change impacts on vulnerable populations.

Table 5-5 Population Vulnerability Scoring

Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Increased human health risk (i.e., poor air quality, infectious diseases, mental health concerns, limited access to potable water, heat-related illnesses)	High	Medium	4
Lack of electricity during Public Safety Power Shutoffs implemented during times of high wildfire risk	Medium	Low	4
Reduced available water supply from extended drought periods	High	High	3
Increased exposure to flood risk from extreme precipitation and sea-level rise	Medium	Medium	3
Increased exposure of people to landslides	Medium	High	2
Limited ability to prepare for climate events and to respond and evacuate	Medium	High	2
Increased exposure of people to wildfires	Low	High	1

Source: Ascent Environmental 2021.

Impacts on the City's Transportation System



The public roadway system, including bicycle and pedestrian facilities, in the city is operated and maintained by the City's Public Works Department. One of the major effects of climate change on the city's roadway system is the reduction in the overall lifespan of transportation infrastructure (OPR, CEC, and CNRA 2018a). Increased average temperatures and extreme heat can result in the degradation of pavement and could impact roadway, trail, and bicycle facilities. Increases in flooding-related hazards along

roadways can result in increased erosion of subbase materials underneath roadways and further roadway degradation. This impact can result in secondary impacts on roadway facilities, including disruptions to vehicular access and commerce between cities. Roadway degradation over time can increase the risk to human safety by damaging or blocking evacuation routes and limiting access for emergency responders.

Transit services in the city are operated by the Santa Clara Valley Transportation Authority. The city is also serviced by Bay Area Rapid Transit, which operates a station in the Milpitas Transit Center. The transit systems available in the city also include local bus services, light rail, and

ride-sharing programs. Transit access, safety, and cost can be impaired by climate change impacts such as extreme heat. Transit stops without adequate sheltering (i.e., bus shelters or street trees) can lead to dangerous exposure to extreme heat with disproportionate impacts on low-income populations who, in general, use transit at higher rates. Additionally, bus and rail transit vehicles can undergo increased stress to maintain proper air conditioning and engine cooling during extreme heat events and risk failure during extreme heat days over 100 °F (Cambridge Systems 2015).

Adaptive Capacity: Transportation System

The Santa Clara County Public Health Department provides resources for regional and local agencies. These agencies collaborate to effectively prepare and adapt to climate change impacts on the transportation system. The Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG) and Caltrans have developed plans and programs to identify roadway network vulnerabilities as well as guidance for how to prioritize transportation projects. Project prioritization through Caltrans' Adaptation Decision-Making Assessment Process will help the city's transportation system increase resilience as climate impacts become more frequent and severe over time, for roadways under Caltrans' jurisdiction. MTC/ABAG's Plan Bay Area 2040 provides strategies to incorporate climate adaptation in the design of new projects and improvements of existing infrastructure. The next iteration, Plan Bay Area 2050, will provide even more resiliency strategies to be implemented throughout the Bay Area.

The City's General Plan 2040 Circulation Element contains goals and policies that address the safe and efficient operation, maintenance, and management of the transportation network. The following policies serve to bolster the efficacy of the city's transportation network:

- **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 1-7:** Coordinate with neighboring jurisdictions regarding planned developments and transportation improvements that impact communities in both jurisdictions.
- **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.

The vulnerability scores for impacts on transportation facilities and infrastructure in the county are provided in **Table 5-6**.

Table 5-6 Transportation System Vulnerability Scoring

Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Increased impacts to evacuation routes and emergency access during hazard events	Medium	High	4
Increased risk of damage to roadways from landslides	Medium	Medium	3
Increased risk of damage to roadways from extreme heat events	Low	Medium	2
Increased risk of damage to roadways from flooding or sea-level rise	Low	Medium	2
Increased risk of damage to roadways from wildfires	Low	Medium	2
Increased risk of damage to transit facilities	Low	Medium	2
Increased risk of damage to railways	Low	Medium	2
Increased risk of damage to bicycle paths and trails	Low	Medium	2
Increased stress on transit service and reduced ridership from increased extreme weather events and spread of infectious disease	Low	Medium	2

Source: Ascent Environmental 2021.

Impacts on the City's Energy Systems

Electrical and natural gas infrastructure within the city is owned and operated by PG&E. Electricity delivered to consumers in the city is generated from a mix of power sources from elsewhere in the region and state, as well as on-site generation of electricity from local public and private facilities. The City is a member of Silicon Valley Clean Energy (SVCE), a local community-choice aggregator, that partners with PG&E and supplies carbon-free electricity to its members. The City supports the development and maintenance of electricity generation and storage at City-owned sites (i.e., on-site solar panels and battery storage at City facilities).

Impacts on electricity resources from climate hazards can include stress and physical damage to the electricity generation, transmission, and distribution system. Extended drought periods may reduce the available surface water supply to generate hydroelectric power. Transmission facilities face increasing climate-related risks as a result of the increased frequency of wildfires, severe wind, and extreme heat events. Extreme heat events result in increased energy demand for cooling in residential and commercial buildings and can add stress to transmission systems, resulting in brownouts and damage to electricity infrastructure. Wildfires, flooding, landslides, and severe wind can cause physical damage to or destruction of transmission facilities. Due to a number of recent large-scale wildfires caused by electricity infrastructure exposed to extreme heat and high winds, utilities have begun to implement PSPS events to avoid wildfire risk. PSPS events can result in communities experiencing no electricity for multiple days and prevent individuals from using prescribed medications and treatments that rely on electricity or

refrigeration. PSPS events can also result in impacts to commerce and economic losses, particularly for businesses that rely on refrigeration such as grocery stores. Hazards such as landslides, wildfires, and flooding can also affect underground natural gas pipelines, exposing and/or damaging these pipelines. The damage resulting from climate change-related hazards on electricity and natural gas infrastructure can have a greater impact on disadvantaged populations, particularly communities that are low-income or individuals who have limited mobility or lack the financial means to make repairs to their property.



Increases in extreme heat and heat waves will have implications for energy demand in residential and nonresidential buildings in the city with a higher energy demand for cooling and a decrease in energy demand for heating, in general. In general, for buildings in the city, temperature increases will result in increased electricity demand for cooling and place increased demand on the electricity grid, particularly during extreme heat days and heat wave events which are projected to increase peak electricity demand for utilities. Currently, during extreme heat days and heat wave

events, electricity utilities and the State's grid operator, California Independent System Operator, initiates "Flex Alerts," requesting customers to conserve energy during certain times of the day to reduce stress on the electricity grid. Some initial research that models future changes in peak load for utilities in California during extreme heat events has demonstrated that peak loads are substantially more sensitive to temperature anomalies, indicating warm-anomalous temperatures (e.g., extreme heat days and heat waves) will have a disproportionate impact on higher-intensity electricity consumption (Kumar et al. 2020). The research also indicates that disregarding the asymmetry in the temperature response of electricity demand will lead to underestimating the climate-sensitive portion of the upper extremes of demand for electricity utilities in California, for short-term (2021-2040) and long-term (2081-2099) time periods included in the study. This will likely lead to an increase in the frequency of brownout and blackouts, in which portions of the electricity grid are disrupted and communities lose power due to an imbalance between power generation and power consumption.

Studies of PG&E's electricity and natural gas infrastructure show that hazards from sea-level rise, flooding, and wildfire are the greatest threats from climate change. As flooding may occur from a storm event, power system infrastructure in the coastal regions may be damaged and could be impacted for several weeks (OPR, CEC, and CNRA 2018a). As flooding becomes more frequent, transmission lines will become more susceptible to corrosion. Though impacts on natural gas infrastructure would be less severe than impacts on electrical facilities because gas pipelines are generally located underground, natural gas infrastructure will require increased maintenance due to climate change-related impacts such as wildfire and flooding (Bruzgul et al. 2018).

Adaptive Capacity: Energy System

The city relies on PG&E and SVCE for the generation and distribution of a majority of its electricity and natural gas supply. In the event of an emergency or a climate change-related hazard event, PG&E and the California Independent System Operator issue preventative measures that may reduce stress on energy systems and reduce energy demand. These measures include conservation notifications such as Flex Alerts and operational notifications such as restricted maintenance operations or PSPS events. PG&E has also invested in the implementation of wildfire safety measures, which are included in its 2021 Wildfire Mitigation Plan, which provides updated details on PG&E’s comprehensive Community Wildfire Safety Program, incorporates lessons learned from 2020, and outlines additional programs to continue to reduce wildfire risk ignited by electrical infrastructure (PG&E 2021). Based on the 2021 Wildfire Mitigation Plan, PG&E operated over 300 Community Resource Centers in 2020 with plans to expand this number through partnerships with participating counties and cities (PG&E 2021). Additionally, SVCE has partnered with Bay Area-based solar installer Sunrun to install up to roughly 20 megawatts of emissions-free solar and battery backup power to 6,000 households vulnerable to emergency power shutoffs during wildfire seasons.

Additionally, the following policy from the General Plan 2040 Safety Element addresses the city’s energy resources:

- **Policy SA 6-3:** Encourage and support private sector investment in climate adaptation through climate-resilient infrastructure such as on-site renewable energy, integrated stormwater management, and water conservation.
- **Policy SA 6-4:** Promote community awareness of climate-resilient actions that can be implemented by homeowners, such as water conservation, on-site water collection, passive solar designs, and alternative energy strategies.

The vulnerability scores for impacts to energy resources are shown in **Table 5-7**.

Table 5-7 Energy Vulnerability Scoring			
Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Increased demand for electricity generation during extreme heat events	Medium	Low	4
Increased system stress during droughts and extreme heat events	Medium	Low	4
Reduced effectiveness of hydro-electric electricity generation facilities during drought and extreme precipitation events	Low	Low	3
Reduced effectiveness of solar electricity generation facilities due to increased smoke from wildfires	Low	Low	3
Increased system stress and physical damage from flooding, sea-level rise, and landslides	Medium	Medium	3
Risk of physical damage from wildfires	Low	High	1

Source: Ascent Environmental 2021.

Impacts on the City's Water Supply

The city's water resources will be affected by climate change due to changes in precipitation, and a slight increase in the occurrence of extreme precipitation events. Extreme precipitation events that occur with more intensity over a short period could cause flooding, limiting access or damage to water facilities. As previously discussed, snowmelt in Northern California is also projected to occur earlier in the year, causing springtime recharge to occur before the warmer and drier summer months when it is most needed. Reduced snowpack also reduces water captured for storage in surface water bodies and aquifers for potable water. As a result, the city and region could experience decreased water supply during the spring and summer months, which are also projected to become drier and warmer as a result of climate change.



Changes in rainfall and snowmelt timing can affect SFPUC and SCVWD's ability to provide adequate and safe drinking water on a reliable basis. While these agencies may be able to rely on groundwater to provide additional supply, which is currently the direction SCVWD is moving, drawing from these sources can substantially lower water tables, resulting in land subsidence. Precipitation variability will also affect the city's local surface and groundwater supply causing the city to rely on other sources such as recycled water resources, which is currently the intent of SCVWD moving into the future.

It is estimated that by 2040, the city's water demand will increase by approximately 28 percent from 2020 levels due to population and economic growth, further emphasizing the need for a sustainable water supply and water supply management (City of Milpitas 2021). Increased episodes of drought and increased water demand could result in water shortages for the region, endangering residents, and ecological systems (e.g., flood control or sensitive habitat, recreational areas).

SFPUC and SCVWD and their member agencies contribute to the region's local water supply, which is composed of surface water, groundwater, and recycled water. Throughout Northern California, and extending from the coast to the Sierra Nevada mountains, surface water reservoirs retain water resources for residents in the region. Currently, groundwater does not supply customers located in the city; however, groundwater resources do supply water to SCVWD, the main water provider for the city. Recycled water in the region has increased over time and provides non-potable water to recreational areas in the city with plans to increase overall recycled water use in the future.

The city's stormwater infrastructure was developed to maintain flood control while directing water northwest to the San Francisco Bay. The system consists of conveyance pipelines known as municipal separate stormwater systems which discharge stormwater and non-stormwater. The

City identifies the highest priority water quality conditions within each watershed and specific goals, strategies, and schedules to address those priorities, including numeric goals and activity levels, and requirements for water quality monitoring and assessment (City of Milpitas 2016).

Wastewater facilities are also threatened by climate change. Flooding during larger storm events increases the risk of sewage and hazardous and/or toxic materials being released into waterways if wastewater treatment plants are inundated, storage tanks are damaged, or pipelines are damaged. Wastewater treatment facilities in Santa Clara County have already been impacted during large storms that have caused sewage spills. During these flooding-induced spill events, there is an increased risk of contracting water-borne illnesses and fungal infections. While the City does not treat wastewater, it pumps its wastewater through two force mains to the San Jose/Santa Clara Water Pollution Control Plant, also known as the RWF, which is located approximately 0.25-miles directly west of the northwestern boundary of the city. Though the City may not have jurisdiction over operations of the RWF, flooding-related incidences may be widespread and could affect city residents.

Adaptive Capacity: Water System

The majority of the city's water supply is imported from areas outside of the city. SFPUC imports water from the Hetch Hetchy Reservoir located in Yosemite National Park; SCVWD imports water from the Delta. The City's 2020 UWMP, prepared in coordination with SFPUC and SCVWD, demonstrates a goal of meeting future demand through a combination of implementing water conservation and demand management strategies, and increasing recycled water usage. Additionally, the City's Water Supply Augmentation Study recommends that the City add groundwater as a water resource to meet future demand. The City has also amended its water conservation ordinance that addresses extended periods of drought. In 2015, the city was able to conserve 30 percent more water than the previous year in response to the state's 4-year period drought period from 2012-2016, demonstrating the City's adaptive capacity to reduce water consumption when necessary. The vulnerability scores for impacts on water resources are shown in **Table 5-8**.

Table 5-8 Water Vulnerability Scoring			
Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Reduction in available water supply	Medium	Medium	3
Increased risk of physical damage to flood control and water conveyance facilities	Medium	High	2
Increased demand for flood control and water conveyance facilities	Medium	High	2
Increased water demand	Medium	High	2
Increased risk of contamination of potable water supply from sea-level rise	Low	Medium	2

Source: Ascent Environmental 2021.

Impacts to the City's Emergency Services

On August 5, 2021, the Milpitas City Council approved a full update to the City's Emergency Operations Plan (EOP). The EOP provides an overview of the City's approach to emergency operations. It identifies emergency response policies, describes the response and recovery organization, and assigns specific roles and responsibilities to City departments, agencies, and community partners. The EOP has the flexibility to be used for all emergencies, including climate change-related hazards, and will facilitate response and recovery activities efficiently and effectively.

The EOP is reviewed, updated, republished, and redistributed on a 2-year review, 5-year revision cycle in accordance with the 2016 State Homeland Security Grant Program guidance. The EOP may be modified as a result of post-incident analyses and/or post-exercise reviews and assessments. City staff will coordinate future revisions to ensure that relevant or updated climate-related hazards or risk conditions are included.

Emergency operation facilities are locations that provide essential products and services to the public, particularly during emergency events. Emergency operation facilities can include hospitals or other health care facilities, police and fire stations, and communication facilities. An increase in climate-related hazard event emergencies will place more demand on emergency operation facilities, emergency personnel, related infrastructure, and equipment in the city. As discussed above, the city is anticipated to experience more frequent hazard events including coastal storms, erosion, floods, wildfire impacts, drought, and extreme weather. As temperatures increase and heat waves occur more frequently, the city is likely to experience potential public health impacts. Floods and landslides may threaten transportation routes, emergency services stations, and evacuation routes, which could hinder emergency response times during such events. PSPS events may place pressure on emergency generators, which are used during black-out periods to power police, fire, and the emergency operations center.

Additionally, physical damage to emergency services facilities could occur as a result of climate change-related hazards. Within the city, four fire stations and one police station are located within either the 100- or 500-year flood zones. Schools often serve as community resource centers and evacuation centers during emergencies. Based on the GIS analysis in the OAHMP, 12 schools are located within the Federal Emergency Management Agency floodplain designations. Notification of emergencies and evacuation instructions rely upon functioning communication facilities such as AM/FM antennas, broadband radio transmitters, and television transmitters. Communications facilities within the city may be affected by increases in frequency and severity of flooding events and extreme heat events.

Adaptive Capacity: Emergency Services

Milpitas OES is responsible for emergency response in disaster situations. Milpitas OES provides alerts and notifications to residents through various communication channels in the event of an emergency and is also responsible for ensuring resources are available and for implementing emergency response and recovery procedures. The City contributed to the development of the OAHMP, which identifies goals, objectives, and potential actions to reduce hazard risks and enhance emergency response capabilities. The City also retains and updates a city-specific Multi-Hazard Mitigation Plan and manages the Community Emergency Response Team

program to train residents to protect themselves, family, and neighborhood in the event of an emergency. Additionally, the City keeps the Emergency Operation Center active at all times and provides residents with emergency preparedness resources on its website. Also, Policy SA-62 of the General Plan 2040 directs the City to “ensure that emergency response plans and training programs continue to evolve and are modified to protect residents, infrastructure, and facilities during emergencies and extreme weather events.” The vulnerability scores for impacts to emergency services are shown in **Table 5-9**.

Table 5-9 Emergency Services Vulnerability Scoring			
Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Increased exposure of emergency responders to heat-related sickness, smoke inhalation, and infectious disease	High	Medium	4
Increased risk of damage to emergency facilities (e.g., hospitals, cooling centers, telecommunication systems, and evacuation centers)	Medium	Medium	3
Increased demand for emergency response services	Medium	High	2
Increased demand for emergency facilities (e.g., hospitals, cooling centers, telecommunication systems, and evacuation centers)	Medium	High	2

Source: Ascent Environmental 2021.

Climate Adaptation Strategies

This section includes a comprehensive set of adaptation strategies that are intended to help the City prepare for and become more resilient to the impacts of climate change. The strategies have been developed based on the findings of the vulnerability assessment, discussed above, and based on input from community members, City staff, and elected officials and are designed to complement the existing set of local and regional plans that address natural hazards in the city. Each strategy in this section also includes a corresponding set of measures and associated actions. Each of the measures included here has been given a Climate Resilience Benefit score of 4, 6, or 8 which helps the City prioritize implementation of the measures based on the appropriateness and efficacy of the measure. The measures also include a list of key co-benefits for the city when the measure is implemented. The actions associated with each measure are included in **Chapter 6**.

Strategy 1. Resilient Communities and Equity and Environmental Justice

The Resilient Communities and Equity and Environmental Justice strategy focuses on ensuring that city residents and businesses can thrive in the face of climate change. The strategy prioritizes the protection of the city's most vulnerable populations, recognizing that past and current social inequities place certain populations at increased risk from the impacts of climate change.

Measure 1.1: Increase community resilience to impacts from air pollution.

This measure and associated actions focus on providing resources and education to city residents to help protect them from the worsening air quality impacts caused by climate change.

Climate Resilience Benefit: 6

Co-Benefits:



Measure 1.2: Increase community resilience to respond to and recover from widespread health emergencies.

This measure and associated actions focus on helping prepare City staff and residents for large public health emergencies that may be caused or exacerbated by climate change such as vector-borne diseases.

Climate Resilience Benefit: 8

Co-Benefits:



Measure 1.3: Protect populations vulnerable to extreme heat.

This measure and associated actions focus on preparing for public health impacts associated with projected increases in the frequency and severity of heat wave events with an emphasis on protecting vulnerable populations.

Climate Resilience Benefit: 8

Co-Benefits:



Measure 1.4: Increase community awareness of climate change.

This measure and associated actions focus on conducting outreach to educate the city's residents and businesses about climate change, its projected impacts, and how individuals can become more resilient in the face of climate change.

Climate Resilience Benefit: 6



Co-Benefits:

Measure 1.5: Ensure that climate impacts and climate adaptation measures aimed at reducing climate risks do not lead to disproportionately adverse effects on vulnerable populations.

This measure and associated actions are intended to ensure that as the City begins to implement the actions included in the CAP Update, implementation is not resulting in a negative impact (e.g., financial impacts) on historically disadvantaged or climate-vulnerable populations.

Climate Resilience Benefit: 4



Co-Benefits:

Measure 1.6: Improve mobility and ensure basic needs are met for vulnerable populations

This measure and associated actions, while not directly addressing a specific climate impact, focus on increasing mobility access and options for vulnerable populations. This will increase the resilience of the city's vulnerable populations during emergency evacuation events as well their ability to access services and resources during emergency events more broadly. The measure also works to ensure that climate-vulnerable populations have their basic needs met and are adequately prepared to protect themselves in emergency events and post-disaster recovery periods.

Climate Resilience Benefit: 6



Co-Benefits:

Measure 1.7: Ensure completeness and availability of emergency supplies and resources to all segments of the population, focusing especially on vulnerable populations and individuals.

This measure and associated actions ensure that emergency supplies and resources are equitably provided to all city residents as the frequency and severity of climate-related hazards increase in the future.

Climate Resilience Benefit: 8

Co-Benefits:    

Strategy 2. Resilient Transportation Systems and Resilient Energy Resources

The Resilient Transportation Systems and Resilient Energy Resources strategy focuses on ensuring that the city's transportation system and energy system are adequately prepared and upgraded to withstand the impacts of climate change. The strategy focuses on steps the City can take independently to prepare these systems for climate change as well as steps the City can take to collaborate and advocate for changes to systems outside its jurisdictional control.

Measure 2.1: Integrate climate change considerations in all transportation agency planning and decision-making processes.

This measure and associated actions ensure that the City's future planning efforts take into consideration and plan for the projected impacts of climate change.

Climate Resilience Benefit: 8

Co-Benefits: 

Measure 2.2: Reduce local flooding impacts to transportation infrastructure.

This measure and associated actions focus on increasing the overall resilience of the city's transportation system to projected future changes in the intensity of large storm events.

Climate Resilience Benefit: 6

Co-Benefits:     

Measure 2.3: Increase the resilience of existing residential and commercial development through energy efficiency upgrades and onsite energy generation and storage.

This measure and associated actions focus on decentralizing energy supplies and energy storage through the development of microgrids and battery storage.

Climate Resilience Benefit: 8

Co-Benefits:     

Measure 2.4: Minimize stress on the electrical grid and increase the resilience of existing residential and commercial development through energy efficiency upgrades and on-site energy generation and storage.

This measure and associated actions focus on helping reduce stress on the electricity grid during extreme heat events by reducing overall energy demand from buildings in the city. The measure can also help increase energy independence during PSPS or other utility disruption events (e.g., brownouts, blackouts).

Climate Resilience Benefit: 6

Co-Benefits:    

Measure 2.5: Protect critical energy and telecommunications infrastructure and systems from climate change.

This measure and associated actions focus on advocating for and partnering with utility providers to increase the resiliency of the critical energy and telecommunications infrastructure that support services provided to the city.

Climate Resilience Benefit: 6

Co-Benefits:    

Strategy 3. Reduced Flooding

The Reduced Flooding strategy focuses on helping to reduce the impacts of flooding in the city as the intensity and frequency of large storm events increases throughout the 21st century, prioritizing nature-based solutions for flood management.

Measure 3.1: Minimize risks to life and property resulting from flooding and flood-induced hazards.

This measure and associated actions support the ongoing protection of life and property from flood-related risks and ensure that climate-related changes in precipitation patterns are fully integrated into flood management planning.

Climate Resilience Benefit: 8

Co-Benefits:



Measure 3.2: Evaluate proposed development in areas of the city subject to flooding impacts caused by rising sea levels.

This measure and associated actions ensure that future development in the city considers and implements measures to protect the city from the impacts of sea level rise.

Climate Resilience Benefit: 8

Co-Benefits:



Measure 3.3: Maintain up-to-date flood risk and hazard data.

This measure and associated actions ensure that the City continues to assess and update flood risk and hazard data as the intensity and frequency of large storm events change over the 21st century.

Climate Resilience Benefit: 6

Co-Benefits:



Strategy 4. Robust Emergency Services and Improved Disaster Recovery

The Robust Emergency Services and Improved Disaster Recovery strategy ensures that emergency services (e.g., Fire Department, Police Department) are adequately resourced for increases in the frequency and intensity of climate-related hazards as well prepared for novel hazards created by climate change. The strategy also ensures that the City is adequately prepared to assist residents and businesses in post-disaster recovery efforts.

Measure 4.1: Ensure that emergency services have adequate capacity to address increased demand due to climate change-related impacts.

This measure and associated actions focus on assessing and adjusting, if necessary, the capacity (e.g., staffing, resources, education, and funding) of the City's emergency services to adequately address the increasing severity of hazards under climate change.

Climate Resilience Benefit: 8

Co-Benefits:



Measure 4.2: Develop programs to improve efficiency and equity of disaster recovery.

This measure and associated actions focus on processes to improve the efficacy and efficiency of disaster recovery as hazards and disaster events become more common while also ensuring disaster recovery is implemented equitably.

Climate Resilience Benefit: 8

Co-Benefits:



Strategy 5. Reduced Urban Heat Island Effect and Resilient Water Resources

The Reduced Urban Heat Island Effect and Resilient Water Resources strategy focuses on upgrades to the city's built environment to mitigate the urban heat island effect on the city which is projected to worsen under climate change. The strategy also works to ensure water resources provided to the city are resilient to worsening drought scenarios.

Measure 5.1: Reduce urban heat island effect through cool roofs, parking lot shading, landscaping, and urban greening in new and existing private and public development.

This measure and associated actions focus on implementing various strategies for new and existing development in the city to mitigate the worsening impacts of the urban heat island effect.

Climate Resilience Benefit: 6

Co-Benefits:      

Measure 5.2: Advocate for Drought-Proof Water Supplies including recycled water systems or indirect potable recharge.

This measure and associated actions support the City in advocating for drought resiliency for the city's water supply, which is managed and provided by the SFPUC and the SCVWD.

Climate Resilience Benefit: 8

Co-Benefits: 

Strategy 6. Integrated Resilience Planning and Improved Biodiversity and Habitat

The Integrated Resilience Planning and Improved Biodiversity and Habitat strategy is intended to ensure that climate adaptation becomes an integral part of long-range planning at the City and that nature-based solutions are prioritized for addressing climate change.

Measure 6.1: Embed climate resiliency and adaptation across planning efforts.

This measure and associated actions ensure that climate change and future changes in key climate variables are considered and integrated into planning projects and processes at the City.

Climate Resilience Benefit: 8

Co-Benefits:     

Measure 6.2: Integrate findings of climate vulnerability into all phases of emergency planning.

This measure and associated actions support the use of the vulnerability assessment finding to inform emergency planning efforts and help the City better anticipate changes in demand for emergency services.

Climate Resilience Benefit: 8

Co-Benefits:   

Measure 6.3: Prioritize nature-based solutions to improve resilience while promoting biodiversity.

This measure and associated actions promote the use of nature-based solutions (e.g., habitat conservation) to help the City become more resilient to climate impacts while also achieving the city's natural resource and conservation goals.

Climate Resilience Benefit: 8

Co-Benefits:       



Implementation and Monitoring

This chapter outlines actions that the City of Milpitas (City) will take to implement Climate Action Plan Update (CAP Update) strategies and measures, and it describes the process for assessing and monitoring progress over time to ensure the CAP Update is effective in reducing emissions and improving resilience to climate change. This chapter also discusses the application of the CAP Update for future development projects and provides potential funding resources to support implementation.

Implementation Strategy

Effective implementation of this CAP Update will require ongoing management and oversight. To gauge progress over time, it will also require updates to the City's greenhouse gas (GHG) emissions inventory and vulnerability assessment. Ensuring that the measures identified in the CAP Update result in emissions reductions and resilience improvements is central to the success of this CAP Update. Achieving these goals will require investments and long-term commitments from the City as well as participation from City staff. The success of the CAP Update implementation will also depend on the participation of residents, businesses, and other stakeholders in the city and region.

To help guide the implementation of CAP Update actions, the City developed a prioritization matrix to evaluate each action considering a variety of criteria. GHG emissions reduction actions and adaptation actions were evaluated in two separate matrices. For GHG emissions reduction actions, these criteria included GHG emissions reduction potential, cost-effectiveness, technological/implementation feasibility, consistency with existing policies or programs, jurisdictional control, timeframe of implementation, and associated co-benefits, to generate a prioritization score. The same criteria were evaluated for adaptation actions, except that climate resilience benefit was scored rather than GHG emissions reduction potential. The criteria that were evaluated for prioritizing each action are described in further detail below. After CAP Update adoption, the prioritization matrix and scores will help City staff determine which actions should be implemented and when, which will contribute to the effectiveness of the CAP Update.

Prioritization Evaluation Criteria

The following criteria were used to develop a prioritization score for each CAP Update action.

- ▶ **GHG Emissions Reduction Potential** was evaluated quantitatively for each emissions reduction action using the results of the City's GHG emissions reduction quantification analysis, which was conducted in preparation of the CAP Update (see Appendix B for more details). Each action was assigned a score of 4, 6, or 8, which correspond to a small, medium, or high GHG reduction potential. A score of 4 (low) was assigned to actions that would result in a 0 to 2 percent reduction in community emissions in 2030. A score of 6 (medium) was assigned to actions that would reduce emissions by 3 to 5 percent in 2030, and a score of 8 (high) was assigned to actions that would result in at least a 5 percent reduction in community emissions in 2030. It is important to note that the scores associated with this criterion are higher than those used for other criteria; this decision was made to increase the weight (i.e., importance) of each action's GHG reduction potential relative to other criteria in the prioritization process. Lastly, emissions reductions in the quantification analysis were evaluated at the measure level, rather than for each action, to capture the cumulative impact of multiple complementary actions and/or because some measures only include one action. Therefore, the GHG emissions reduction potential score for a measure was applied to each action under that measure.
- ▶ **Climate Resilience Benefit** was evaluated qualitatively, and each action was assigned a score of 4, 6, or 8, which corresponds to a low, medium, or high climate resilience benefit. It is important to note that the scores associated with this criterion are higher than those used for other criteria; this decision was made to increase the weight (i.e., importance) of each action's climate resilience benefit relative to other criteria in the prioritization process. The scoring reflects each action's ability to improve community resilience and reduce overall risk or exposure to climate change impacts based on the City's vulnerability assessment, in conjunction with associated research and established best practices. For example, because extreme heat impacts will continue to pose a high risk to the city, climate adaptation actions that will be effective in increasing resilience to extreme heat received a higher score than actions focused on improving resilience to climate changes effects that pose less risk to the city, such as increased landslides.
- ▶ **Cost-Effectiveness** was evaluated qualitatively, and each action received a score of 0 or 2 for either City cost-effectiveness or residential and business cost-effectiveness, depending on the applicability of the action. Actions that would primarily result in impacts to City budgets were rated for City cost-effectiveness. For example, **Adaptation Action 1.7.5** involves the City conducting outreach and education and therefore was evaluated for City cost-effectiveness. A score for residential and business cost-effectiveness was assigned to actions that would primarily impact residents and/or businesses. **GHG Action TR-2.1.1**, for example, provides incentives for installing EV chargers to residents and business owners, so residential and business-cost effectiveness was evaluated. A score of 0 was assigned where long-term financial benefits would be balanced with implementation costs or where cost-effectiveness was unknown, and a score of 2 was assigned where benefits would outweigh costs.

- ▶ **Technological/Implementation Feasibility** scoring was determined for each action based on the availability of necessary technology or other resources (e.g., funding) for successful implementation and achievement of the action's intended goal. Actions received a score of 0 or 2. A score of 0 was assigned where technology or resources needed for implementation are on track to be deployed for successful implementation, or where the status of technology or resources are unknown. For example, **GHG Action BE-2.3.1**, which involves developing additional incentives for green building, would require additional funding, so it received a score of 0. Most actions received a score of 2, which was assigned where technology or resources needed for effective action implementation currently exist.
- ▶ **Current Policies or Ordinances** considered whether existing City policies or ordinances that would support the implementation of an action are currently in place. If policies or ordinances would need to be developed to support an action, a score of 0 was assigned. If policies or ordinances that support implementation currently exist, actions received a score of 2. Where City policies or ordinances did not exist, but either other City initiatives (e.g., established programs) or State regulations did exist, actions received a score of 2. For example, **GHG Action CS-1.1.1**, which involves implementing the City's Urban Forestry Management Plan, received a score of 2.
- ▶ **Jurisdictional Control** was rated on a scale of 0 to 2 and represents the City's ability to achieve the overall objective of an action. A score of 0 was assigned to actions where the City would only be able to influence—through encouragement, support, or similar effort—the success of the intended goal. Under **GHG Action BE-2.4.2**, for example, the City would connect building owners to funding resources and financing options, but would not require building owners to implement energy efficiency retrofits and improvements, so this action received a score of 0. When the City could require the desired outcome of an action through regulation and/or enforcement, a score of 1 was assigned. For example, **Adaptation Action 2.5.1** received a score of 1, as it would result in the development of an ordinance requiring all new power and gas lines and transformers to be installed underground, whenever feasible. Actions that involved the City developing a program, creating a partnership, or engaging in a similar initiative also received this score, such as **GHG Action GE-1.1.1**, which involves the City creating a regional partnership to provide a green jobs training program. Lastly, a score of 2 was given to actions where the City would have direct authority over implementation and control the success of the action. Actions associated with City municipal operations and policies received this score, such as **GHG Action CS-3.1.2**, which involves the City reviewing Capital Improvement Program projects to identify opportunities for green infrastructure.
- ▶ **Timeframe of Implementation** evaluated the amount of time that it would take for an action to be implemented and operational. This criterion was scored on a scale of 0 to 2, with the scoring favoring actions that could be implemented quickly. Actions that would take at least six years to implement received a score of 0, while actions that would be operational in three to five years received a score of 1. Actions that could be implemented in one to two years were assigned a score of 2. Actions that involve the City encouraging or supporting initiatives received a score of 2 because of the ease of implementation, while those that would require the City to create and implement a program, develop an ordinance, or install infrastructure received a score of 1.

- ▶ **Co-benefits** evaluated include benefits to renters, improved equity, air pollution prevention, health and well-being benefits, increased reliability of critical infrastructure and services, strengthened resilience, job development, and resource preservation. To weight the importance of equity improvements, actions that would benefit equity in the city received a score of 2, while a score of 1 was given for all other co-benefits that would result from action implementation (i.e., maximum score of 9). Co-benefits are described in more detail in **Chapter 1**.

GHG Reduction Prioritization Matrix

Based on the assessment approach described above, the maximum prioritization score for each action was 29. To enable the City to focus on and feasibly implement high-priority actions, a minimum score of 18 was chosen as the threshold for the inclusion of an action in the CAP Update. The 28 actions with prioritization scores equal to or greater than 18 are included in the summarized prioritization matrix below, which presents each action's overall prioritization score, and the City department responsible for implementation, which is based on the criteria above as well as additional considerations such as community values and priorities that may not be reflected elsewhere. The full prioritization matrix with all factor scores can be found in Appendix B. Details regarding monitoring, ongoing engagement, potential funding sources, and GHG emissions thresholds are included in the sections following the matrix.

Measure	Action	Prioritization Score	Implementing Department	Prioritized for Implementation in First 18 months?
BUILDING ENERGY				
STRATEGY BE-1. SHIFT TO CLEAN AND RELIABLE ENERGY				
Measure BE-1.1: Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.	Action BE-1.1.1: Require new development to install on-site renewable energy and storage systems capable of meeting anticipated building energy consumption, or participate in a group-buy solar and storage program, or opt-in to SVCE.	22	BSH	NO
	Action BE-1.1.2: Review zoning regulations for opportunities to simplify and encourage renewable energy systems.	20	BSH/PL	NO
	Action BE-1.1.3: Conduct outreach to residents and business owners to increase awareness of SVCE's carbon-free electricity supply.	18	PW	NO

Measure	Action	Prioritization Score	Implementing Department	Prioritized for Implementation in First 18 months?
Measure BE-1.3: Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.	Action BE-1.3.1: Work with regional partner agencies and utilities, such as BAAQMD, PG&E, and SVCE, to promote State rebates and other incentives and funding opportunities for renewable energy.	18	PW	YES
	Action BE-1.3.2: Develop and implement a comprehensive energy efficiency, energy conservation, electrification, and clean energy outreach and education campaign to support emissions reductions from building energy use.	18	PW	NO
STRATEGY BE-2. MAXIMIZE BUILDING DECARBONIZATION AND EFFICIENCY				
Measure BE-2.1: Adopt updated “reach” building codes with each building and energy code cycle to accelerate all-electric new development.	Action BE-2.1.1: Adopt an updated reach code for the 2022 code cycle that prohibits the installation of natural gas infrastructure in new development	20	BSH	YES
	Action BE-2.1.2: Include a ban on the installation of fossil fuel-powered backup energy sources in new development by 2030.	18	BSH	NO
Measure BE-2.3: Expand the City’s Green Building Program.	Action BE-2.3.1: Develop additional 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.	18	PL/BSH	YES
Measure BE-2.4: Retrofit existing residential and nonresidential buildings and municipal facilities to improve energy efficiency and facilitate fuel switching.	Action BE-2.4.1: Develop a comprehensive energy retrofit program to transition existing residential buildings to all-electric by 2045. Begin program providing education and incentives, then transition to point-of-sale and replace retrofit requirements.	23	PW/BSH	YES
	Action BE-2.4.2: Connect building owners to funding resources and financing options, such as Energy Upgrade California, for energy efficiency retrofits and improvement projects.	18	PW/BSH/ED	NO

Measure	Action	Prioritization Score	Implementing Department	Prioritized for Implementation in First 18 months?
TRANSPORTATION AND LAND USE				
STRATEGY TR-1. FACILITATE SUSTAINABLE TRANSPORTATION AND LAND USE PLANNING				
Measure TR-1.1: Reduce VMT from new development with SB 743 compliance.	Action TR-1.1.1: Enforce the City's requirements for SB 743, which mandates a 15% reduction in new project-generated VMT.	18	PL	YES
	Action TR-1.1.2: Enforce the City's requirements for SB 743 and continuously update VMT Policy and Implementation Tools to further reduce VMT.	18	PL	YES
Measure TR-1.2: Reduce VMT from existing development.	Action TR-1.2.1: Work with local employers to provide subsidies to employees for using transit or active transportation to commute to work, and encourage flexible work schedules (e.g., 9/80s and 4/10s) as well as tele-commuting.	20	ED/EN	NO
	Action TR-1.2.2: Partner with local businesses to provide discounts or rewards programs to incentivize using transit or active transportation to travel to businesses.	20	ED	NO
Measure TR-1.3: Continue to implement and adopt policies that support high-density, mixed-use, transit-oriented development and housing near jobs.	Action TR-1.3.1: Facilitate the development of complete streets and neighborhoods.	19	PL	NO

Measure	Action	Prioritization Score	Implementing Department	Prioritized for Implementation in First 18 months?
STRATEGY 2. DECARBONIZE VEHICLES				
Measure TR-2.1: Increase EV charging infrastructure.	Action TR-2.1.1: Work with SVCE and other partners to provide incentives and increase EV charging stations in visible, accessible, shared locations such as mixed-use development or accessible to multi-family renters.	21	PW	YES
	Action TR-2.1.2: With each Title 24 and CALGreen code cycle, adopt updated EV charging station standards for all new development through the City's reach codes that go beyond State requirements. Require at least 50% of parking spaces in new development to be EV-ready/EVSE installed by 2030.	20	BSH	NO
Measure TR-2.2: Increase EV and low-carbon vehicle adoption.	Action TR-2.2.1: Improve awareness of local, regional, and State incentives for low- and zero-emission vehicles and increase EV purchases in Milpitas through events and resource promotion such as through Climate Action Milpitas Dashboard.	18	PW	YES
STRATEGY 3. INCREASE ACTIVE AND PUBLIC TRANSPORTATION USE				
Measure TR-3.1: Enhance and expand transit facilities and infrastructure.	Action TR-3.1.1: Implement the Milpitas OnDemand "hub-and-spoke" micro-transit pilot program, including on-demand shuttle service for first- and last-mile connections to existing transit hubs such as the BART station and VTA light rail stops.	22	PL	YES
	Action TR-3.1.2: Ensure a pedestrian-friendly environment around the BART and light rail transit stations.	19	PL/EN	NO
Measure TR-3.2: Increase transit ridership.	Action TR-3.2.1: Work with transit agencies to provide free or subsidized transit to low-income residents, expanding to all residents by 2030.	21	CMO	NO

Measure	Action	Prioritization Score	Implementing Department	Prioritized for Implementation in First 18 months?
Measure TR-3.3: Improve active transportation options.	Action TR-3.3.5: Implement the updated Trail, Pedestrian, and Bicycle Master Plan to enhance and expand bicycle and pedestrian infrastructure networks	19	EN	YES
SOLID WASTE				
STRATEGY SW-1. ACHIEVE ZERO WASTE				
Measure SW-1.1: Eliminate the disposal of organic solid waste in landfills.	Action SW-1.1.3: Implement and enforce the requirements of SB 1383 and eliminate disposal of compostable organic materials to landfills.	19	PW	YES
WATER AND WASTEWATER				
STRATEGY WA-1. PROMOTE RESILIENT WATER SUPPLY, WATER USE, AND WATER RESOURCES				
Measure WA-1.2: Reduce water consumption for irrigation and landscaping.	Action WA-1.2.1: Continue to fund and operate the City's Water Conservation Program in conjunction with resources provided by Valley Water and BAWSCA, including the Irrigation Equipment Upgrades Rebate Program, Landscape Conversion Rebate Program, Water Wise Survey Program, and Water Efficient Gardening workshops.	18	PW	YES
CARBON SINKS				
STRATEGY CS-1. RESILIENT INFRASTRUCTURE AND HEALTHY FOREST AND NATURAL SYSTEMS				
Measure CS-1.1: Protect native trees and vegetation and enhance carbon sequestration.	Action CS-1.1.1: Based on the recommendations from the City's Urban Forestry Management Plan, implement a tree planting program to expand the city's urban forest canopy.	18	PW	YES
	Action CS-1.1.2: Develop and implement a street tree planting program for residential neighborhoods.	18	PW	NO

Measure	Action	Prioritization Score	Implementing Department	Prioritized for Implementation in First 18 months?
Measure CS-3.1: Increase the use of green infrastructure.	Action CS-3.1.1: Develop and implement a green infrastructure program for the installation and maintenance of projects and existing public resources, such as the parks system and other open spaces.	18	EN/PW	NO
CIRCULAR AND GREEN ECONOMY				
STRATEGY GE-1. FOSTER GREEN AND SUSTAINABLE ECONOMIC DEVELOPMENT OPPORTUNITIES				
Measure GE-1.1: Support and attract clean technology businesses and jobs in Milpitas.	Action GE-1.1.1: Partner with local and regional agencies and educational institutions to offer courses/training that prepare students/workers for green jobs, such as the Milpitas Adult School Program, South Bay Consortium for Adult Education, Center for Employment Training in San Jose and PG&E's on-demand energy trainings.	18	ED	YES

Notes: BAAQMD = Bay Area Air Quality Management District; BART = Bay Area Rapid Transit; BAWSCA = Bay Area Water Supply and Conservation Agency; BSH = Building Safety and Housing Department; CALGreen = California Green Building Standards; CMO = City Manager's Office; ED = Economic Development Department; EN = Engineering Department; EV = electric vehicle; FTE = Full-time equivalent; PG&E = Pacific Gas & Electric; PL = Planning Department; PW = Public Works Department; Valley Water = Santa Clara Valley Water District; SVCE = Silicon Valley Clean Energy; VTA = Santa Clara Valley Transportation Authority.

Municipal Operations Actions

Municipal operations actions were not evaluated using the prioritization matrix. Action development for municipal operations relied heavily on existing and planned policies, programs, and other initiatives, as well as recommendations from previous efforts to identify GHG reduction opportunities. Therefore, the actions presented below only identify the suggested timing of implementation. Timing of implementation was assigned to each action using a scale of immediate, near-term, or mid-term. This rating was determined based on the magnitude of GHG emissions reductions associated with the action, the amount of time and effort required for the action to be operational, and the presence or absence of existing traction or support for each action.

Measure	Action	Timing	Implementing Department	Prioritized for Implementation in First 18 months?
EMPLOYEE COMMUTE				
STRATEGY MEC-1. SUSTAINABLE EMPLOYEE COMMUTES				
Measure MEC-1.1: Reduce employee commute VMT and support low-carbon alternatives.	Action MEC-1.1.1: Provide preferential parking, EV charging, and/or other benefits for City employee carpool and EVs and alternative fuel vehicles at City facilities.	Near-term	PW	NO
	Action MEC-1.1.2: Provide secure bicycle parking, showers, lockers and other amenities at City facilities.	Near-Term	PW	NO
	Action MEC-1.1.3: Expand and improve existing incentives for City employees to choose alternatives to single-occupant auto commuting, such as flexible work schedules, telecommuting, transit incentives and subsidies, and ridesharing and carpooling services and subsidies.	Immediate	CMO/HR	NO

Measure	Action	Timing	Implementing Department	Prioritized for Implementation in First 18 months?
VEHICLE FLEET				
STRATEGY MVF-1. ZERO- AND LOW-EMISSION FLEET VEHICLES AND EQUIPMENT				
Measure MVF-1.1: Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel.	Action MVF-1.1.1: Install EV charging and alternative fuel stations at appropriate sites throughout the city, including the Senior Center, Sports Center, City Hall, and Public Works, to service the fleet's alternative fuel vehicles.	Mid-term	PW	YES
	Action MVF-1.1.2: Where practical, utilize bicycles and low- or zero-emissions vehicles for City employees traveling between facilities and for park maintenance and operations (e.g., electric golf carts).	Immediate	PW	NO
	Action MVF-1.1.3: Update the City's Green Fleet Policy to convert the City's non-specialized fleet to all electric and identify alternative fuel options for other vehicles and equipment.	Mid-term	PW	YES
BUILDINGS AND PUBLIC LIGHTING				
STRATEGY MBL-1. CLEAN ENERGY				
Measure MBL-1.1: Continue to use SVCE-supplied 100 percent renewable electricity.	Action MBL-1.1.1: Continue to participate in SVCE whereby City-owned facilities, parks, and streetlights will be supplied by renewable electricity.	Immediate	PW	NO
Measure MBL-1.2: Transition to 100 percent clean energy for municipal operations.	Action MBL-1.2.1: Implement solar photovoltaic installations at the Senior Center; Community Center; Sports Center. Pursue funding to expand to Public Works Administration Building/Corp Yard and Police Department, and other City facilities such as fire stations. .	Immediate to Mid-term	PW	YES

Measure	Action	Timing	Implementing Department	Prioritized for Implementation in First 18 months?
	Action MBL-1.2.2: Install battery electric storage microgrid systems at Senior Center and Community Center. Pursue funding to expand to Public Works Administration Building/Corp Yard and Police Department, and other City facilities such as fire stations. .	Immediate to Mid-term	PW	YES
STRATEGY MBL-2. ENERGY EFFICIENCY AND CONSERVATION				
Measure MBL-2.1: Reduce lighting-related energy consumption.	Action MBL-2.1.1: Retrofit all municipal facility lighting with LEDs (or other high-efficacy lighting where LEDs are infeasible) by 2025.	Near-term	PW	NO
	Action MBL-2.1.2: Require all new municipal facility lighting to be LEDs (or other high-efficacy lighting where LEDs are infeasible).	Immediate	PW	NO
	Action MBL-2.1.4: Retrofit all City-owned streetlights to LEDs.	Near-term	PW	NO
	Action MBL-2.1.5: Retrofit lighting at City sports facilities and parks with LEDs.	Near-term	PW	NO
Measure MBL-2.2: Increase energy efficiency.	Action MBL-2.2.2: Replace outdated electricity transformers with new, high-efficiency models at the Sports Center, Police Department, Public Works, and City Hall.	Mid-term	PW	NO
	Action MBL-2.2.3: Replace current Energy Management Systems at municipal buildings with Automated Logic building management/automation systems.	Near-term	PW	NO
	Action MBL-2.2.4: Replace outdated HVAC equipment at municipal facilities.	Mid-Term	PW	NO

Measure	Action	Timing	Implementing Department	Prioritized for Implementation in First 18 months?
Measure MBL-2.3: Implement conservation best practices to reduce energy use.	Action MBL-2.3.1: Develop and enforce energy conservation guidelines for municipal employees to implement at facilities and in day-to-day operations.	Near-term	PW	NO
STRATEGY MBL-3. ELECTRIFICATION				
Measure MBL-3.1: Transition municipal buildings and facilities to be all-electric.	Action MBL-3.1.1: Require new municipal development to be all-electric by 2030.	Mid-term	PW	NO
	Action MBL-3.1.2: Inventory and develop strategy to retrofit existing municipal buildings and facilities to be all-electric by 2045.	Mid-term	PW	YES
	Action MBL-3.1.3: Eliminate fossil-fuel powered backup generator usage by 2040 and replace with zero-emission alternatives to ensure energy resilience at municipal facilities.	Mid-term	PW	NO
SOLID WASTE				
STRATEGY MSW-1. ZERO WASTE				
Measure MSW-1.1: Increase waste diversion and achieve zero waste by 2030.	Action MSW-1.1.1: Increase the amount of recycling and organics diversion/composting at City facilities to achieve a 95 percent diversion rate by 2030.	Near-term	PW	NO
	Action MSW-1.1.2: Require 75 percent of construction and demolition debris to be recycled and reused from municipal projects by 2030.	Mid-term	PW	NO
	Action MSW-1.1.3: Require that contractors use best management practices to maximize diversion of waste from the landfill by including a provision in requests for services and City agreements.	Immediate	PL	NO

Measure	Action	Timing	Implementing Department	Prioritized for Implementation in First 18 months?
STRATEGY MSW-2. RESPONSIBLE CONSUMPTION				
Measure MSW-2.1: Implement an environmentally preferable purchasing policy.	Action MSW-2.1.1: Use resource-efficient landscaping techniques in new or renovated medians and parks.	Immediate	PW	YES
	Action MSW-2.1.2: Continue to increase the percentage of recycled content in purchases made through City purchasing policies and other efforts, such as 100 percent recycled content paper, other office supplies, and transportation supplies.	Near-term	FD	NO
	Action MSW-2.1.3: Enhance and expand waste reduction policies and programs for City facilities, such as the environmentally preferable purchasing policy.	Near-term	ED	NO
WATER				
STRATEGY MWA-1. WATER EFFICIENCY AND CONSERVATION				
Measure MWA-1.1: Reduce municipal water consumption.	Action MWA-1.1.1: Implement the water fixture and water meter upgrades	Near-term	PW	YES
	Action MWA-1.1.2: Develop and implement a "water neutrality program" that requires new municipal development not increase the City's total municipal water demand.	Mid-term	PW	NO
	Action MWA-1.1.3: Ensure that all of the City's irrigation systems in parks and other spaces are controlled by computer systems that tie watering cycles to soil moisture.	Near-Term	PW	NO

Notes: CMO = City Manager's Office; ED = Economic Development Department; EV = electric vehicle; FD = Finance Department; FTE = Full-time equivalent; HVAC = heating, ventilation, and air conditioning; LED = light-emitting diode; PL = Planning Department; PW = Public Works Department

Adaptation Prioritization Matrix

Based on the assessment approach described above, the maximum prioritization score for each adaptation action was 29. To enable the City to focus on and feasibly implement high-priority actions, a minimum score of 18 was chosen as the threshold for the inclusion of an action in the CAP Update. The 23 actions with prioritization scores equal to or greater than 18 are included in the summarized prioritization matrix below, which presents each action's overall prioritization score, the City department responsible for implementation, and the need for additional staffing in FTE, which is based on the criteria above as well as additional considerations such as community values and priorities that may not be reflected elsewhere. Many of the adaptation actions in the CAP Update are consistent with other City and regional planning documents including the General Plan 2040, the 2020 Local Hazard Mitigation Plan Update, the 2013 CAP, and Silicon Valley 2.0.

Measure	Action	Prioritization Score	Implementing Department
STRATEGY 1: RESILIENT COMMUNITIES, EQUITY, AND ENVIRONMENTAL JUSTICE			
Measure 1.7: Ensure that climate impacts and climate adaptation measures aimed at reducing climate risks do not lead to disproportionately adverse effects on vulnerable populations.	Action 1.7.3: Support health care facilities and services that assist underserved populations, including minorities, disabled persons, and the homeless community.	18	CMO, RCS, OEM
	Action 1.7.5: Continue to promote public safety through public education programs, and ensure programs are available and accessible to all segments of the community.	19	CMO, RCS, OEM
STRATEGY 2: RESILIENT TRANSPORTATION SYSTEM AND RESILIENT ENERGY RESOURCES			
Measure 2.1: Integrate climate change considerations in all transportation planning and decision-making processes.	Action 2.1.1: Update maintenance protocols to incorporate projected climate change effects and evaluate the potential for increased frequency or need to maintain transportation infrastructure, specifically from extreme heat and increased frequency of flooding events.	18	EN, PL

Measure	Action	Prioritization Score	Implementing Department
STRATEGY 3: REDUCED FLOODING			
Measure 3.1: Minimize risks to life and property resulting from flooding and flood induced hazards.	Action 3.1.2: Continue to maintain good standing and compliance under the National Flood Insurance Program (NFIP). This will be accomplished through the implementation of floodplain management programs that will, at a minimum, meet the requirements of NFIP: • Enforcement of the flood damage prevention ordinance. • Participate in the floodplain identification and mapping updates. • Provide public assistance/information on floodplain requirements and impacts.	20	EN
	Action 3.1.3: Evaluate and consider increasing the design criteria for current and future flood protection projects from 100-year flood events to higher impact flood events.	19	PW
	Action 3.1.4: Evaluate the need to increase pump station capacity and provide protection for pump stations.	18	PW
Measure 3.2: Evaluate proposed development in areas of the City subject to flooding impacts caused by rising sea levels.	Action 3.2.1: Require evaluation of projected inundation for development projects near San Francisco Bay or at flooding risk from local waterways which discharge to San Francisco Bay.	19	PW
STRATEGY 4: ROBUST EMERGENCY SERVICES AND IMPROVED DISASTER RECOVERY			
Measure 4.1: Ensure that emergency services have adequate capacity to address increased demand due to climate change-related impacts.	Action 4.1.3: Establish resilience hub locations in neighborhoods throughout the community, equipped with backup power and disaster assistance and supplies.	18	OEM/PW/RCS
	Action 4.1.5: Continue to maintain the City's Emergency Operations Center and conduct regular staff training exercises to ensure that all City staff members, in addition to emergency responders, are adequately trained to fulfill their duties in the event of an emergency.	18	OEM

Measure	Action	Prioritization Score	Implementing Department
	Action 4.1.7: Clearly communicate to the public the City's plans, procedures, and responsibilities in the event of a disaster or emergency. Communications and information made available to the public shall be provided in multiple languages to ensure the greatest number of community members have access to this information.	19	OEM, CMO
	Action 4.1.9: Develop Disaster Documentation Program to include tracking disasters affecting Milpitas and tracking via photos damage incurred during and after disaster events. This data can be used for tracking and trending, and ultimately mitigation planning.	19	OEM
STRATEGY TR-5: REDUCED URBAN HEAT ISLAND EFFECT AND RESILIENT WATER RESOURCES			
Measure 5.1: Reduce urban heat island effect through cool roofs, parking lot shading, landscaping, and urban greening in new and existing private and public development.	Action 5.1.1: Amend the Zoning Code to create tree planting standards for new and renovated development, to require the planting of two trees in single-family development in the front, side, or rear yard as feasible, and to create lineal landscaping standards for commercial development that identify a minimum number of tree plantings based on lineal frontage length.	18	PL
	Action 5.1.2: Encourage the inclusion of additional shade trees, vegetated stormwater treatment and landscaping to reduce the "heat island effect" in development projects.	20	PL/EN
	Action 5.1.5: Reduce heat gain from surface parking lots in new development for a minimum of 50 percent of the site's hardscape. Develop standards to provide shade from the existing tree canopy or from appropriately selected new trees that complement site characteristics and maximize drought tolerance. Where feasible, use open-grid pavement systems (at least 50 percent pervious, which would also satisfy the stormwater Low Impact Development requirement).	18	PL
STRATEGY 6: INTEGRATED RESILIENCY PLANNING AND IMPROVED BIODIVERSITY AND HABITAT			
Measure 6.1: Embed climate resiliency and adaptation across planning efforts.	Action 6.1.1: Integrate climate resiliency throughout long-term planning and current development projects.	21	PL
	Action 6.1.2: Participate in regional climate adaptation planning efforts.	20	PW

Measure	Action	Prioritization Score	Implementing Department
Measure 6.2: Integrate findings of climate vulnerability into all phases of emergency planning.	Action 6.2.1: Ensure that emergency response plans and training programs continue to evolve and are modified to incorporate future climate projections in order to protect residents, infrastructure, and facilities during emergencies and extreme weather events.	20	OEM
Measure 6.3: Prioritize nature-based solutions to improve resilience while promoting biodiversity.	Action 6.3.1: Continue the City's Tree Maintenance Program.	20	PW
	Action 6.3.4: Conserve existing native trees and vegetation where possible and integrate regionally native trees and plant species into development and infrastructure projects where appropriate.	20	PW
	Action 6.3.5: Work with Valley Water to restrict future fencing, piping and channelization of creeks when flood control and public safety can be achieved through measures that preserve the natural environmental and habitat of riparian corridors; in addition, evaluate opportunities to revert some existing concrete-lined channels to more natural alternatives such as levees.	18	EN, PW
	Action 6.3.6: Collaborate with Valley Water to support the priorities and projects of the Safe, Clean Water and Natural Flood Protection Program. Pursue grant funding opportunities from the District to provide funding for water conservation, habitat restoration, and open space projects that increase community resiliency, while improving water quality and increasing flood safety throughout the community.	19	EN, PW
	Action 6.3.7: Continue to collaborate with Valley Water and pursue grant funding from the district to support the priorities and projects of the Safe, Clean Water and Natural Flood Protection Program.	19	EN, PW
	Action 6.3.8: Encourage and accommodate multipurpose flood control projects that incorporate recreation, education, resource conservation, preservation of natural riparian habitat, and the scenic value of drainages, creeks, and detention ponds.	18	EN

Notes: CMO = City Manager's Office; ED = Economic Development Department; EN = Engineering Department; EV = electric vehicle; FTE = Full-time equivalent; OEM = Office of Emergency Management; PL = Planning Department; PW = Public Works Department; RCS = Recreation and Community Services Department.

California Environmental Quality Act and CAP Update

Implementation of the CAP Update will require that new development is constructed with more sustainable and low-carbon features than existing development. New development projects that are consistent with the growth projections and applicable GHG reduction measures in the CAP Update are eligible for California Environmental Quality Act (CEQA) streamlining, per the provisions of State CEQA Guidelines Section 15183.5. Under these provisions, a project that is subject to discretionary review and is consistent with the City's General Plan 2040 growth projections can show consistency with applicable GHG reduction measures in the CAP Update, and the level of analysis for the project required under CEQA can be streamlined. Furthermore, a project's incremental contribution to cumulative GHG emissions may be determined not to be cumulatively considerable in such cases.

The "qualified" CAP Update will allow project-specific environmental documents, if eligible, to tier from and/or incorporate by reference the CAP Update's programmatic review of GHG impacts in their cumulative impact analyses. The CAP Update meets the requirements under Section 15183.5 of the State CEQA Guidelines as a qualified plan for the reduction of GHG emissions for use in cumulative impact analysis pertaining to new development projects. Details on how projects can demonstrate consistency with the CAP Update are provided in Appendix D, the guidelines and consistency review checklist.

The consistency review checklist is the mechanism that is used to demonstrate consistency with the CAP Update and contains GHG reduction measures applicable to development projects that are required to be implemented on a project-by-project basis to ensure that the specified emissions targets identified in the CAP Update are achieved. New development projects will need to incorporate all applicable CAP Update measures to demonstrate consistency with the CAP Update. These measures will be enforced as conditions of approval for ensuring that compliance can be confirmed before the project can be implemented.

Monitoring and Updates

The City will begin implementing CAP Update measures and actions upon adoption, and data tracking will begin in the year following. As measures are implemented, the effects on emissions trends and climate resilience in the city will necessitate CAP Update maintenance and updates to ensure relevancy and effectiveness. Therefore, City staff will need to evaluate and monitor CAP Update performance over time and alter or amend the plan if it is not achieving the desired outcomes. This will include conducting periodic GHG emissions inventories and vulnerability assessment updates, as well as analyzing individual action performance.

City staff will evaluate the performance of each GHG reduction action that has been implemented. This entails monitoring the level of community participation, costs, benefits, effectiveness, and barriers to implementation, as well as actual reductions in activities that result in GHG emissions. In addition to considering these factors, assessing the performance of CAP Update adaptation actions will be informed by resilience-related improvements in the community. By evaluating whether the implementation of an action is on track to achieve its objective, the City can identify successful actions and reevaluate or replace underperforming measures.

City staff will prepare a monitoring report annually and a GHG emissions inventory and vulnerability assessment update every two to three years. This report will provide updates on CAP Update progress, including the status of actions implemented to achieve GHG reductions and improve resilience as well as other important milestones in the CAP Update implementation process. As technologies and markets change and the City implements the actions in the CAP Update, these reports will be used to track progress and identify actions that need to be improved, adjusted, or removed. The report will also be used for periodic presentations to the City Council and Energy and Environmental Sustainability Commission about implementation progress on actions and overall progress towards CAP Update objectives. The report would also serve to provide transparency and promote engagement with the public for CAP Update implementation. The report will be derived from the online dashboard that the City has developed and monitoring and progress updates will be available through the tracking metrics included on the dashboard.

Finally, the City will prepare an update to the plan every five years, beginning in 2026. Updates would reflect the findings and recommendations of the monitoring reports and inventory updates. Future updates are necessary to account for any new State or federal legislation that may affect the CAP Update, and to focus on GHG reduction measures and actions that may have been difficult to implement previously due to a lack of available technologies or high upfront implementation costs.

Ongoing Engagement

Continued engagement with and active participation by the community is critical for successful implementation of the CAP Update. As the City implements and monitors CAP Update measures, involvement with residents and businesses, community organizations, developers, property owners, and other local, regional, and State agencies will ultimately guide the City's measure implementation and promote achievement of CAP Update objectives. While a handful of mitigation strategies will be led solely by the City, many measures will require partnerships and collaboration.

Effective and long-term climate action and resilience building in the community depends on efforts that continue to change the way individuals interact with the environment. Numerous measures require participation from residents and visitors to fully implement, and the City is committed to continuing its outreach efforts through CAP Update implementation, monitoring, and future plan updates. Many of the measures in **Chapter 3** and **Chapter 4** are focused on increasing community awareness and participation in existing programs and connecting the community with new information, tools, funding, or resources.

Vulnerable populations typically experience disproportionate impacts of climate change relative to the rest of the community. Following CAP Update adoption, addressing some of these climate inequities in the form of more prominent engagement with vulnerable communities will be of utmost priority. The City is committed to overcoming the barriers of engagement with frontline communities, such as lack of access to technology and language barriers, to ensure a more equitable implementation process.

In addition, the City is maintaining a CAP Update Dashboard which features an online way for residents and businesses to continue to engage with the CAP Update, monitor progress by the City, and provide a direct line of communication between City staff and residents and businesses. As part of this CAP Update, the City is preparing an education toolkit which provides additional resources for encouraging more sustainable practices in homes and businesses.

Funding Sources

The City will incur costs to implement some of the measures included in the CAP Update. These include initial start-up, ongoing administration, staffing, and enforcement costs. While some measures will only require funding from the City and other public entities, others would result in costs impacts for businesses, developers, and residents. However, implementation of CAP Update measures will result in substantial cost-savings for the City, residents, and business owners in the long term. The City will be proactive in seeking cost-effective implementation and strategic funding opportunities and developing partnerships to lessen the burden of implementation costs.

Capital improvement, investment, and increased operation and maintenance costs will be required for successful CAP Update implementation. Funding options are available from a variety of sources, including the City funds, local utilities, and regional and State agencies. The City will continuously monitor private and public funding sources for new grant and rebate opportunities. A preliminary summary of available funding and financing options is presented in Table 6-1.

The funding sources and programs listed below are subject to change. Aside from seeking the listed funding sources, the City should continue to search for new funding sources through the State’s [Climate Change Funding Wizard](#) website, which provides the most up-to-date information on funding opportunities for projects related to climate change mitigation and adaptation.

Table 6-1 Funding Opportunities for Implementation	
Residential and Nonresidential Energy	
PG&E and SVCE Rebates and Incentives Program	PG&E and SVCE, the two main energy providers in the county, offer a variety of energy efficiency programs such as free energy audits designed to help residential and nonresidential customers save energy and money.
Energy Upgrade CA	Energy Upgrade California is a statewide initiative to improve energy efficiency, use renewable energy resources, and reduce demand on the electrical grid through incentives available for residents and businesses.
California Energy Commission 1 Percent Interest Rate Loans	The California Energy Commission offers 1 percent loans for local jurisdictions to conduct projects with proven energy savings at municipal facilities.

Table 6-1 Funding Opportunities for Implementation

Residential and Nonresidential Energy	
California Lending for Energy and Environmental Needs Center	This funding source, as a program of California Infrastructure and Economic Development Bank, provides direct public financing to municipalities, universities, schools, and hospitals to help meet the State's goals for GHG reductions, water conservation, and environmental preservation.
GRID Alternatives	GRID Alternatives is a nonprofit organization that provides no-cost solar installations to low-income residents and provides assistance for communities in developing multifamily and community-scale solar installations. The organization also provides hands-on job training for volunteers interested in employment in the solar industry.
Low-Income Weatherization Program	Administered by the California Department of Community Services and Development, the Low-Income Weatherization Program provides low-income households with solar photovoltaic (PV) systems and energy efficiency upgrades at no cost to residents. The program is designed with the primary goal of reducing GHG emissions by saving energy and generating clean renewable energy while reducing energy costs for low-income single-family households and multi-family affordable housing.
Transportation and Land Use	
Federal Infrastructure Investment and Jobs Act	The U.S. Department of Transportation announced the availability of nearly \$3 billion in competitive grant funding for surface transportation projects that were included in the infrastructure law. The grants can fund projects too large or complex for traditional funding programs like multijurisdictional and multimodal projects. The grants can also fund freight infrastructure.
National Electric Vehicle Infrastructure Program	The U.S. Department of Transportation and U.S. Department of Energy unveiled a new National Electric Vehicle Infrastructure formula program that was included in the Infrastructure Investment and Jobs Act. The program includes \$4.6 billion in grants to fund EV infrastructure.
RAISE Grants	The U.S. Department of Transportation is offering \$1.5 billion in grant funding through the Rebuilding American Infrastructure with Sustainability and Equity discretionary grant program. The program uses a merit-based process to select projects that will build and repair critical pieces of freight and passenger transportation networks.
Caltrans Active Transportation Planning Program	This program provides competitive planning grants for jurisdictions working on planning projects to increase the proportion of trips accomplished by biking and walking and reduce community-wide vehicle miles traveled.
Caltrans Transportation Planning Grant Program	The Transportation Planning Grant Program provides competitive planning grants to help local jurisdictions in a variety of transportation planning efforts including development and implementation of regional transportation plans. The program also helps address multimodal transportation deficiencies with a focus on transit and support planning actions that advance climate adaptation efforts for local transportation systems.

Table 6-1 Funding Opportunities for Implementation

Transportation and Land Use	
California Clean Vehicle Rebate Project	This CARB program provides rebates of up to \$7,000 for the purchase or lease of a new, eligible zero-emission or plug-in hybrid light-duty vehicle.
PG&E California Clean Fuel Reward Program and Empower EV Program	Through PG&E's participation in the California Clean Fuel Reward Program, customers can receive an upfront incentive worth up to \$1,500 on new EV purchases or leases. PG&E also offers incentives of up to \$2,500 per income-eligible single-family household to help cover the cost of purchasing and installing EV charging equipment through the Empower EV Program.
Transportation and Land Use	
Affordable Housing and Sustainable Communities Program	This program, administered by the California Department of Housing and Community Development, funds land use, housing, transportation, and land preservation projects that support infill and compact development and reduce GHG emissions. Funds are available in the form of loans and/or grants in two kinds of project areas: Transit-Oriented Development Project Areas and Integrated Connectivity Project Areas.
SB 2 Planning Grant Program	This planning grant program provides financial and technical assistance to local governments to update planning documents and zoning ordinances, including general plans, community plans, specific plans, sustainable communities strategies, and local coastal programs, to streamline housing production. The program does not use a competitive process to award funds. All localities that meet the eligibility requirements outlined in the grant application will be funded.
Strategic Growth Council Affordable Housing and Sustainable Communities Program	This program makes it easier for Californians to drive less by making sure housing, jobs, and key destinations are accessible by walking, biking, and transit. Program funding can be used for affordable housing development, sustainable transportation infrastructure and related amenities that reduce vehicle miles traveled, and programs to encourage an increase in modes of active transportation.
Urban Greening Program	Urban Greening Program will fund projects that reduce greenhouse gases by sequestering carbon, decreasing energy consumption, and reducing vehicle miles traveled, while also transforming the built environment into places that are more sustainable, enjoyable, and effective in creating healthy and vibrant communities. These projects will establish and enhance parks and open space, using natural solutions to improve air and water quality, reduce energy consumption, and create more walkable and bike-able trails.

Table 6-1 Funding Opportunities for Implementation

Transportation and Land Use	
Volkswagen (VW) Environmental Mitigation Trust	The VW Environmental Mitigation Trust provides about \$423 million for California to mitigate the excess nitrogen oxide emissions caused by VW's use of illegal emissions testing defeat devices in certain VW diesel vehicles. The trust provides funding opportunities for specified eligible actions that are focused mostly on "scrap and replace" projects for the heavy-duty sector, including on-road freight trucks, transit and shuttle buses, school buses, forklifts and port cargo handling equipment, commercial marine vessels, and freight switcher locomotives.
Solid Waste	
CalRecycle Food Waste Prevention and Rescue Grant Program	The purpose of this competitive grant program is to reduce overall GHG emissions by establishing new or expanding existing food waste prevention projects (source reduction or food rescue for people) in California to reduce the amount of food being disposed of in landfills.
CalRecycle Local Enforcement Agency Grant Program	CalRecycle administers a non-competitive grant program to assist local enforcement agencies with their solid waste facilities permit and inspection program.
General Funding and Staff Capacity	
CivicSpark Program	The CivicSpark Program supports sustainability-focused research, planning, and implementation projects throughout California by providing public agencies and other organizations with high-quality capacity-building support. This 11-month AmeriCorps program employs highly motivated emerging sustainability professionals.
General Funding and Staff Capacity	
California Climate Investments	California Climate Investments is a statewide initiative that provides funds from the state's cap-and-trade program for projects and programs that work to reduce GHG emissions in the state. Funds from California Climate Investments can go to support a variety of projects, including affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, sustainable agriculture, and recycling. Numerous state programs already itemized above are funded by California Climate Investments; however, the program continues to evolve and is updated by the state periodically to include new or modified programs.
Local Early Action Planning (LEAP) Grants	LEAP provides one-time grant funding to cities and counties to update their planning documents and implement process improvements that will facilitate the acceleration of housing production and help local governments prepare for their 6th cycle Regional Housing Needs Assessment, much like the SB 2 Planning Grants.

Table 6-1 Funding Opportunities for Implementation	
General Funding and Staff Capacity	
Regional Early Action Planning (REAP)	REAP allows councils of governments and other regional entities to collaborate on projects that have a broader regional impact on housing. Grant funding is intended to help regional entities and governments facilitate local housing production that will assist local governments in meeting their Regional Housing Need Allocation.
Sustainable Transportation Equity Project (STEP)	STEP is a new transportation equity pilot that aims to address community residents’ transportation needs, increase access to key destinations, and reduce greenhouse gas emissions by funding planning, clean transportation, and supporting projects. STEP’s overarching purpose is to increase transportation equity in disadvantaged and low-income communities throughout California via two types of grants: Planning and Capacity Building Grants and Implementation Grants. Within these two grant types, CARB currently has up to \$22 million available.

Source: Compiled by Ascent Environmental in 2021.

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Chapter 6

There are no references used in this chapter.



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Summary of Comment	Submitted by	Response
It seems that one of the major sources of emissions in Milpitas is on-road transportation. I'd like to seek stronger action on that sector. For example, by 2030 transition to all electric public transit and significantly reduce or even ban the sale of gasoline vehicles in Milpitas.	M. Goon	This comment represents an opinion and does not suggest revisions to the CAP Update; no revisions were made. Also, note that the City has does not own or operate public transit.
Accelerate the interim target of 79% reduction (below 2019 levels) to be achieved by 2035 This updated target would more closely align with the greenhouse gas reduction targets of other recently adopted Climate Action Plans, such as those in San Jose and Menlo Park, which have carbon-neutral-by-2030 targets. Palo Alto has an 80% GHG reduction-by-2030 target. Santa Clara has an interim target of 80% reduction by 2035, and Cupertino is considering a similar 80x35 target in their draft Climate Action Plan. As more jurisdictions adopt similar targets, work together and shift the marketplace, the opportunities for rapid emissions reductions will increase.	Sierra Club Loma Prieta Chapter	The City seeks to adopt a CEQA-qualified CAP that follows BAAQMD guidance. As such, the City's targets are based on the city's fair share of GHG emissions reduction consistent with SB 32. Many jurisdictions opting to have more aggressive targets in their CAPs are not CEQA-qualified CAPs because they cannot demonstrate with substantial evidence that these targets would be met with the actions identified in the plans. The objective of this CAP Update is to establish and elevate Milpitas community support for climate action. It is unclear with current technology and funding opportunities how such aggressive goals and targets would be achieved. Therefore, the City is not altering the 2030 GHG reduction target and no revisions were made to the CAP Update at this time. This will be reviewed during implementation and monitoring and future update cycles. .
Accelerate goals to fully decarbonize existing buildings (BE 2.4) a. non-residential buildings by 2035 b. all residential buildings by 2040 c. All municipal buildings by 2035 These updated existing building targets align with the targets set in jurisdictions such as Menlo Park, San Jose and San Mateo, and would establish Milpitas as a climate leader in the field of building electrification.	Sierra Club Loma Prieta Chapter	While these suggestions for accelerating goals are commendable, the project team has established actions and strategies that support the needed reductions to meet the City's 2030 GHG reduction target and establish and elevate Milpitas community support and buy-in for future aggressive targets and goals. No revisions to the CAP Update were made based on this comment at this time.
Establish an end of flow date by 20401	Sierra Club Loma Prieta Chapter	While these suggestions for accelerating goals are commendable, the project team has established actions and

We believe that Milpitas should adopt a date by which the flow of methane gas will cease as part of the Climate Action Plan. This date would align with the accelerated existing building targets in our suggestion #2. An end of flow date can be an important public symbol that communicates that gas is on the way out, allowing them to make informed decisions about their future appliance purchases.		strategies that support the needed reductions to meet the City's 2030 GHG reduction target and establish and elevate Milpitas community support and buy-in for future aggressive targets and goals. No revisions to the CAP Update were made based on this comment at this time.
Prepare for the end of sale of Internal Combustion Engine (ICE) cars by 2035 in accordance with California Executive Order N-79-20 a. For MVF-1, develop a city fleet electrification and charging infrastructure plan for specialized vehicles (many new electric options are becoming available). b. For BE 2.1.1 expand requirements for EV charging capability in multifamily new construction so every parking place includes at least Level 1 charging. c. Consider only zero emission vehicles for MVF-1. "Renewable diesel" has significant challenges and still emits CO2.	Sierra Club Loma Prieta Chapter	While these suggestions for accelerating goals are commendable, the project team has established actions and strategies that support the needed reductions to meet the City's 2030 GHG reduction target and establish and elevate Milpitas community support and buy-in for future aggressive targets and goals. No revisions to the CAP Update were made based on this comment at this time.
As part of BE 2.4.1 and 2.4.3, the comprehensive energy retrofit programs should include the following: a. Significant community education efforts. b. Permit streamlining. c. Anti-displacement ordinances.	Sierra Club Loma Prieta Chapter	The building retrofit programs will be developed as part of implementation of the CAP Update. The specifics of the program has not yet been determined. No revisions to the CAP Update were made based on this comment.
Add Dark Sky Policies to the municipal action to retrofit all municipal facility lighting with LEDs (or other high-efficacy lighting where LEDs are infeasible) by 2025 a. The City should establish internal light pollution standards (also known as dark sky standards), which include the following: i. all lighting shall have a correlated color temperature of 2700 Kelvin or less City-wide, ii. all lighting shall be angled downwards, no light trespass shall be allowed into adjacent properties, and no light shall be allowed to be angled towards the Bay or other natural areas,	Sierra Club Loma Prieta Chapter	No revisions to the CAP Update were made based on this comment. Consideration of these policy standards may be reviewed as part of the City's Zoning Ordinance update process.

and iii. timers, dimmers, and shades should be used in commercial buildings to ensure that lights are turned off when buildings are not in use, and nonessential lights should be turned off at 11pm. b. Using the above standards, Milpitas should create a standalone City-wide Dark Sky Ordinance which seeks to mitigate light pollution from newly installed fixtures and lighting retrofits.		
7. Add the following specific provisions to the All-Electric Reach Code (BE 2.1.1) a. Reach code requirements shall apply to all new building types including residential and commercial buildings. b. No new gas infrastructure (including both plumbing and appliances) shall be installed in new buildings. The ordinance should exist as a standalone municipal code existing outside of the Title 24 building code 3-year cycle update. This would technically be a San Jose style natural gas prohibition ordinance, and not a “reach code”.	Sierra Club Loma Prieta Chapter	The reach code will be developed as part of implementation of the CAP Update. The specifics of the reach code have not yet been determined. No revisions to the CAP Update were made based on this comment as this will be considered as part of the Reach Code development process.
...Second, I strongly support the Climate Action Plan update and hope that it passes quickly and the City immediately starts on implementation with regular tracking to make sure all the items are completed. Third, while this is a great first step since it looks like it will meet the City’s 2030 goals, we see on Page ES-3 Figure ES-1 that it will not be sufficient beyond that, mainly because of the two largest sources of emissions in the City (fossil fuel burning transportation 62% and heating of buildings with methane ‘natural’ gas 25%). I urge you to NOT wait until the next CAP update to address this. This would be like waiting until you can see the iceberg to start turning the Titanic.	F. Mbuga	This comment represents an opinion and does not suggest revisions to the CAP; no revisions were made at this time. This may be considered with future updates.

Instead, I request you take the following actions: Announce the shutting down of flow of methane 'natural' gas to all commercial buildings by 2035 and all residential buildings by 2040. Zurich and Half Moon Bay have already done this. Announce the end of sales of fossil-fuel vehicles by 2030. Governor Newsom has mandates 2035 but seeing as Milpitas median household income is 75% higher than California's we should be leading on this. Other cities in the area will see this and follow our lead.		
Page ES-9: typo? in Measure 1.2 "... respond to a recover from" Perhaps it's meant to be "... respond to and recover from"	P. Sexton	This revision has been made to the CAP.
Page ES-10: terminology? Measure 2.5 "telecommunications" A more generic term for today is "communications"	P. Sexton	This is a minor terminology difference and therefore was not changed in the CAP as it does not affect the intent of the measure.
Page ES-12: comment - I hope we can find a non-GHG emitting fuel replacement for both renewable diesel and biodiesel in the near future. I understand that currently, renewable diesel is the lowest GHG replacement for regular diesel. I hope we don't have to rely on it for too many years...	P. Sexton	This comment represents an opinion and does not suggest revisions to the CAP; no revisions were made.
Page ES-13 MSW 1.1: comment - Zero waste by 2030 – yes please! MWA - is there anyway to add automatic shut off for accidental fire hydrant leaks and damage? These high-pressure, high-volume water outlets can waste so much water in the few minutes that it takes to respond to a broken fire hydrant. Is it possible to mix in recycled water (purple pipe) into the water supply to fire hydrants?	P. Sexton	No revisions to the CAP Update were made based on this comment. Staff recently received a grant to install pressure monitoring devices in key areas of the waste system as a leak detection tool (sudden, large drops in pressure can signal a large pipe break or other leaks).

Page ES-14 Muni-Ops Actions (MVF 1.1.1): EV charging stations - are these for public use? If so the cost should be at a reasonable rate, similar to the cost of charging at home. Perhaps vary the cost of charging by time of day and how many cars want to charge at that location (app based waiting line).	P. Sexton	Electric vehicle charging stations at City facilities would available for public use. Costs associated with charging have not been determined as part of the CAP Update. No revisions to the CAP Update were made based on this comment.
Page 1-12 Second paragraph from the bottom: “the second workshop was held on June 1, 2022...” did this workshop occur? I didn’t see any announcements for it.	P. Sexton	This workshop was not held and therefore this reference has been removed from the CAP.
Page 2-18 Table 2–8 source: ... “Prepared by UC Berkeley in 2015...” Based on previous text I think the year should be 2013.	P. Sexton	The UC Berkeley report used for the consumption-based inventory was released in 2015 using 2013 data. No revisions to the CAP Update were made based on this comment.
Page 2-15 through 2-17: In Table 2–7 the numerical values for “Fruits/Vegetables “ and “Other Foods “don’t match with the graphical representations for those categories in Figures 2–8 and 2–9.	P. Sexton	The project team did not find an error in the table or figures associated with this comment. No revisions to the CAP Update were made based on this comment.
Measure 5.1: Reduce urban heat island effect through cool roofs, parking lot shading, landscaping, and urban greening in new and existing private and public development. Add rooftop and parking lot solar panel installations (on any flat top space) to this measure to further reduce urban heat island effect:	L. Oliver	Onsite renewable energy installations (including rooftop solar) are included in the building energy strategies, measures, and actions of the CAP Update. This measure is focused on alternatives to energy generation such as cool roofs and green infrastructure. No revisions to the CAP Update were made based on this comment.
Please provide specific measures in the appendix for this statement on page 1-7: Since its adoption, over half of the GHG mitigation measures included in the CAP have been implemented, resulting in significant GHG emissions reductions.	L. Oliver	The Informational Memo to the Milpitas City Council regarding the implementation status of measures from the 2013 CAP including the support for this statement can provided upon request.
Page 1-9: To install solar on low-use and low-income residential units, I suggest partnering with SunWorks located in Milpitas. (https://sunwork.org/)	L. Oliver	This suggestion is noted. No revisions to the CAP Update were made based on this comment.

I suggest that the city count the number of EVs and gas-powered cars owned by residents and business owners and offer incentives to low-income residents.	L. Oliver	City staff work with local partners, such as Silicon Valley Clean Energy, and obtain electric vehicle registration data by zip codes which includes this type of data; no revisions were made.
Page 1-9: , GHG reduction and adaptation efforts will be tracked and monitored over time to ensure the City is making progress toward achieving its GHG reduction targets and climate resilience objectives. Reference where to find GHG monitoring plan. (Page 6-21 - City staff will prepare a monitoring report annually and a GHG emissions inventory and vulnerability assessment update every two to three years.) Explain how to rectify mitigation if GHG reduction goals are not met.	L. Oliver	There is no monitoring plan outside the implementation chapter (Chapter 6 of the CAP Update). The monitoring report will be compiled annually and provided to the City Council. No revisions to the CAP Update were made based on this comment.
Page 4-12 Measure TR-1.1: Reduce VMT from new development in compliance with SB 743. These municipal actions seem out of place. MUNICIPAL ACTIONS n Require all new municipal development to be all electric by 2030. n Require all new municipal facility lighting to be LEDs (or other high-efficacy lighting where LEDs are infeasible).	L. Oliver	The commenter is correct that the municipal actions under Measure TR-1.1 were out of place. These have been removed because they are covered under the building energy section of the CAP.
Page 4-12 Action TR-1.2.1: Work with local employers to provide subsidies to employees for using transit or active transportation to commute to work, and encourage flexible work schedules (e.g., 9/80s and 4/10s) as well as telecommuting. Will VMT be measured for each employer? What are the carrots and sticks for employers to reduce VMT? Discounts, rewards programs, incentives generally don't work. How about a property tax surcharge or property tax rebate based on VMT?	L. Oliver	The specifics of transportation demand management programs have not yet been determined. No revisions to the CAP Update were made based on this comment.

Work to fix inefficiencies of the VTA light rail system. The light rail needs to be reimagined and re-engineered.		
Page 4-21. Measure SW-1.1: Eliminate the disposal of organic solid waste in landfills. 75% of waste is diverted from landfills citywide, including at municipal facilities by 2030 doesn't align with SB 1383 - 75% reduction by 2025.	L. Oliver	Waste diversion and organics diversion are addressed and evaluated differently. Waste diversion includes recycling as well as organics diversion, therefore the percentage is lower than the organics target. This is based on coordination with City departments and plans to comply with SB 1383. No revisions to the CAP Update were made based on this comment.
Page 4-21. Measure SW-1.2: Increase recycling and the diversion of other inorganic solid waste. I suggest partnering with GoodWill, CityTeam Ministries, Salvation Army and other nonprofits that collect donated materials to become leaders in recycling and reusing. Perhaps these places can be turned into recycling centers where inorganics can be dropped off. Incentivize tech to research ways to reuse materials.	L. Oliver	This suggestion is noted. No revisions to the CAP Update were made based on this comment.
Page 4-22 Action SW-1.3.2: Encourage local businesses to reduce the use of single-use, non-biodegradable products, and support the establishment of a regional ordinance that restricts and/or limits the use of these products by local businesses. Include a timeline to ban single-use plastics.	L. Oliver	The City will determine the timing for implementing this measure through coordination with appropriate City departments and neighboring jurisdictions. No revisions to the CAP Update were made based on this comment.
Page 4-22 Action SW-1.5.4 Promote redesign of products so that they do not require end of life disposal, but are incorporated back into useful products. The EU will require battery manufacturers to have a recycling plan in order to operate. Perhaps grocery and retailers should invest a part of their infrastructure for recycling.	L. Oliver	This comment represents an opinion and does not suggest revisions to the CAP; no revisions were made.
Page 4-28	L. Oliver	The City is working to accelerate lawn conversions consistent the City's Water Conservation Program and Water Shortage

Measure WA-1.2: Reduce water consumption for irrigation and landscaping. Add a timeline to convert existing commercial and residential lawns to drought tolerant landscaping. Add a measure to detect water leaks and to get them fixed within a short window.		Contingency Plan including cost sharing in Valley Water landscape rebate programs (and doubling the rebate amount for Milpitas residents). Additionally, the City instituted a new program that includes deploying smart water meters and an online monitoring portal to track water use and detect leaks. No revisions to the CAP Update were made based on this comment.
Page 4-36 Measure GE-1.2: Incentivize and promote green business practices. Perhaps for the future add a sustainability scorecard for businesses to meet in order to get a business license.	L. Oliver	This suggestion is noted. No revisions to the CAP Update were made based on this comment.
Page 5-4 Changes in Precipitation and Flooding The historic annual average (1961–1990) precipitation in the city has been 15.6 inches. As shown in Table 4-2, the total annual precipitation in the city is projected to be 17.6 inches by mid-century (2035–2064) and 17.7 inches by the late-century period (2065–2099) under the medium-emissions scenario Where is Table 4-2? Table 5-2 and discussion of data are confusing. The table is titled Changes in Average Annual Precipitation and Increases in Large Storm Events in Milpitas, but the data is not the change but the actual data. The table should include past and present annual precipitation measurements to show change to current and future.	L. Oliver	The commenter correctly pointed out that this reference should have been Table 5-2, which is revised in the CAP Update. Additionally, to make Tables 5-1 and 5-2 more understandable, the titles have been revised to remove “Changes in” to make and current temperature and precipitation were added to the tables, respectively.
Page 5-6 Particulate matter from wildfires will also hasten polar ice melting because the black soot absorbs solar radiation.	L. Oliver	This comment is noted. No revisions to the CAP Update were made based on this comment.
Page 5-27 Strategy 5. Reduced Urban Heat Island Effect and Resilient Water Resources	L. Oliver	This comment represents an opinion and does not suggest revisions to the CAP; no revisions were made.

My neighbor recently added a lot of hardscape cement in his yard and walkways. Education/ordinances are needed for landscape companies, cement companies, businesses and residents to prevent these kinds of installations.		
Page 6-22 Funding sources Will the city support a local carbon tax if a carbon price is not implemented either nationally or state-wide?	L. Oliver	While the suggestion to developing a carbon tax or carbon pricing in the city is a commendable strategy, the project team has established actions and strategies that support the needed reductions to meet the City's 2030 GHG reduction target and establish and elevate Milpitas community support and buy-in for future aggressive targets and goals. No revisions to the CAP were made based on this comment at this time.
Please define PPA on page 4-6.	L. Oliver	This revision has been made to the CAP.

Elaine Marshall

From: Mary Goon [REDACTED]
Sent: Friday, June 10, 2022 1:20 AM
To: Climate Action
Subject: Comments on City of Milpitas Climate Action Update

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

I'd like to thank the City Council members for putting attention on and prioritizing climate action.

It seems that one of the major sources of emissions in Milpitas is on-road transportation. I'd like to seek stronger action on that sector. For example, by 2030 transition to all electric public transit and significantly reduce or even ban the sale of gasoline vehicles in Milpitas.

Thank you.

Best regards.

Mary Goon

Elaine Marshall

From: Dashiell Leeds [REDACTED]
Sent: Friday, June 10, 2022 4:30 PM
To: Climate Action
Cc: James Eggers; Mike Ferreira; Gladwyn D'Souza; Kristel Wickham; Barbara Kelsey
Subject: SCLP comments on Milpitas Climate Action Plan
Attachments: 2022.06.10 SCLP letter to Milpitas re CAP.pdf

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Dear Milpitas City Staff,

The Sierra Club Loma Prieta Chapter strongly supports Milpitas' Climate Action Plan Update. Thank you to City Staff and Consultants for all of the work that went into this document. We are excited to see that Milpitas is poised to join the many Bay Area Cities, such as San Jose, Palo Alto, Cupertino, Half Moon Bay, Menlo Park and others, who are exploring plans to electrify existing buildings. We are also looking forward to the application of measure "CS 1.3: Increase the use of green infrastructure" to Milpitas' adaptation efforts.

Please read the attached letter for our full list of suggestions.

Sincerely,

Kristel Wickham
Co-Chair, Climate Action Leadership Team
Sierra Club Loma Prieta Chapter

Dashiell Leeds
Conservation Organizer
Sierra Club Loma Prieta Chapter



SIERRA CLUB

LOMA PRIETA CHAPTER

SAN MATEO, SANTA CLARA & SAN BENITO COUNTIES

June 10th, 2022
 City of Milpitas
 55 E Calaveras Blvd
 Milpitas, CA 95035

RE: Draft Climate Action Plan

Dear Milpitas City Staff,

The Sierra Club Loma Prieta Chapter strongly supports Milpitas' Climate Action Plan Update. Thank you to City Staff and Consultants for all of the work that went into this document. We are excited to see that Milpitas is poised to join the many Bay Area Cities, such as San Jose, Palo Alto, Cupertino, Half Moon Bay, Menlo Park and others, who are exploring plans to electrify existing buildings. We are also looking forward to the application of measure "CS 1.3: Increase the use of green infrastructure" to Milpitas' adaptation efforts.

Please consider the following suggestions listed below.

1. Accelerate the interim target of 79% reduction (below 2019 levels) to be achieved by 2035

This updated target would more closely align with the greenhouse gas reduction targets of other recently adopted Climate Action Plans, such as those in San Jose and Menlo Park, which have carbon-neutral-by-2030 targets. Palo Alto has an 80% GHG reduction-by-2030 target. Santa Clara has an interim target of 80% reduction by 2035, and Cupertino is considering a similar 80x35 target in their draft Climate Action Plan. As more jurisdictions adopt similar targets, work together and shift the marketplace, the opportunities for rapid emissions reductions will increase.

2. Accelerate goals to fully decarbonize existing buildings (BE 2.4)

- a. non-residential buildings by 2035**
- b. all residential buildings by 2040**
- c. All municipal buildings by 2035**

These updated existing building targets align with the targets set in jurisdictions such as Menlo Park, San Jose and San Mateo, and would establish Milpitas as a climate leader in the field of building electrification.

3. Establish an end of flow date by 2040

We believe that Milpitas should adopt a date by which the flow of methane gas will cease as part of the Climate Action Plan. This date would align with the accelerated existing building targets in our suggestion #2. An end of flow date can be an important public symbol that communicates that gas is on the way out, allowing them to make informed decisions about their future appliance purchases.

4. Prepare for the end of sale of Internal Combustion Engine (ICE) cars by 2035 in accordance with California Executive Order N-79-20

- a. For MVF-1, develop a city fleet electrification and charging infrastructure plan for specialized vehicles (many new electric options are becoming available).
- b. For BE 2.1.1 expand requirements for EV charging capability in multifamily new construction so every parking place includes at least Level 1 charging.
- c. Consider only zero emission vehicles for MVF-1. "Renewable diesel" has significant challenges and still emits CO₂.

5. As part of BE 2.4.1 and 2.4.3, the comprehensive energy retrofit programs should include the following:

- a. Significant community education efforts.
- b. Permit streamlining.
- c. Anti-displacement ordinances.

6. Add Dark Sky Policies to the municipal action to retrofit all municipal facility lighting with LEDs (or other high-efficacy lighting where LEDs are infeasible) by 2025

- a. The City should establish internal light pollution standards (also known as dark sky standards), which include the following:
 - i. all lighting shall have a correlated color temperature of 2700 Kelvin or less City-wide,
 - ii. all lighting shall be angled downwards, no light trespass shall be allowed into adjacent properties, and no light shall be allowed to be angled towards the Bay or other natural areas, and
 - iii. timers, dimmers, and shades should be used in commercial buildings to ensure that lights are turned off when buildings are not in use, and non-essential lights should be turned off at 11pm.
- b. Using the above standards, Milpitas should create a standalone City-wide Dark Sky Ordinance which seeks to mitigate light pollution from newly installed fixtures and lighting retrofits.

7. Add the following specific provisions to the All-Electric Reach Code (BE 2.1.1)

- a. Reach code requirements shall apply to all new building types including residential and commercial buildings.
- b. No new gas infrastructure (including both plumbing and appliances) shall be installed in new buildings

- c. The ordinance should exist as a standalone municipal code existing outside of the Title 24 building code 3-year cycle update. This would technically be a San Jose style natural gas prohibition ordinance, and not a “reach code”.

Thank you for reviewing our suggestions. We are available to answer questions and provide resources regarding any of our recommendations.

Sincerely,



Kristel Wickham
Co-Chair, Climate Action Leadership Team
Sierra Club Loma Prieta Chapter



Dashiell Leeds
Conservation Organizer
Sierra Club Loma Prieta Chapter

Elaine Marshall

From: Felix Mbuga [REDACTED]
Sent: Friday, June 10, 2022 9:32 PM
To: Climate Action
Cc: Elaine Marshall
Subject: Milpitas CAP Update Comment

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Dear members of the Milpitas City Council,

My name is Felix Mbuga and I am a resident of Milpitas.

I am writing regarding the draft of the Milpitas Climate Action Plan Update.

First, I'd like to thank all involved (you, city staff, etc) for making climate action a priority. In California, climate change is not 40 years from now. We're already seeing it NOW, being in the worst mega-drought in 1200 years and with the historic wildfires we've seen in the last 5 years.

It is our kids and grandkids who will pay the most though if we don't take decisive climate action, so I'm glad the City is taking action.

Second, I strongly support the Climate Action Plan update and hope that it passes quickly and the City immediately starts on implementation with regular tracking to make sure all the items are completed.

Third, while this is a great first step since it looks like it will meet the City's 2030 goals, we see on Page ES-3 Figure ES-1 that it will not be sufficient beyond that, mainly because of the two largest sources of emissions in the City (fossil fuel burning transportation 62% and heating of buildings with methane 'natural' gas 25%).

City of Milpitas Climate Action Plan Update

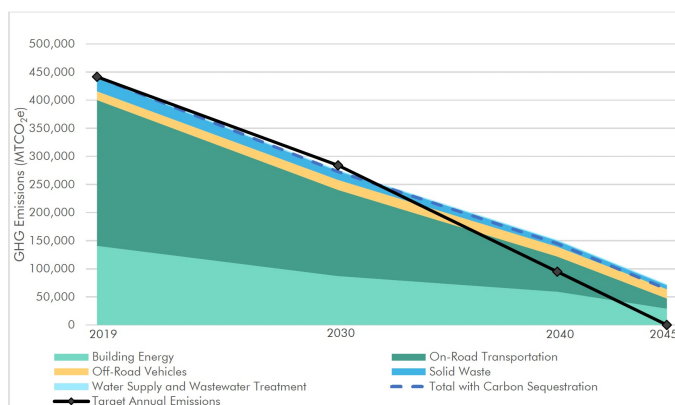
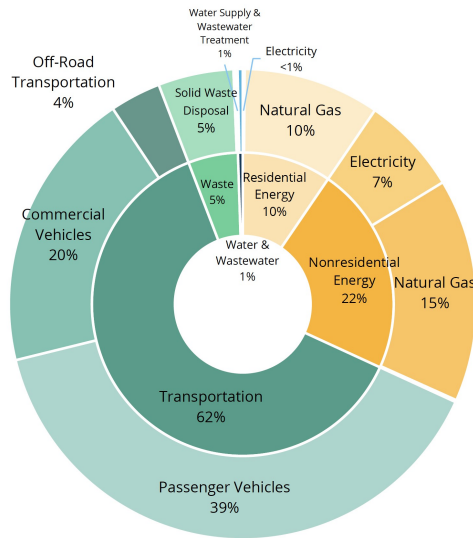


Figure ES-1 Milpitas Community Greenhouse Gas Emissions Reduction Measures Analysis

Source: Ascent Environmental 2021.

Milpitas Greenhouse Gas Emissions: 2019



I urge you to NOT wait until the next CAP update to address this. This would be like waiting until you can see the iceberg to start turning the Titanic.

Instead, I request you take the following actions:

1. Announce the shutting down of flow of methane 'natural' gas to all commercial buildings by 2035 and all residential buildings by 2040. Zurich and Half Moon Bay have already done this.
2. Announce the end of sales of fossil-fuel vehicles by 2030. Governor Newsom has mandates 2035 but seeing as Milpitas median household income is 75% higher than California's we should be leading on this. Other cities in the area will see this and follow our lead.

Doing this now instead of waiting for some future date or some future magic technology gives people sufficient time to prepare and is better than planning on technology that doesn't exist at the necessary scale to save future generations from the ravages of climate change. Since cars and methane gas account for ~90% of Milpitas emissions, these are impactful moves and combined with massive expansion of all-electric public transit and EV charging infrastructure, would get us well on the way to meeting our climate goals.

Thank you for your consideration.

Best regards,

Felix Mbuga

Milpitas, CA 95035

Elaine Marshall

From: Elaine Marshall
Sent: Saturday, June 11, 2022 6:09 AM
To: Climate Action
Subject: Fwd: Comments on Draft CAP Update

[REDACTED]

Begin forwarded message:

From: Patti Sexton [REDACTED]
Date: June 10, 2022 at 11:26:40 PM PDT
To: Elaine Marshall <[REDACTED]>
Subject: Comments on Draft CAP Update

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hi Elaine,

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Overall: Excellent! The CAP update is well-structured and contains the relevant information to fully explain the situation. It shows we have serious work to do to bridge the gap in order to meet the goals for 2045.

Detailed comments and questions:

Page ES-9: typo? in Measure 1.2 "... respond to a recover from"
 Perhaps it's meant to be "... respond to and recover from"

Page ES-10: terminology? Measure 2.5 "telecommunications"
 A more generic term for today is "communications"

Page ES-12: comment - I hope we can find a non-GHG emitting fuel replacement for both renewable diesel and biodiesel in the near future. I understand that currently, renewable diesel is the lowest GHG replacement for regular diesel. I hope we don't have to rely on it for too many years...

Page ES-13 MSW 1.1: comment - Zero waste by 2030 – yes please!
 MWA - is there anyway to add automatic shut off for accidental fire hydrant leaks and damage? These high-pressure, high-volume water outlets can waste so much water in the few minutes that it takes to respond to a broken fire hydrant. Is it possible to mix in recycled water (purple pipe) into the water

supply to fire hydrants?

Page ES-14 Muni-Ops Actions (MVF 1.1.1): EV charging stations - are these for public use? If so the cost should be at a reasonable rate, similar to the cost of charging at home. Perhaps vary the cost of charging by time of day and how many cars want to charge at that location (app based waiting line).

Page 1-12 Second paragraph from the bottom: "the second workshop was held on June 1, 2022..." did this workshop occur? I didn't see any announcements for it.

Page 2-18 Table 2-8 source: ... "Prepared by UC Berkeley in 2015..."
Based on previous text I think the year should be 2013.

Page 2-15 through 2-17: In Table 2-7 the numerical values for "Fruits/Vegetables" and "Other Foods" don't match with the graphical representations for those categories in Figures 2-8 and 2-9.

Please contact me if any of my comments/questions aren't clear. I'll be checking email daily.

Thanks a lot!
-Patti

Elaine Marshall

From: Elaine Marshall
Sent: Saturday, June 11, 2022 6:11 AM
To: Climate Action
Subject: Fwd: draft CAP update comments

----- Forwarded message -----

From: Lisa Oliver [REDACTED]
Date: Thu, Jun 9, 2022 at 2:16 PM
Subject: draft CAP update comments
To: <ClimateAction@milpitas.ca.gov>

Hello Milpitas Climate Action Plan Team,

Congratulations on an impressive, transformative vision for Milpitas. Thank you for the effort and thought that went into this document.

I'd like to offer these comments on the draft CAP update.

Regards,

Lisa Oliver

Milpitas

COMMENTS on CAP

Measure 5.1: Reduce urban heat island effect through cool roofs, parking lot shading, landscaping, and urban greening in new and existing private and public development.

Add rooftop and parking lot solar panel installations (on any flat top space) to this measure to further reduce urban heat island effect:

Please provide specific measures in the appendix for this statement on page 1-7:

Since its adoption, over half of the GHG mitigation measures included in the CAP have been implemented, resulting in significant GHG emissions reductions.

Page 1-9:

To install solar on low-use and low-income residential units, I suggest partnering with SunWorks located in Milpitas.

<https://sunwork.org/>

I suggest that the city count the number of EVs and gas-powered cars owned by residents and business owners and offer incentives to low-income residents.

Page 1-9:

, GHG reduction and adaptation efforts will be tracked and monitored over time to ensure the City is making progress toward achieving its GHG reduction targets and climate resilience objectives.

Reference where to find GHG monitoring plan. (Page 6-21 - City staff will prepare a monitoring report annually and a GHG emissions inventory and vulnerability assessment update every two to three years.)

Explain how to rectify mitigation if GHG reduction goals are not met.

Page 4-12

Measure TR-1.1: Reduce VMT from new development in compliance with SB 743.

These municipal actions seem out of place.

MUNICIPAL ACTIONS v Require all new municipal development to be all electric by 2030. v Require all new municipal facility lighting to be LEDs (or other high-efficacy lighting where LEDs are infeasible).

Page 4-12

Action TR-1.2.1: Work with local employers to provide subsidies to employees for using transit or active transportation to commute to work, and encourage flexible work schedules (e.g., 9/80s and 4/10s) as well as telecommuting.

Will VMT be measured for each employer? What are the carrots and sticks for employers to reduce VMT? Discounts, rewards programs, incentives generally don't work.

How about a property tax surcharge or property tax rebate based on VMT?

Work to fix inefficiencies of the VTA light rail system. The light rail needs to be reimagined and re-engineered.

Page 4-21.

Measure SW-1.1: Eliminate the disposal of organic solid waste in landfills.

75% of waste is diverted from landfills citywide, including at municipal facilities by 2030 doesn't align with SB 1383 - 75% reduction by 2025.

Page 4-21.

Measure SW-1.2: Increase recycling and the diversion of other inorganic solid waste.

I suggest partnering with GoodWill, CityTeam Ministries, Salvation Army and other nonprofits that collect donated materials to become leaders in recycling and reusing. Perhaps these places can be turned into recycling centers where inorganics can be dropped off. Incentivize tech to research ways to reuse materials.

Page 4-22

Action SW-1.3.2: Encourage local businesses to reduce the use of single-use, non-biodegradable products, and support the establishment of a regional ordinance that restricts and/or limits the use of these products by local businesses.

Include a timeline to ban single-use plastics.

Page 4-22

Action SW-1.5.4 Promote redesign of products so that they do not require end of life disposal, but are incorporated back into useful products.

The EU will require battery manufacturers to have a recycling plan in order to operate. Perhaps grocery and retailers should invest a part of their infrastructure for recycling.

Page 4-28

Measure WA-1.2: Reduce water consumption for irrigation and landscaping.

Add a timeline to convert existing commercial and residential lawns to drought tolerant landscaping.

Add a measure to detect water leaks and to get them fixed within a short window.

Page 4-36

Measure GE-1.2: Incentivize and promote green business practices.

Perhaps for the future add a sustainability scorecard for businesses to meet in order to get a business license.

Page 5-4

Changes in Precipitation and Flooding The historic annual average (1961–1990) precipitation in the city has been 15.6 inches. As shown in Table 4-2, the total annual precipitation in the city is projected to be 17.6 inches by mid-century (2035–2064) and 17.7 inches by the late-century period (2065–2099) under the medium-emissions scenario

Where is Table 4-2? Table 5-2 and discussion of data are confusing. The table is titled **Changes in Average Annual Precipitation and Increases in Large Storm Events in Milpitas**, but the data is not the change but the actual data. The table should include past and present annual precipitation measurements to show change to current and future.

Page 5-6

Particulate matter from wildfires will also hasten polar ice melting because the black soot absorbs solar radiation.

Page 5-27

Strategy 5. Reduced Urban Heat Island Effect and Resilient Water Resources

My neighbor recently added a lot of hardscape cement in his yard and walkways. Education/ordinances are needed for landscape companies, cement companies, businesses and residents to prevent these kinds of installations.

Page 6-22

Funding sources

Will the city support a local carbon tax if a carbon price is not implemented either nationally or state-wide?

Elaine Marshall

From: Elaine Marshall
Sent: Saturday, June 11, 2022 6:25 PM
To: Climate Action
Subject: FW: draft CAP update comments

From: Lisa Oliver <[REDACTED]>
Sent: Saturday, June 11, 2022 6:20 PM
To: Elaine Marshall [REDACTED]
Subject: Re: draft CAP update comments

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links.

Hello Elaine,
Here's another comment on the CAP update.
Please define PPA on page 4-6.
Thank you.

Lisa

City of Milpitas, California

BUDGET CHANGE FORM

Type of Change	From*		To*	
	Account	Amount	Account	Amount
Check one:	100-9104640	\$150,000	100-3952	\$150,000
☐ Budget Appropriation	331-9513416153831	\$150,000	331-951341674800	\$150,000
☐ Budget Transfer				

Open the public hearing for comments and move to close the hearing; (2) Adopt the Addendum to the Milpitas General Plan 2040 EIR for the Milpitas Climate Action Plan Update; (3) Adopt a Resolution to Adopt the Climate Action Plan Update; (4) Approve a Budget Appropriation in the amount of \$150,000 to CIP #3416 for near term implementation of the Climate Action Plan Update.

Background:

The City's Climate Action Plan (CAP) was adopted in May 2013 and was intended to serve as a roadmap to meeting the State's 2020 greenhouse gas (GHG) emissions reduction target (15% below 2005 baseline emissions). The CAP was designed to streamline environmental review of future development projects in the City of Milpitas and its planning horizon only went as far as 2020.

Since 2013, new studies and reports are showing that climate change is happening faster than anticipated. Many communities, including some nearby, are experiencing extreme weather events such as flooding, prolonged drought, and wildfires. New state targets have been adopted that call for longer term GHG reductions including the most recent Executive Order B-55-18 (signed in September 2018) which sets a goal for the State to achieve carbon neutrality by 2045. Additionally, there are new requirements to increase organics diversion and ensure water is used efficiently.

City Council approved CIP #3416 to update the CAP as part of the adoption of the 2019-2025 Capital Improvement Program. After a competitive RFP process, on August 4, 2020, the City Council approved a contract with Ascent Environmental Consultants to provide technical support for the CAP Update.

Through the development and implementation of its CAP Update, the City is joining hundreds of other communities across the nation in tackling the challenges posed by climate change. The update process began in fall 2020 with multiple community engagement points throughout 2021 including an online survey, virtual community workshop in May 2020, workshops with Milpitas High school students, and multiple meetings with the Energy and Environmental Sustainability Commission, and City's Executive Steering Committee. The CAP Update aims to meet these long term targets as approved by the State and sets a path for the City to achieve carbon neutrality by 2045. This CAP Update is primarily focused on achieving the 2030 target and aims to make substantial progress in achieving the longer-term 2040 and 2045 targets.

On April 5, 2022, the City Council received an update on the final draft of Climate Action Plan Update and provided some general feedback to staff. The April 5, 2022 Agenda Report is included as Attachment 1. On May 11, 2022, the Public Review Draft of the CAP Update was released for public review and comment. The availability of the CAP Update for public review was noticed in the Milpitas Post and publicized through the City's Facebook page, Milpitas Matters, and through the Sustainability newsletter. Presentations and information on the public comment period were made to the Energy and Environmental Sustainability Commission and the City's Community Development Roundtable. The public comment period closed on June 10, 2022.

Analysis:

During the public comment period, the City received six sets of comments on the CAP Update document, five from Milpitas residents and a letter from the Sierra Club Loma Prieta Chapter. A majority of the comments were administrative corrections or clarifications to the document and can be easily incorporated into the final, published CAP Update. Attachment 2 includes the responses to all the comments received. There are several other comments that relate to accelerating longer term goals and targets. The key emerging themes from those other comments are summarized below:

- Accelerate the 2040 and 2045 targets to achieve additional reductions sooner
- Accelerate goals to fully decarbonize existing buildings sooner
- Establish and End of Flow (of natural gas) by 2040 (or 2035 for commercial buildings and 2040 for residential buildings)
- Announce the end of sales of fossil-fuel vehicles by 2030 or Prepare for the end of sale of Internal Combustion Engine (ICE) cars by 2035 in accordance with California Executive Order N-79-20

These comments regarding accelerating the building and vehicle electrification timelines and targets are commendable, and likely justified, and consistent with some of the feedback shared by Councilmember Phan during the April 5, 2022 City Council meeting. However, the project team believes that the actions, targets, and strategies already included in the CAP Update are necessary to establish and elevate Milpitas community support and buy-in for such aggressive targets and goals. Additionally, while the more aggressive goals and targets are visionary, it is unclear how these targets can be met with current technology and at what costs to the City or community. For these reasons, staff recommends adopting the CAP Update as drafted and following the implementation, monitoring, and regular update process for adapting actions and targets which can include a review and consideration to accelerate targets and goals dates as suggested at a later time.

The City's priority actions for the next 18 months would not be adjusted even if the more aggressive targets and goals were incorporated as the priority actions are foundational to the building decarbonization/electrification efforts (e.g., adopting Reach Codes for Electrification of New Construction and increase EV Charging Station Infrastructure Requirements for New Construction) while also raising community awareness and support for electrification of existing buildings and purchases of electric vehicles.

Key Strategies

The CAP Update identifies strategies, measures, and actions that the City will implement to reduce GHG emissions to achieve its emissions reduction targets. These locally based initiatives are organized under six emissions sectors and include descriptions of actions that can be taken for implementation, GHG reduction potential, and associated co-benefits.

The proposed strategies, measures, and actions proposed for inclusion in the CAP Update were developed based on a combination of factors, including the results of the City's GHG emissions inventories and forecasts, robust engagement with the public and stakeholders, feedback from City staff and elected officials, and the best available climate action planning guidance. Ten key strategies have been identified to address the key sources of GHG emissions in our community. The Key Strategies are:

Strategy	Emission Source/Sector
Shift to Clean and Reliable Energy	Building Energy
Maximize Building Decarbonization and Efficiency	Building Energy
Facilitate Sustainable Transportation and Land Use Planning	Transportation
Decarbonize Vehicles	Transportation
Increase Active and Public Transportation Use	Transportation
Achieve Zero Waste	Solid Waste
Shift to Clean Off Road Equipment and Vehicles	Other Sources
Promote Resilient Water Supply, Water Use, and Water Resources	Water and Wastewater
Resilient Infrastructure and Healthy Urban Forest and Natural Systems	Carbon Sequestration
Foster Green Economic Opportunities and Support Circular Economy Policies	All

2022-2025 Actions

Under each Key Strategy are specific measures and actions that define the activities, programs, policies, or projects that the City will implement or support to achieve the CAP Update's goals. This CAP Update identifies ten (10) Key Strategies (see table above), forty-five (45) Measures, and more than 130 potential actions for reducing community GHG emissions. An evaluation process was applied to the extensive list to help prioritize actions for near term implementation. These criteria included GHG emissions reduction potential, cost-effectiveness, technological/implementation feasibility, consistency with existing policies or programs, jurisdictional control, timeframe of implementation, and associated co-benefits, to generate a prioritization score. These 28 actions are further prioritized into which actions will be implemented within the first 18 months after CAP Update adoption. These immediate actions were highlighted during April 5, 2022 City Council Presentation.

Next 18 Month Actions
Adopt an updated reach code for all electric new construction and increase EV charging station standards beyond State requirements. (BE-2.1.1 and TR-2.1.2)
Promote benefits and incentives for clean energy, improved energy efficiency, and electrification of existing buildings. (BE-1.3.2 and BE-2.4.1)
Enforce the City's requirements for SB 743 and continuously Update VMT Policy and Implementation Tools to further reduce VMT (TR-1.1.1)
Incorporate Sustainable Design Measures and incentives into the City's new Zoning Ordinance Update (BE-2.3.1 and TR-1.3.1)
Improve awareness of incentives for low- and zero-emission vehicles and increase EV purchases in Milpitas (TR-2.2.1)
Implement the Milpitas OnDemand "hub-and-spoke" micro-transit pilot program (TR-3.1.1)
Implement the updated Trail, Pedestrian, and Bicycle Master Plan to enhance and expand bicycle and pedestrian infrastructure and networks (TR-3.3.5)
Implement and enforce the requirements of SB 1383 and eliminate disposal of compostable organic materials to landfills (SW-1.1.1)
Based on the recommendations from the City's Urban Forestry Management Plan, implement a tree planting program to expand the city's urban forest canopy (CS-1.1.1 and CS-1.1.2)
Work with partners offer courses/training that prepare students/workers for green jobs (GE-1.1.1)
MUNICIPAL OPERATIONS ACTIONS
Install EV charging and alternative fuel stations at appropriate City sites (MVF-1.1.1)
Update the City's Green Fleet Policy to convert the City's non-specialized fleet to all electric and identify alternative fuel options for other vehicles and equipment (MVF-1.1.3)
Pursue funding to expand solar and back up battery systems to other City facilities such as PW/PD, City Hall, Sports Center (MBL-1.2.2)
Inventory and develop strategy to retrofit existing municipal buildings and facilities to be all-electric (MBL-3.1.2)
Enhance and expand waste reduction policies and programs for City facilities (MSW-1.1.1 and MSW-2.1.3)
Use resource efficient landscaping techniques in new or renovated medians and parks (MWA-1.1.4)

Policy Alternatives:

N/A

Fiscal Impact:

Staff estimates that up to \$150,000 is needed to support near term CAP implementation over the next 10 months as discussed during the April 5, 2022 City Council presentation. This funding is needed to bring on a sustainability fellow to support CAP implementation and coordination as well as funding for technical consultant support to develop a municipal facilities electrification strategy. This funding is available in the City's unrestricted General Fund reserve.

Going implementation of the CAP Update and associated costs will be brought forward for City Council consideration as more programs and policies are further developed. Additionally, Staff will pursue grant funding opportunities to support CAP implementation as opportunities are announced. This includes recent grant funding opportunities available through Silicon Valley Clean Energy, State of California, and federal funding opportunities. Additional information and implementation costs will be brought forward with the CAP adoption and/or for budget appropriation.

California Environmental Quality Act:

To achieve compliance with CEQA guidelines, staff prepared the California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) Addendum (Addendum) to the Milpitas General Plan Update EIR (Milpitas GP EIR; State Clearinghouse No. 2020070348). The City adopted the Milpitas GP EIR on March 9, 2021.

The General Plan 2040 EIR is a program EIR that considers the environmental effects of implementing the General Plan through the 20-year planning horizon. Among the proposed policies and actions evaluated in the General Plan 2040 EIR, Action CON-1a required the City to update the City's Climate Action Plan (CAP) to achieve the greenhouse gas (GHG) reduction targets for 2030 and 2050. This update to the CAP has been prepared and was released for public review in May of 2022.

As demonstrated in this Addendum (Attachment 3), the proposed CAP would not change any of the conclusions of the General Plan 2040 EIR. The analysis demonstrates that implementation of the proposed CAP would not result in new significant effects or a substantial increase in the severity of previously identified significant effects. Further, no new information of substantial importance has been identified that suggests the potential for the CAP to result in significant or substantially more severe effects not discussed in the General Plan 2040 EIR. A Public Hearing Notice regarding the City Council's proposal adoption of this Addendum was published in the Milpitas Post on July 29, 2022.

Recommendation:

1. Open the public hearing for comments and move to close the hearing;
2. Adopt Addendum to the Milpitas General Plan 2040 EIR for the Milpitas Climate Action Plan Update;
3. Adopt a Resolution to Adopt the Climate Action Plan Update;
4. Approve a Budget Appropriation in the amount of \$150,000 to CIP #3416 for near term implementation of the Climate Action Plan Update.

Attachments:

1. April 5, 2022 Agenda Report on CAP Update Presentation
2. Summary of Response to Comments Received on the Public Review Draft of the Climate Action Plan Update
3. Addendum to the Milpitas General Plan 2040 EIR for the Milpitas Climate Action Plan Update
4. Resolution **XX** to Adopt the Climate Action Plan Update
5. [Public Review CAP Update](#)
6. Budget Change Form to Appropriate \$150,000 for CIP #3416

☐ Check if City Council Approval required.

Meeting Date: August 09, 2022

Requested by:	Department Head: Tony Ndah	Date: August 09, 2022
Reviewed by:	Finance Director: Lauren Lai	Date: August 09, 2022

Date approved by City Council, if required:

Confirmed by:

FI/24786/V

Form 30-222 (Rev. 1/92)



**CITY OF MILPITAS
AGENDA REPORT
(AR)**

Item Title:	Conduct a Public Hearing and Adopt the Milpitas Water, Sewer, and Storm Master Plans and Addendum to the Environmental Impact Report for the Milpitas General Plan (Staff Contact: Tony Ndah, Public Works Director, 408-586-2602)
Category:	Public Hearings-Community Services and Sustainable Infrastructure
Meeting Date:	8/9/2022
	<u>Recommendation:</u> (1) Open the public hearing for comments and move to close the hearing; (2) Approve resolution to adopt Water Master Plan and direct staff to return with a five-year rate study by December 2022; (3) Approve resolution to adopt Sewer Master Plan and direct staff to return with a five-year rate study by December 2022; (4) Approve resolution to adopt Storm Master Plan and direct staff to return to Council with various funding options for the Stormwater System by December 2022; and (5) Approve resolution to adopt the City of Milpitas Utility Master Plans – Addendum to the Environmental Impact Report for the Milpitas General Plan.

Background:

The City of Milpitas owns, operates and maintains an extensive network of water, sewer and storm utilities. The water system consists of 206 miles of pipeline, 4 pumping stations, 5 storage reservoirs and pressure valves regulating 7 pressure zones which deliver on average 11 million gallons of potable water per day to approximately 16,750 customer accounts. The sewer collection system consists of 175 miles of pipeline and 2 pumping stations which convey an average rate of 7.5 million gallons per day (MGD) to the San Jose/Santa Clara Regional Wastewater Facility. The storm system consists of 112 miles of pipeline, approximately 1,400 manholes and 3,500 storm drain inlets. The system collects surface stormwater runoff and conveys the stormwater to 13 pump stations.

An essential element of competently operating and maintaining a utility system is long term asset planning. Based on industry standards and practices, a utility should develop or update its utility master plans every 10 years in order to assess the health and durability of the system. A reliable system is one which has adequate capacity, is optimized hydraulically to efficiently serve its customers, incorporates proactive and manageable capital improvement programs, is flexible through redundant pumping and distribution facilities and has recourse should an emergency occur.

On May 18, 2021, City Council received presentations from staff and City consultants (West Yost Associates and HydroScience Engineers, Inc.) on the draft Milpitas Water and draft Milpitas Sewer Master Plans. Subsequently, on November 2, 2021 staff and City consultant (Schaaf and Wheeler) presented to City Council the draft Milpitas Storm Master Plan. Each draft Master Plan report compiled findings and made recommendations for capital improvement program projects (Projects). The recommendations were aggregated for phased implementation using planning level cost estimates. The Projects recommended for the City's existing and future water, sewer and storm systems incorporated existing system evaluations, future system evaluations, asset renewal and replacement studies and risk and resiliency assessments. Recommended Projects address improvements which at a minimum; maintain existing levels of service, address future system requirements and address findings from the risk and resiliency assessments through sustained improvements. The CIP assessment is on a 30-year time horizon and therefore assessed through 2051, as is consistent with industry practice; however, to remain consistent with the General Plan, the master plan development buildout timeframes are assessed to 2040.

Following presentations of the three draft master plans to Council, staff received feedback, comments and questions from Council. The comments and questions from Council were addressed by staff and master plan consultant(s) during their respective meetings. For the draft Water Master Plan, feedback from Council was related to groundwater wells, specifically the capital cost of building groundwater wells as it relates to their perceived benefit to the community. Staff addressed the benefit(s) of groundwater wells during the meeting and provided additional information to Council on the benefits of groundwater wells during Council adoption of the City's Urban Water Management Plan. For the draft Storm Master Plan, Council feedback centered around the lack of funding for the storm utility with an emphasis on exploring funding options for the system.

As discussed as part of the presentations of the draft Master Plans to Council and consistent with Council feedback, staff has worked with a consultant to develop a financial feasibility plan for the recommended master plan projects and has completed an assessment of the environmental impacts associated with the recommended capital improvements to determine the appropriate level of environmental review required to comply with the California Environmental Quality Act (CEQA).

On July 29, 2022, the City issued a notice to the public, by posting the notice in the designated locations and publishing it in the Milpitas Post, informing the public that a public hearing will be taking place on August 9, 2022 and that the Addendum to the Milpitas General Plan 2040 Environmental Impact Report for the City of Milpitas Utility Master Plans was available on the City website for review.

Analysis:

The City contracted with the financial consulting firm Raftelis to develop fiscal impact models to assess the financial feasibility of the master plan Projects, with projects beginning in FY 2024 through FY 2040. The financial models are not intended to be a detailed rates study but instead intended to evaluate the water, sewer and storm utility fund revenues and expenses with the intent to assess and analyze the impacts of the master plan Projects on said funds. The goal of the analysis is to provide the City Council with the expected funding needs to implement the Projects.

Water Master Plan

Consistent with the 2040 General Plan Update, 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. A summary of the analysis is below:

- Supply Capacity — Buildout supplies fall short of maximum day demands. The supply surplus in the SFPUC service area cannot make up for the deficit in the VW service area. Additional points of connection to the wholesaler's water system are recommended in the VW service area to draw water from both wholesalers as demand requires.
- 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. A new 2 MG storage reservoir including a new pump station with a capacity of 4,000 gpm in the VW service area is recommended to deliver water from this new storage reservoir.
- Distribution System — The buildout distribution system meets the minimum pressure criterion under peak demand conditions however, there are locations which do not meet the minimum fire flow pressure requirements. To address locations not meeting recommended fire flows, a new pressure regulating valve is recommended which would allow flows from higher pressure zones to lower pressure zones should pressures drop significantly.

Recommended projects include general maintenance modifications, detailed condition assessment, refurbishment, and replacement. A list of capital and non-capital recommendations was developed based on the risk assessment and the risk thresholds. 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. For the existing system analysis, high priority improvements are recommended for completion within the first 5-years

following approval of the master plan, while medium and low priority improvements are recommended for completion prior to 2040. The major capital investments for the water utility include:

- \$43 million for replacement or rehabilitation for assets or facilities. Projects include replacement of ageing pipes, valves and appurtenances and improvements to above grade facilities such as pump stations and water tanks. ;
- \$7 million for pipeline replacement to improve flow in the system for fire suppression; and,
- \$6 million for development of groundwater wells.

The total CIP cost for the water system through 2040 is approximately \$67 million of which \$23 million is projected to be funded through TASP development impact fees. The masterplan identifies potential funding strategies that could be used to fund these improvements. Specifically, absent a detailed rate study completed every five years starting with fall 2022, it is expected that the water utility fund will require annual total rate increases of 6.4% from FY2024 through FY2026, and between 4% to 5% each fiscal year thereafter. As detailed in the table below, the total rate increase consists of 6% for the volumetric rate from FY2024 through FY2026, and 3% to 4% each fiscal year thereafter. The capital surcharge would be increased by 10% from FY2024 through FY2028, 3% in FY2029 and FY2030 and not projected to increase between FY2030 and FY2040, which translates into a rate increase of 0.4% for the first three fiscal years and average of 0.7% the following two fiscal years and zero thereafter, for the average single-family resident using 14 HCF. Based on a preliminary analysis, the typical single-family residential customers using 14 HCF bi-monthly would see their bi-monthly bill increase by \$9.19 in FY 2024, and \$9.87 and \$10.42 the subsequent two years.

Rate Component	FY 2024	FY 2025	FY 2026	FY 2027 to FY 2040 (Average)
Volumetric Rate Increase in Percent	6.0%	6.0%	6.0%	4%
Capital Surcharge Increase in Percent	0.4%	0.4%	0.4%	0%
Total Annual Rate Increase	6.4%	6.4%	6.4%	3.8%
Bi-monthly Average Increase for Single Family Residential Customer (\$)	\$9.19	\$9.87	\$10.42	\$8.35

Annual projected capital surcharge increases of 10% starting in FY 2024 through FY2028, and 3% in FY2029 and FY2030 are recommended to fund capital projects. Without capital surcharge increases, the revenue is insufficient to fund the capital plan beyond FY 2025. The strategy does not require any debt issuance although it is projected to draw down capital fund balances substantially. The City continues to maintain minimum reserve targets as established by policy.

In addition to the CIP expenses, rate increases will be needed to cover operating expenses, including wholesale water purchases which are projected to increase by 15.9% for the San Francisco Public Utility Commission (SFPUC) and 15% for Santa Clara Valley Water District (Valley Water) in FY 2023, based on wholesaler projected purchase costs.

As the next step, after approval of the Water Utility Master Plan, staff will return to Council by December 2022 to present a five-year water rates study and the timeline for completing the Proposition 218 process inclusive of the community engagement process.

Sewer Master Plan

Consistent with the 2040 General Plan Update, the City's buildout sewer system was evaluated based on supply, storage, and pumping capacities, as well as its ability to meet recommended performance and operational criteria. A summary of the analysis is below:

- Collection System Capacity --There are no major capacity deficiencies identified as part of this analysis. There were six pipeline segments with a recorded surcharge indicating that they are under capacity. Of these six segments, five segments are hydraulically sufficient.

As part of the City's Master Plan project, a *Sewer Utility Asset Renewal and Replacement Study* (R&R study) was conducted. The study documented 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. Pipe segments considered high or extreme risk are at the greatest likelihood of deterioration and/or have the highest consequence of failing. As such, pipe rehabilitation and inspection for these pipelines are prioritized in the R&R study.

The recommended CIP for the City's existing and future sewer system at a cost of approximately \$55 million (2020 dollars) through 2040 includes recommendations from the existing system evaluation and the current system evaluation. 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 major capital investments for the sewer utility include:

- \$25 million for replacement or rehabilitation of sewer Force Main A which is connected to the Main List Station which conveys all of Milpitas' sewer flows to the San Jose/Santa Clara Regional Wastewater Facility;
- \$25 million for replacement or rehabilitation for assets or facilities. Projects include improvements to ageing pipelines, manholes and appurtenances and above grade facilities such as pump and lift stations.
- \$5 million for improvements identified through on-going CCTV.

The Force Main A is a 40 year steel pipeline that conveys sewage from the City to the San José-Santa Clara Regional Wastewater Facility for treatment. The pipeline is in a corrosive environment and the condition of the pipeline is unknown due to the inability to dewater and inspect the pipeline. Due to these factors, staff developed two timelines for replacement of the Force Main A with a start date in FY 2025 or FY 2030 and related financing options. In order to commence the replacement project in FY 2025, the City will have to issue 20-year debt. Additionally, with this timeline, the payment of this replacement is spread over 20 years, requiring only a 4% annual rate increase. Based on a preliminary analysis, a typical single-family residential customers would see their bi-monthly bill increase by \$4.97 in FY 2024, and \$5.26 and \$5.58 the subsequent two years. Alternatively, the Force Main A project could be completed in FY 2030 delaying the timeline of critical asset improvements by five (5) years thereby increasing the risk of failure. Under this option the sewer utility fund will require annual rate increases of 6% through FY2029, and 4% thereafter. A typical single family residential customers would see their bi-monthly bill increase by \$7.45 in FY 2024, and \$7.90 and \$8.37 the subsequent two years.

Either rate increase option will cover capital and operating expenses, including currently known San Jose/Santa Clara Regional Wastewater Facility capital and projected O&M costs, as well as meet reserve goals for the Capital Fund for Emergencies and Rate Stabilization Reserve.

As the next step, after approval of the Sewer Utility Master Plan, staff will return to Council by December 2022 to present a five-year sewer rates study and the timeline for completing the Proposition 218 process inclusive of the community engagement process.

Stormwater Master Plan

Storm project priorities are assigned based on modeled inundation impact of the existing stormwater system condition. A high priority CIP project addresses extensive flooding on residential or commercial properties which spreads across several streets and can widely disrupt traffic and 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.

The Draft Storm Drain Master Plan identifies approximately five (5) miles of pipe replacement and upsizing to alleviate stresses on the storm drain infrastructure and mitigate the likelihood of flooding. Approximately 2.5 miles of the total recommended CIP is expected to address extensive flooding and therefore is categorized as high priority. The Draft Storm Drain Master Plan prioritizes storm pump stations based on maintenance requirements, on-going renewal and replacement and station capacity. High priority pump station projects include complete replacement of Penitencia Pump Station and upgrading the Jurgens Pump Station to 100-year storm pumping capacity to eliminate the temporary storage of excess runoff within Dixon Landing Park.

The total CIP cost for the stormwater system through 2040 is approximately \$59 million (2020 dollars) of which \$26 million is a stormwater main replacement or rehabilitation and \$33 million is for replacement and rehabilitation of pump stations. Unlike the water and sewer utilities, the stormwater utility does not have a dedicated funded source. Any expenditure for the stormwater utility including operation and maintenance (O&M) expenses are funded by the General Fund. In order to maintain the stormwater utility, staff estimates that approximately \$5 million annually for O&M and capital expenses would be needed.

The Capital Improvement Program for the storm system is currently funded with an annual \$500,000 transfer from General Government CIP Fund, while the operation and maintenance is funded from the General Fund. The O&M budget for FY 2022-23 amounts to approximately \$1.0 million.

Staff has estimated \$2.5 to \$3 million of reasonable annual O&M expenses and the Master Plan has identified \$59 million of capital projects from 2024 to 2040, which is equivalent to an annual expense of \$5 million. Since there are insufficient General Fund dollars to adequately fund the stormwater utility, staff recommends that Council direct staff to bring forward options by December 2022 to fund the utility including but not limited to a stormwater property fee, a parcel tax, and issuance of General Obligation (GO) bonds (for capital projects only). Any such fee, tax, or issuance of bonds requires property owner or voter approval.

Policy Alternatives:

Alternative 1: Do not adopt the Water, Sewer, and Storm Master plans

Pros: None

Cons: Formally adopting master plans accredits them as policy documents. In some cases, federal grant funding of utility projects requires said projects to be part of a formally adopted plan. Not adopting the master plans may preclude the City from applying for certain grants.

Reason for Not Recommending: Not adopting the master plans would delay recommended system improvements, increase year over year operation and maintenance costs and increases capital costs resulting from a reactive (fix after failure) CIP approach versus a proactive replacement program.

Fiscal Impact:

There is no fiscal impact associated with the adoption of the Addendum to the Environmental Impact Report for the Milpitas General Plan and the Water, Sewer, and Storm Master Plans. However, \$181 million (2020 dollars) funding is required to implement all proposed recommendations, goals, and improvements as shown in the Master Plans through 2040. The following is a breakdown of improvement cost by utility type:

Utility Type	Cost through 2040 (2020 dollars)
Water	\$67 million
Sewer	\$55 million
Stormwater	\$59 million
Total	\$181 million

Once Council approves the Master Plans, staff will return by the end of the calendar with a five-year rate study for the Water and Sewer Utilities and options to fund the Stormwater Utility.

California Environmental Quality Act:

To achieve compliance with CEQA guidelines, staff prepared the California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) Addendum (Addendum) to the Milpitas General Plan Update EIR (Milpitas GP EIR; State Clearinghouse No. 2020070348). The City adopted the Milpitas GP EIR on March 9, 2021.

The City was the lead agency for the Milpitas GP EIR. The EIR evaluated potential environmental impacts which could occur as a result of implementing the Milpitas GP. The impact analysis is intended to programmatically

cover the construction and operation of actions to be taken under the Milpitas GP, such as new utilities and other elements of utilities master plans.

The Milpitas GP EIR policies and actions to reduce impacts, include the following:

- Action UCS 3a: periodically review and update the Sewer Master Plan and the Sewer System Management Plan.
- Action UCS 2a: Periodically review and update the City's Water Master Plan and Urban Water Management Plan in order to meet regulatory requirements and to ensure the documents address existing and projected demand.
- Action UCS 4a: Regularly review and update the Storm Drainage Master Plan.

CEQA Guidelines (Sections 15162 and 15164) require a lead agency prepare an addendum to a previously certified EIR, if some changes or additions to the environmental evaluation of a project are necessary. Preparing an Addendum to the approved Milpitas GP EIR is deemed acceptable to meet the requirements of CEQA. The Addendum summarizes the utility master plans as considered in the GP EIR, describes additional changes to the Plans made since the certification of the GP EIR and analyzes any change in environmental effects associated with those changes.

Environmental review of the master plans, along with environmental review prepared for the Certified Milpitas GP EIR have led the staff to conclude that the master plans would not result in any new impacts not previously disclosed in the Certified EIR; nor would it result in a substantial increase in the magnitude of any significant environmental impact previously identified. For these reasons, an addendum to the Certified EIR is enough to meet the requirements of CEQA Section 15164. Staff also concluded the proposed master plan changes do not trigger any of the conditions in CEQA Guidelines Section 15162; therefore, a subsequent EIR is not required.

Recommendation:

1. Open the public hearing for comments and move to close the hearing;
2. Approve resolution to adopt Water Master Plan and direct staff to return with a five-year rate study by December 2022;
3. Approve resolution to adopt Sewer Master Plan and direct staff to return with a five-year rate study by December 2022;
4. Approve resolution to adopt Storm Master Plan and direct staff to return to Council with various funding options for the Stormwater System by December 2022; and
5. Approve resolution to adopt the City of Milpitas Utility Master Plans – Addendum to the Environmental Impact Report for the Milpitas General Plan.

Attachments:

1. 2022 Water Master Plan
2. 2022 Sewer Master Plan
3. 2022 Storm Master Plan
4. California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) Addendum
5. Resolution for Adoption of Water Master Plan
6. Resolution for Adoption of Sewer Master Plan
7. Resolution for Adoption of Storm Master Plan
8. Resolution for Adoption of California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) Addendum



CITY OF MILPITAS

Water Master Plan

MARCH 2021



Water Master Plan

PREPARED FOR

City of Milpitas



PREPARED BY



Water Master Plan

Prepared for

City of Milpitas

Project No. 270-60-19-16



Project Manager: Elizabeth Drayer, PE

06-13-22

Date

Polly L. Boissevain

QA/QC Review: Polly Boissevain, PE

06-13-22

Date

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- Appendix F: Water Utility Financial Plan
- Appendix G: Capital Improvement Program Mapbook and Project Summary Sheets

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

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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
MWEO	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

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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
VT	Valley Transit Authority
VW	Valley Water
WTP	Water Treatment Plant
WUF	Water Use Factors

Executive Summary

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, has recently completed an update to its General Plan and is in the process of updating 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 the future planned development included in the City's General Plan Update
- 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



Executive Summary

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 in the Milpitas Gateway-Main Street and the Milpitas Metro specific plans.

Since updates to the General Plan, Milpitas Gateway-Main Street Specific Plan, and Milpitas Metro Specific Plan were in progress during the development of this Water Master Plan, 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).

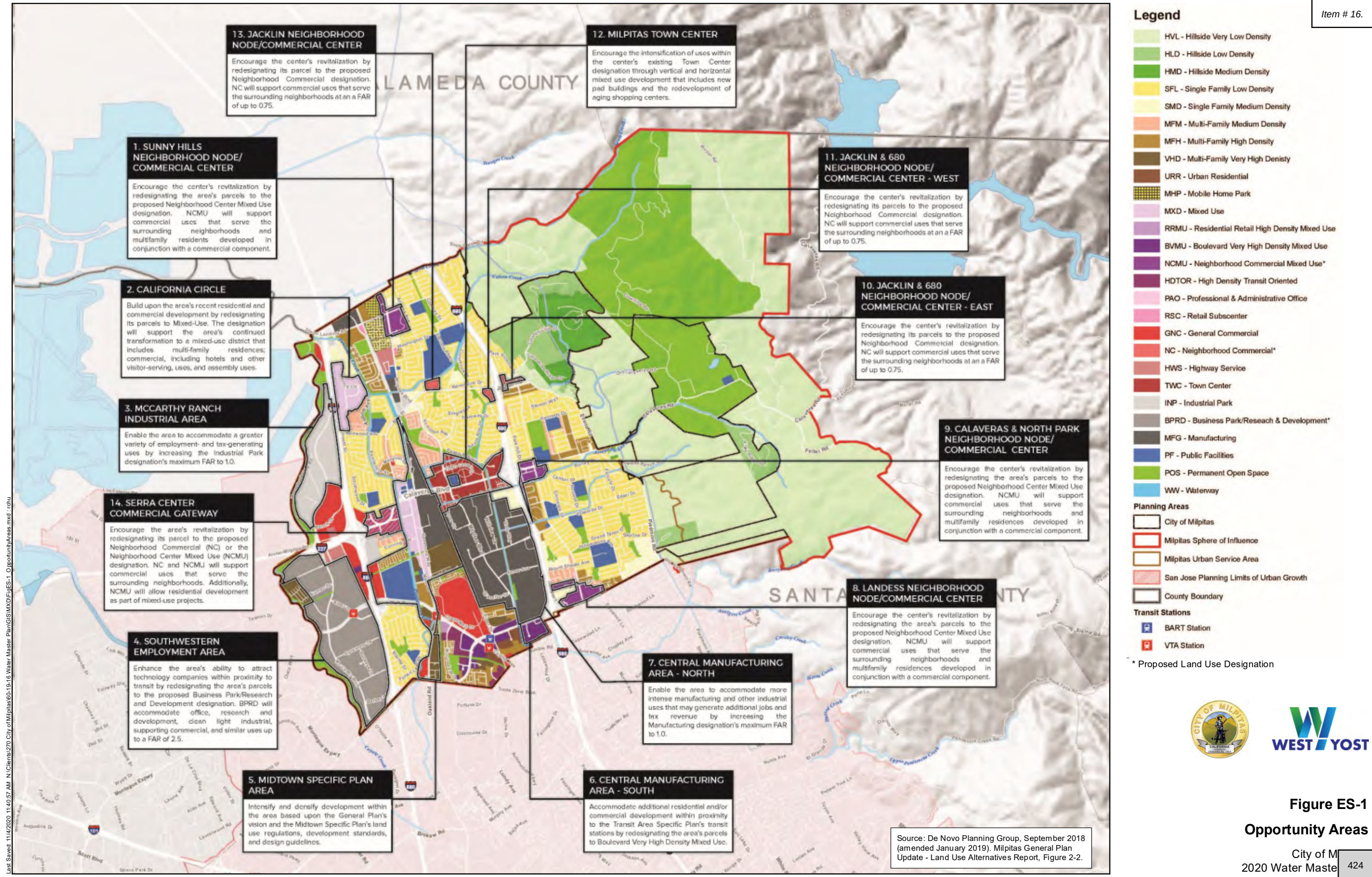


Figure ES-1
Opportunity Areas

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.



Executive Summary

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.

Groundwater can supplement reduced supplies from the SFPUC or Valley Water during prolonged droughts. As presented in the City's 2020 Urban Water Management Plan (UWMP), the City expects to rely on groundwater to augment supplies and meet demands during future dry years. 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 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.

To further improve supply reliability, this Water Master Plan also recommends that the City construct an additional VW turnout.



Executive Summary

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.				



Executive Summary

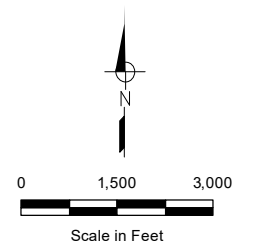
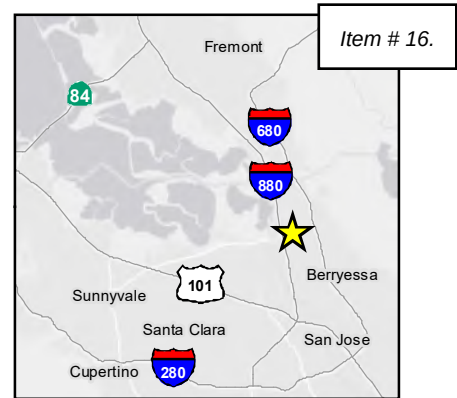
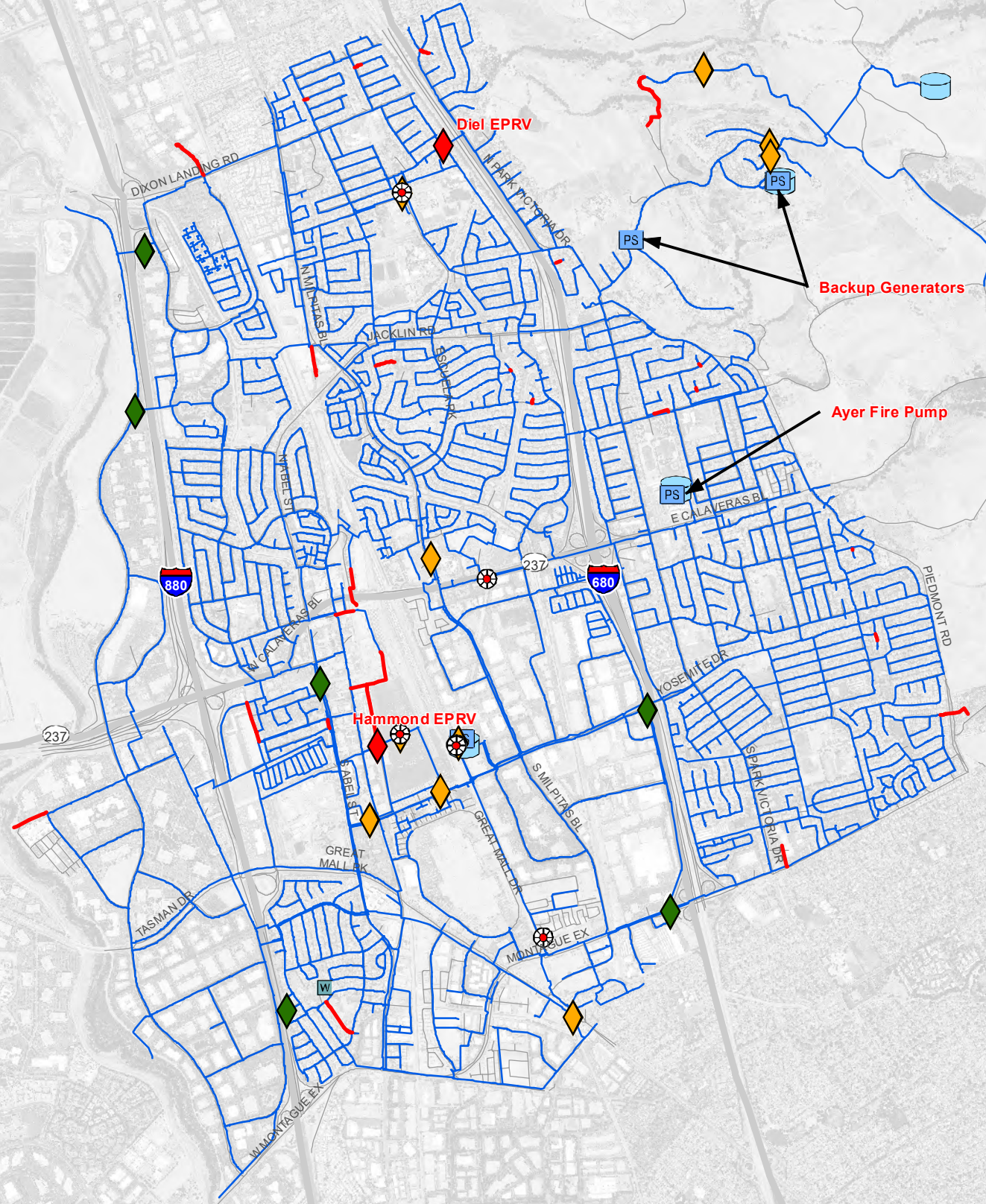
EVALUATION OF EXISTING WATER SYSTEM

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.

Last Saved: 11/15/2020 8:56:39 AM N:\Clients\270 City of Milpitas\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\FigES-2 Existing Improvements.mxd : rchu

Notes:
1. Pipeline improvements include new pipes and existing pipes upsized to address existing deficiencies.



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



Figure ES-2
Recommended Improvements
for Existing Water System



Executive Summary

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).



Executive Summary

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. 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 \$82.1 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	\$5.6	-	-	-	-	-	\$5.6
Fire Pump at Ayer Pump Station	-	\$2.1	-	-	-	-	\$2.1
Diel EPRV	-	\$0.5	-	-	-	-	\$0.5
Pipeline Improvements and New Pipelines - Fire Flow (Outage)	-	\$0.2	-	-	-	-	\$0.2
Backup Generators at Country Club and Tularcitos Pump Stations	-	\$0.7	-	-	-	-	\$0.7
Hydrant Service Pipeline Improvements	-	\$0.4	-	-	-	-	\$0.4
Subtotal	\$6.1	\$3.9	\$0.0	\$0.0	\$0.0	\$0.0	\$9.9
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	\$28.2	\$5.3	\$17.7	\$3.8	\$17.0	\$10.1	\$82.1

(a) Costs shown are in 2020 dollars and have been updated from those presented in the March 2021 Draft Water Master Plan to account for the recent bidding climate.

(b) Costs include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering Design: 10 percent; Construction Management: 15 percent; and Permitting and 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, recently completed an update to its General Plan and is currently in the process of updating 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 the future planned development included in the City's General Plan Update
- 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 requirements¹
- 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 recently completed a General Plan Update which was adopted by City Council in March 2021. The City's previous General Plan was adopted in December 1994 and last amended in April 2015. The General Plan Update was 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 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 Urban Water Management Plan

As an urban water supplier in California, the City is required to prepare and adopt an Urban Water Management Plan (UWMP) every five years. The City's 2015 UWMP was adopted in June 2016, and the City's 2020 UWMP was adopted in June 2021. The purpose of the UWMP is to evaluate the availability and reliability of the City's water supplies to meet projected future water demands over the next 20 years under various hydrologic conditions, while the purpose of the Water Master Plan is to evaluate and identify the needed water system infrastructure improvements to meet projected future water demands. At the time of preparation of this Water Master Plan, the 2020 UWMP was not yet prepared. However, assumptions used for this Water Master Plan and the 2020 UWMP were consistent with regard to future planned development within the City's service area.

1.3.5 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: Water Utility Financial Plan	Presents the water financial plan prepared by Raftelis which evaluates water utility revenues and expenditure forecasts for the study period from FY 2022 through FY 2040 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.

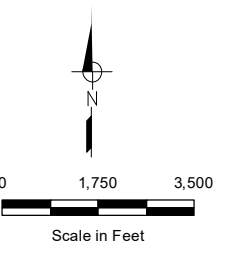
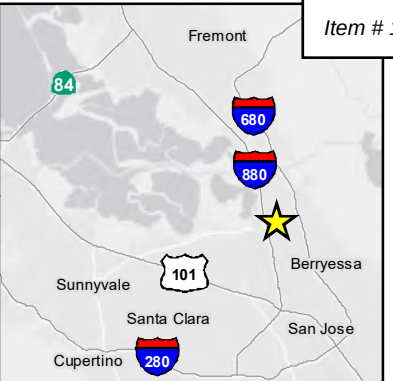
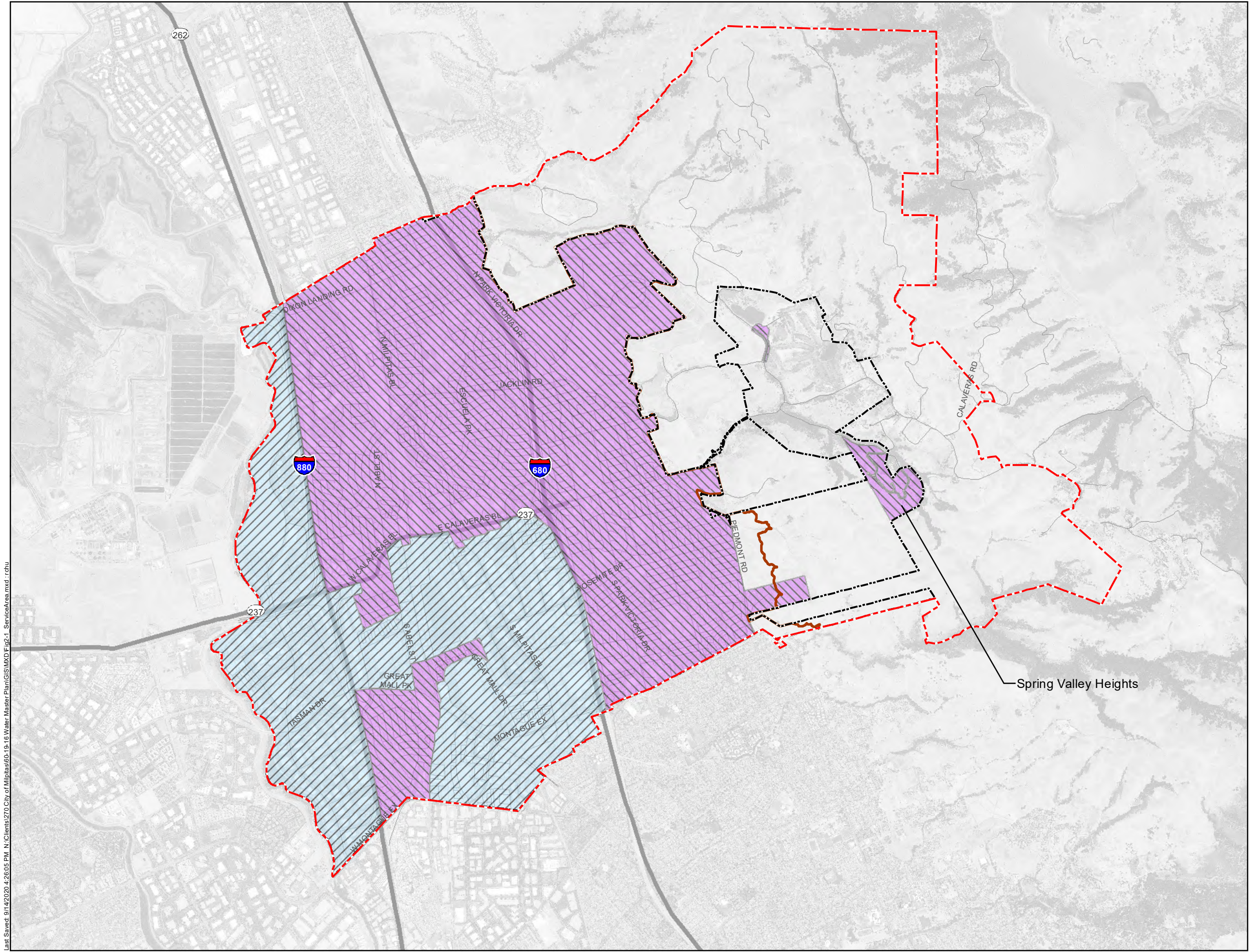
One exception to the moratorium is the Spring Valley Heights community, which is located outside the Urban Growth Boundary but served by City infrastructure. In 2005, after its groundwater supply became inadequate, the Spring Valley Heights community entered into an agreement with the City to receive 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).



- Water Service Area**
- SFPUC
 - VW
 - City Limits
 - Urban Growth Boundary
 - Sphere of Influence



Figure 2-1
Existing Water Service Area

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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.															



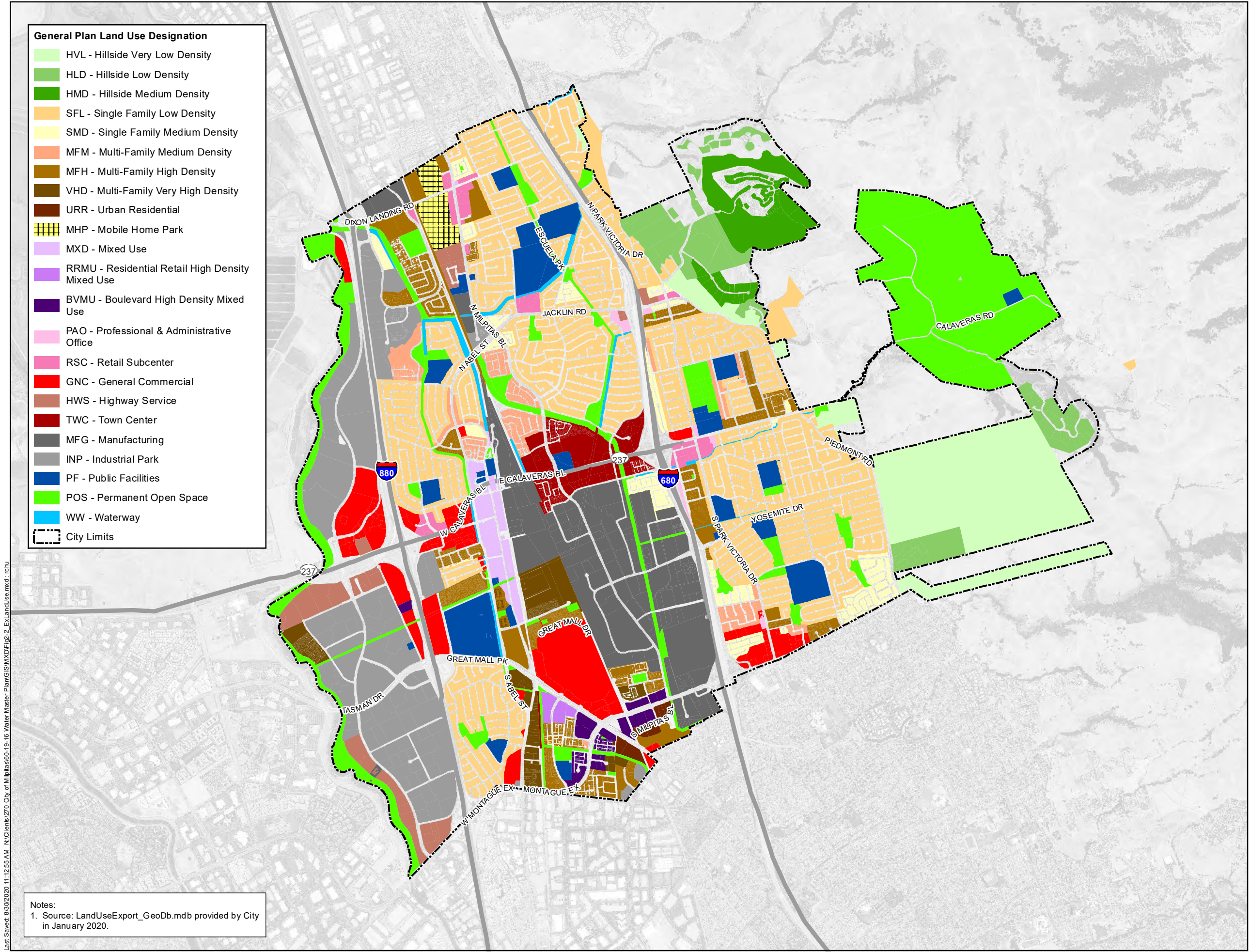
2.2 EXISTING LAND USE

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 data³ 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.

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.

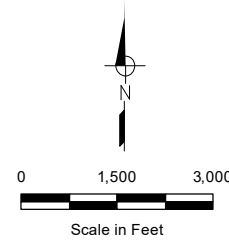
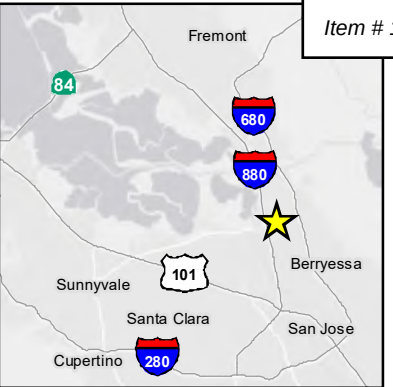


Figure 2-2
Existing Land Use

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Table 2-3. Large Water Users^(a)

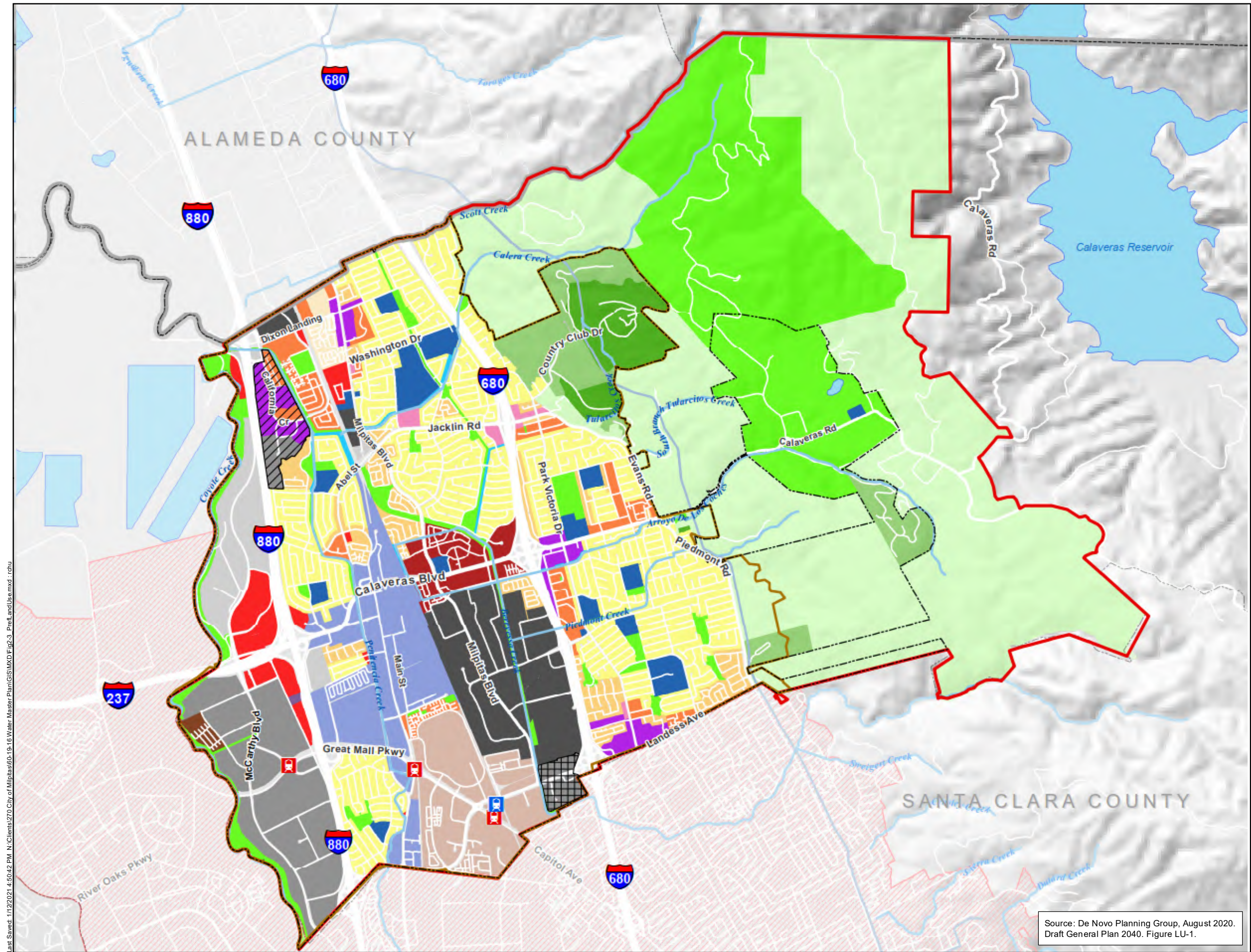
Rank	Location ID ^(b)	Customer	CY 2019 Consumption, gpd
1	3015659	Linear Technology	179,606
2	3015510	Evoqua Water Technologies LLC	177,956
3	3014575	SCC GSA Fiscal Bldg3	110,257
4	3015655	Headway Technologies Inc	92,605
5	3016862	Essex Management Corporation	92,074
6	3014546	Milpitas Mills LP	77,853
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.

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.

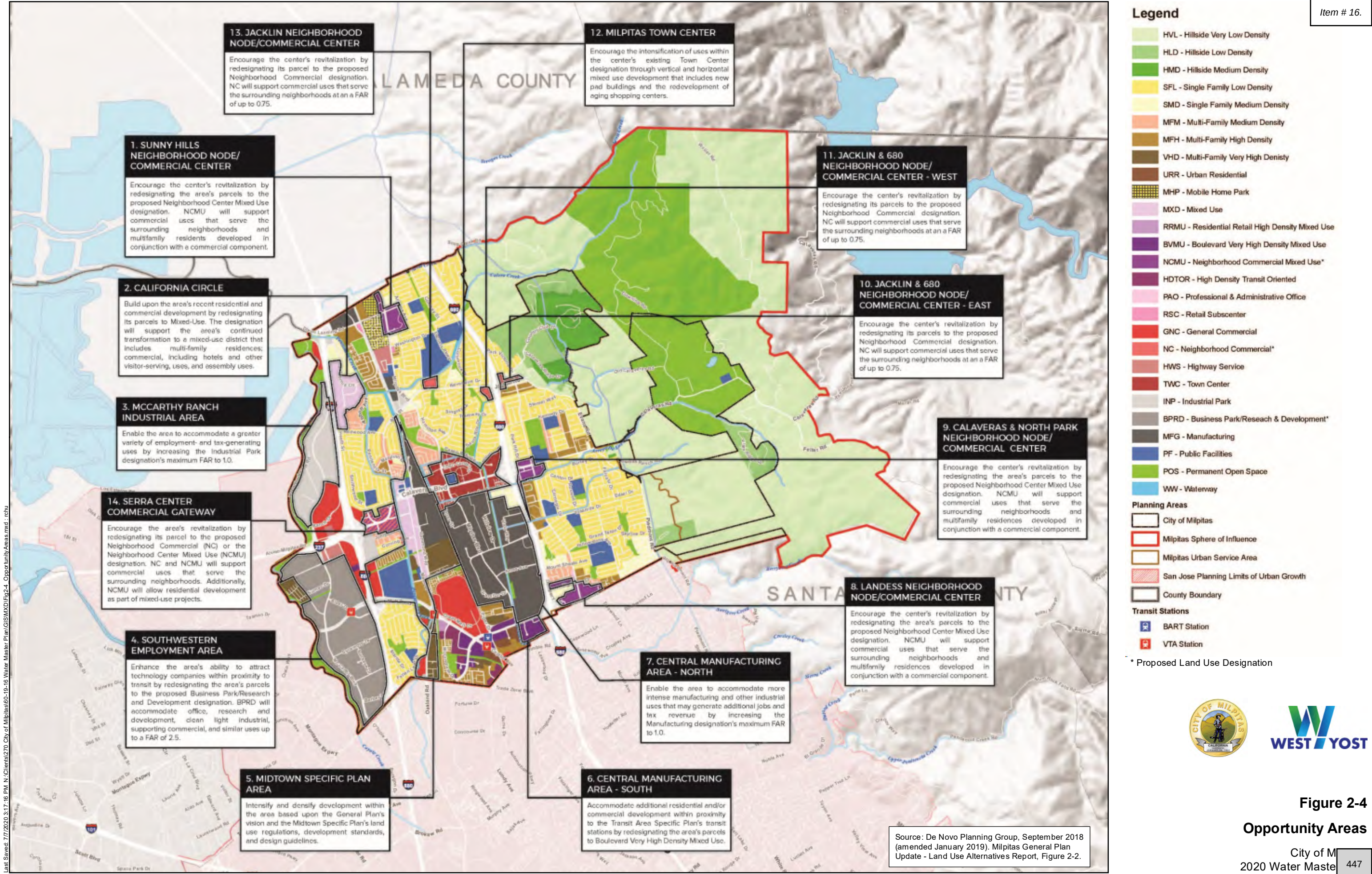


- Legend**
- HVL - Hillside Very Low Density
 - HLD - Hillside Low Density
 - HMD - Hillside Medium Density
 - LDR - Low Density Residential
 - MDR - Medium Density Residential
 - HDR - High Density Residential
 - VHDR - Very High Density Residential
 - MHP - Mobile Home Park
 - VHDMU - Very High Density Mixed Use
 - NCMU - Neighborhood Commercial Mixed Use
 - GNC - General Commercial
 - NC - Neighborhood Commercial
 - TWC - Town Center
 - INP - Industrial Park
 - BPRD - Business Park/Research & Development
 - MFG - Manufacturing
 - PF - Public Facilities
 - POS - Permanent Open Space
 - MMSP - Milpitas Metro Specific Plan
 - MGSP-Milpitas Gateway-Main Street Specific Plan
 - WW - Waterway
 - Future Specific Plan Overlay
 - Innovation District Overlay
- Planning Areas**
- City of Milpitas
 - Milpitas Sphere of Influence
 - Milpitas Urban Service Area
 - San Jose Planning Limits of Urban Growth
 - County Boundary
- Transit Stations**
- BART Station
 - VTA Station



Figure 2-3
Preferred Land Use

Source: De Novo Planning Group, August 2020.
Draft General Plan 2040. Figure LU-1.



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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.



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 future updates are made to the City's future development plans.

2.2.1 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.

2.2.1.1 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.

2.2.1.2 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.

Chapter 2

Water Service Area and Land Use



Item # 16.

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 use 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).

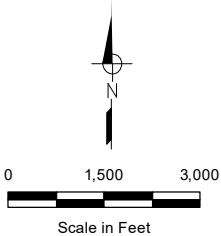
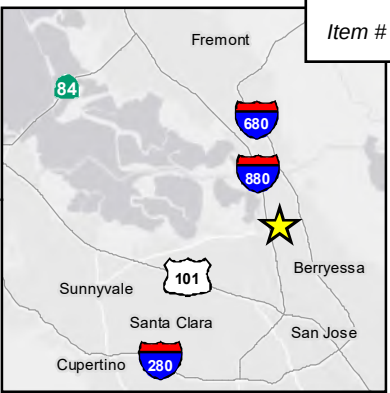
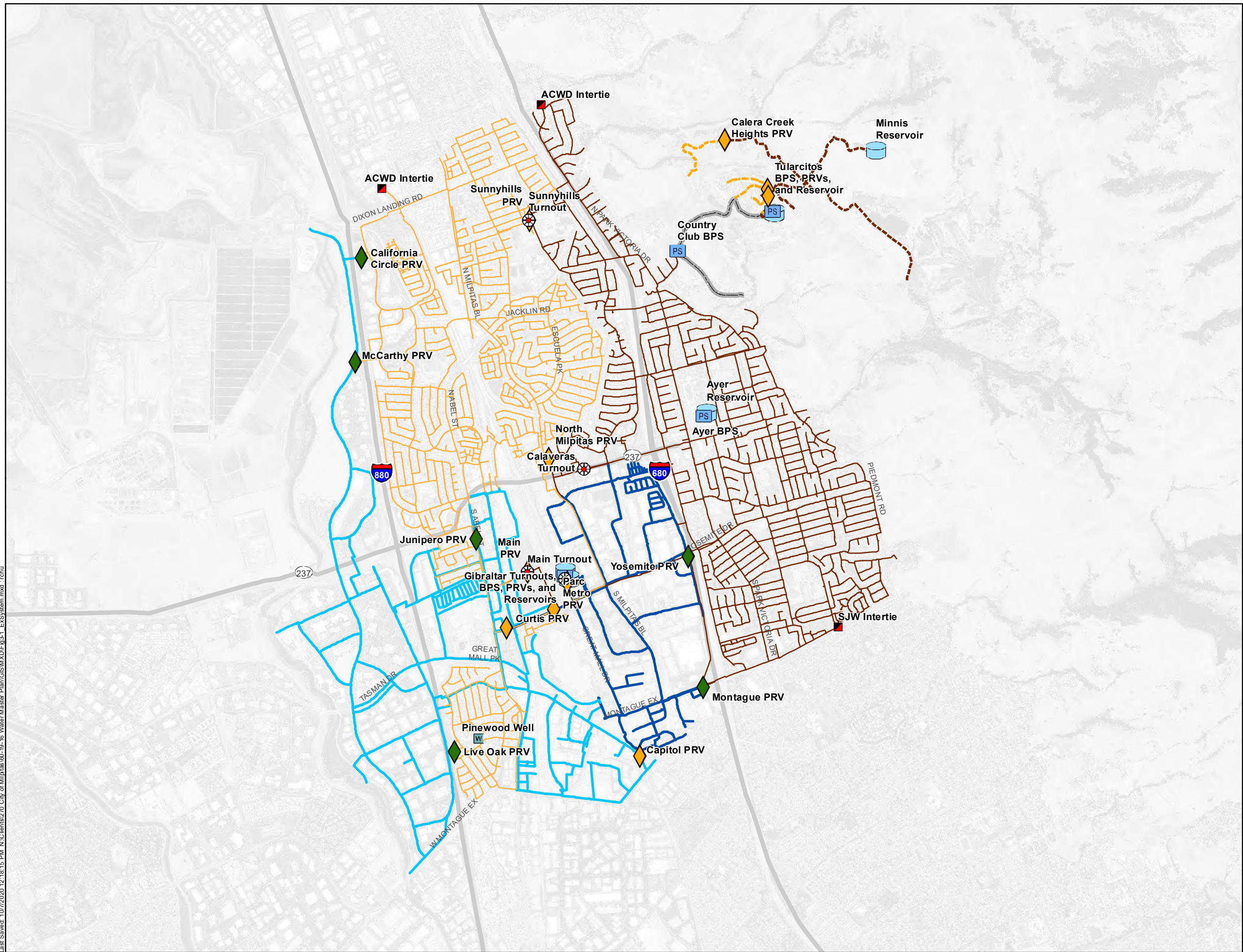
The City's valley floor area is generally served directly from SFPUC or VW turnouts, with pressure reducing valves (PRVs) reducing pressures for lower elevation customers. Storage reservoirs and their associated pump stations in the valley floor area help supply peak demands and meet emergency conditions. 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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- Turnout
- Well
- Emergency Intertie
- Pressure Reducing Valve
- Emergency Pressure Reducing Valve
- Pump Station
- Storage Reservoir
- Pipeline Pressure Zone**
- VW1
- VW2
- SF1
- SF2
- SF3
- SF4-1
- SF4-2



Figure 3-1
Existing Water
Distribution System



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 Pipeline⁵. 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 4572810888	SF1, SF2	10.1
Calaveras	584 East Calaveras Blvd.	2-8" Neptune High Performance Turbo	5000000628 5000000975	SF1, SF2	13.0
Main	534 Hammond Way	1-8" and 1-6" Neptune High Performance Turbo	9338710434 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	3K220000195 183	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) 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	MVT	Diesel	Yes (all)
		1 @ 4,000	MVT	Electric	
		1 @ 2,000	MVT	Electric	
		1 @ 2,000	SCHC	Electric	

(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

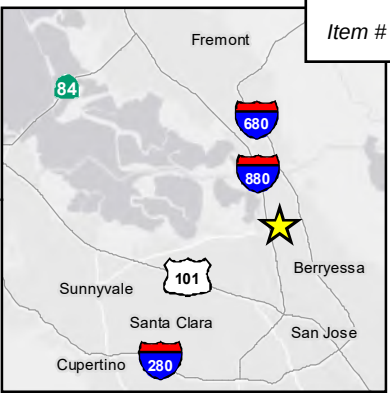
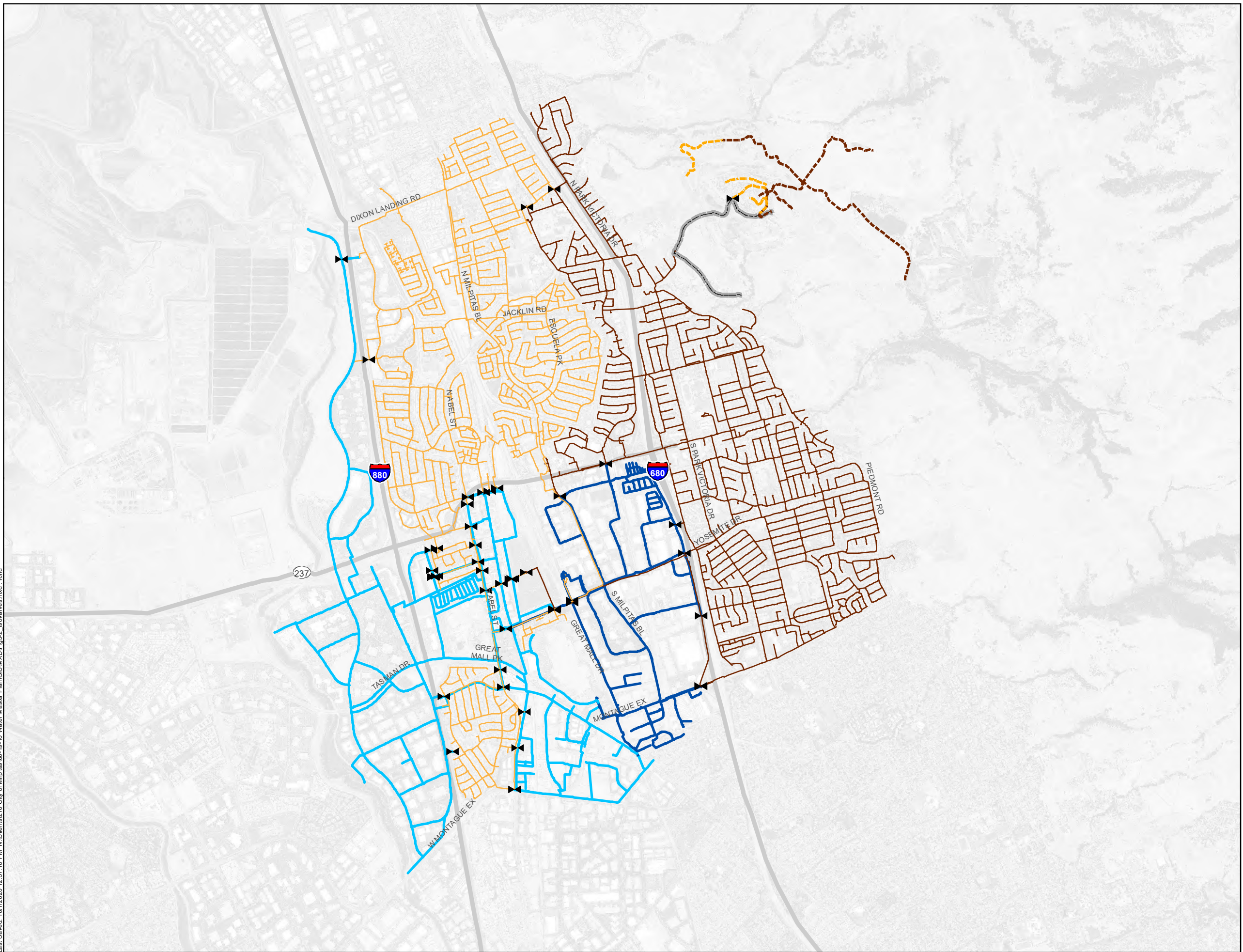
To prevent blending of the two water sources (SFPUC and VW) and better control water quality, the City has installed 49 isolation valves throughout the distribution system. Thirty-one are in Zone 1 (i.e., separating zones SF1 and VW1), and nine are in Zone 2. The remaining nine isolation valves separate 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.

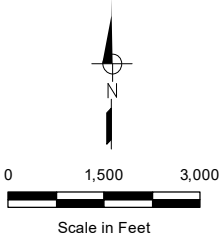
3.3.5 Pipelines

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.

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Item # 16.



Isolation Valve

Pipeline Pressure Zone

VW1

VW2

SF1

SF2

SF3

SF4-1

SF4-2



Figure 3-2
Existing Water System
Isolation Valves

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.

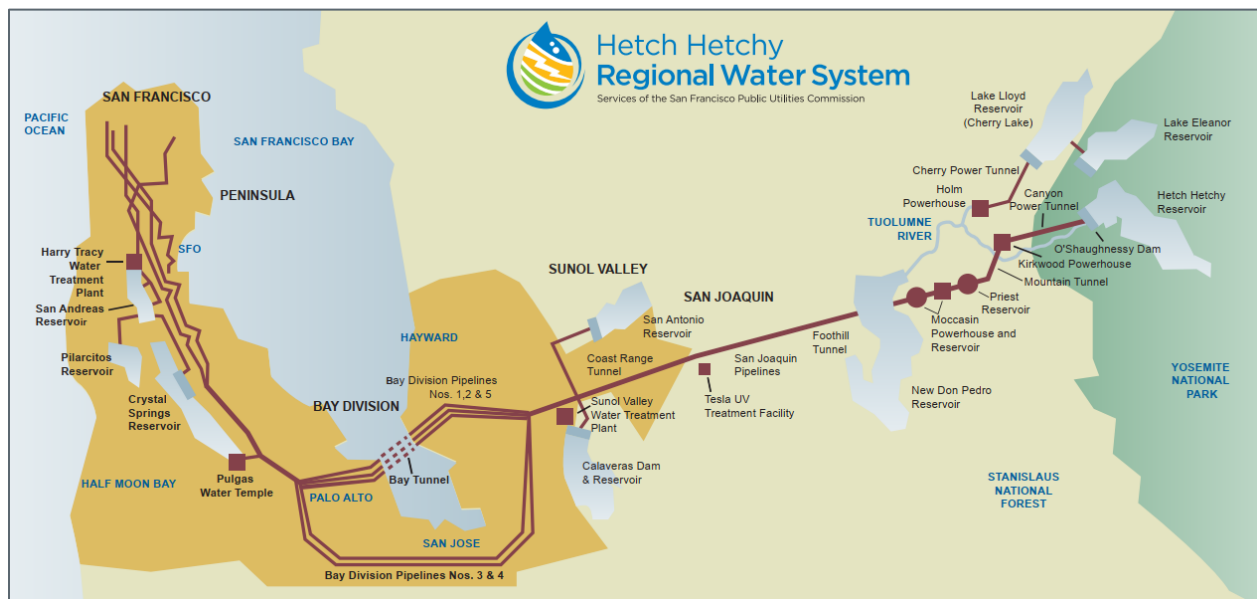
The Alameda and Peninsula watersheds produce the rest of the total water supply. The Alameda watersheds (the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds) located in Alameda and Santa Clara Counties, contribute surface water supplies captured and stored in two reservoirs: Calaveras 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.

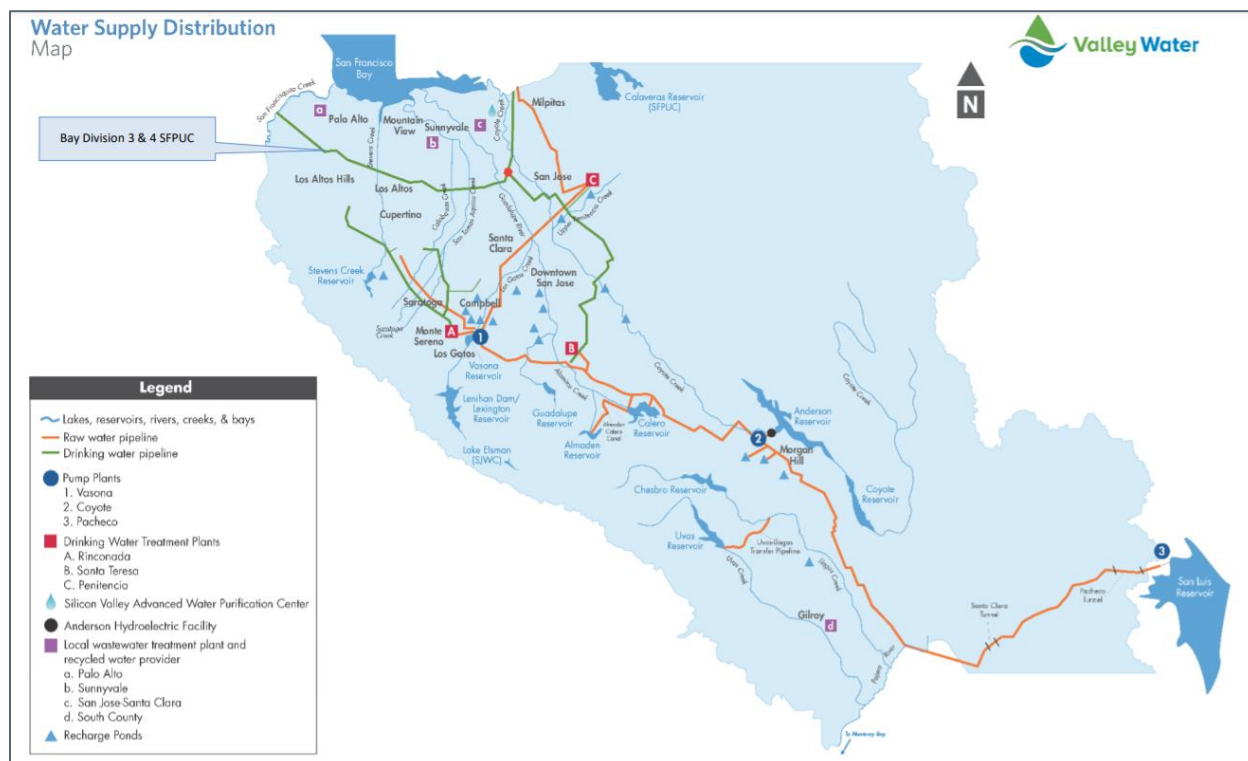
⁶ Three wholesale customers do not have ISGs: the cities of San Jose, Santa Clara, and Hayward. The cities of San Jose and Santa Clara are supplied on a temporary and interruptible basis and thus do not have an allocated share of the Supply Assurance. The City of Hayward has an unspecified allocation, equal to the difference between 184 mgd and the sum of the ISGs.

Chapter 4

Water Supply Sources

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 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.

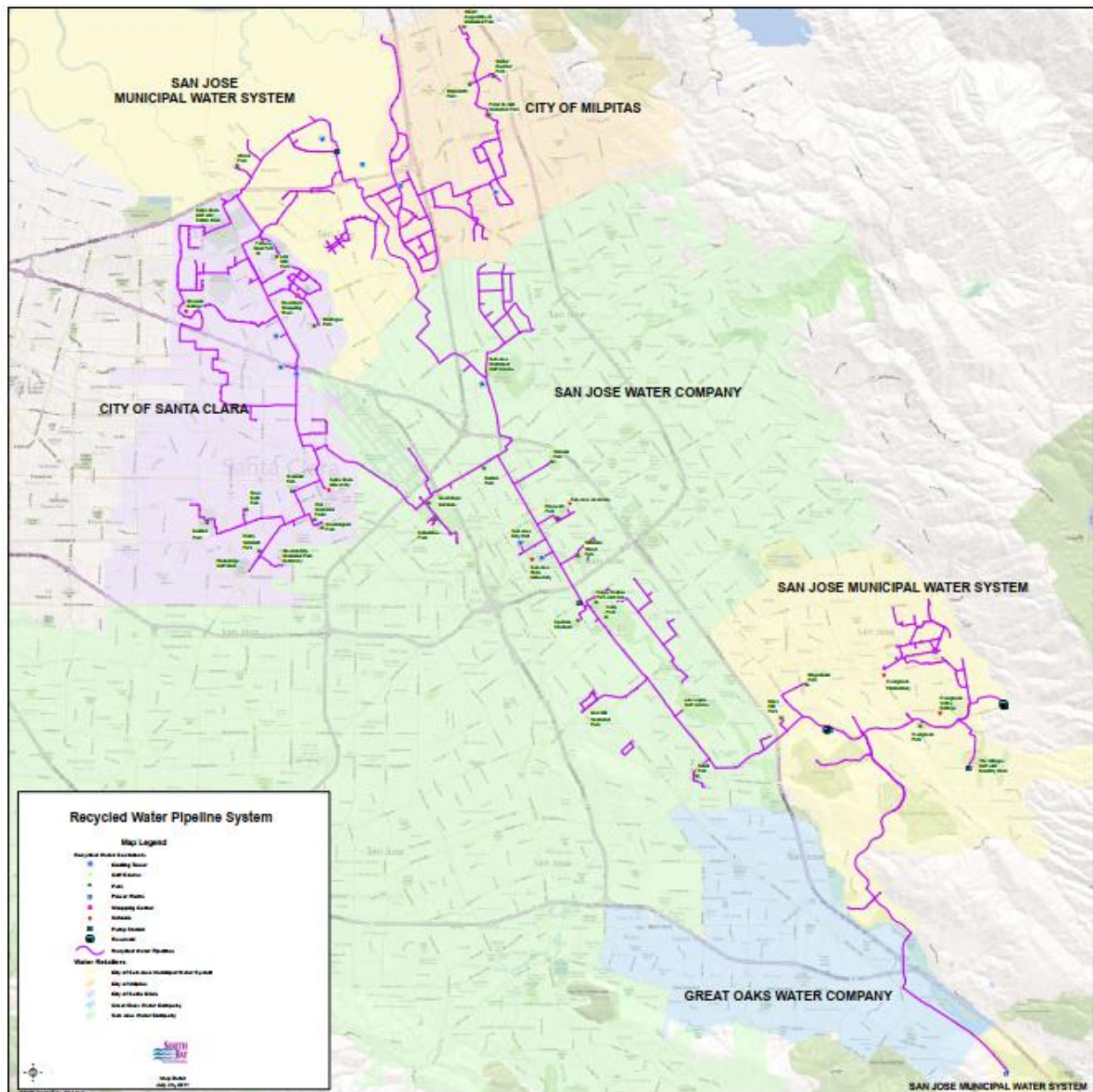
Surface water is treated at either the Penitencia or Santa Teresa Water Treatment Plants (WTPs) before delivery to the City. It should be noted that VW also operates a third WTP, the Rinconada WTP, but it primarily serves the west side of Santa Clara County, which does not include the City. The Penitencia 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, 5 pump stations, and 10 million gallons of storage in reservoirs. SBWR delivers more than 4 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 current active 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 Water Master Plan. Therefore, this Water 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

Groundwater can supplement reduced supplies from the SFPUC or Valley Water during prolonged droughts. As presented in the City's 2020 Urban Water Management Plan (UWMP), the City expects to rely on groundwater to augment supplies and meet demands during future dry years.



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. 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.

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.

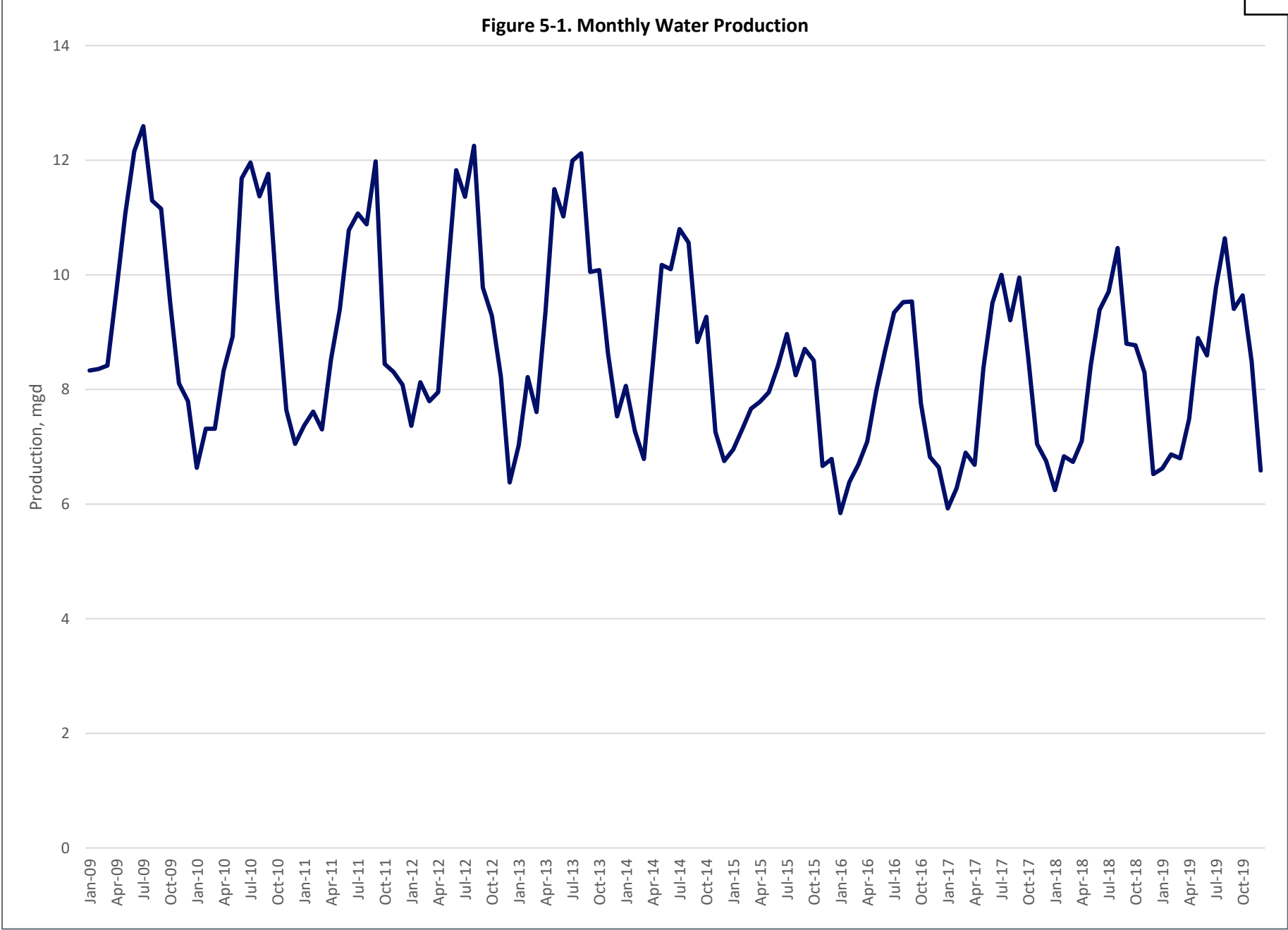


Table 5-1. Historical Water Production^(a)

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 data⁷. 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 and 2020 was well below (in compliance with) the City's per capita water use goals as required by the Water Conservation Act of 2009.

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.

As reported in the City's 2020 UWMP, the City's 2020 actual per capita water use was 108 gpcd, well below (and in compliance with) the City's final target for 2020. The City exceeded its 2020 per capita water use target compliance by 26 percent. This is in part due to the City's on-going implementation of permanent water conservation measures outlined in Chapter 6 Water Conservation of the City's Code of Ordinances.

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.

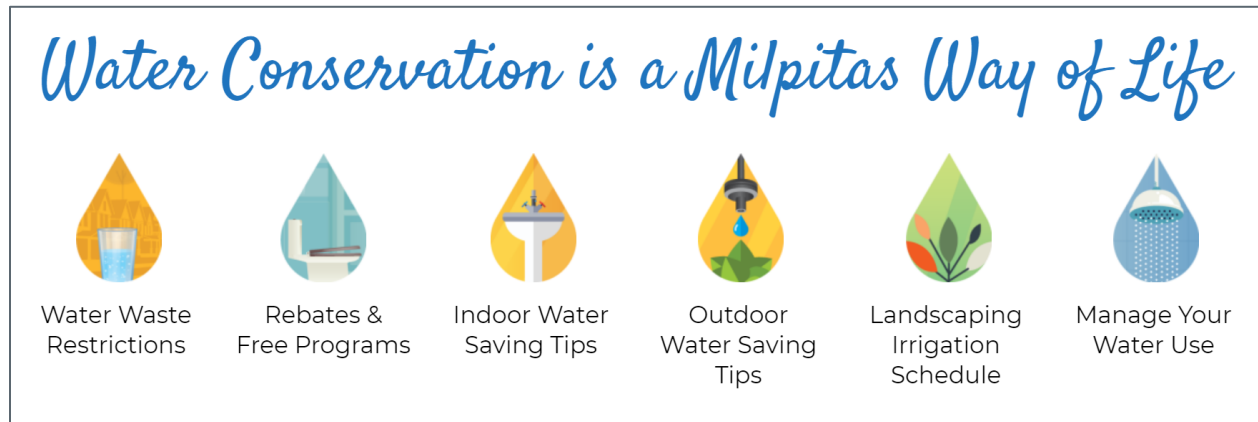
5.2.3 Current Water Conservation Programs

The City’s 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

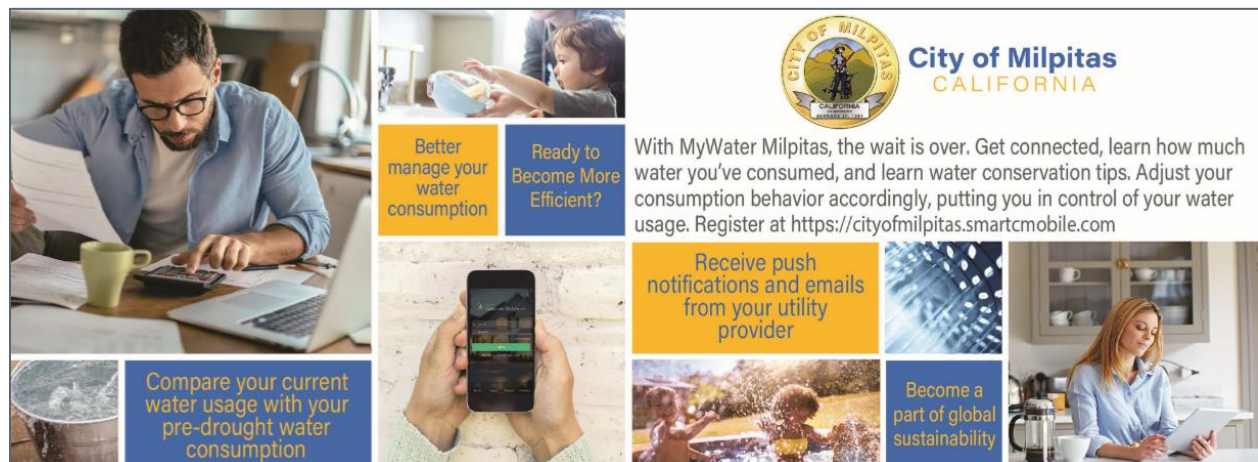
- High-efficiency clothes washer rebates
- Rebates for process, technology, and equipment retrofits that save water
- High-efficiency toilet and urinal valve replacement rebates

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)	WUE ^(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
<i>Source: Technical Memorandum #2 BAWSCA Regional Water Demand and Conservation Projection Demand Forecast, prepared for Bay Area Water Supply & Conservation Agency, prepared by Maddaus Water Management, Inc., February 21, 2020</i> (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 H₂ONet. In the 2009 WMPU, RMC converted the hydraulic model to H₂OMAP and re-evaluated the City's water system using updated land use information. This H₂OMAP-based hydraulic model has not been regularly updated since the 2009 WMPU.

In 2017, Innovyze retired the H₂OMAP 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

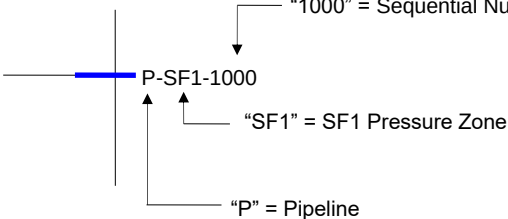
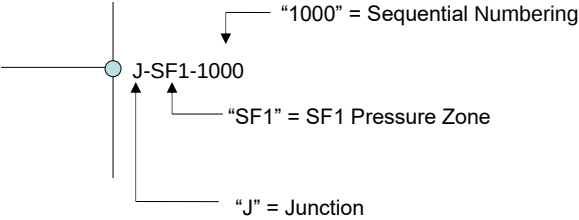
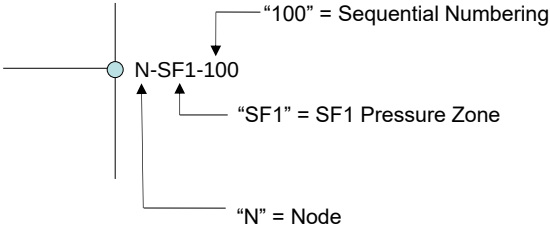
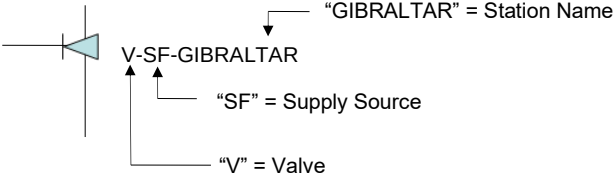
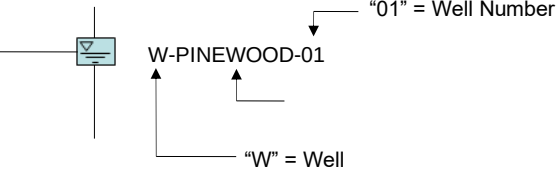
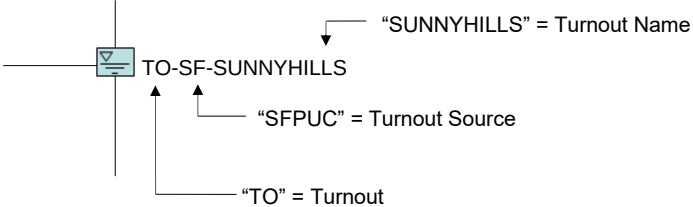
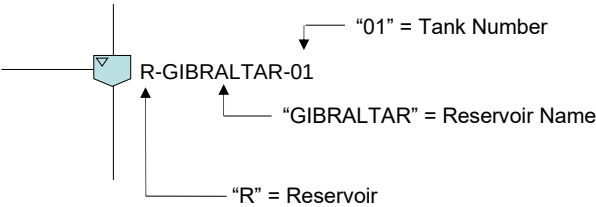
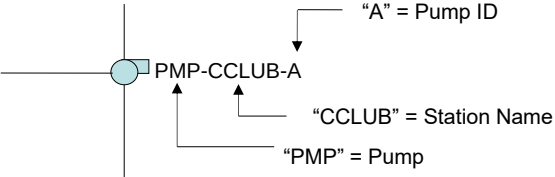
A specific and consistent naming convention allows modelers to easily locate and identify modeling elements like pipes, junctions, pumps, and storage reservoirs. As each facility is created in the model, it is named logically and sequentially based on industry standards and West Yost's extensive modeling 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	 “1000” = Sequential Numbering P-SF1-1000 “SF1” = SF1 Pressure Zone “P” = Pipeline
Junctions	 “1000” = Sequential Numbering J-SF1-1000 “SF1” = SF1 Pressure Zone “J” = Junction
Nodes	 “100” = Sequential Numbering N-SF1-100 “SF1” = SF1 Pressure Zone “N” = Node
Valves	 “GIBALTAR” = Station Name V-SF-GIBALTAR “SF” = Supply Source “V” = Valve
Wells	 “01” = Well Number W-PINEWOOD-01 “W” = Well
Turnouts	 “SUNNYHILLS” = Turnout Name TO-SF-SUNNYHILLS “SFPUC” = Turnout Source “TO” = Turnout
Storage Reservoirs	 “01” = Tank Number R-GIBALTAR-01 “GIBALTAR” = Reservoir Name “R” = Reservoir
Pumps	 “A” = Pump ID PMP-CCLUB-A “CCLUB” = Station Name “PMP” = Pump



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 contours⁸ 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

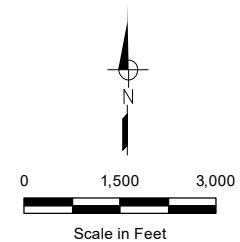
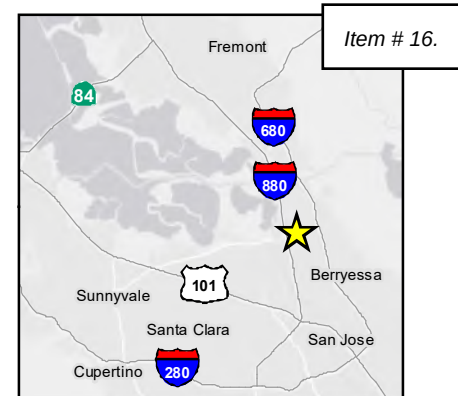
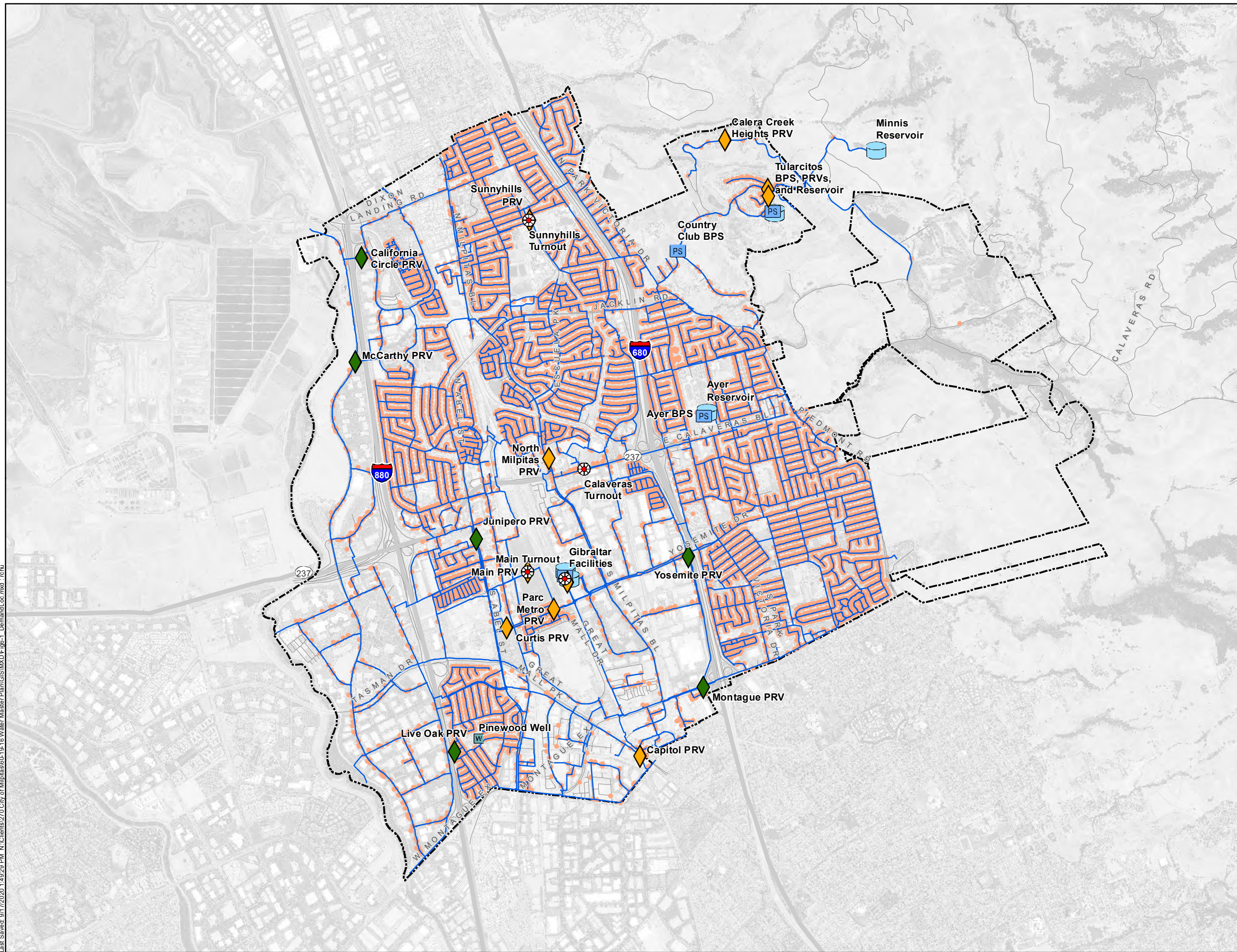
The first step in spatially locating water consumption involved linking billed water consumption to spatially located meters using a unique identifier. The City provided West Yost bimonthly water billing data listing the consumption, service address, unique billing code (i.e., Location_ID), meter type, 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/>

Last Saved: 9/17/2020 1:49:29 PM N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Fig-1 Demand Loc.mxd : rctu



- Spatially Located Demand
- ⊗ Turnout
- W Well
- ◇ Pressure Reducing Valve
- ◆ Emergency Pressure Reducing Valve
- PS Pump Station
- Storage Reservoir
- Pipeline
- - - City Limits



Figure 6-1
Spatially Located
Water Demands



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.

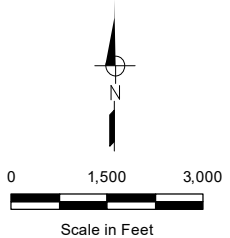
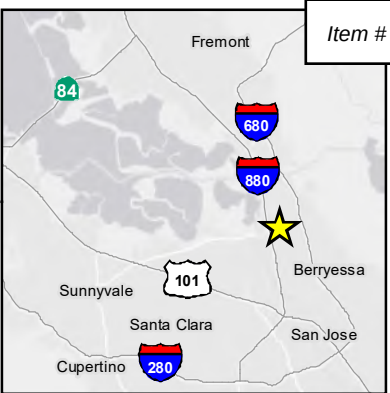
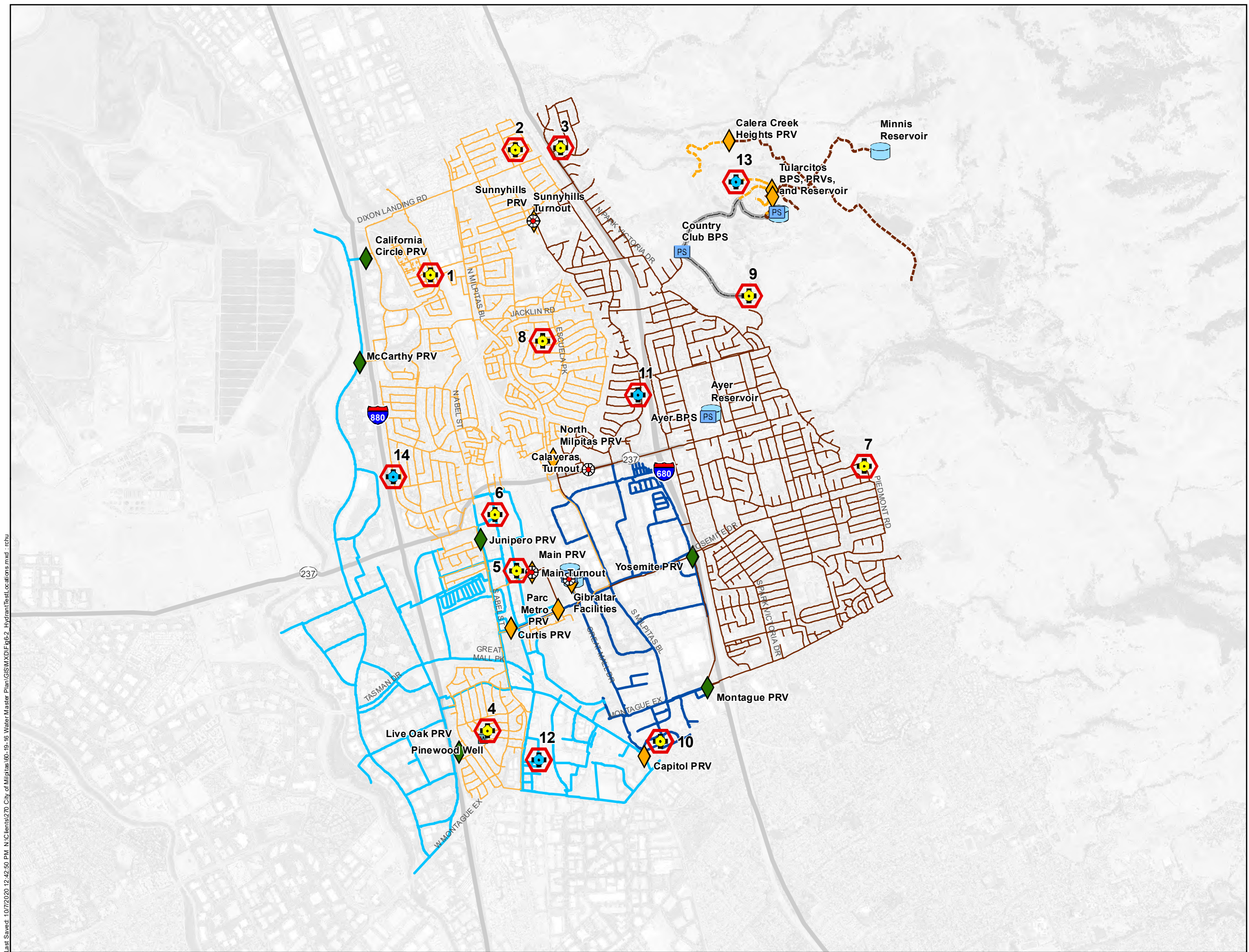
6.5 STEADY-STATE HYDRAULIC MODEL CALIBRATION

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.				



- 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



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			Comparison of Differential Pressures between Field and 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)	
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		
<i>Fire Flow Requirements</i> ^(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	
<i>Peak Supply Capacity</i>		
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	
<i>System Pressures</i>		
Minimum Pressure - Normal Conditions	Average and Maximum Day Demand: 40 psi at customer service connection 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 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		
<i>Transmission Main</i>		
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.
<i>Distribution Main</i>		
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) guidelines⁹, 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.

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.

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]
Station	Status	Available Storage Capacity, MG			Required Storage Capacity, MG			Total Required Storage	Storage Surplus (Deficit), MG
		Reservoir Capacity	Emergency Groundwater Storage Credit ^(a)	Total Available Storage	Operational ^(b)	Emergency ^(c)	Fire Flow ^(d)		
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.									

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.							



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.

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

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.

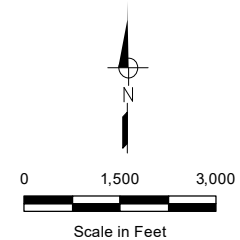
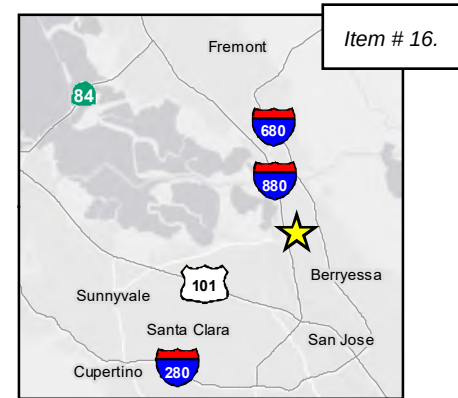
Results from the ADD simulations for Base and Alternative 1 operations are shown on Figure 8-1 and Figure 8-2, respectively. In each figure, color-coded circles represent distribution system pressures during an ADD condition. In both Base and Alternative 1 cases, there are no customer service locations 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.

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 Plumbing 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.



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

• PS Pump Station

• Storage Reservoir

• Pipeline

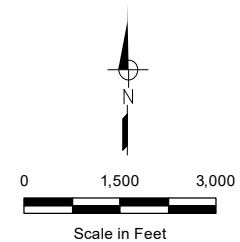
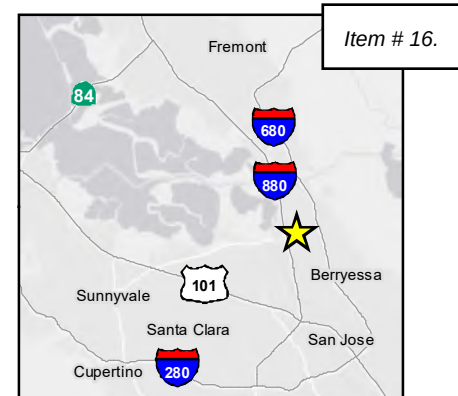


Figure 8-1

**Existing System Pressures
Average Day Demand
Base Operations**

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 Plumbing 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.



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

• PS Pump Station

• Storage Reservoir

• Pipeline



Figure 8-2

**Existing System Pressures
Average Day Demand
Alternative 1 Operations**



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.

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.

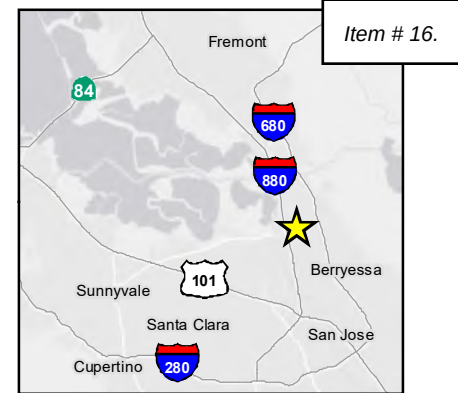
8.5.4 Maximum Day Demand Analysis

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.

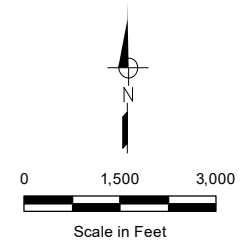
Results from the MDD simulations for Base and Alternative 1 operations are shown on Figure 8-5 and Figure 8-6, respectively. As with figures for ADD and PHD demand conditions, distribution system locations are color coded by pressure. Pressures are slightly higher for Alternative 1 (pumps on), but there are no significant differences in system performance based on operations. In both cases, there are no customer service locations with pressures below 40 psi.

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 Plumbing 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.



Item # 16.



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



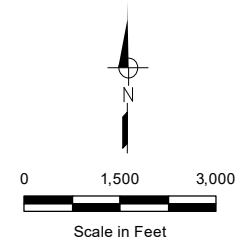
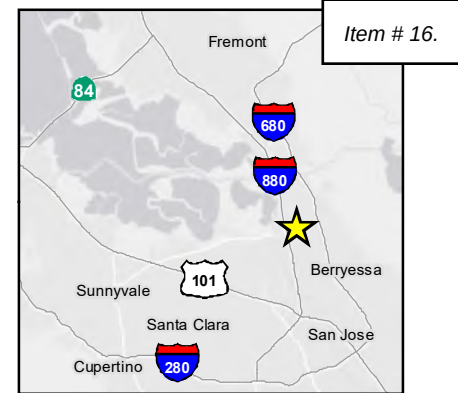
Figure 8-3

Existing System Pressures
Peak Hour Demand
Base Operations

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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 Plumbing 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.



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

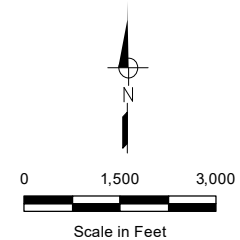
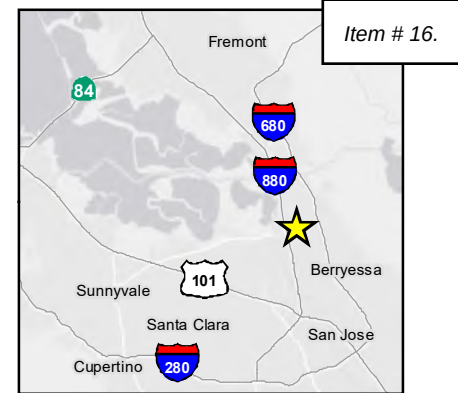


Figure 8-4

Existing System Pressures
Peak Hour Demand
Alternative 1 Operations

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 Plumbing 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.



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

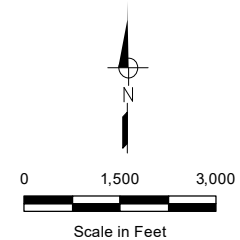
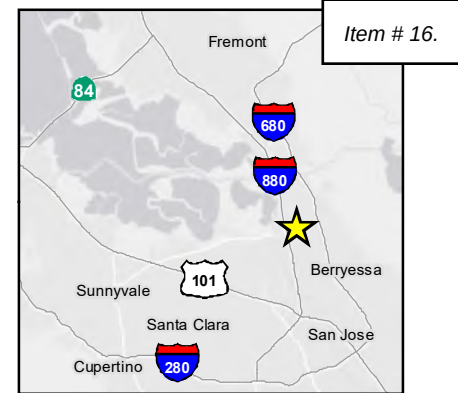


Figure 8-5

Existing System Pressures
Maximum Day Demand
Base Operations

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 Plumbing 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.



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

Pipeline



Figure 8-6

Existing System Pressures
Maximum Day Demand
Alternative 1 Operations



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.

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.

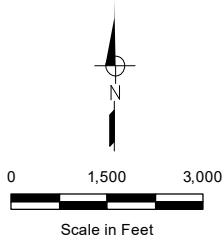
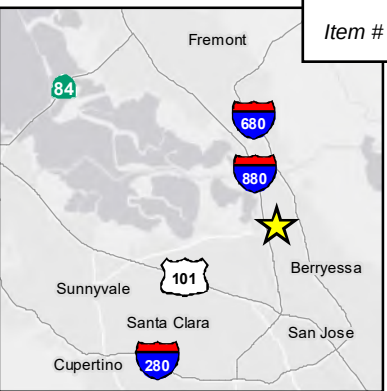
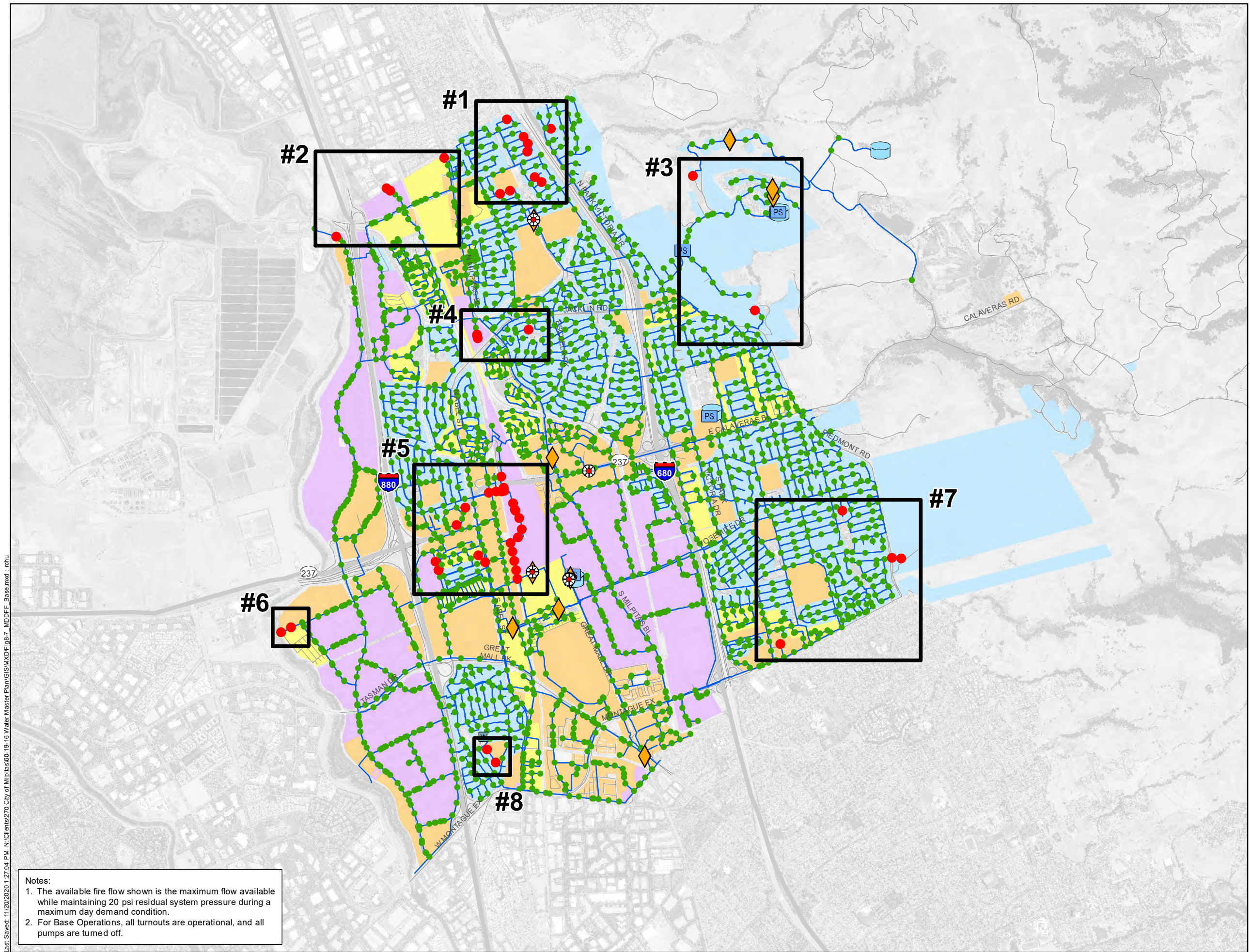
System performance is similar for the two operational alternatives. With pumps off (Base alternative), 51 locations do not meet recommended fire flows, while 45 locations are below the fire flow criterion under Alternative 1. All "below criterion" locations in Alternative 1 are also flagged in the Base 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.

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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.



Available Fire Flow

- Below Recommended Fire Flow (Red dot)
- Meets Recommended Fire Flow (Green dot)
- Turnout (Red star symbol)
- Groundwater Well (Blue 'W' symbol)
- Pressure Reducing Valve (Yellow diamond)
- Pump Station (Blue 'PS' symbol)
- Storage Reservoir (Blue cylinder symbol)
- Pipeline (Blue line symbol)

Recommended Fire Flow

- 1,500 gpm (Light blue fill)
- 2,500 gpm (Yellow fill)
- 3,000 gpm (Orange fill)
- 4,000 gpm (Purple fill)

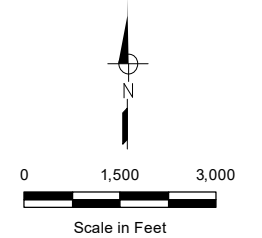
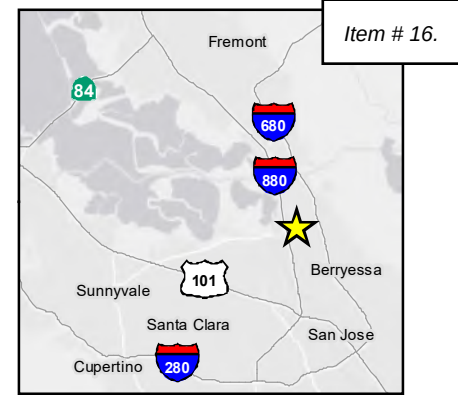


Figure 8-7
Existing System
Available Fire Flow
Base Operations

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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.



Available Fire Flow

- Below Recommended Fire Flow
- Meets Recommended Fire Flow
- ⊗ Turnout
- Ⓜ Groundwater Well
- ◇ Pressure Reducing Valve
- PS Pump Station
- Ⓢ Storage Reservoir
- Pipeline

Recommended Fire Flow

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm



Figure 8-8

Existing System
Available Fire Flow
Alternative 1 Operations



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.

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).

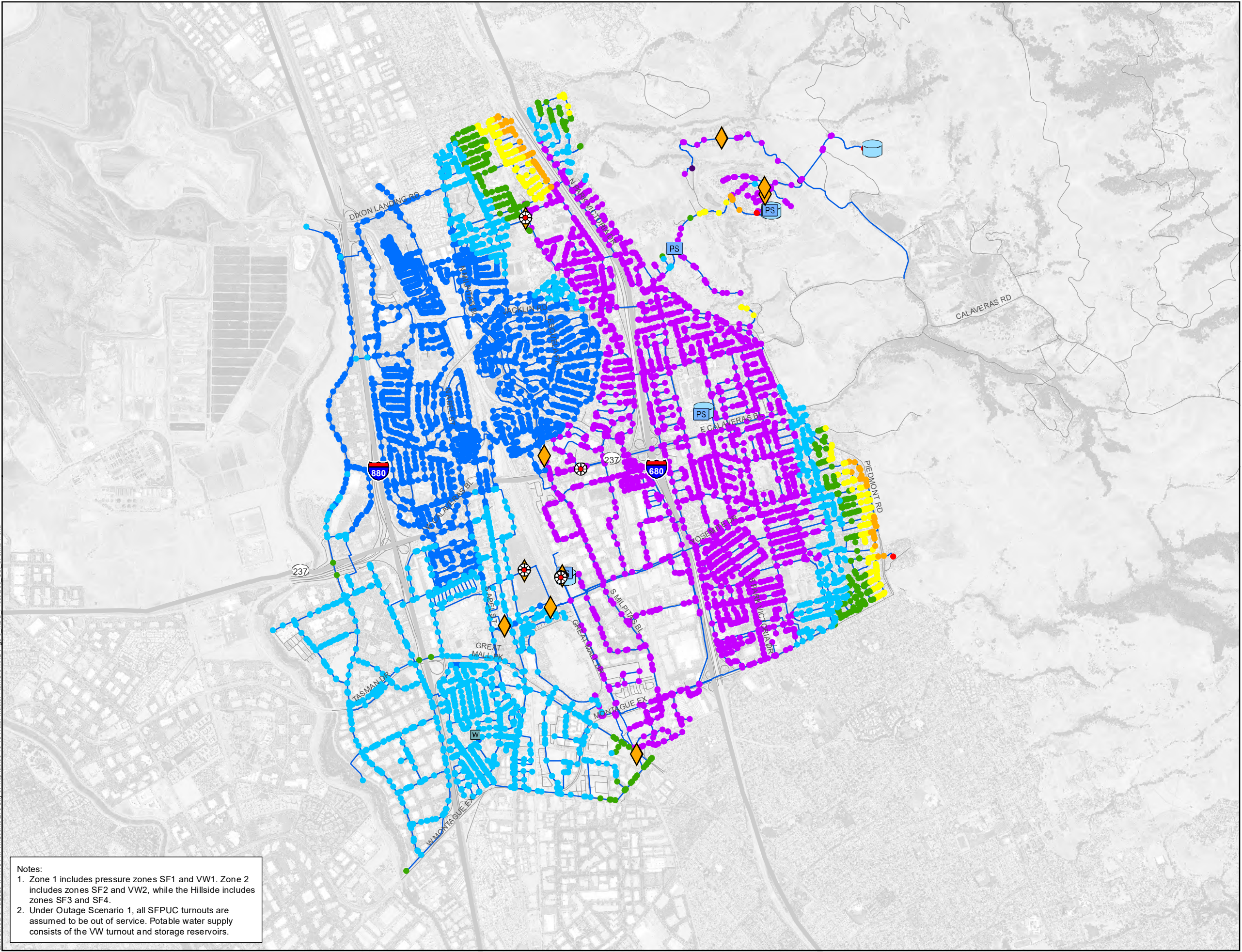
8.5.6.1 Outage Scenario 1 – SFPUC Offline

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.

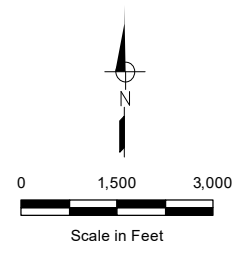
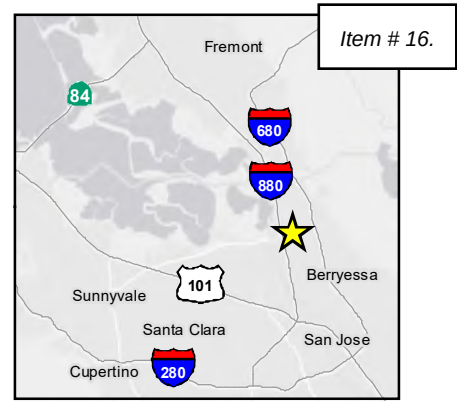
Figure 8-9 shows system pressures under MDD conditions in this outage scenario. Even without SFPUC turnout flows, the system is able to maintain adequate pressures. There are no customer service locations with pressures below 40 psi.

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.

Last Saved: 9/16/2020 4:47:18 PM N:\Clients\270 City of Milpitas\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Fig-9 MDD Pressures Out_SF.mxd :rchu



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 1, all SFPUC turnouts are assumed to be out of service. Potable water supply consists of the VW turnout and storage reservoirs.

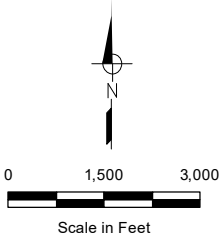
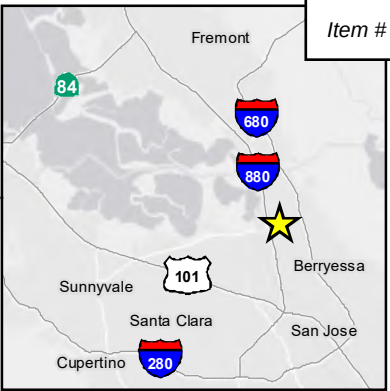
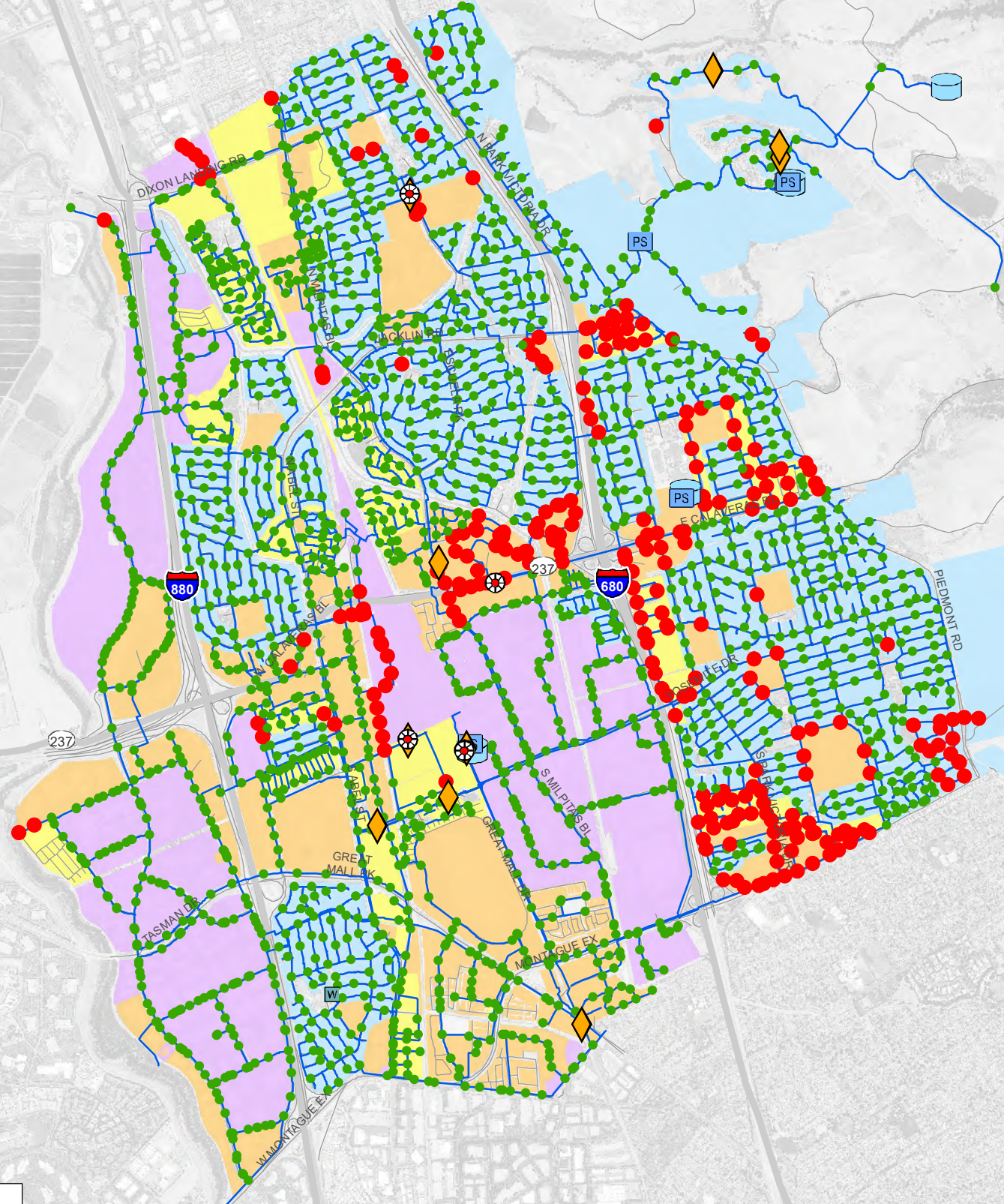


- Maximum Day Pressure**
- Less than 40 psi
 - 40 psi to 50 psi
 - 50 psi to 60 psi
 - 60 psi to 70 psi
 - 70 psi to 80 psi
- High Pressure (Zone 1)**
- Greater than 80 psi
- High Pressure (Zone 2 and Hillside)**
- 80 psi to 150 psi
 - Greater than 150 psi
- Turnout
- Groundwater Well
- Pressure Reducing Valve
- PS Pump Station
- Storage Reservoir
- Pipeline



Figure 8-9
Existing System Pressures
Maximum Day Demand
Outage Scenario 1

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.



- 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 8-10
Existing System
Available Fire Flow
Outage Scenario 1



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.

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.

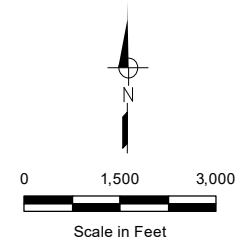
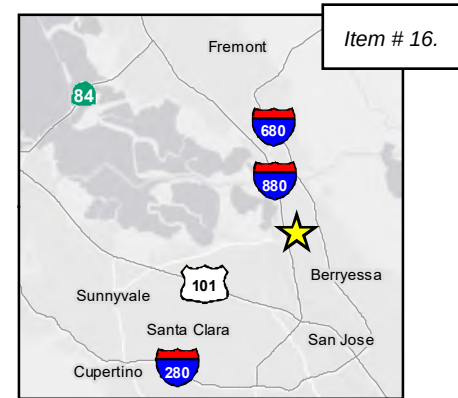
Figure 8-15 and Figure 8-16 show system pressures and fire flow availability, respectively, under MDD conditions in this outage scenario. The power outage does not significantly impact customer service pressures or fire flow availability, as the hillside storage reservoirs can adequately serve their 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.

Last Saved: 9/16/2020 4:48:18 PM N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Fig-11 MDD Pressures Out VW.mxd - rchu

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 2, the VW turnout is assumed to be out of service. Potable water supply consists of SFPUC turnouts and storage reservoirs.



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



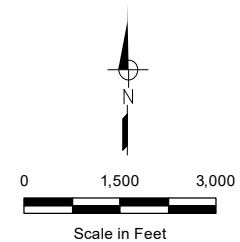
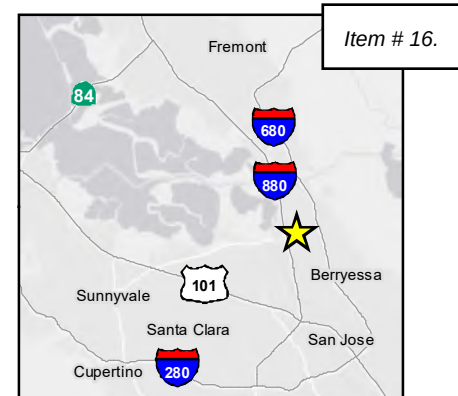
Figure 8-11

Existing System Pressures
Maximum Day Demand
Outage Scenario 2

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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.



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



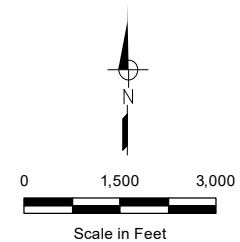
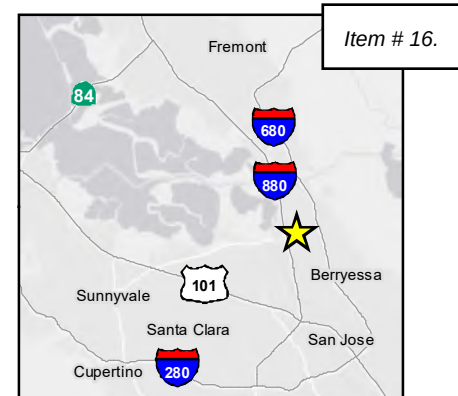
Figure 8-12

Existing System
Available Fire Flow
Outage Scenario 2

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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.



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



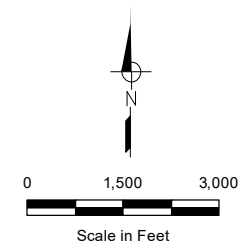
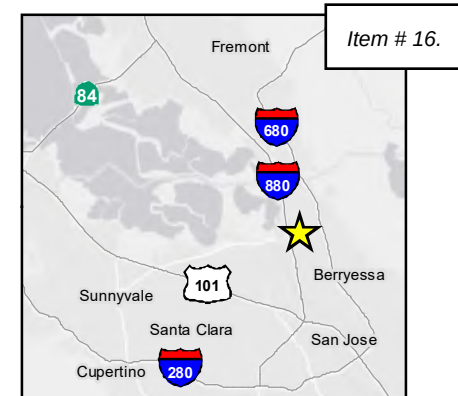
Figure 8-13

Existing System Pressures
Maximum Day Demand
Outage Scenario 3

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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.



Available Fire Flow

- Below Recommended Fire Flow (Red dot)
- Meets Recommended Fire Flow (Green dot)
- Turnout (Wheel icon)
- Groundwater Well (W icon)
- Pressure Reducing Valve (Diamond icon)
- Pump Station (PS icon)
- Storage Reservoir (Blue cylinder icon)
- Pipeline (Blue line icon)

Recommended Fire Flow

- 1,500 gpm (Light blue)
- 2,500 gpm (Yellow)
- 3,000 gpm (Orange)
- 4,000 gpm (Purple)



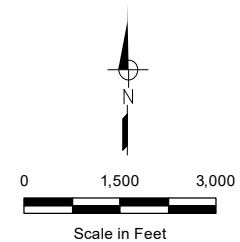
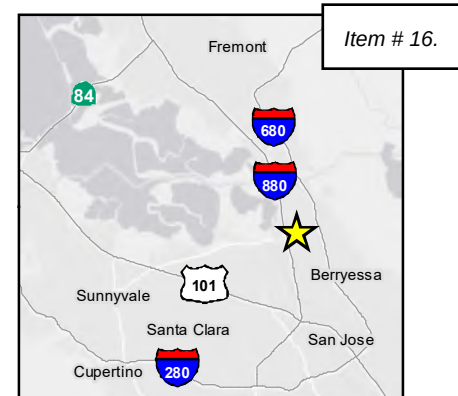
Figure 8-14

Existing System
Available Fire Flow
Outage Scenario 3

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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 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.



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

• PS Pump Station

• Storage Reservoir

• Pipeline



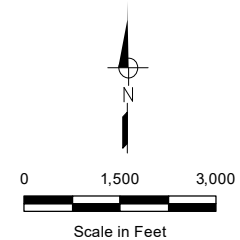
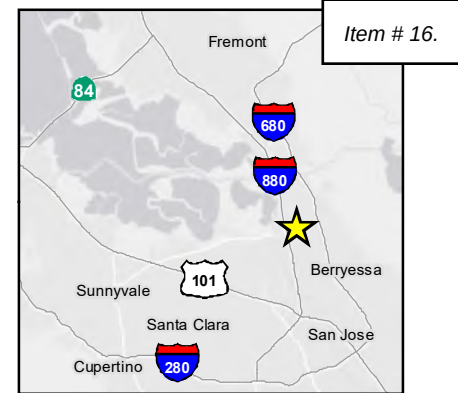
Figure 8-15

Existing System Pressures
Maximum Day Demand
Outage Scenario 4

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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.



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 8-16

Existing System
Available Fire Flow
Outage Scenario 4



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).

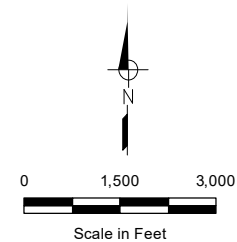
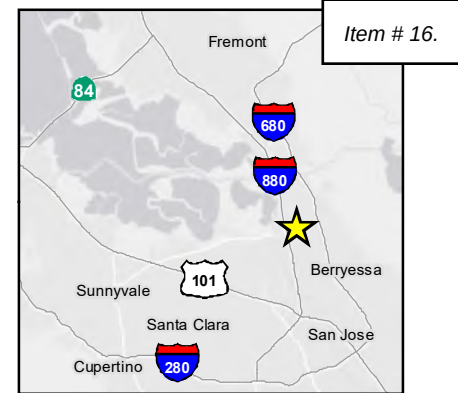
8.5.6.5.4 PRV Outage Priority

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.



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
- PS Pump Station
- Ⓢ Storage Reservoir
- Pipeline

Recommended Fire Flow

- 1,500 gpm
- 2,500 gpm
- 3,000 gpm
- 4,000 gpm



Figure 8-17

Existing System Available Fire Flow Outage Scenario 5



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.

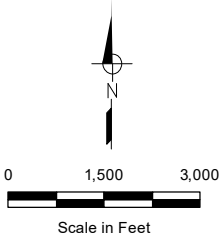
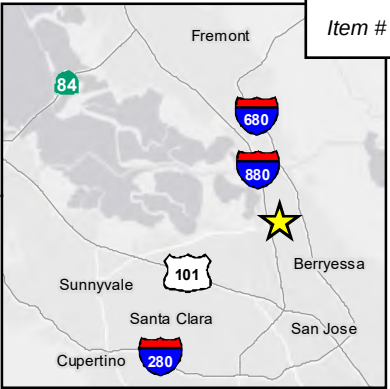
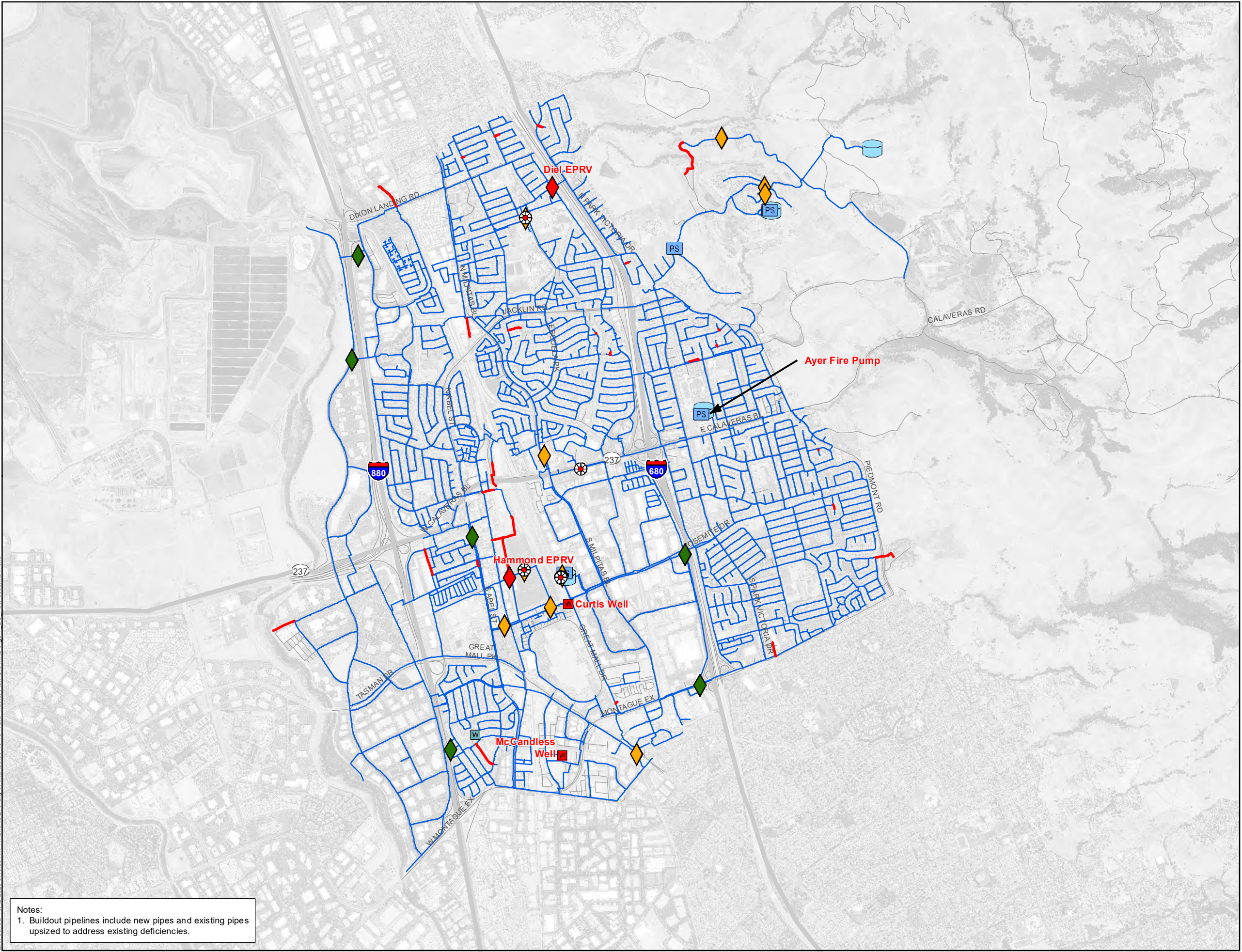
9.2 POTABLE WATER FACILITIES FOR BUILDOUT ANALYSIS

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.

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Notes:
1. Buildout pipelines include new pipes and existing pipes upsized to address existing deficiencies.



- 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



Figure 9-1
Potable Water Facilities for
Buildout Analysis



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 5,000 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]
Facility	Status	Available Storage Capacity, MG			Required Storage Capacity, MG				Storage Surplus (Deficit), MG
		Available Reservoir Capacity	Emergency Groundwater Storage Credit ^(a)	Total Available Storage	Required Operational ^(b)	Emergency ^(c)	Fire Flow ^(d)	Total Required Storage	
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 station.

(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.

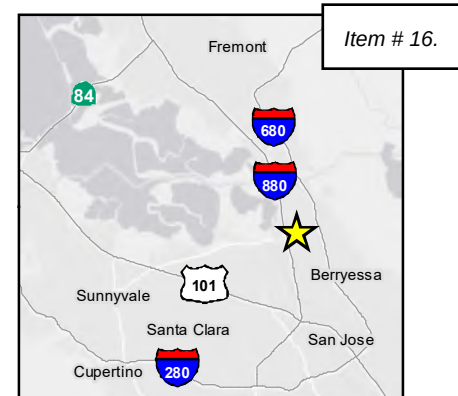
Per Table 7-1 of this report, under normal conditions the maximum recommended velocities for transmission and distribution mains is 6 and 8 ft/s, respectively. Transmission mains are pipelines 16 inches or larger in diameter, while distribution mains are pipelines smaller than 16 inches in diameter. 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.

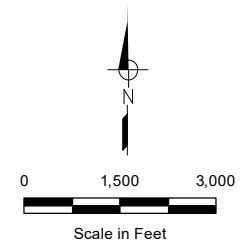
In the VW service area, high velocity pipelines are located at and adjacent to the Gibraltar facility and PRVs. This includes the transmission main along Curtis Avenue and Yosemite Drive (between South Abel Street and South Milpitas Boulevard). Transmission mains in this area and downstream of the Gibraltar 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.

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 Plumbing 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.



Item # 16.



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



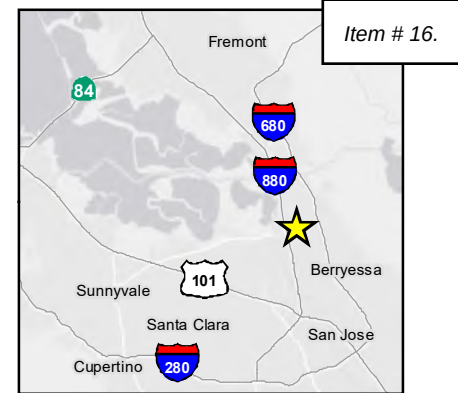
Figure 9-2

**Buildout System Pressures
Peak Hour Demand
Base Operations**

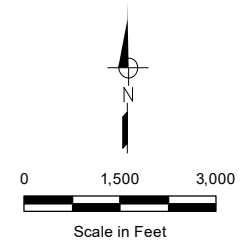
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Notes:

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 Plumbing 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.



Item # 16.



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



Figure 9-3

**Buildout System Pressures
Peak Hour Demand
Alternative 1 Operations**



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.

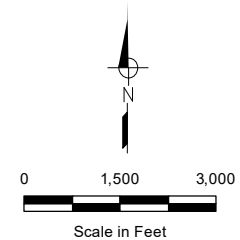
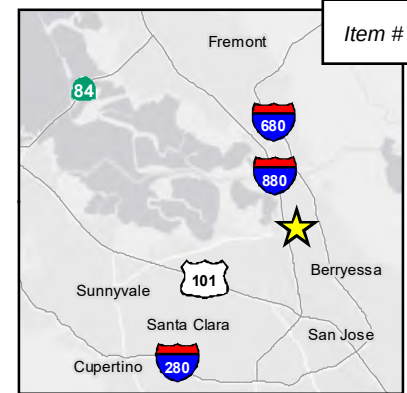
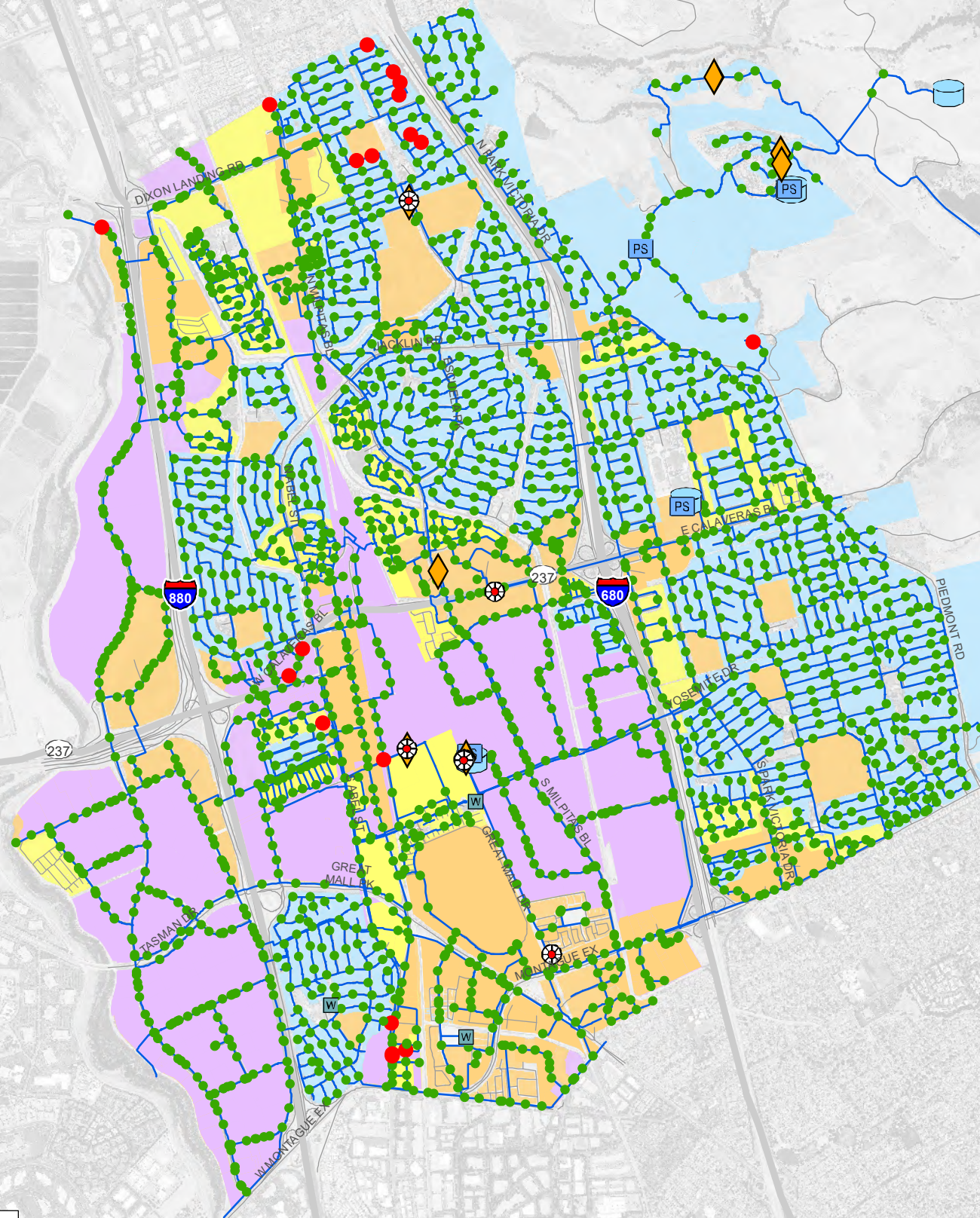
The three remaining below criterion locations are all at the southern end of Zone VW1, near South Main Street. To address these locations, West Yost recommends installing a new EPRV between Zones SF1 and VW1 near the intersection of Cedar Way and South Main Street (CIP ID BCIP-V-01). This emergency 8-inch 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.

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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.



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



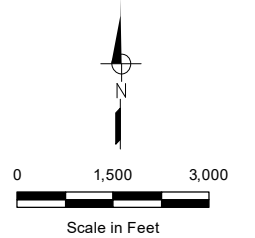
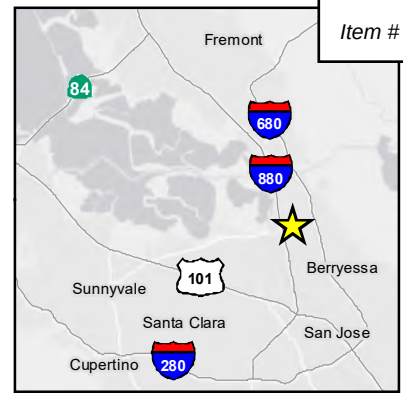
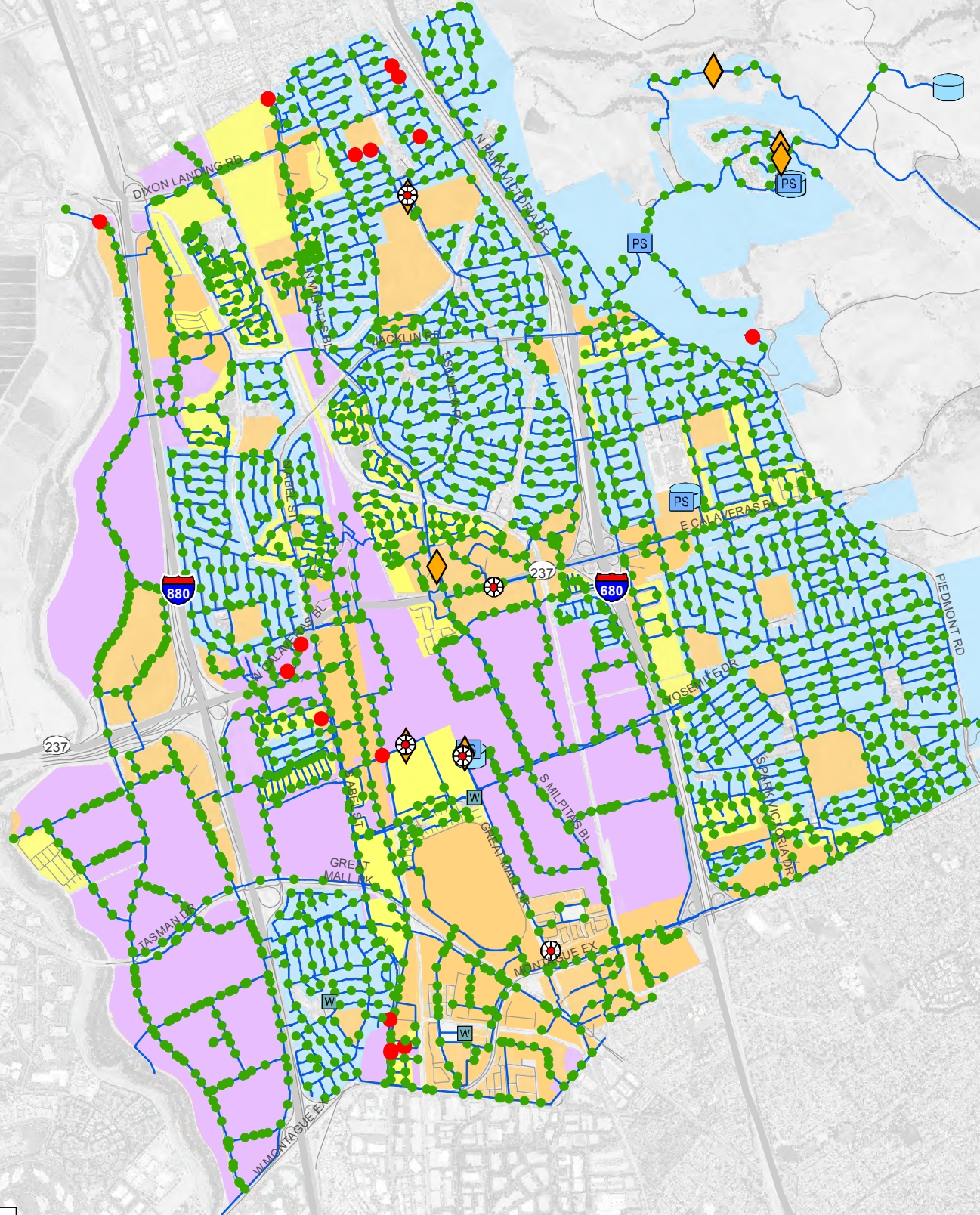
Figure 9-4

Buildout System
Available Fire Flow
Base Operations

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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.



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



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: $Risk = LOF \times COF$

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 Unlikely	2 Possible	3 Likely	4 Very Likely
COF	1 Negligible	Hydrants Valves Pipelines	Hydrants Valves Meters Pipelines	Hydrants Meters Pipelines	Meters Pipelines
	2 Minimal	Hydrants Valves Pipelines	Hydrants Valves PRVs Intertie Meters Pipelines	Hydrants Valves Well Reservoir PRVs Intertie Meters Pipelines	Meters Pipelines
	3 Moderate	Hydrants Valves Pipelines	Hydrants Valves PRVs Intertie Reservoirs Pipelines	Hydrants Valves PRVs Turnouts Reservoirs Pump Stations Pipelines	Pump Stations Pipelines
	4 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 Unlikely	2 Possible	3 Likely	4 Very Likely
COF	1 Negligible	Hydrants Valves Pipelines	Hydrants Valves Meters Pipelines	Hydrants Meters Pipelines	Meters Pipelines
	2 Minimal	Hydrants Valves Pipelines	Hydrants Valves PRVs Intertie Meters Pipelines	Hydrants Valves Well Reservoir PRVs Intertie Meters Pipelines	Meters Pipelines
	3 Moderate	Hydrants Valves Pipelines	Hydrants Valves PRVs Intertie Reservoirs Pipelines	Hydrants Valves PRVs Turnouts Reservoirs Pump Stations Pipelines	Pump Stations Pipelines
	4 Severe	Pipelines	Pipelines	Pipelines	Pipelines

Chapter 10

Asset Renewal and Replacement



Item # 16.

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	



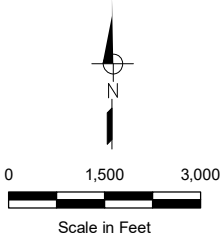
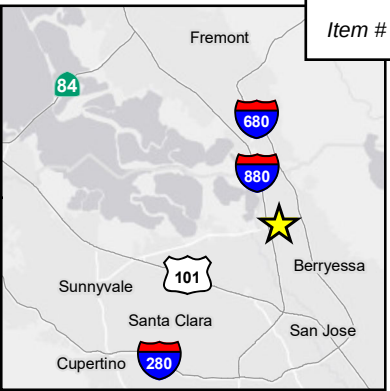
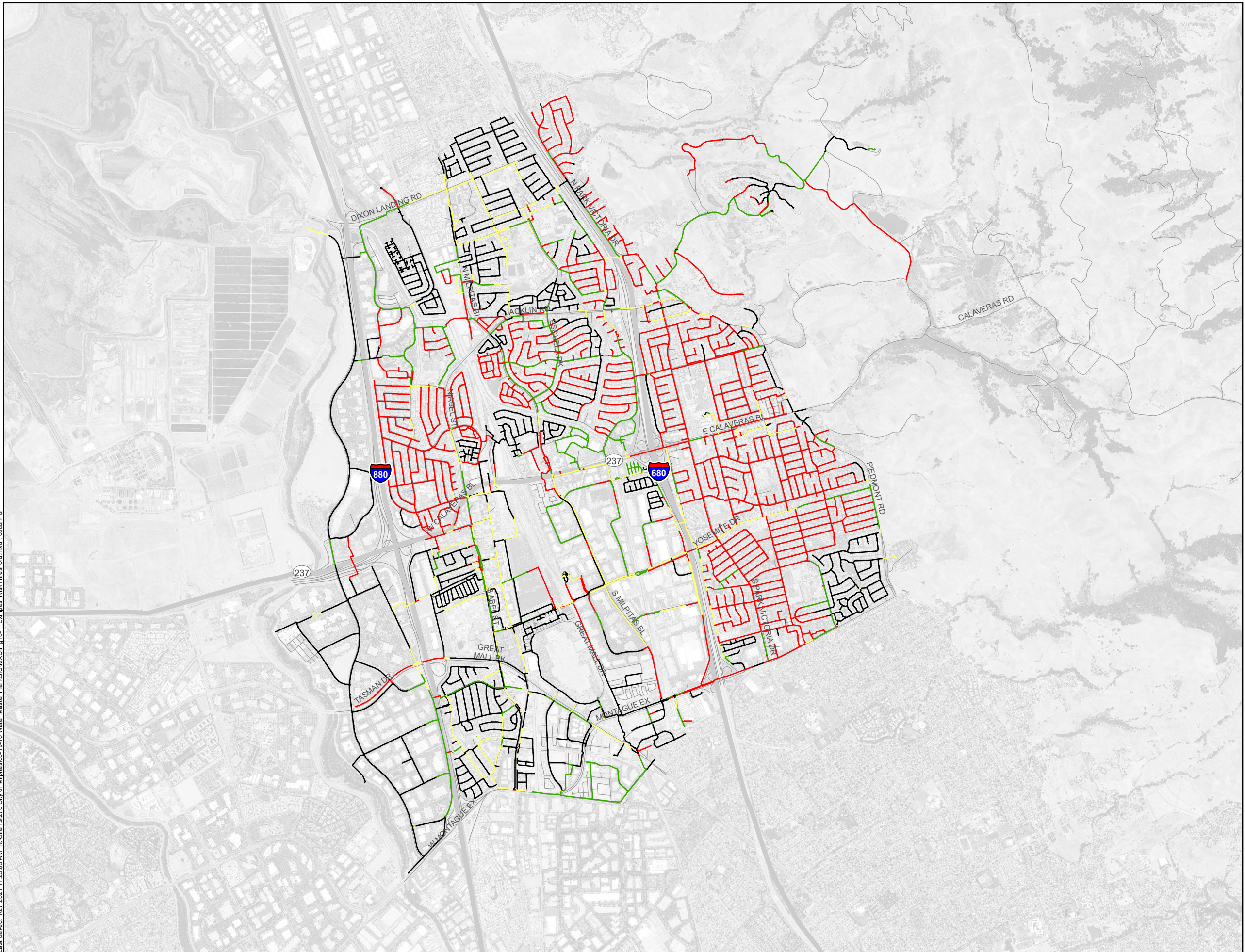
10.2.2.2 Horizontal Assets

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

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Pipeline Risk Threshold Trigger

- No Action
- Level A
- Level B
- Level C



Figure 10-1
Existing Pipelines
Risk Threshold Level



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

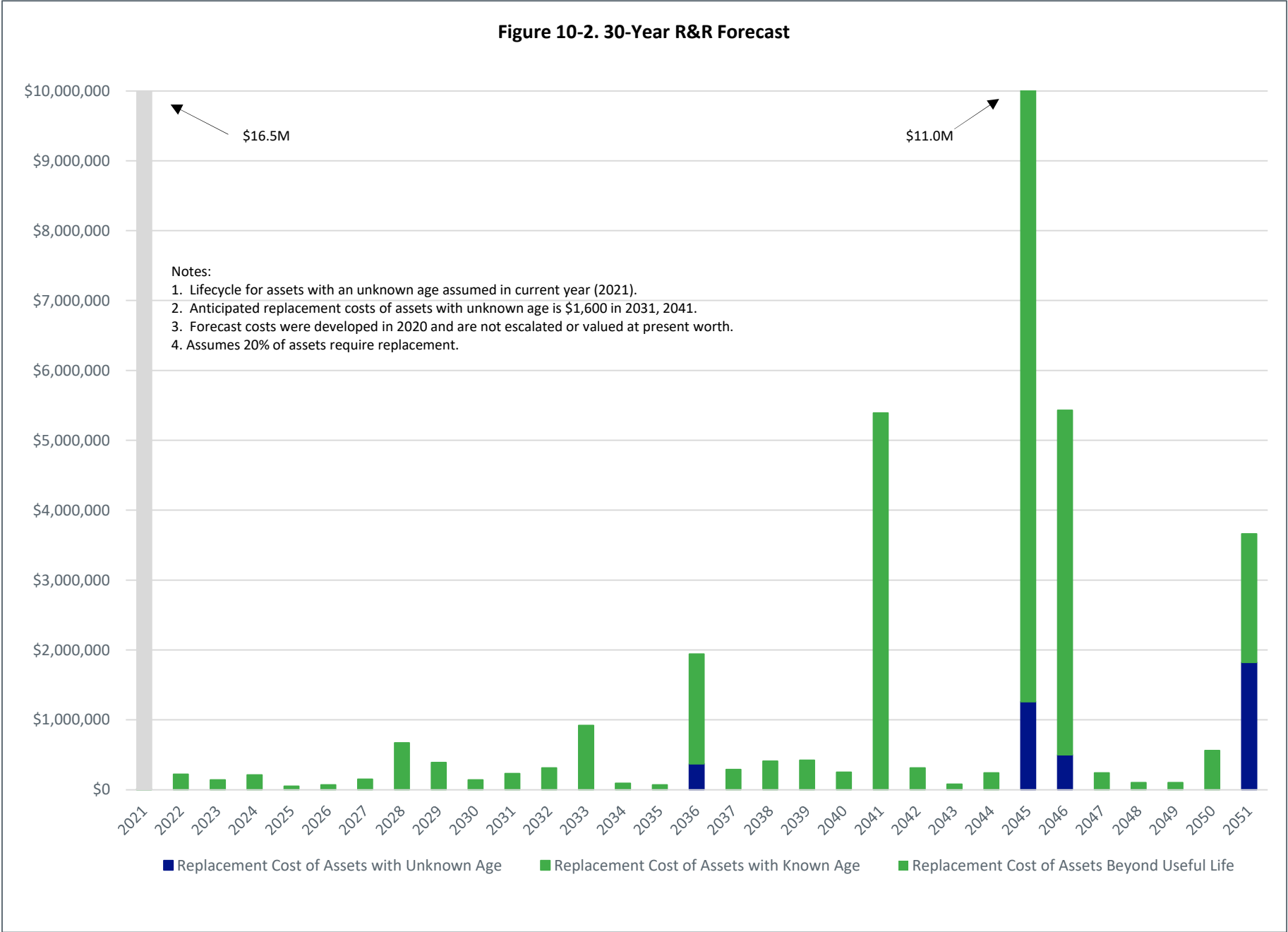


Table 10-8. Asset Renewal and Replacement Recommendations		
Title	Description	Capital Cost Estimate, \$
Capital Projects		
Pipeline Condition Assessment	Conduct a comprehensive assessment of the pipeline distribution system using both destructive and non-destructive assessment techniques. Technologies 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. 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 - Live Oak PRV - North Vault PRV - South Vault PRV - Milpitas PRV - Capitol PRV - Abel PRV - Gibraltar PRV - McCarthy PRV - Sinclair PRV - ACWD Intertie - SCVWD Intertie	5,000 15,000 15,000 5,000 15,000 5,000 15,000 15,000 5,000 15,000 5,000
	Subtotal PRV/Intertie/Turnout	\$115,000
	Well/Res/PS - Curtis Well - Minnis Reservoir - Gibraltar Res (VW) - Gibraltar Res (SF)	75,000 80,000 325,000 325,000
	Subtotal Well/Res/PS	\$805,000
	Level B Total Cost	\$920,000
	Level C Recommendations	
	PRV/Intertie/Turnout - Curtis PRV - Montague PRV - Main Street Turnout - Calaveras Turnout - Sunnyhills Turnout - Gibraltar Turnout	15,000 5,000 20,000 15,000 15,000 25,000
	Subtotal PRV/Intertie/Turnout	\$95,000
	Well/Res/PS - Tularcitos Reservoir - Country Club Pump Station - Tularcitos Pump Station - Ayer Reservoirs - Pinewood Well - Gibraltar Pump Station - Ayer Pump Station	75,000 60,000 70,000 355,000 105,000 435,000 125,000
	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. 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. 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. 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

Chapter 10

Asset Renewal and Replacement



Item # 16.

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.

It should be noted that construction costs for the recommended capital improvement projects have been updated from those presented in the March 2021 Draft Water Master Plan to account for the recent bidding climate. 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 Design: 10 percent
- Construction Management: 15 percent
- Permitting and Implementation: 10 percent

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

Based on the recommendations of this Water Master Plan, as well as the City's recently completed Wastewater Master Plan and Stormwater Master Plan, the City of Milpitas retained Raftelis to prepare a comprehensive financial plan for the City's water, wastewater and stormwater utilities for the period from FY 2022 through FY 2040. The financial plan for the water utility (included in Appendix F) considers the projected revenues and expenditures and seeks to optimize the use of rate revenues and bond issues to minimize revenue adjustments while meeting annual revenue requirements, debt service coverage, and reserve targets. The City's water utility is financially self-sufficient with funding for capital and operating requirements derived primarily from rates.

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.

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	\$ 605,850	\$ 1,030,000
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	\$ 259,700	\$ 441,000
Pipeline Improvement	Along Hanson Court, replace existing 8-inch diameter pipeline with 12-inch diameter pipeline.	ECIP-PI-05	Fire Flow	High	611 lf	\$ 213,850	\$ 364,000
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	\$ 317,450	\$ 540,000
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	\$ 308,000	\$ 524,000
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	\$ 157,500	\$ 268,000
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	\$ 301,350	\$ 512,000
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	\$ 84,000	\$ 143,000
Pipeline Improvement	Along Pinard Street from Ridgmont 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	\$ 238,000	\$ 405,000
Pipeline Improvement	Along Merz Court, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline.	ECIP-PI-21	Fire Flow	High	425 lf	\$ 148,750	\$ 253,000
Pipeline Improvement	Along Sussex Place, replace existing 4-inch diameter pipeline with 8-inch diameter pipeline.	ECIP-PI-23	Fire Flow	High	192 lf	\$ 67,200	\$ 114,000
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	\$ 56,000	\$ 95,000
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	\$ 516,600	\$ 878,000
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	\$ 50,750	\$ 86,000
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	\$ 59,850	\$ 102,000
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	\$ 10,500	\$ 18,000
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	\$ 19,950	\$ 34,000
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	\$ 7,350	\$ 12,000
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	\$ 31,150	\$ 53,000
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	\$ 115,850	\$ 197,000
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	\$ 21,700	\$ 37,000
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	\$ 15,750	\$ 27,000
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	\$ 7,350	\$ 12,000
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	\$ 37,450	\$ 64,000
						Total	\$ 9,929,000

(a) Costs shown are in 2020 dollars and have been updated from those presented in the March 2021 Draft Water Master Plan to account for the recent bidding climate.

(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 Design: 10 percent; Construction Management: 15 percent; and Permitting and 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.



The total CIP cost (including mark-ups) for improvements to the existing system is approximately \$9.9 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.

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.

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 11-3. 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.

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 exercise 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 \$82.1 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	\$5.6	-	-	-	-	-	\$5.6
Fire Pump at Ayer Pump Station	-	\$2.1	-	-	-	-	\$2.1
Diel EPRV	-	\$0.5	-	-	-	-	\$0.5
Pipeline Improvements and New Pipelines - Fire Flow (Outage)	-	\$0.2	-	-	-	-	\$0.2
Backup Generators at Country Club and Tularcitos Pump Stations	-	\$0.7	-	-	-	-	\$0.7
Hydrant Service Pipeline Improvements	-	\$0.4	-	-	-	-	\$0.4
Subtotal	\$6.1	\$3.9	\$0.0	\$0.0	\$0.0	\$0.0	\$9.9
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	\$28.2	\$5.3	\$17.7	\$3.8	\$17.0	\$10.1	\$82.1

(a) Costs shown are in 2020 dollars and have been updated from those presented in the March 2021 Draft Water Master Plan to account for the recent bidding climate.

(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

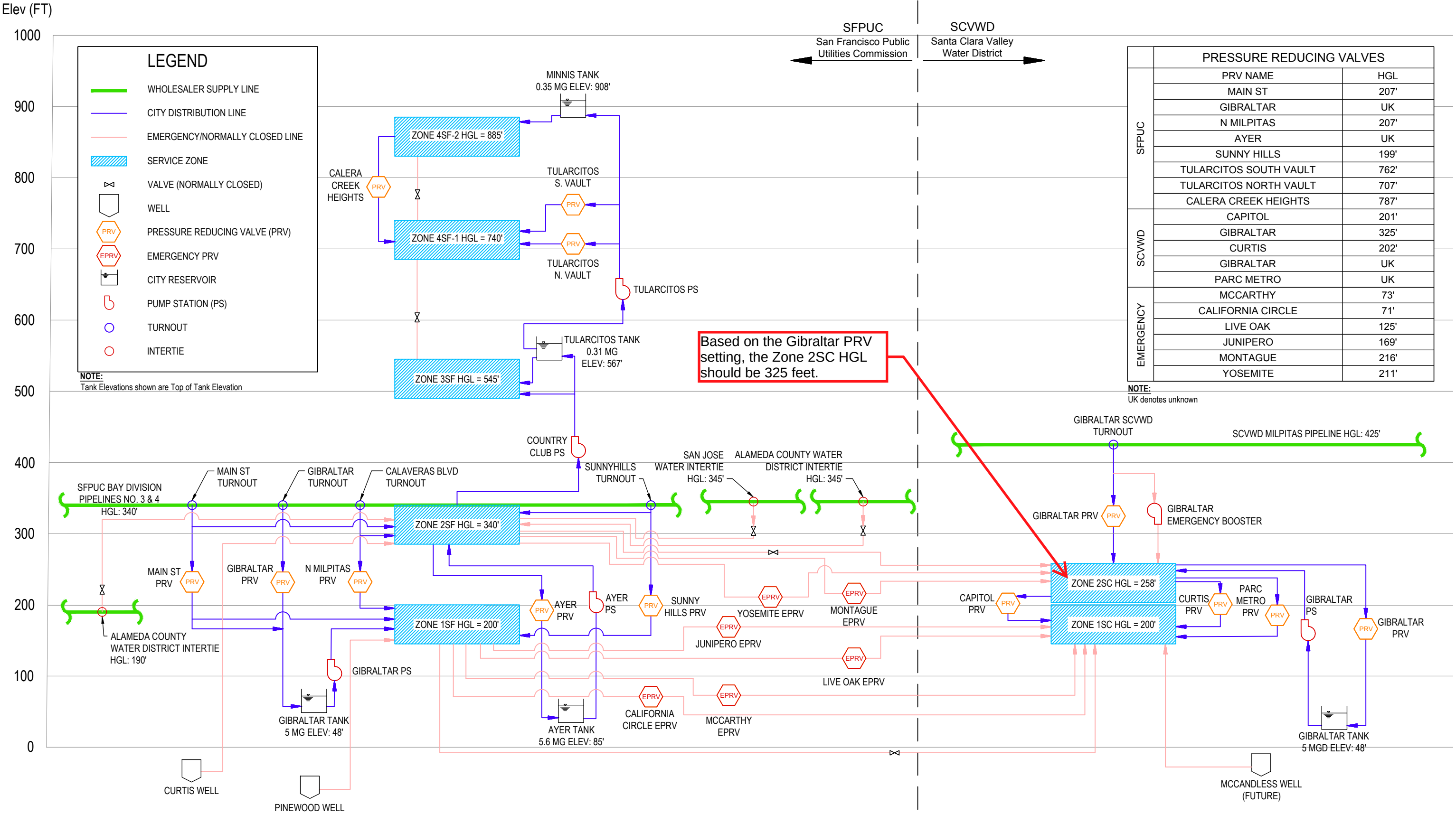
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Below is a list of references used for the preparation of this Water Master Plan, sorted alphabetically by author.

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Appendix A

Water System Schematic Profile



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 to 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 receives 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.

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 a 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 valve 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 to 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). These valves were marked by using large G12 valve boxes and painting them red. They 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

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 through 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)

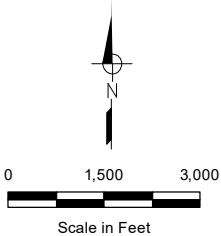
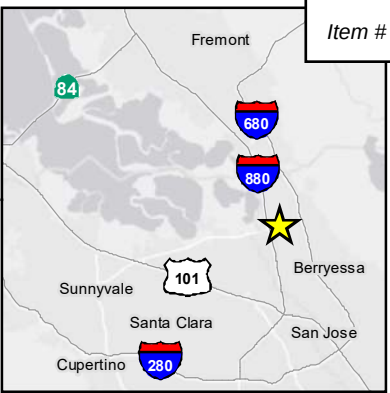
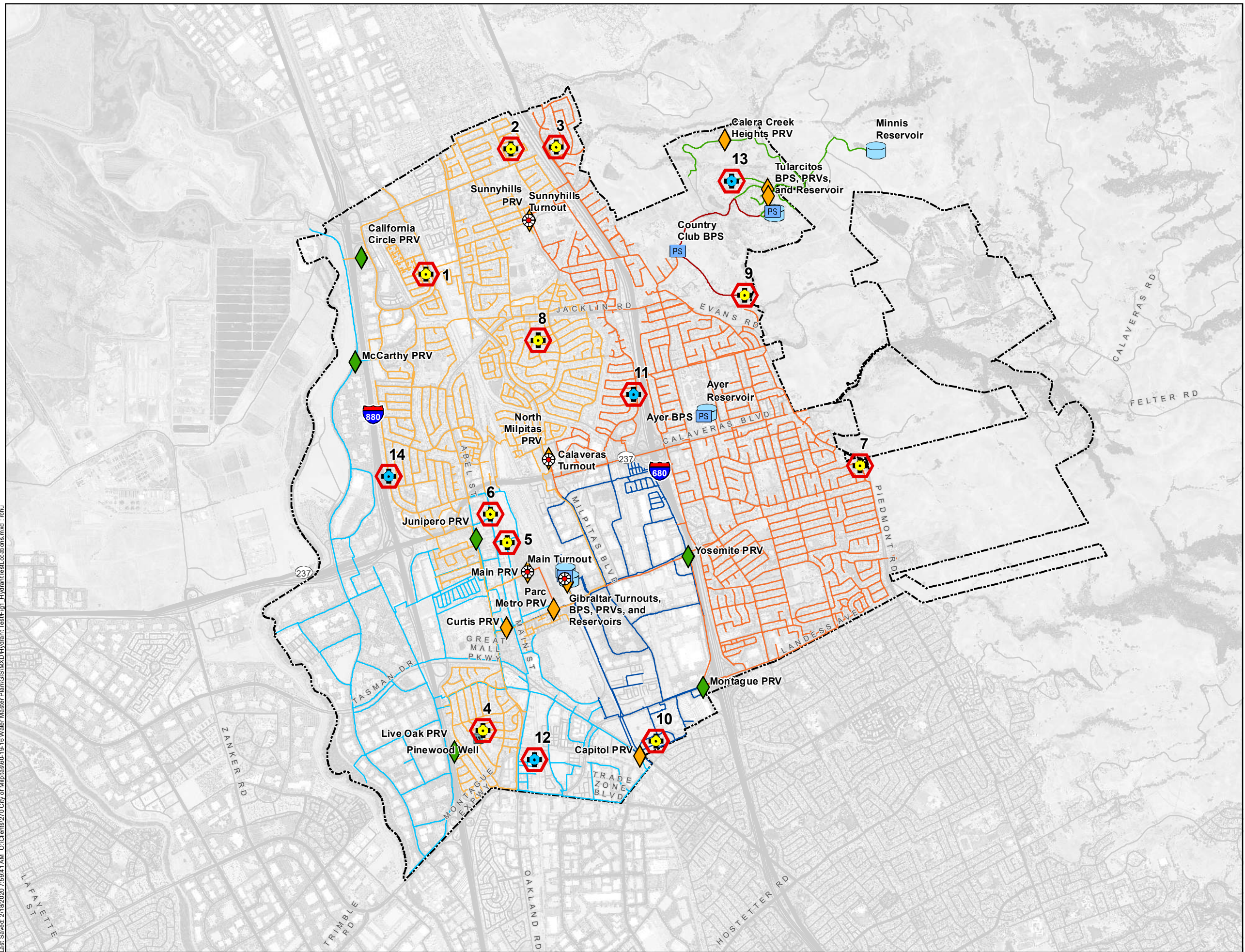
Hydrant Testing Schedule

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).

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- 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



Figure 1
Hydrant Test
Location Map

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.

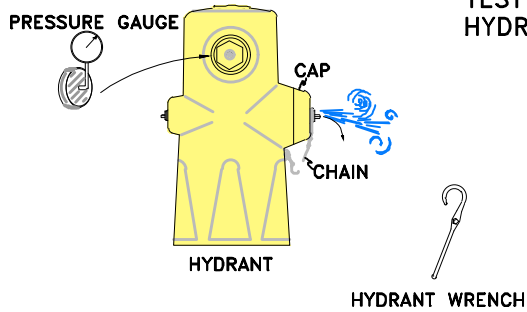
At least one (1) City staff member will be required at the flowing test hydrant and up to two (2) additional City personnel will be required in the field to assist with the opening and closing of valves (refer to Attachment A). West Yost will provide three (3) staff members to direct, oversee, and assist 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.

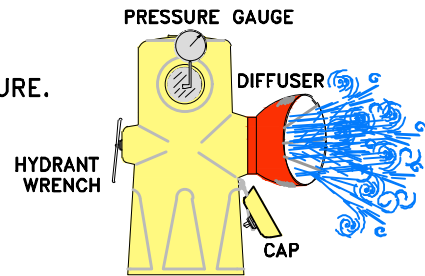
Testing Equipment

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 it is 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.

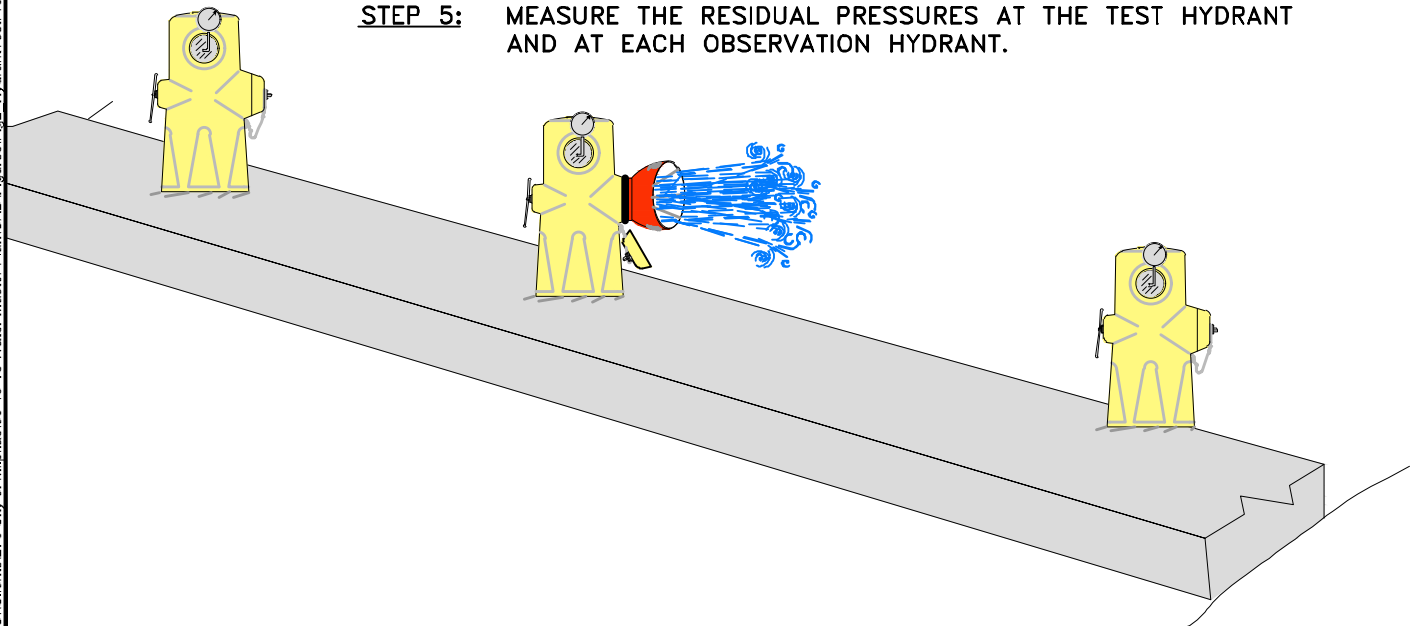
STEPS 1, 2 & 3: REMOVE HYDRANT CAP, FLUSH OUT HYDRANT AND MEASURE THE STATIC PRESSURES AT THE TEST HYDRANT AND AT EACH OBSERVATION HYDRANT.



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.



Note:
1. Figure is not to scale.



Figure 2
Hydrant Test
Procedure

City of Milpitas
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 equipment¹
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.

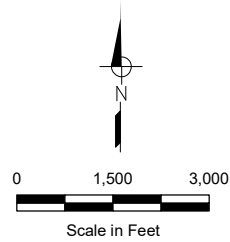
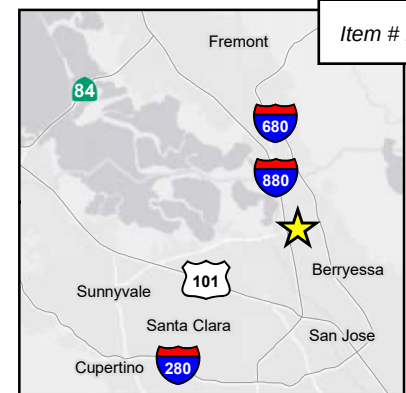
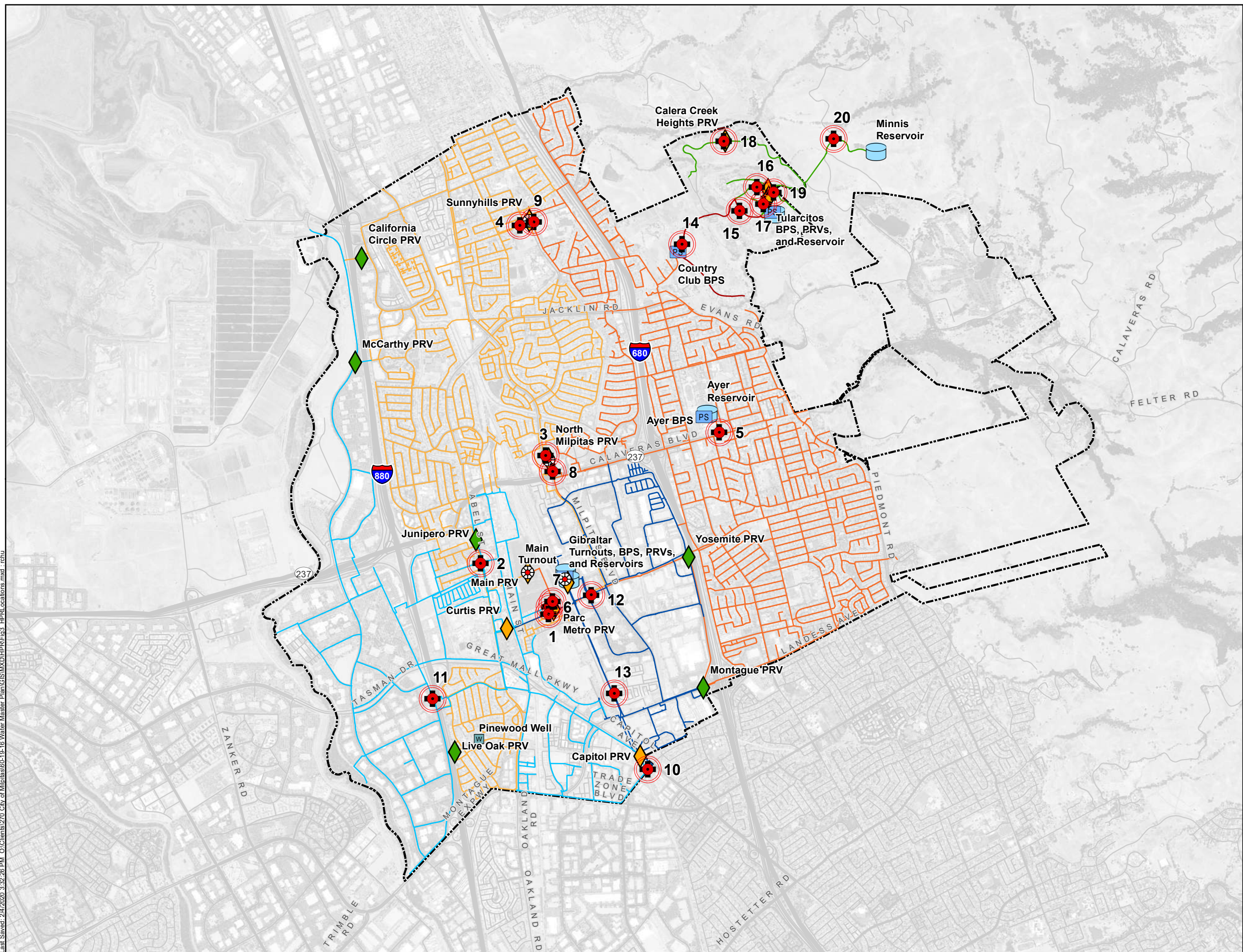
HYDRANT PRESSURE RECORDER PLACEMENT

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.

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- 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

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							



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-  Flowing Hydrant
-  Observed Hydrant
-  Hydrant
-  Closed Valve (1 total)
-  Valve
-  Test Pipeline
-  Pipeline

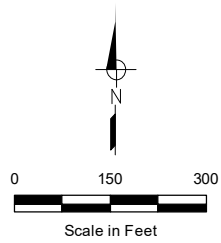
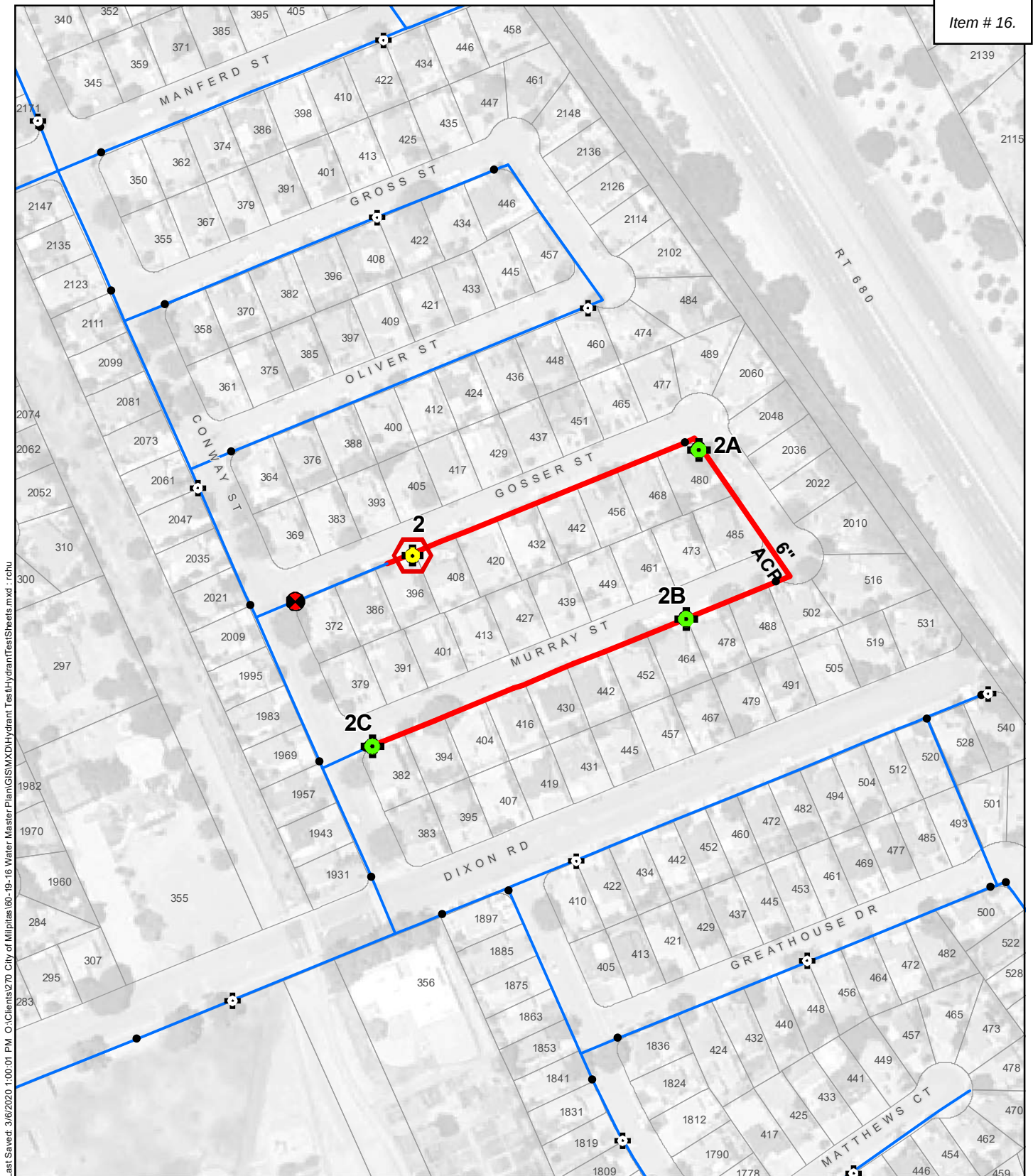


Figure A-1
Test 1 - Zone SF1
(8-inch PVC - 1990s)
 City of Milpitas
 2020 Water Master Plan Update



Flowing Hydrant



Observed Hydrant



Hydrant



Closed Valve (1 total)



Valve

Test Pipeline

Pipeline

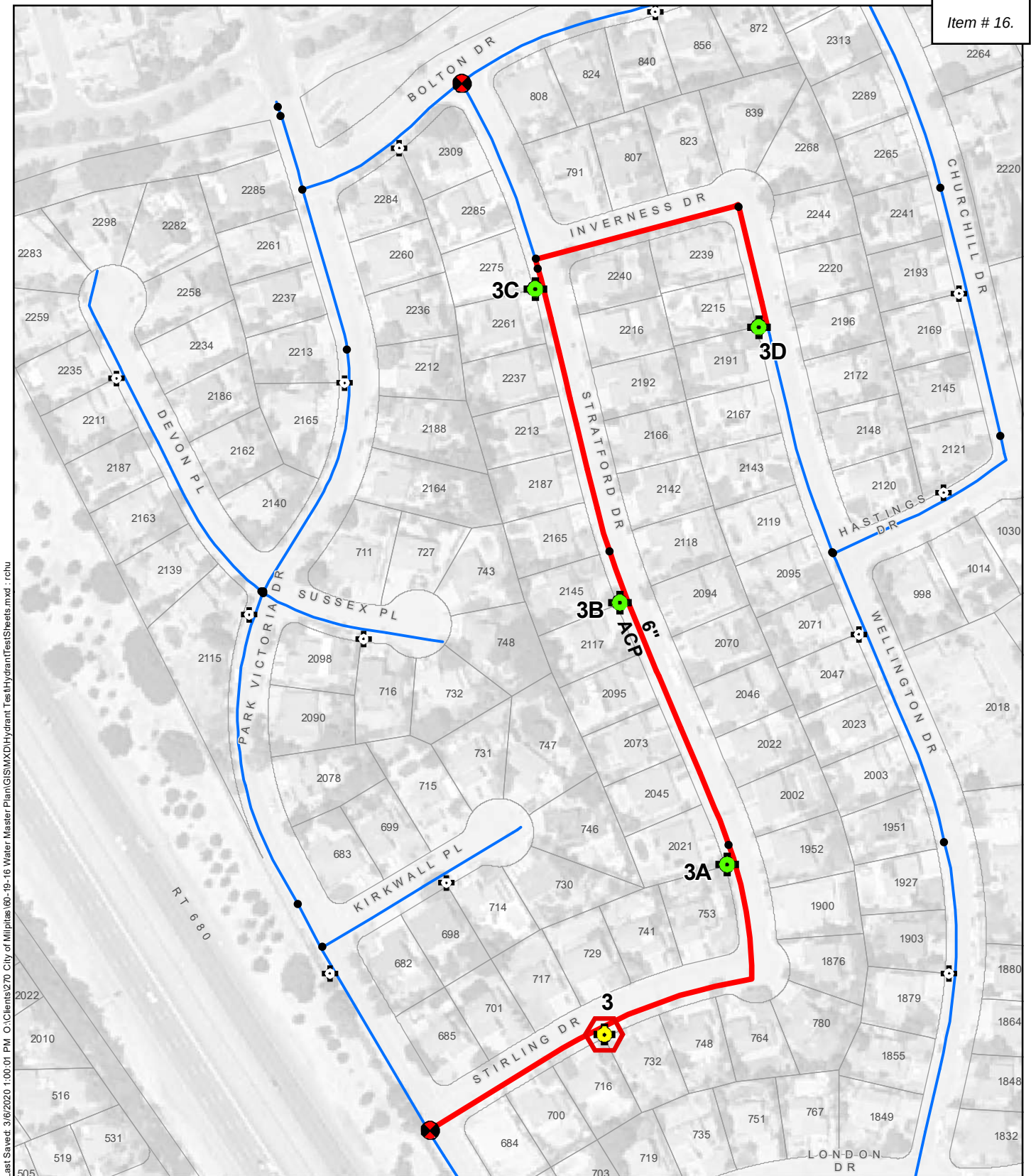


0 100 200
Scale in Feet



Figure A-2

**Test 2 - Zone SF1
(6-inch AC - 1960s)**



Flowing Hydrant



Observed Hydrant



Hydrant



Closed Valve (2 total)



Valve

Test Pipeline

Pipeline

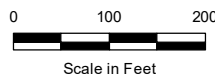
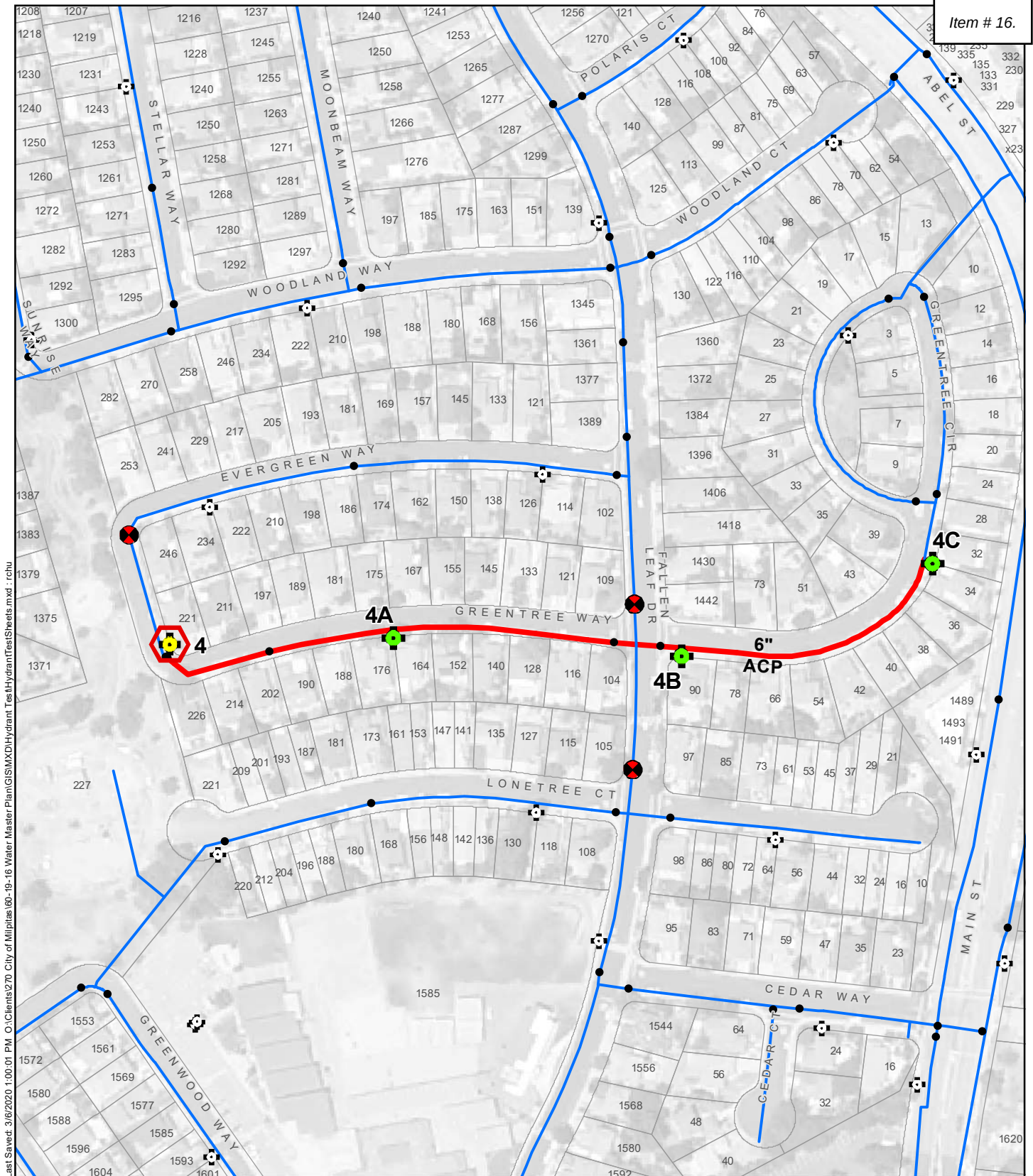


Figure A-3

Test 3 - Zone SF2
(6-inch AC - 1980s)



Flowing Hydrant



Observed Hydrant



Hydrant



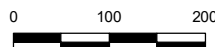
Closed Valve (3 total)



Valve

Test Pipeline

Pipeline

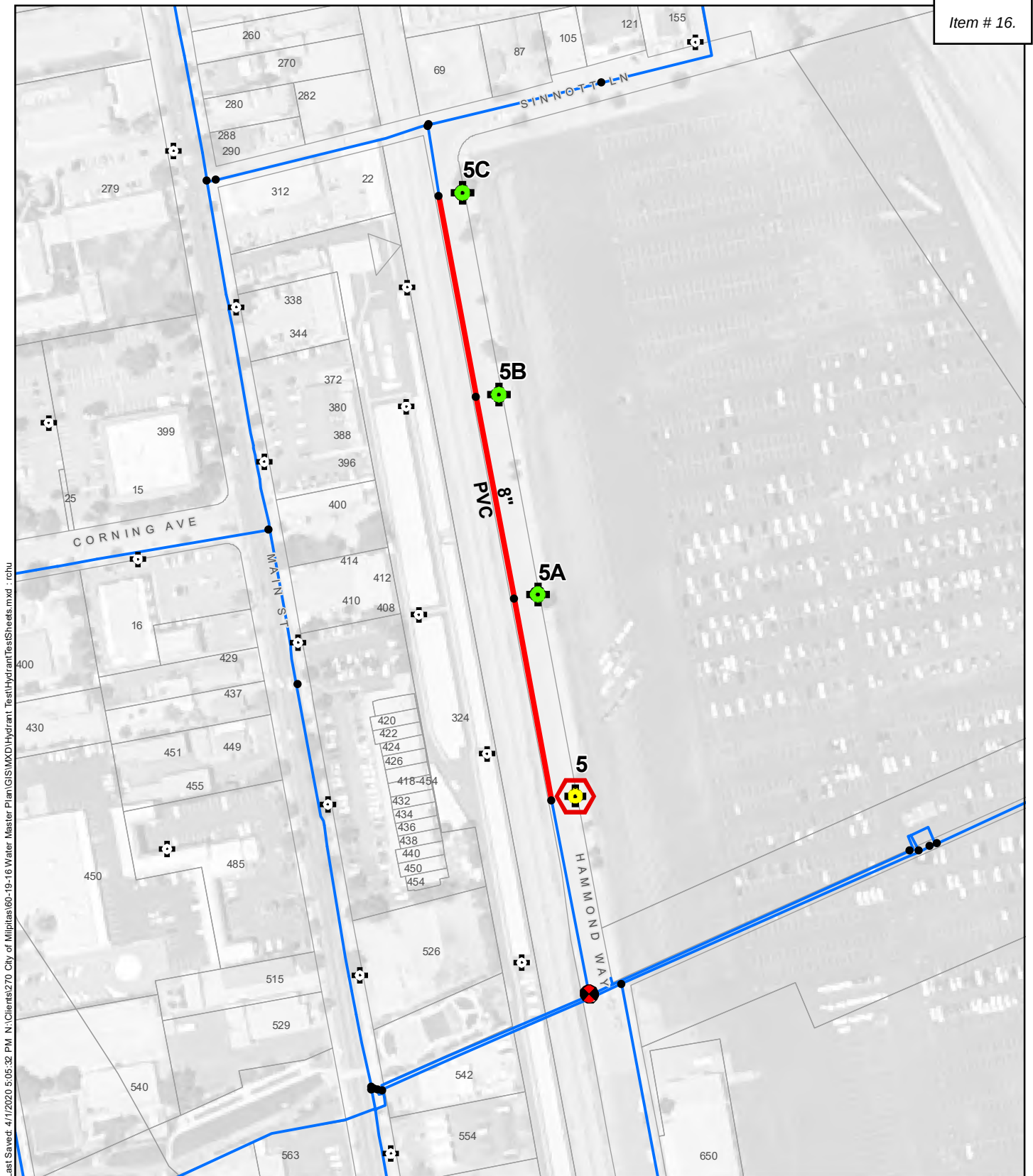


Scale in Feet



Figure A-4

**Test 4 - Zone SF1
(6-inch AC - 1960s)**



Flowing Hydrant



Observed Hydrant



Hydrant



Closed Valve (1 total)



Valve

Test Pipeline

Pipeline

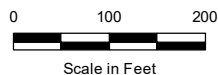
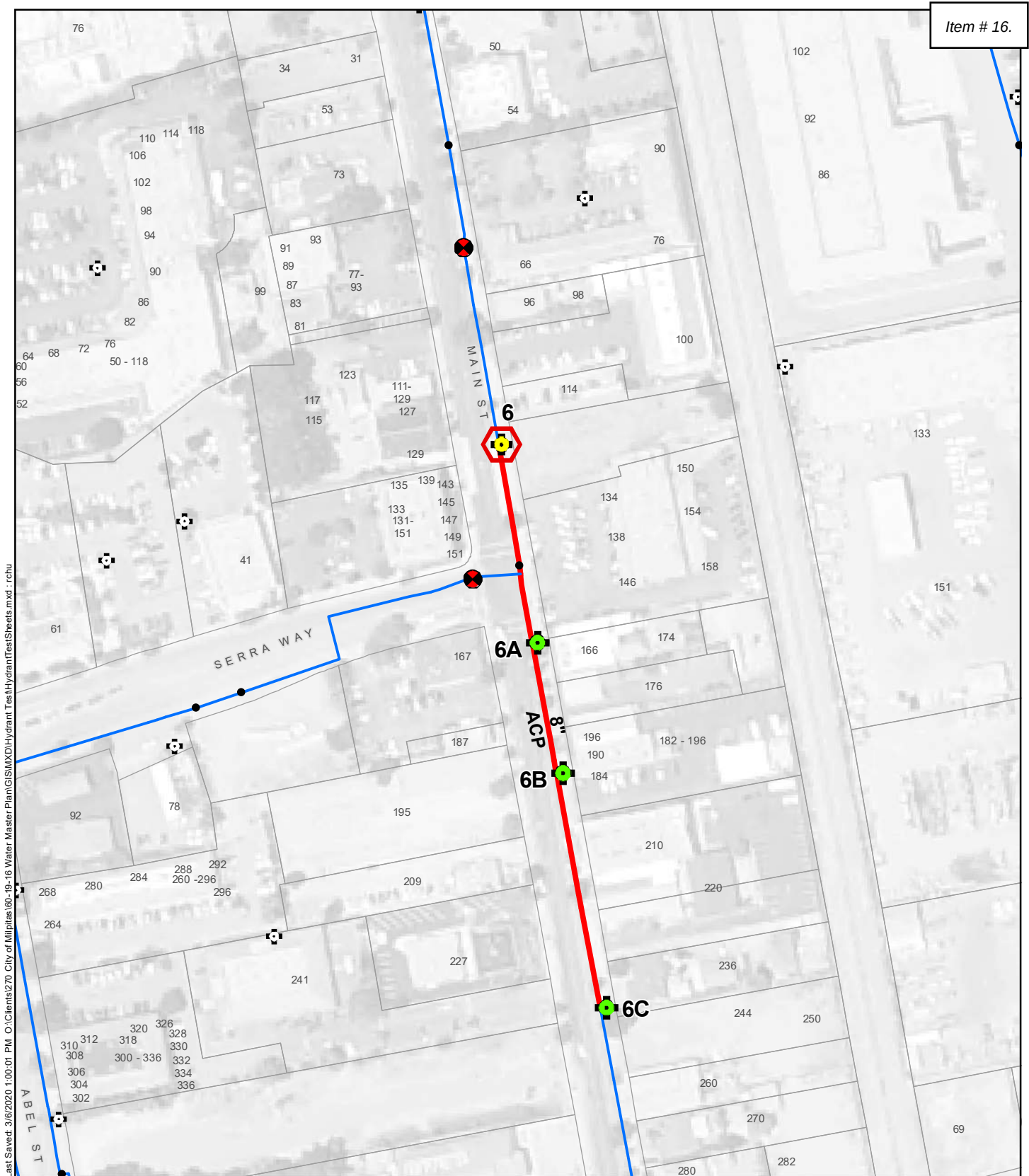


Figure A-5

Test 5 - Zone SC1
(8-inch PVC - 1980s)



Flowing Hydrant



Observed Hydrant



Hydrant



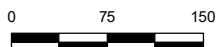
Closed Valve (2 total)



Valve

Test Pipeline

Pipeline



Scale in Feet



Figure A-6

**Test 6 - Zone SC1
(8-inch AC - UNK)**



-  Flowing Hydrant
-  Observed Hydrant
-  Hydrant
-  Closed Valve (1 total)
-  Valve

-  Test Pipeline
-  Pipeline

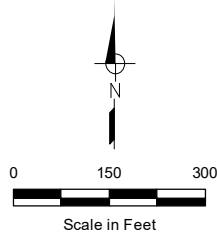
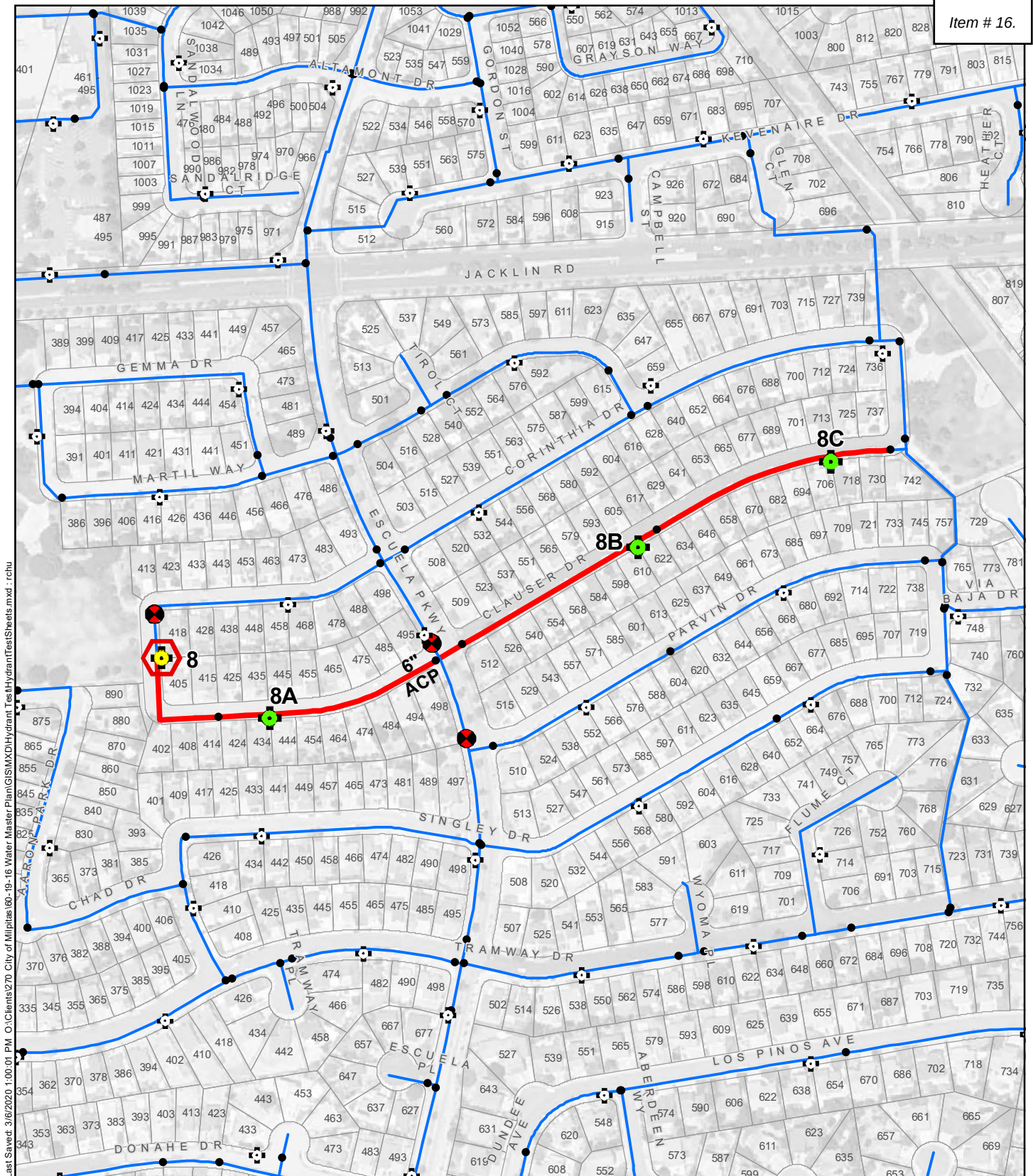


Figure A-7
Test 7 - Zone SF2
(8-inch AC - 1970s)



Flowing Hydrant



Observed Hydrant



Hydrant



Closed Valve (3 total)



Valve

Test Pipeline

Pipeline

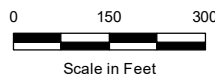
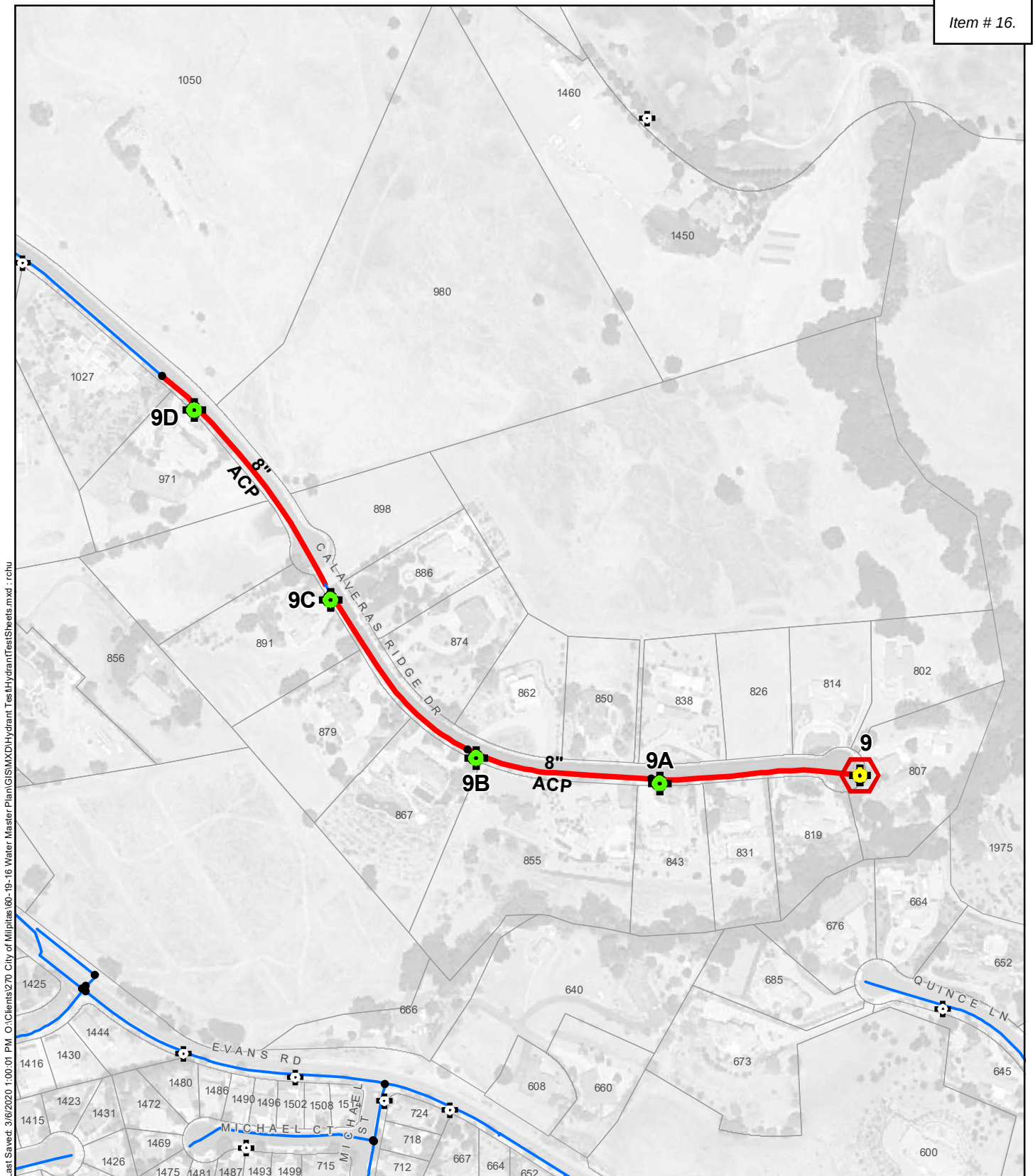


Figure A-8

Test 8 - Zone SF1
(6-inch AC - 1970s)



Flowing Hydrant



Observed Hydrant



Hydrant



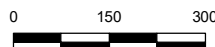
Closed Valve (0 total)



Valve

Test Pipeline

Pipeline



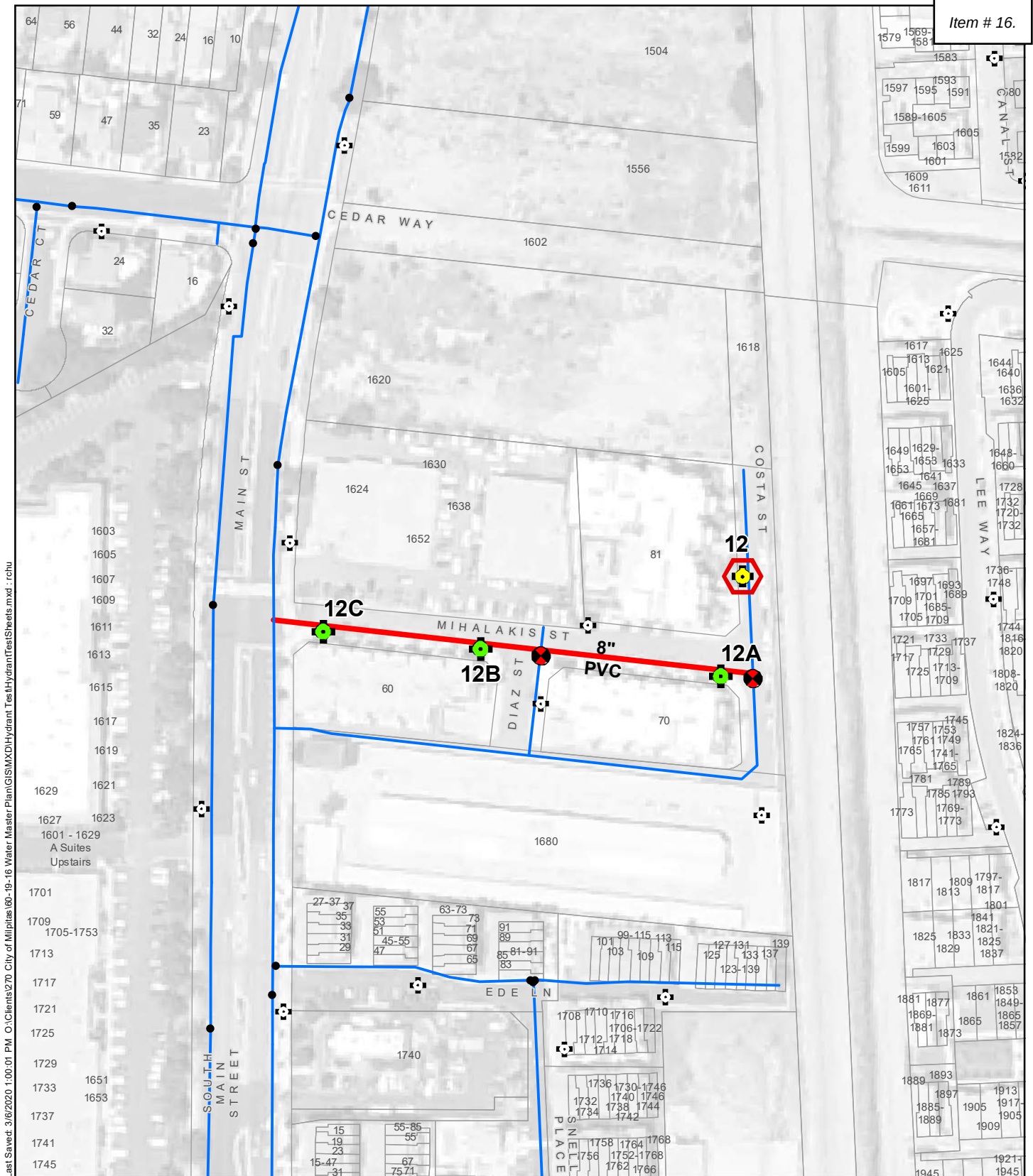
Scale in Feet



Figure A-9

**Test 9 - Zone SF3
(8-inch AC - 1980s)**

City of M
2020 Water Master Plan U 629



Flowing Hydrant



Observed Hydrant



Hydrant



Closed Valve (2 total)



Valve

Test Pipeline

Pipeline

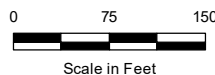
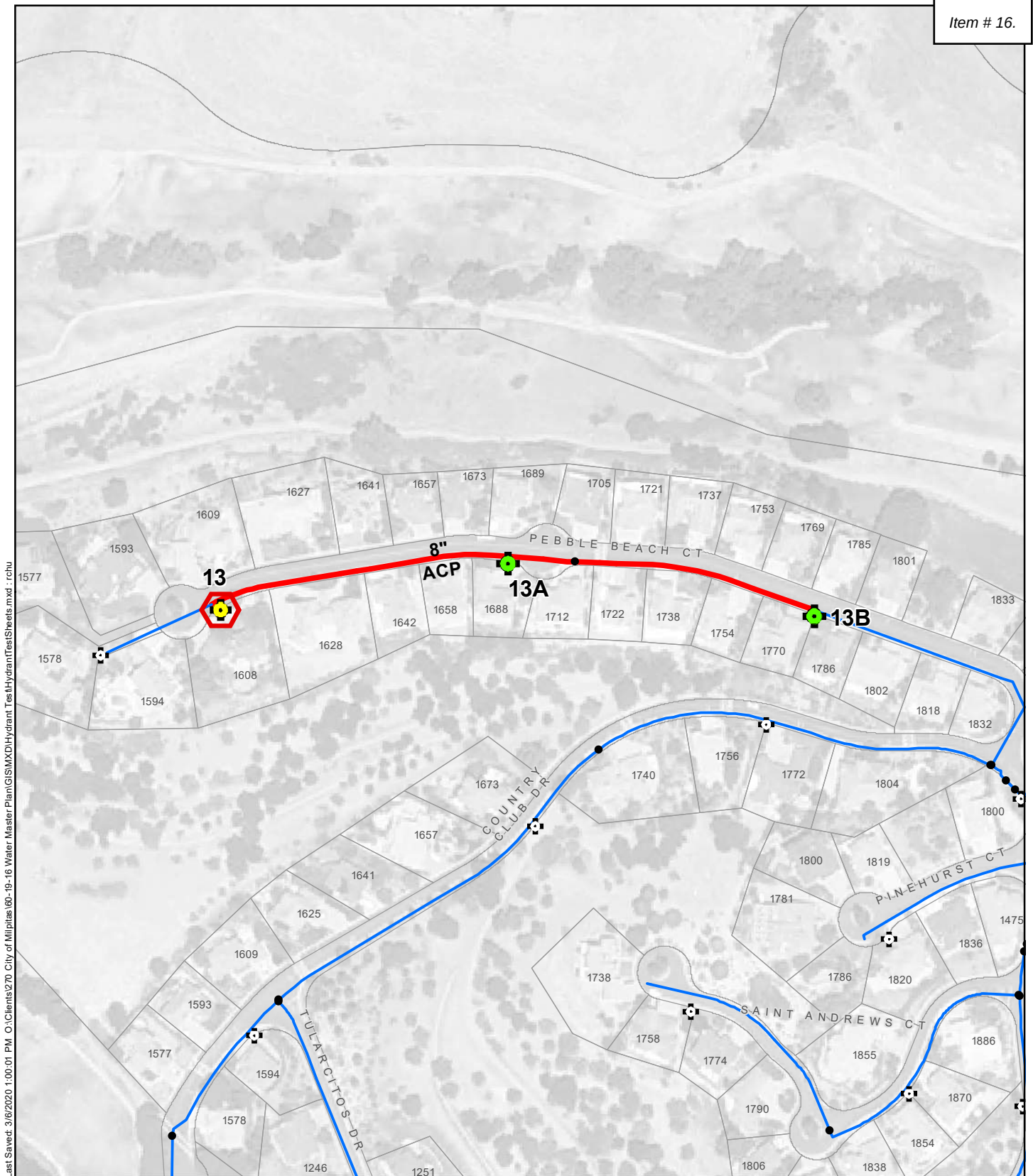


Figure A-12

**Alternate Test 12
Zone SC1
(8-inch PVC - 2000s)**



Flowing Hydrant



Observed Hydrant



Hydrant



Closed Valve (0 total)



Valve

Test Pipeline

Pipeline

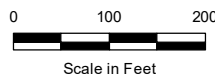
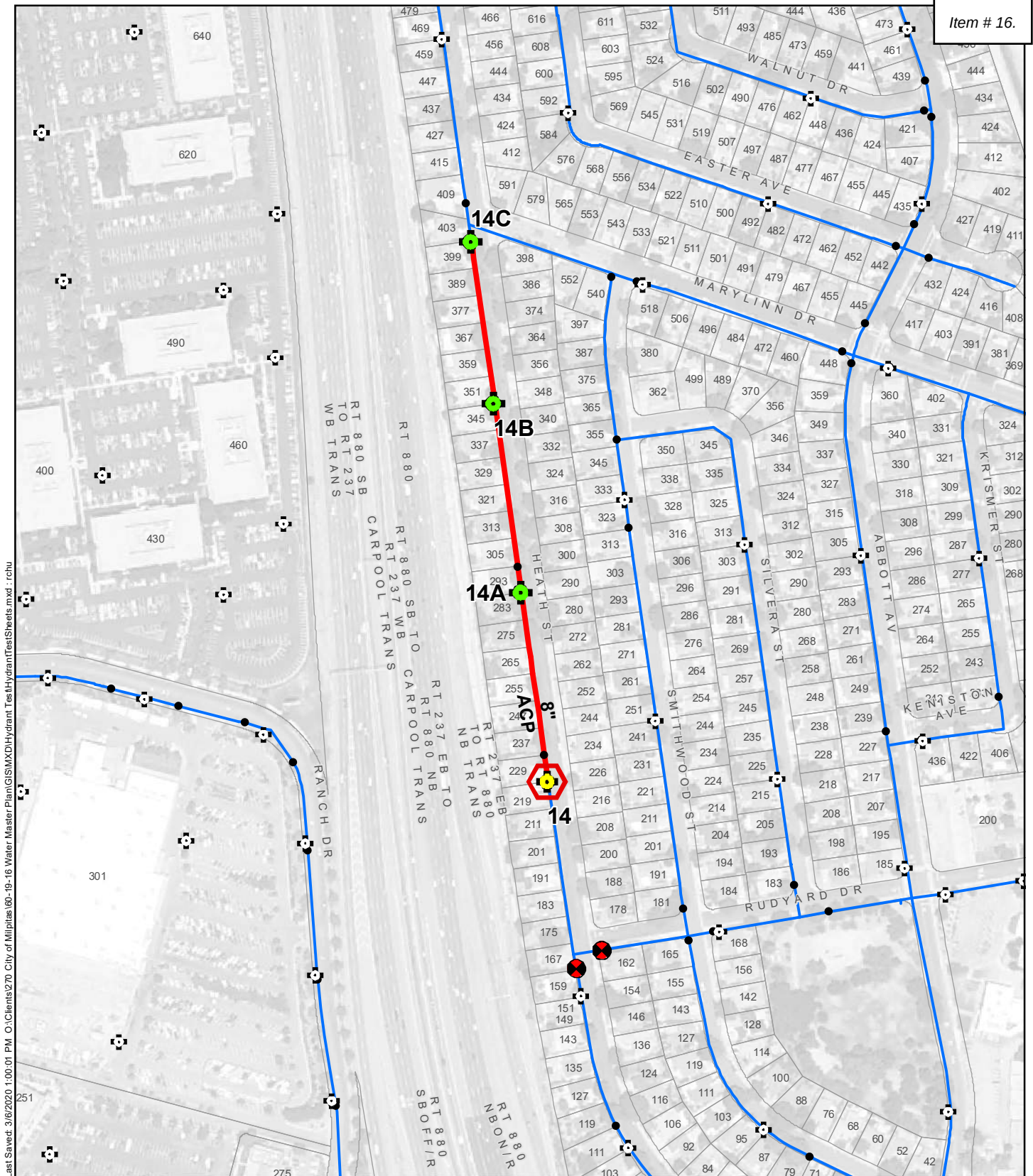


Figure A-13

**Alternate Test 13
Zone SF4-1
(8-inch AC - 1980s)**



Flowing Hydrant



Observed Hydrant



Hydrant



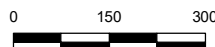
Closed Valve (2 total)



Valve

Test Pipeline

Pipeline



Scale in Feet



Figure A-14

**Alternate Test 14
Zone SF1
(8-inch AC - 1960s)**

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

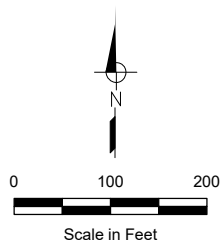
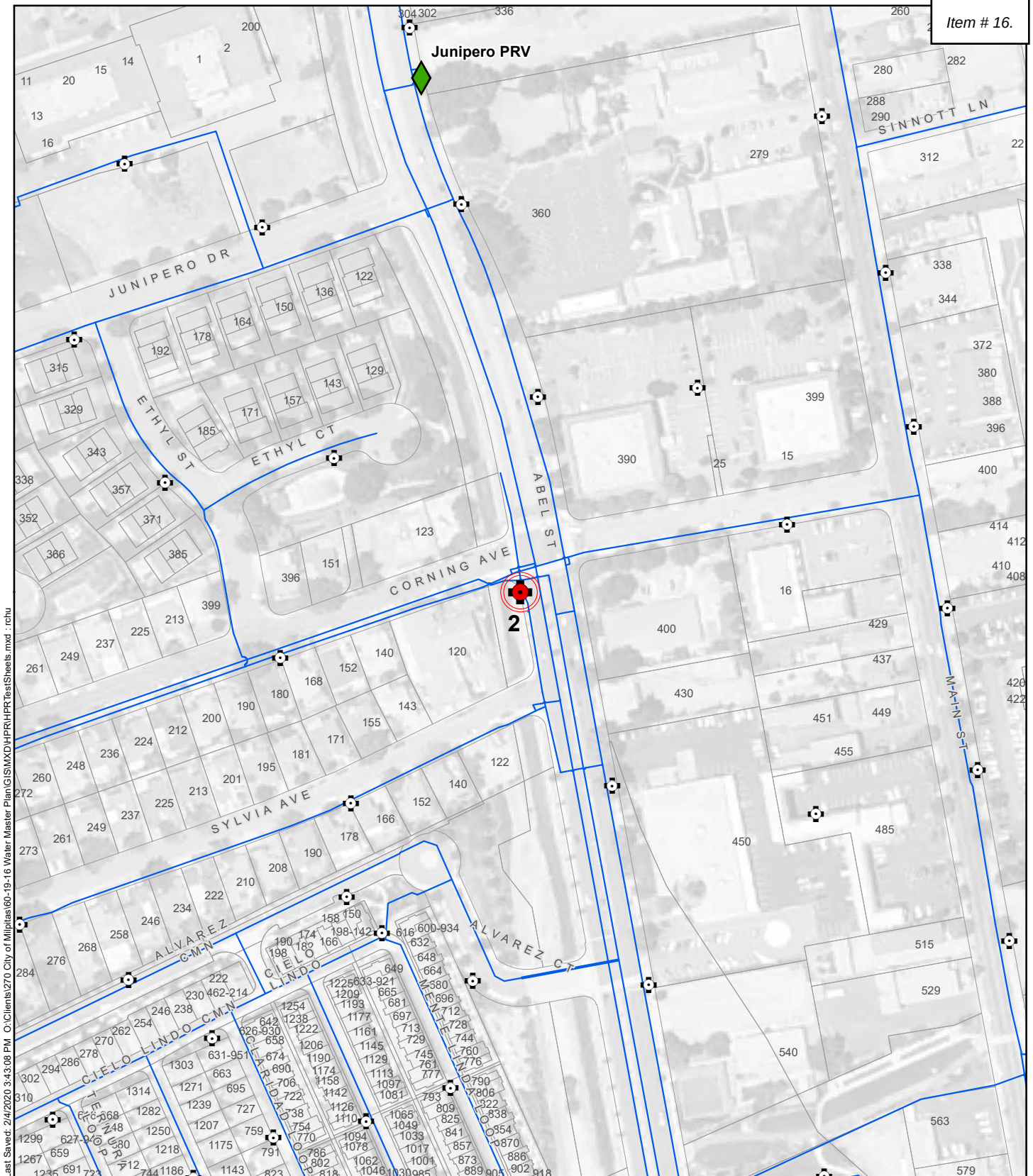


Figure B-1
Hydrant Pressure Recorder Locations



-  Proposed HPR Location
-  Hydrant
-  Turnout
-  Pump Station
-  Storage Reservoir

-  Well
-  Pressure Reducing Valve
-  Emergency PRV
-  Pipeline

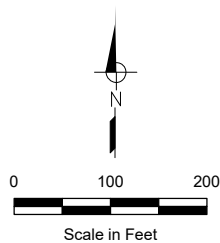
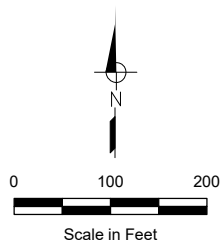


Figure B-2
Hydrant Pressure Recorder Locations



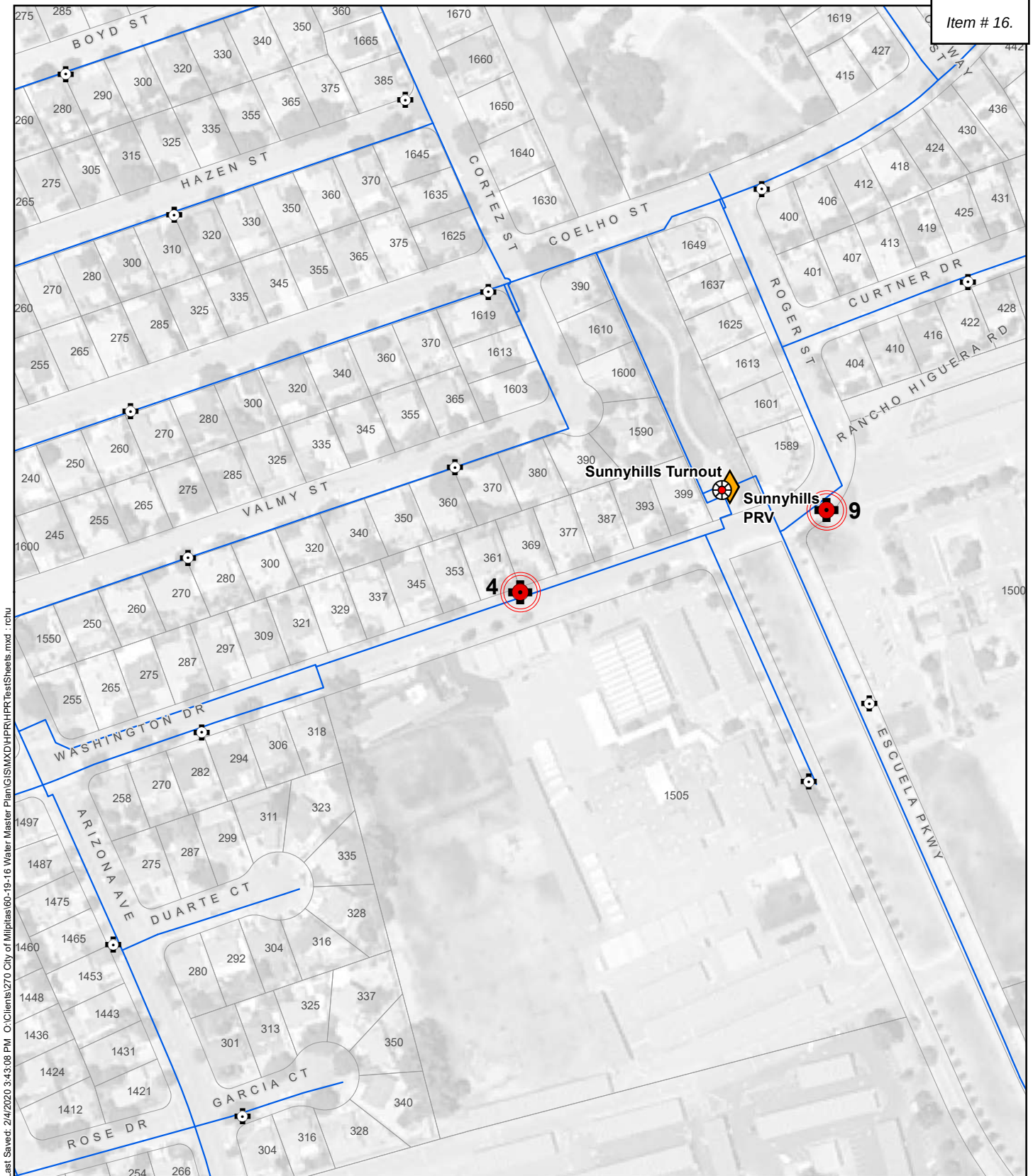
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- | | | | |
|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |



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Figure B-3
Hydrant Pressure Recorder Locations



-  Proposed HPR Location
-  Hydrant
-  Turnout
-  Pump Station
-  Storage Reservoir
-  Well
-  Pressure Reducing Valve
-  Emergency PRV
-  Pipeline

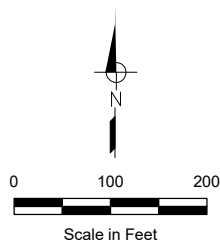


Figure B-4
Hydrant Pressure Recorder Locations



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|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |

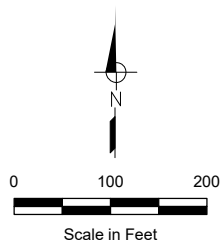


Figure B-5
Hydrant Pressure Recorder Locations



Item # 16.

(SF)
Reservoir
Gibraltar
PRV

Parc Metro
PRV

-  Proposed HPR Location
-  Well
-  Pressure Reducing Valve
-  Hydrant
-  Emergency PRV
-  Turnout
-  Pump Station
-  Storage Reservoir
-  Pipeline

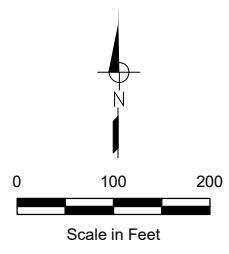


Figure B-6
Hydrant Pressure Recorder Locations



Item # 16.

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-  Proposed HPR Location
-  Hydrant
-  Turnout
-  Pump Station
-  Storage Reservoir
-  Well
-  Pressure Reducing Valve
-  Emergency PRV
-  Pipeline

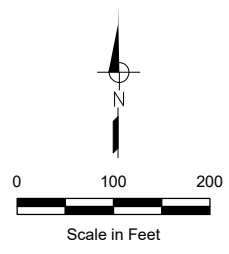


Figure B-7
Hydrant Pressure Recorder Locations



- | | | | |
|---|-----------------------|---|-------------------------|
|  | Proposed HPR Location |  | Well |
|  | Hydrant |  | Pressure Reducing Valve |
|  | Turnout |  | Emergency PRV |
|  | Pump Station |  | Pipeline |
|  | Storage Reservoir | | |

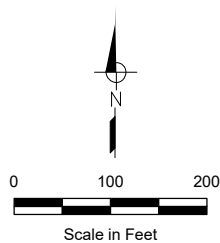


Figure B-8
Hydrant Pressure Recorder Locations



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- | | | | |
|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |

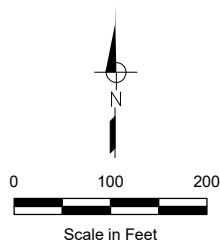
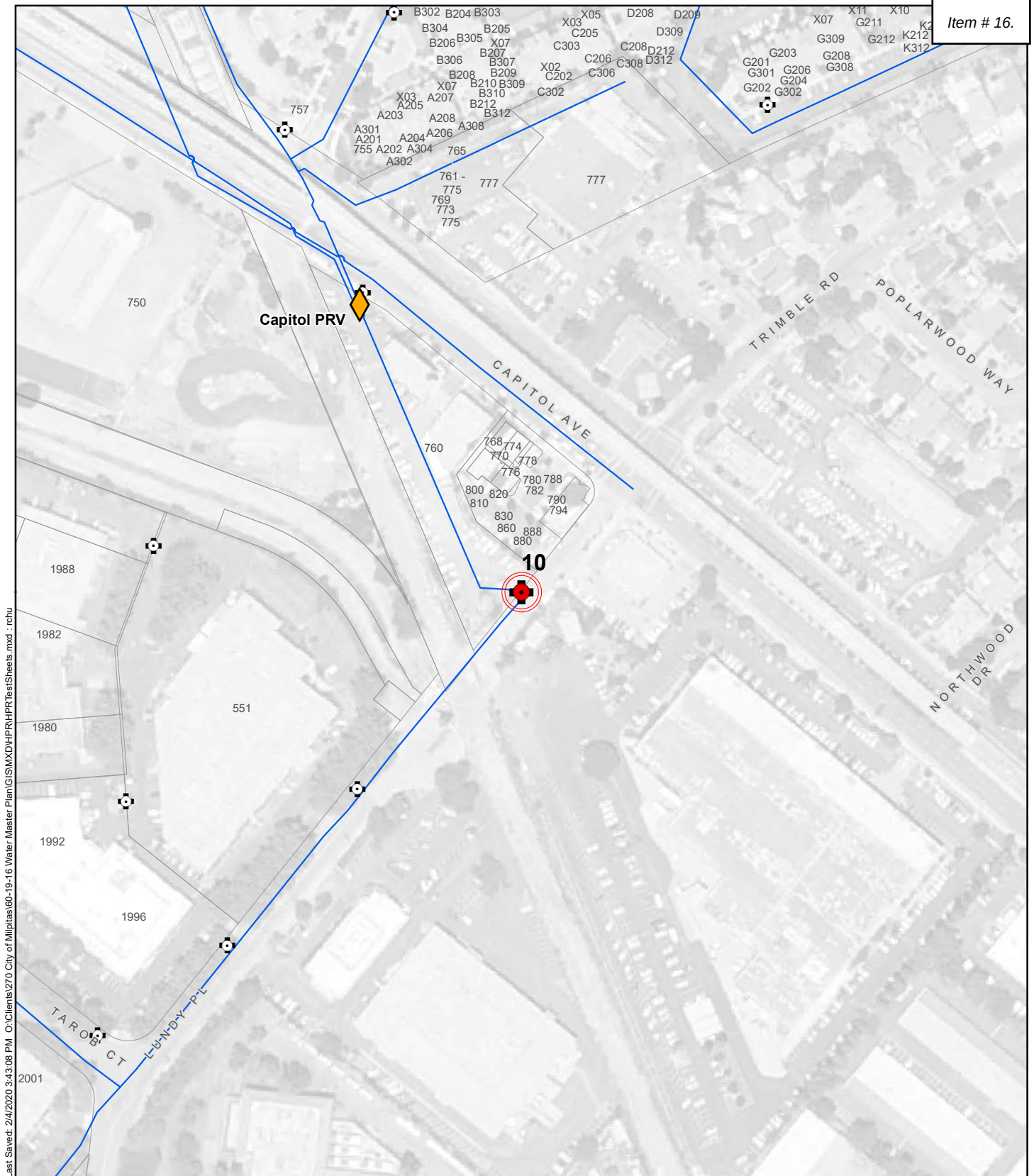


Figure B-9
Hydrant Pressure Recorder Locations



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|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |

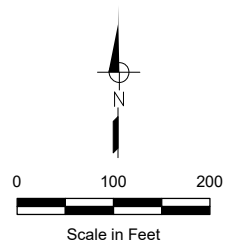
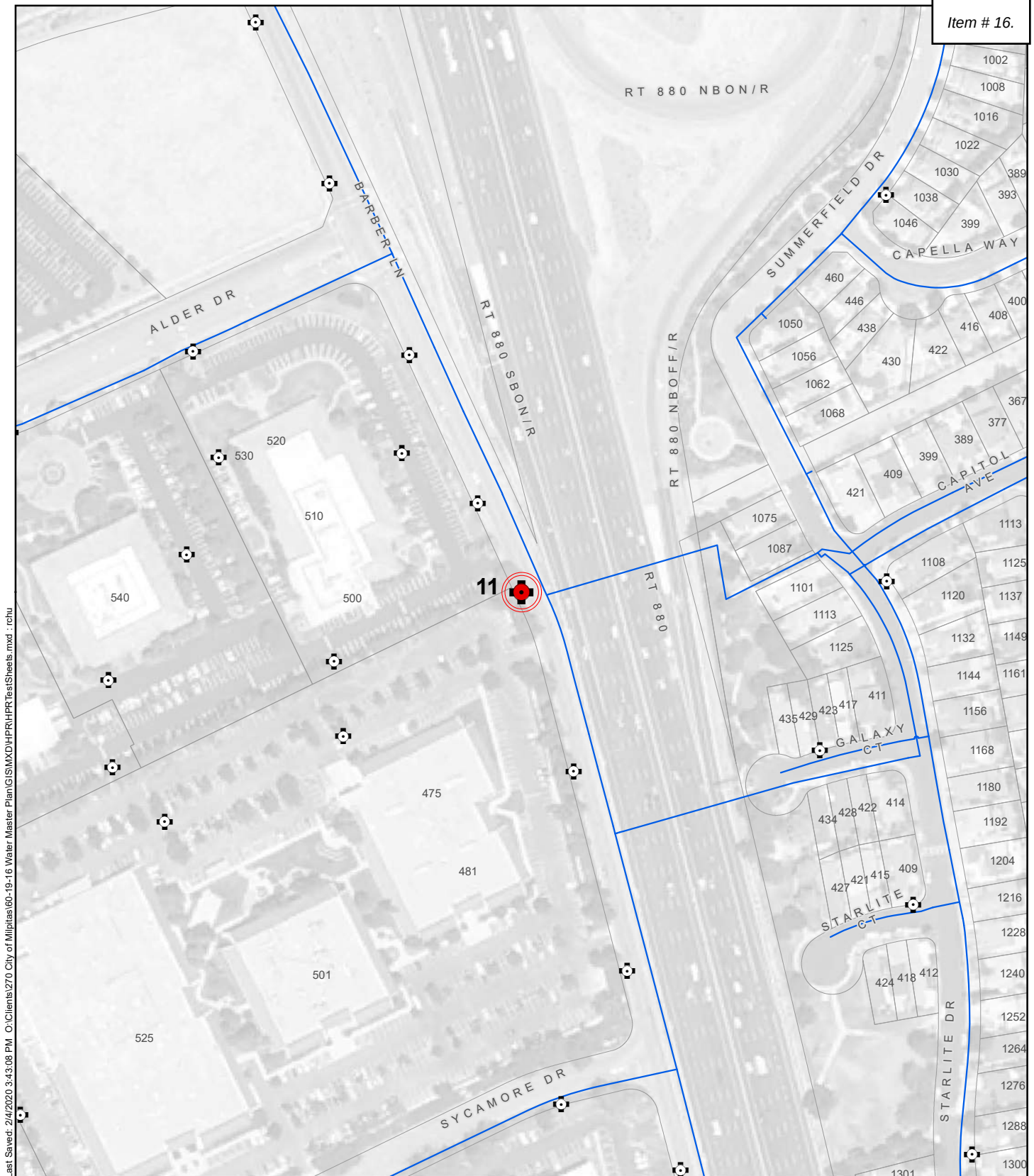


Figure B-10
Hydrant Pressure Recorder Locations



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-  Proposed HPR Location
-  Hydrant
-  Turnout
-  Pump Station
-  Storage Reservoir
-  Well
-  Pressure Reducing Valve
-  Emergency PRV
-  Pipeline

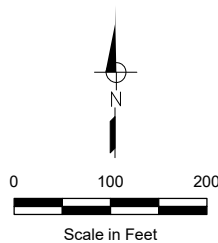


Figure B-11
Hydrant Pressure Recorder Locations



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|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |

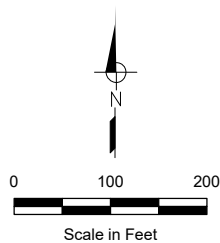
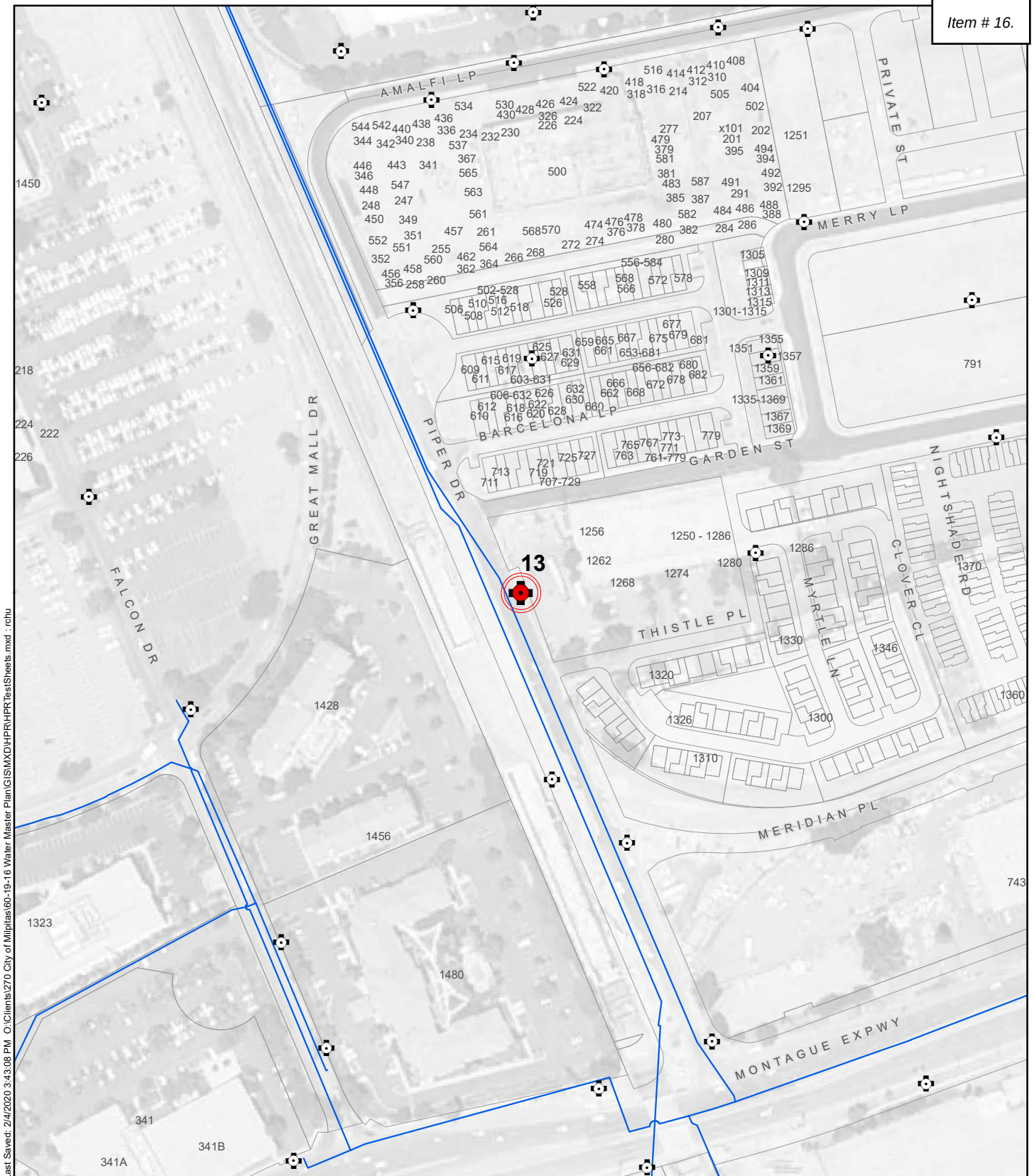


Figure B-12
Hydrant Pressure Recorder Locations



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|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |

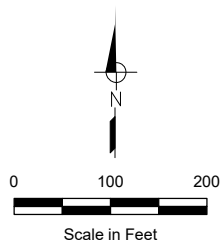
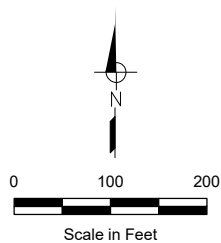


Figure B-13
Hydrant Pressure Recorder Locations



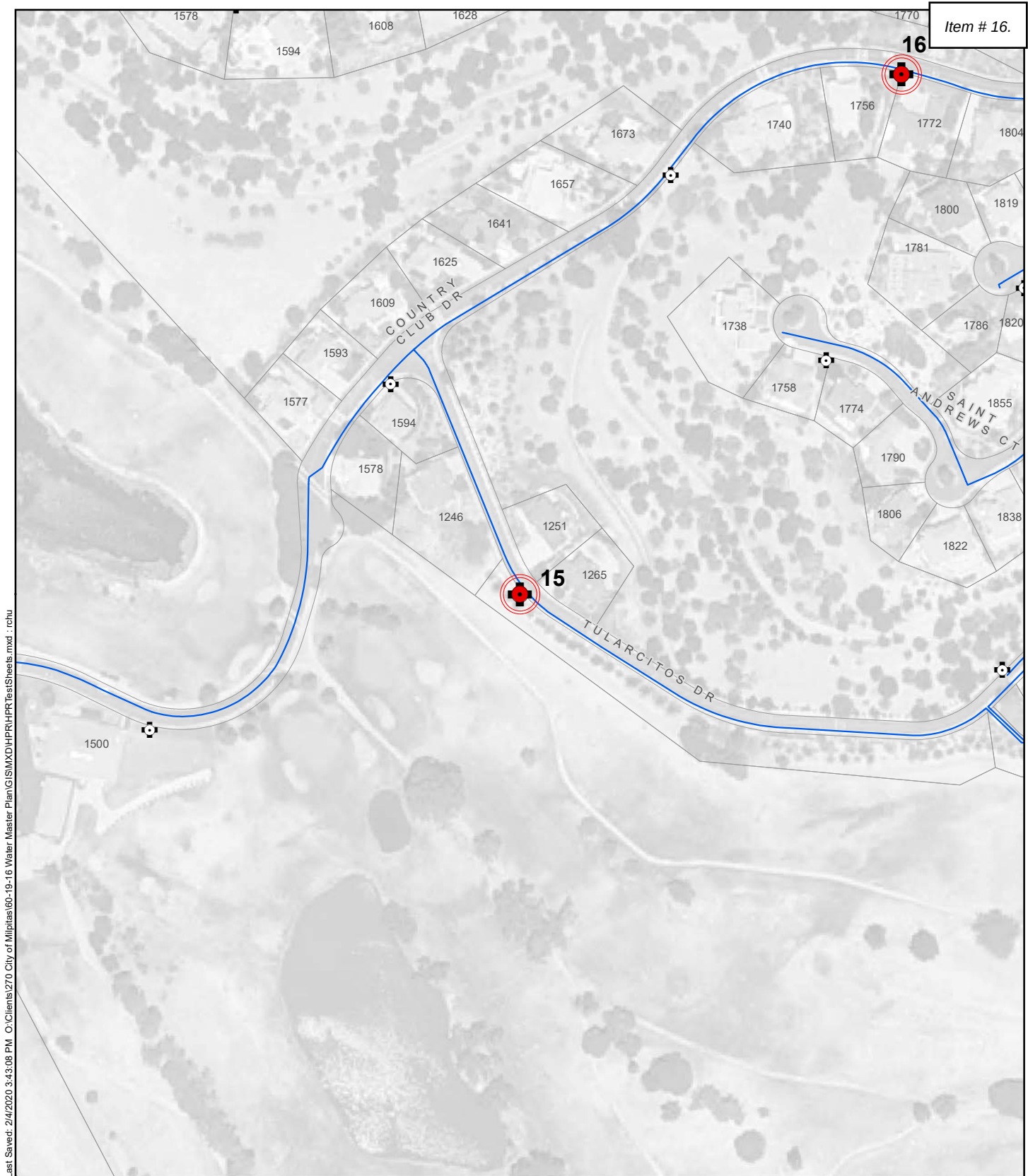
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|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |



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Figure B-14
Hydrant Pressure Recorder Locations



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- | | | | |
|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |

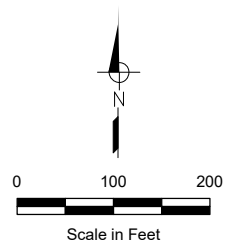


Figure B-15
Hydrant Pressure Recorder Locations



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- | | | | |
|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |

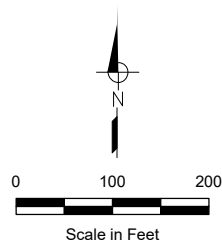
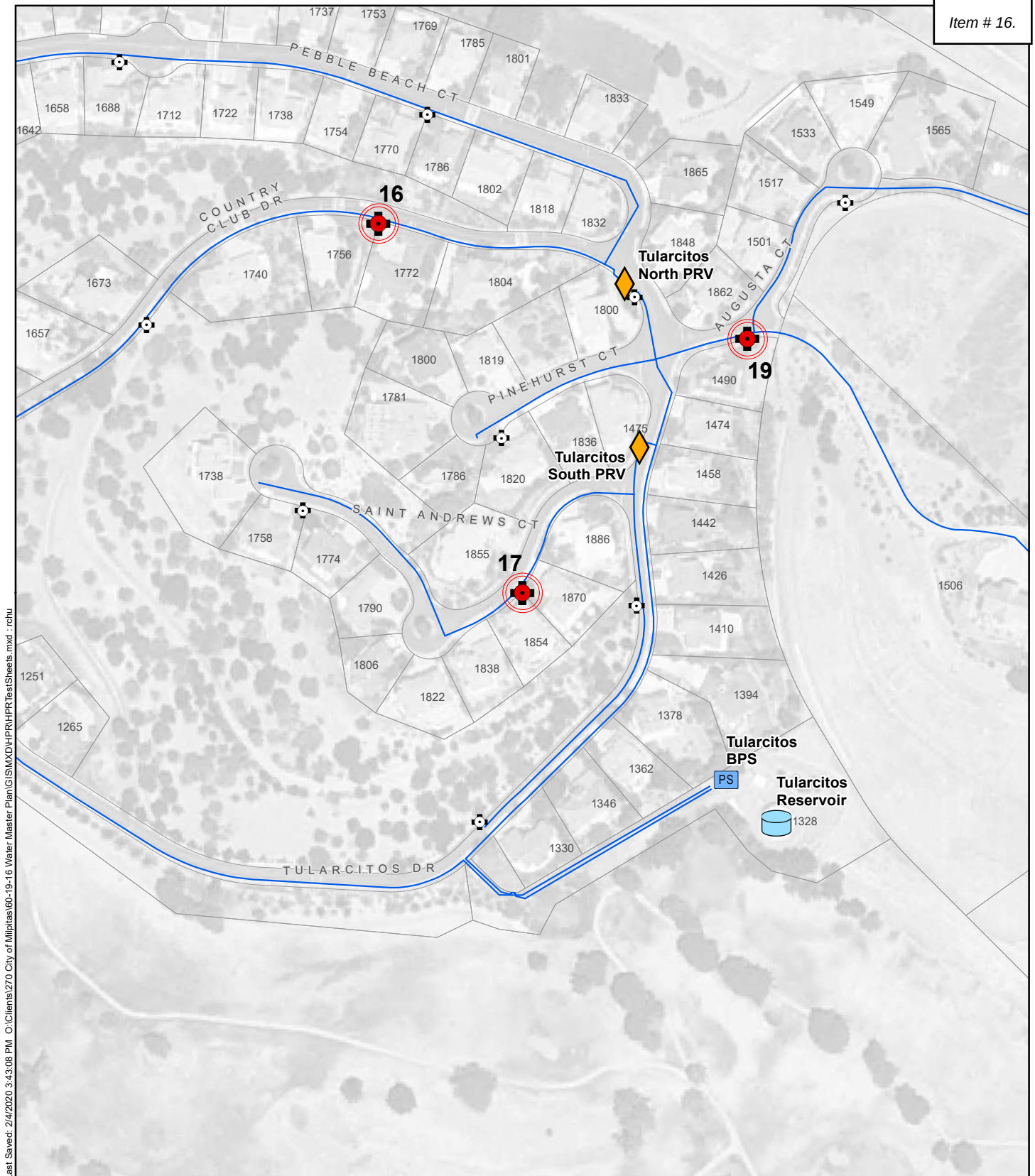


Figure B-16
Hydrant Pressure Recorder Locations



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-  Proposed HPR Location
-  Hydrant
-  Turnout
-  Pump Station
-  Storage Reservoir
-  Well
-  Pressure Reducing Valve
-  Emergency PRV
-  Pipeline

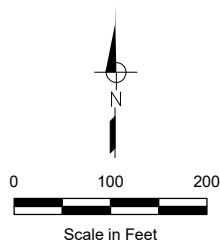
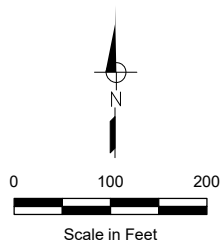


Figure B-17
Hydrant Pressure Recorder Locations



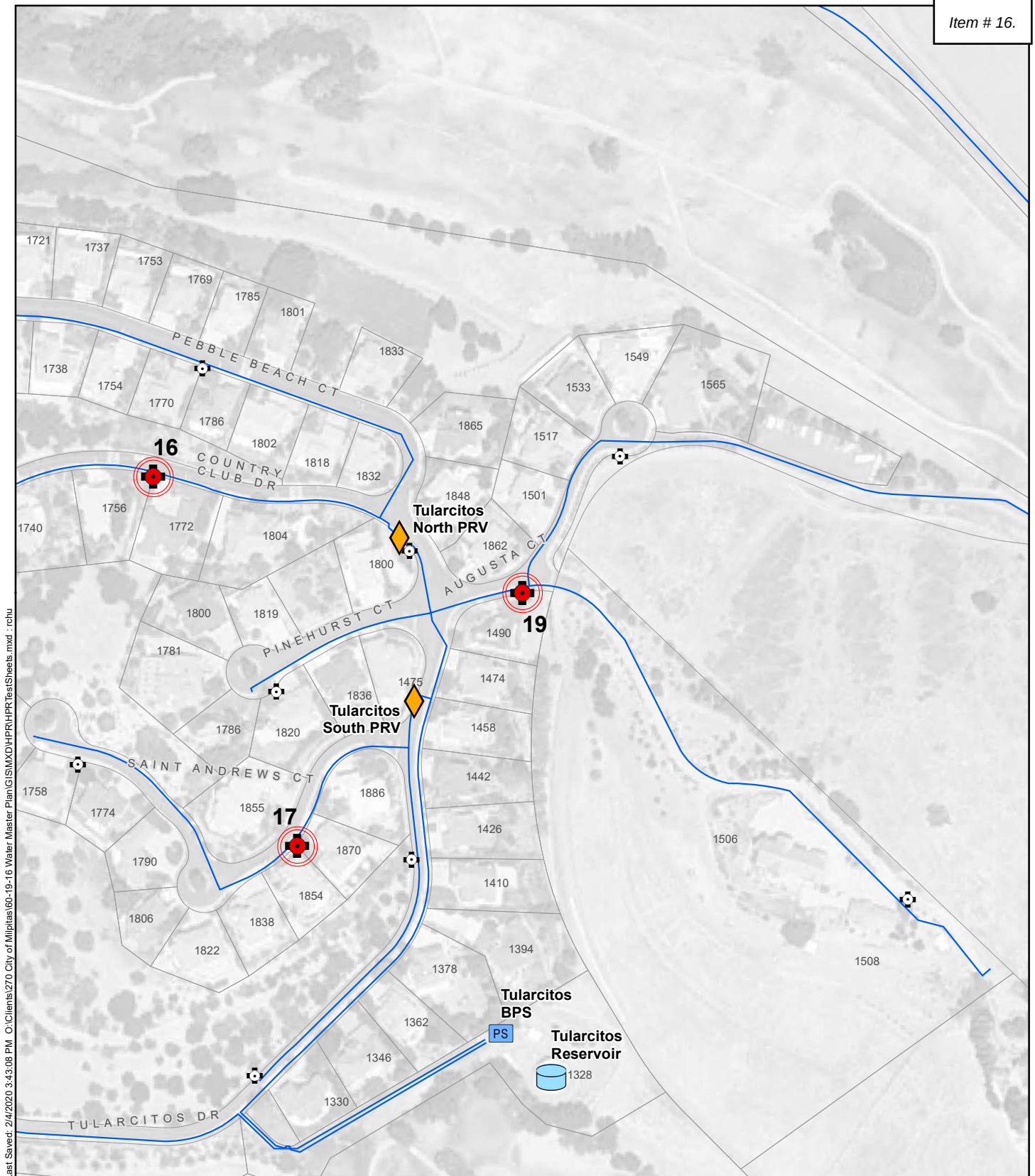
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- | | | | |
|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |



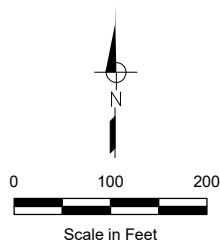
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Figure B-18
Hydrant Pressure Recorder Locations



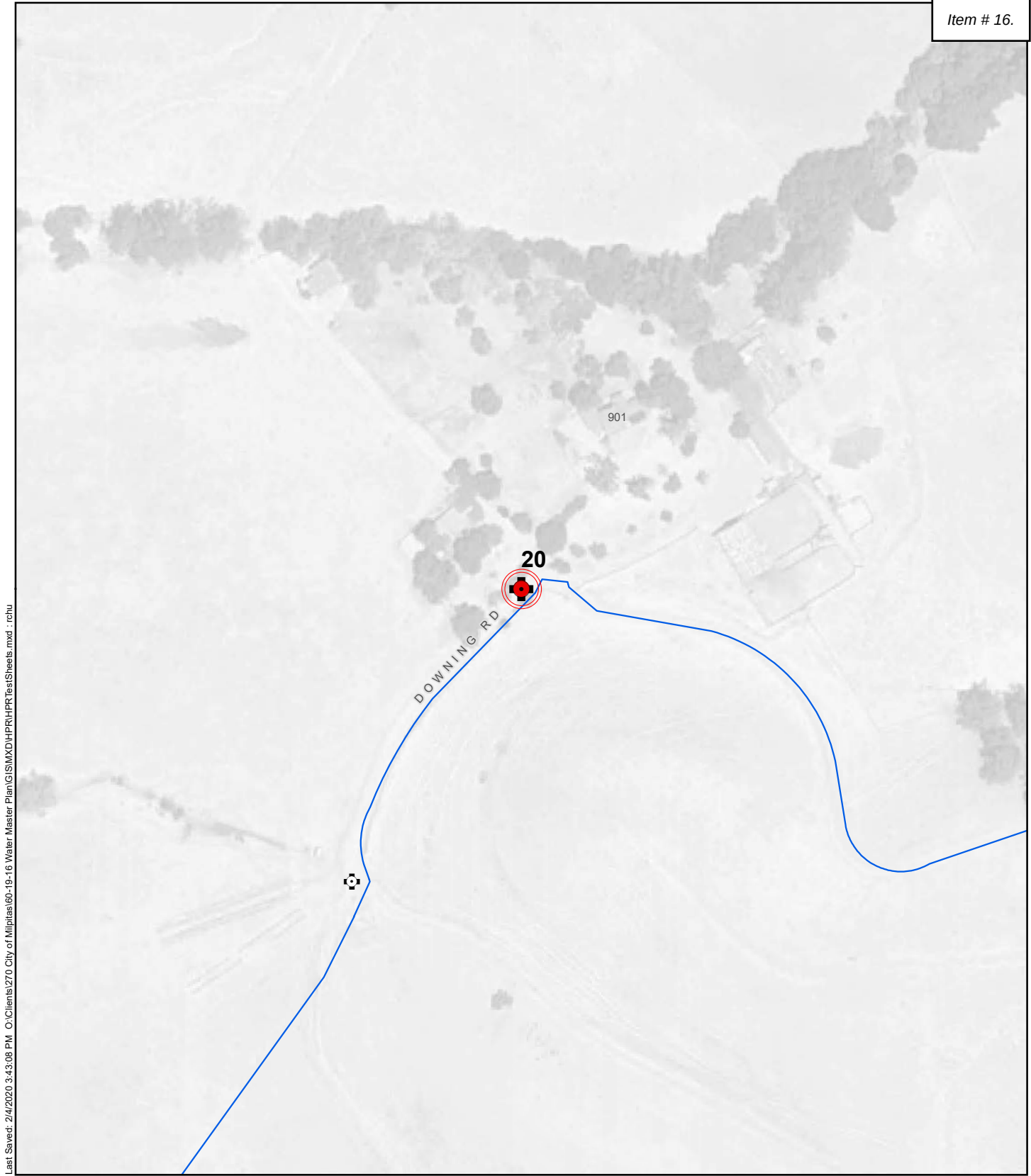
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-  Proposed HPR Location
-  Hydrant
-  Turnout
-  Pump Station
-  Storage Reservoir
-  Well
-  Pressure Reducing Valve
-  Emergency PRV
-  Pipeline



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Figure B-19
Hydrant Pressure Recorder Locations



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- | | | | |
|--|-----------------------|--|-------------------------|
| | Proposed HPR Location | | Well |
| | Hydrant | | Pressure Reducing Valve |
| | Turnout | | Emergency PRV |
| | Pump Station | | Pipeline |
| | Storage Reservoir | | |

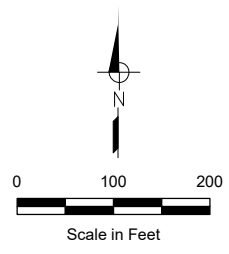


Figure B-20
Hydrant Pressure Recorder Locations

Appendix D

Water Utility Condition Assessment

2020 Water Master Plan Water Utility Condition Assessment

PREPARED FOR

City of Milpitas



PREPARED BY



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

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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 horizontal assets and 87 vertical assets. The breakdown of assets by type is presented in Table 1.



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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.



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Table 2. Water System Replacement Costs, 2002 Utility Depreciation Study (2002 Dollars)

Asset Type	Replacement Cost 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.



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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 depreciation 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



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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.



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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



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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:

$$RUL = \text{Asset Useful Life} - \text{Asset Age}$$

$$RUL (\%) = (\text{Asset Useful Life} - \text{Asset Age}) / \text{Asset Useful Life}$$

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 WERF¹ and represent empirical failure patterns at several

¹ WERF SIMPLE (Sustainable Infrastructure Management Program Learning)



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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).

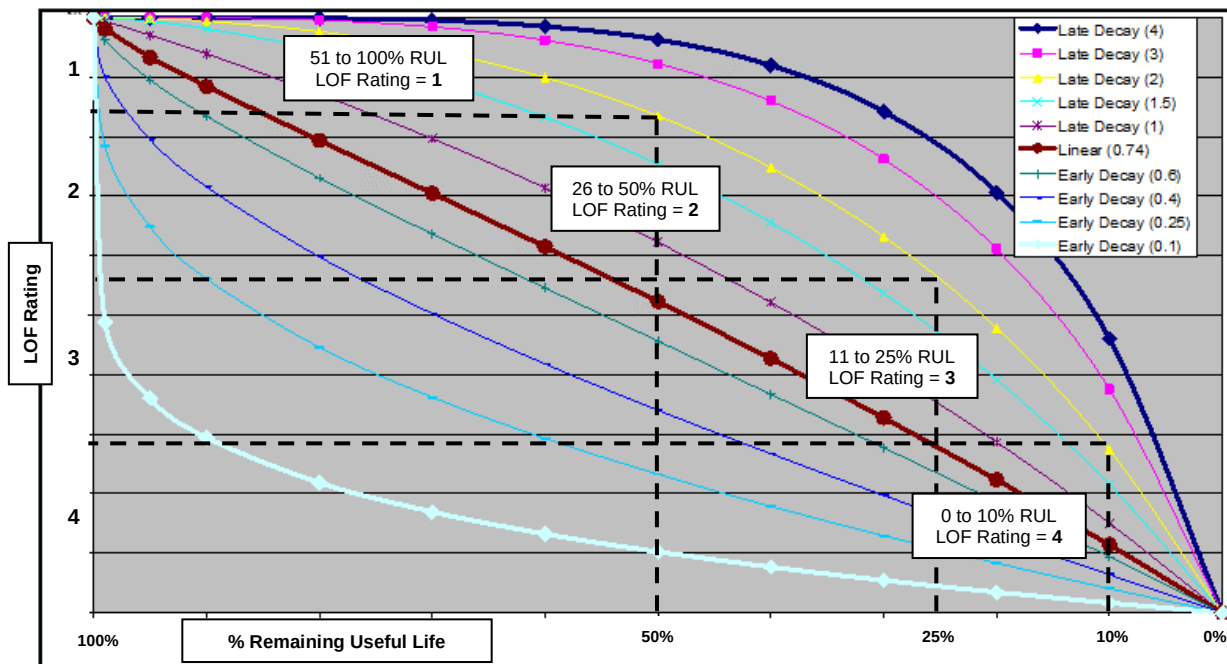


Figure 1. Percent Remaining Useful Life and LOF Rating

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.



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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.



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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 134 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						



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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.

$$\text{Facility LOF} = \frac{\sum_{i=1}^n \text{Component LOF} \times \text{Component Value} (\$)}{\text{Total Facility Value} (\$)}$$



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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



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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 • Integrity and Accountability • Recognition and Celebration • Open Communication • Trust and Respect	• Public Safety • Transportation and Transit • Neighborhoods and Housing • Governance and Administration • Environment • Economic Development and Job Growth • 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 Negligible	2 Minimal	3 Moderate	4 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 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 Negligible	2 Minimal	3 Moderate	4 Severe
(1) Water Service Interruption	Asset failure may cause interruptions to water service	GIS Pipe Diameter ^(c) ; GIS Meter Size	Pipes ≤8-inch	Pipes 10 to 12-inch; All Other Meters	Pipes 14 to 18-inch; 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) ; Critical Facilities ^(a)	-	Pipes ≤8-inch; All Other Meters	Pipes 10 to 12-inch; 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; All Other Meters	Pipes 10 to 12-inch; 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; All Meters	All Pipes; 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; 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 Negligible	2 Minimal	3 Moderate	4 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



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6.3 Horizontal Asset COF Results

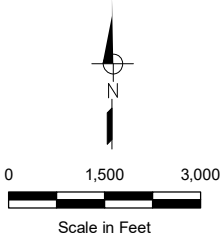
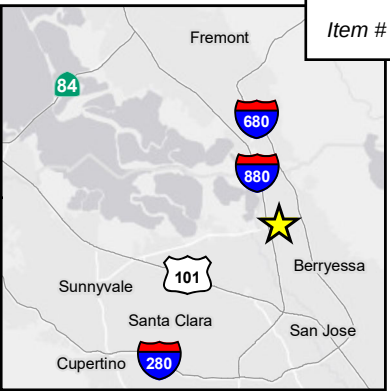
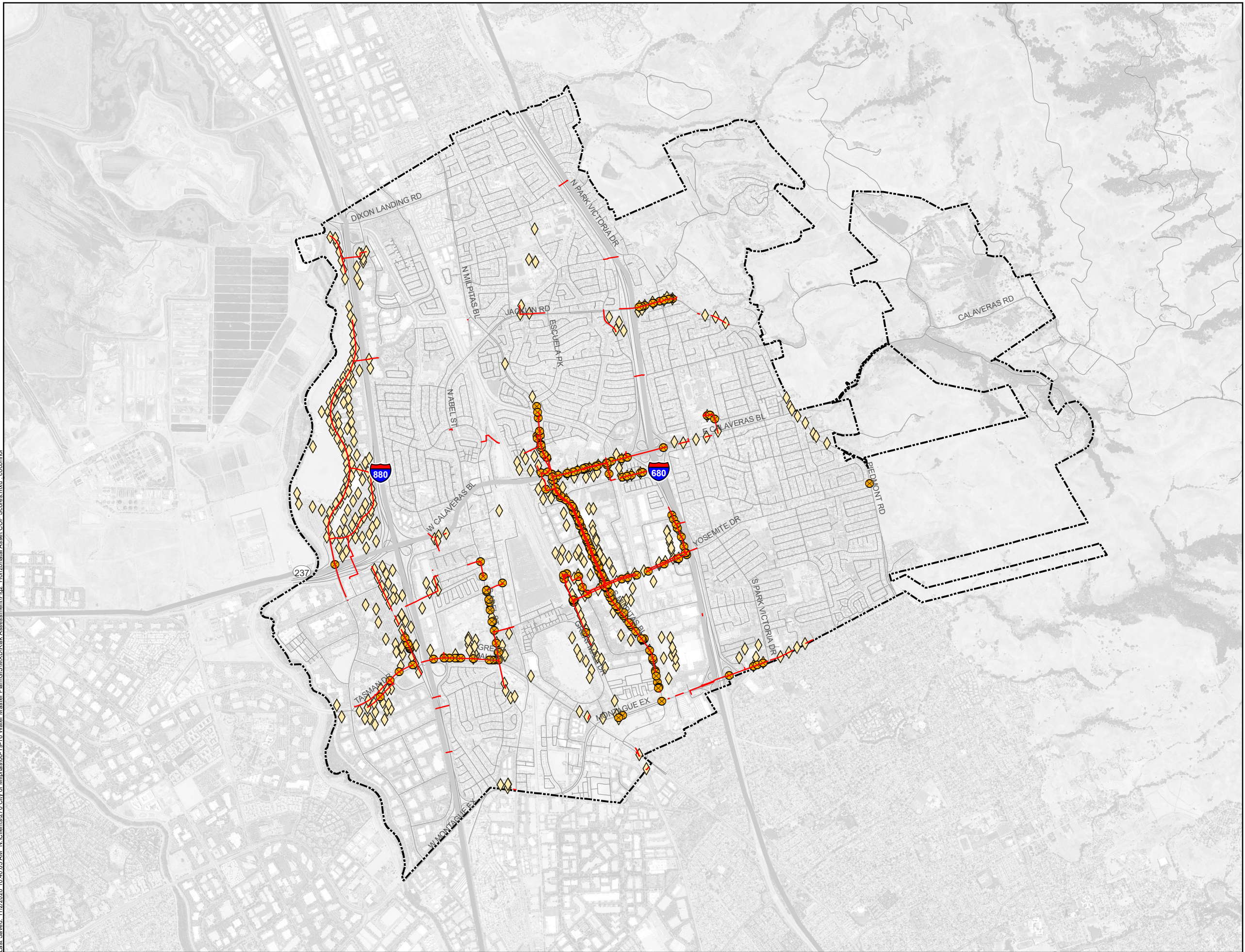
The eight asset COF ratings were averaged to obtain an overall COF rating on the 1 to 4 scale. Table 14 presents the COF rating results for horizontal assets, summarized by percent of total asset type (i.e. for hydrants, 32 percent of all hydrants were evaluated to have a COF rating of 1). Horizontal 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.

Last Saved: 11/2/2020 10:40:03 AM N:\Clients\270 City of Milpitas\60-19-16 Water Master Plan\GIS\MXD\Risk Assessment\Fig2. Horizontal Asset COF Scores.mxd - cocomor



- Valves
- Hydrants
- Pipelines
- City Limits



Figure 2
Existing Horizontal Assets
with COF Score $\geq$ 3



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:

$$Risk = COF \times LOF$$

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



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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

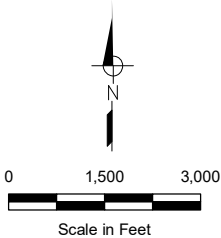
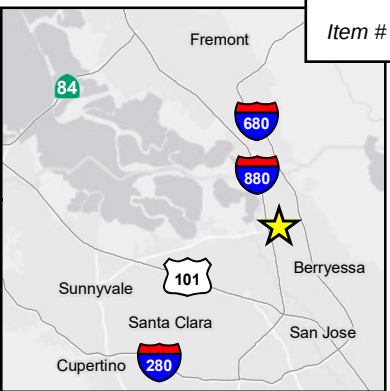
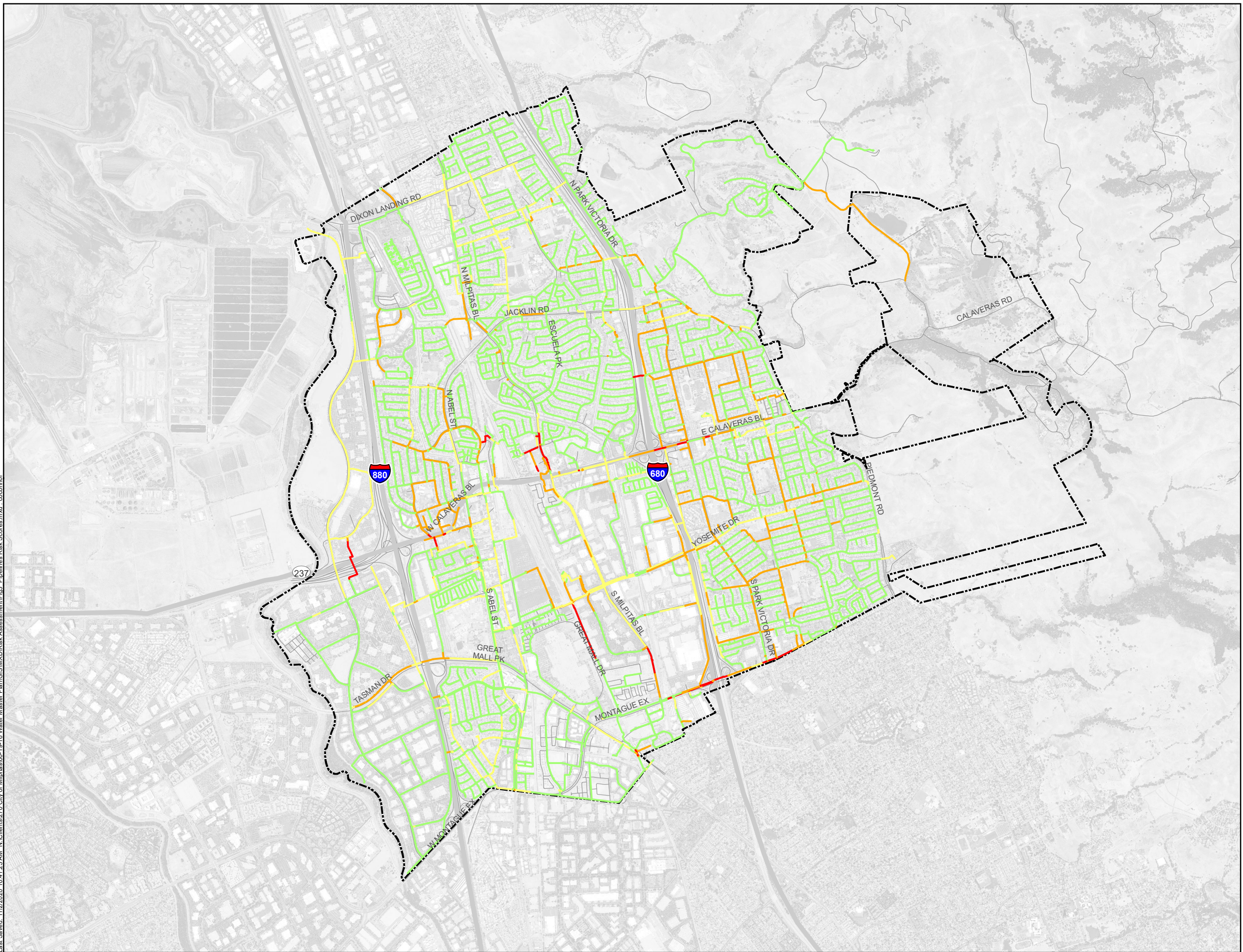
Risk Level	Percent
Low	71
Medium	15
Medium-High	13
High	1

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

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- City Limits
- Low
- Medium
- Med-High
- High



Figure 3
Existing Pipelines
Risk Classifications



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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



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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



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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									
		LOF							
		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
COF	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	--	--	--	--	--	--	--	--



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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 Valves	Well PRVs	--
	3	--	Reservoir	PRVs Turnouts Reservoirs Pump Stations	Well Pump Stations
	4	--	Reservoirs	--	--

Appendix E

Seismic Risk Assessment



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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.

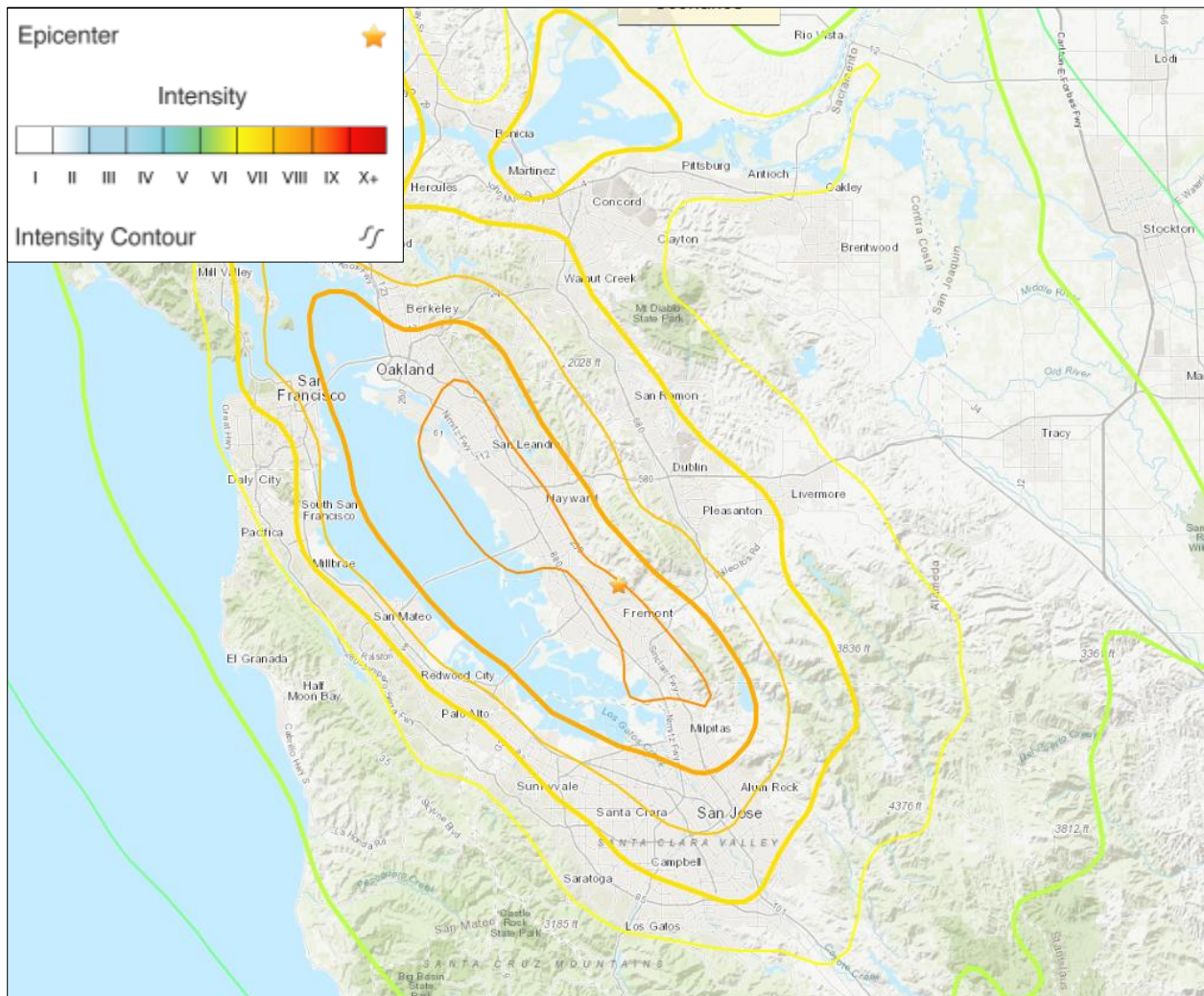


Figure 1. USGS ShakeMap—6.8 Magnitude Earthquake Event for the City of Milpitas

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 <i>City of Milpitas Seismic Isolation Study</i>, 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 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 assessed 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:** $\text{Repair Rate} / 1000 \text{ ft} = K_1 \times 0.00187 \times \text{PGV}$

Where K_1 is a fragility constant related to the expected performance of a given pipe material¹. 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:** $\text{Repair Rate} / 1000 \text{ ft} = K_2 \times 1.06 \times \text{PGD}^{0.319} \times L_s$

Where K_2 is a fragility constant related to the expected performance of a given pipe material², 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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- Department of Homeland Security Federal Emergency Management Agency Mitigation Division. Multi-hazard Loss Estimation Methodology, Earthquake Model, Hazus-MH 2.1 Technical Manual.
- USGS Earthquake Hazards Program. M 6.8 Scenario Earthquake – Hayward-Rodgers Creek.
https://earthquake.usgs.gov/scenarios/eventpage/nclegacyhaywardrogerscreekhsm6p8_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

Table 8.9: Damage Algorithms for Water Storage Tanks

Peak Ground Acceleration			
Classification	Damage State	Median (g)	β
On-Ground Anchored Concrete Tank (PST1)	slight/minor	0.25	0.55
	moderate	0.52	0.70
	extensive	0.95	0.60
	complete	1.64	0.70
On-Ground Unanchored Concrete Tank (PST2)	slight/minor	0.18	0.60
	moderate	0.42	0.70
	extensive	0.70	0.55
	complete	1.04	0.60
On-Ground Anchored Steel Tank (PST3)	slight/minor	0.30	0.60
	moderate	0.70	0.60
	extensive	1.25	0.65
	complete	1.60	0.60
On-Ground Unanchored Steel Tank (PST4)	slight/minor	0.15	0.70
	moderate	0.35	0.75
	extensive	0.68	0.75
	complete	0.95	0.70
Above-Ground Steel Tank (PST5)	slight/minor	0.18	0.50
	moderate	0.55	0.50
	extensive	1.15	0.60
	complete	1.50	0.60
On-Ground Wood Tank (PST6)	slight/minor	0.15	0.60
	moderate	0.40	0.60
	extensive	0.70	0.70
	complete	0.90	0.70
Permanent Ground Deformation			
Classification	Damage State	Median (in)	β
Buried Concrete Tank (PST7)	slight/minor	2	0.50
	moderate	4	0.50
	extensive	8	0.50
	complete	12	0.50

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	0.3
	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

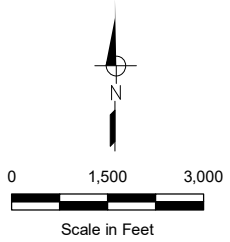
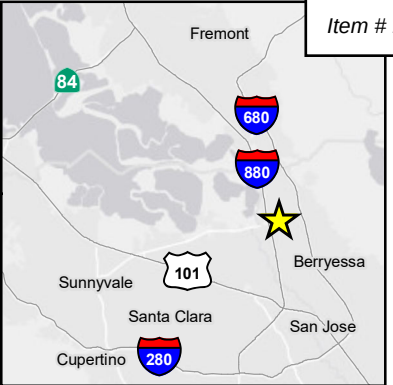
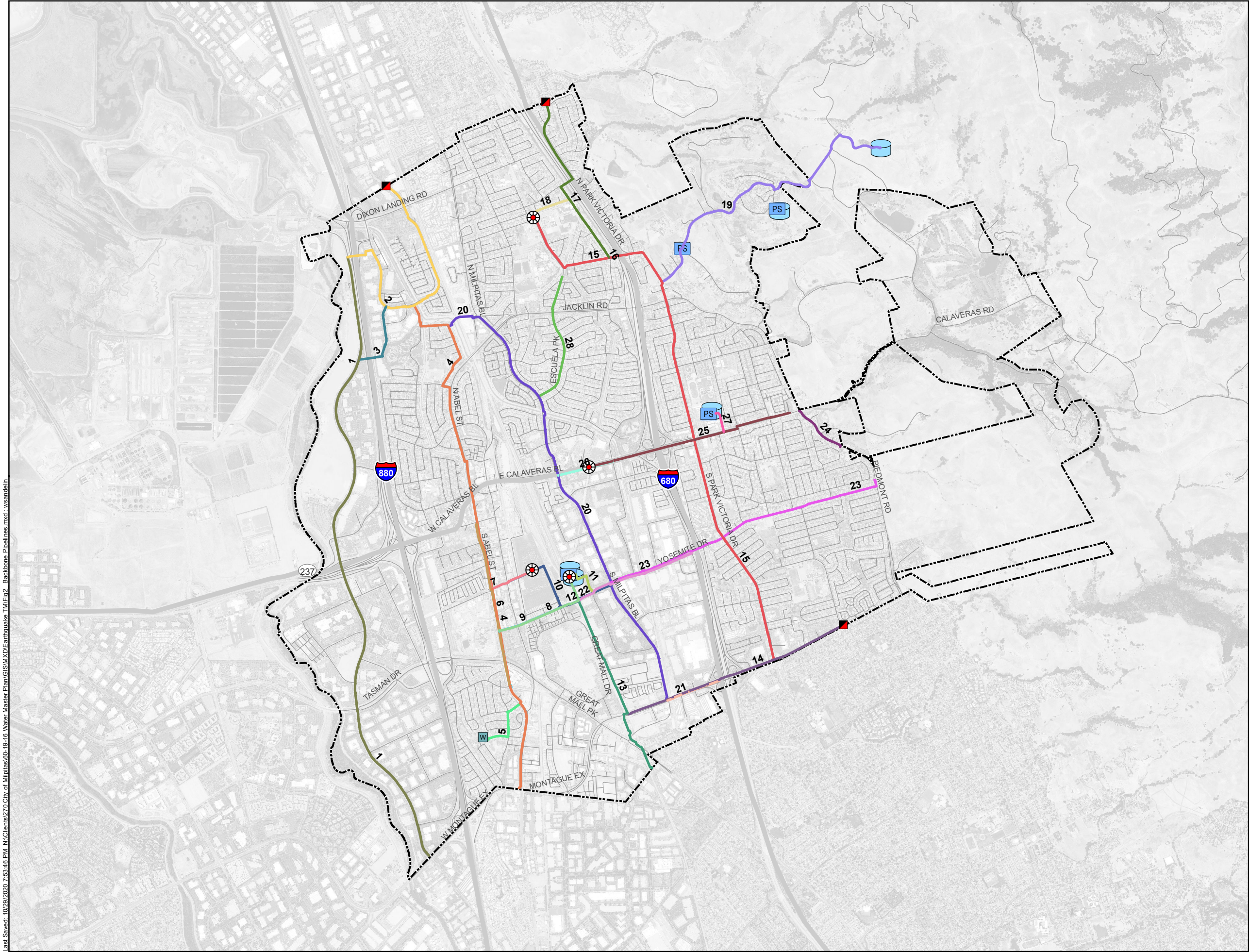
Attachment B

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.		



-  Turnout
-  Well
-  Emergency Intertie
-  Pump Station
-  Storage Reservoir
-  City Limits



Figure B-1
Backbone Pipeline Reaches

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 K₁ 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 K₂ Fragility Constants for Pipelines

Appendix F

Water Utility Financial Plan

Project Memo

DATE: June 9, 2022
TO: Tony Ndah
Public Works Director
FROM: Todd Cristiano
Senior Manager
SUBJECT: Water Financial Plan Options

Introduction

The City of Milpitas retained Raftelis to complete a comprehensive financial planning forecast for their water, wastewater¹, and stormwater utilities². Separate financial plans and memorandums were developed for each utility and this memorandum summarizes the water financial plan results. The analysis included the following:

1. **Revenue forecast.** Includes the projection of rate revenues, the number of accounts, growth in accounts, and billed volume per account; projection of other operating and non-operating income, and development fees.
2. **Expenditures forecast.** Includes the projection of operation and maintenance expenses, transfers to the general fund, payments on existing debt service, and capital projects identified in the most recent master plan documents.
3. **Revenue adjustments.** Optimizing the use of rate revenues and bond issues to minimize revenue adjustments while meeting annual revenue requirements, debt service coverage, and reserve targets.

The forecast presented in this memo is for the study period FY 2022 through FY 2040. The City's water utility is financially self-sufficient with funding for capital and operating requirements derived primarily from rates.

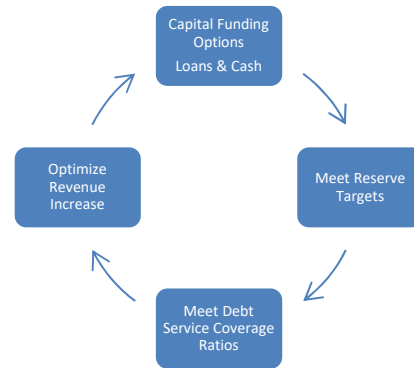
¹ Wastewater and sewer utility are used interchangeably throughout this memo.

² Stormwater activities are currently within the general fund and is not a stand-alone utility. For the purposes of this study, we created a cash flow consolidating the O&M costs for the various areas in the general fund and projects identified in the most recent master plan.

Financial Planning Process

A primary consideration in developing an ‘optimal’ financial plan is minimizing annual revenue increases by balancing the use of reserves, existing rate revenue, and debt proceeds. This balance is subject to the constraints of meeting the City’s target reserve policies and debt service coverage requirements on any proposed debt.

This approach is an iterative process. For example, while issuing debt to fund a capital project may keep revenue increases low, new debt payments may decrease the coverage below the target level. As a result, a revenue increase may be needed to maintain compliance with the target. This revenue may produce an ending balance which exceeds the target reserve. This excess can be used to partially fund the capital project which, in turn, could reduce the proposed debt issuance amount.



Reserves

The City maintains three reserves for the wastewater utility. The excerpts below are from the City’s financial reserve policy 11. These descriptions can also be found in the City’s consolidated annual financial report. The proposed financial plan allows the City to maintain reserves in compliance with this policy.

Capital reserves for emergencies. The City will maintain capital reserves in the Water and Sewer utility enterprise funds to provide for future capital projects and unanticipated emergencies. The City will attempt to maintain a capital reserve of approximately 30% of the annual operating and maintenance expenses for the Water utility fund and 25% of the annual operating and maintenance expenses for the Sewer utility fund.

Rate stabilization reserve. The City will maintain a Rate Stabilization Reserve (RSR) in the Water and Sewer utility enterprise funds with a goal of at least 16.67% or two months of the respective annual operating expenditures after the Capital Reserve requirements have been met. The RSR shall be used to mitigate the effects of occasional shortfalls in revenue or unanticipated expenditures that cannot be rebalanced within existing budgeted resources in any given fiscal year.

Public Employees Retirement (PERS) Rate Stabilization Reserve. The City will maintain in the Utility Enterprise Funds or in a Section 115 Trust a Public Employees Retirement (PERS) Rate Stabilization Reserve to be funded by 20% of any General Fund or Enterprise Funds annual operating surpluses. The Water and Sewer Utility Enterprise Funds’ portion of the Unfunded Actuarial Liability for the Miscellaneous Retirement Plan is 8.5% and 6.6%, respectively. The Utility Funds’ portion of the contribution to the PERS Rate Stabilization Reserve shall be consistent with the General Fund contributions and only be funded after the Capital Reserve and Rate Stabilization Reserve (RSR) requirements in the Water and Sewer utility funds have been met.

Water Utility Findings

Raftelis used the assumptions shown in Table 1 to develop the financial plan options. Changes in these assumptions could materially affect the results. These assumptions were based on information provided by Staff over the course of the study including annual budgets, detailed billing data, forecasts of new customer connections, and master plan reports. The detailed water cash flows are attached at the end of this memorandum.

Table 1: Water Utility Assumptions

Item		Description
FY 2022 Beginning Fund Balance		
Capital Reserve for Emergencies		\$8,614,458
Rate Stabilization Reserve		\$4,347,276
Capital Fund		\$13,199,527
TASP Fund		\$17,869,842
Average growth in number of accounts		2.2%
Annual average O&M Inflation [1]		5.7%
Average Annual Capital Projects Inflation		6.0% (FY 2023 – FY 2026)
		4.0% (FY 2027 – FY 2040)
		Study period average ~4.3%
Projected Wholesale Water Rate Increases [2]		
Year	SFPUC	Valley Water
FY 2023	15.9%	15.0%
FY 2024	11.2%	15.0%
FY 2025	0.0%	15.0%
FY 2026	0.0%	9.1%
FY 2027	0.8%	9.1%
FY 2028	4.5%	9.1%
FY 2029	4.5%	9.1%
FY 2030 – FY 2040	4.5% Annually	5.0% Annually
[1] Includes the water purchase cost increases.		
[2] Current FY22 Rates		
SFPUC (\$4.10/Ccf FY22 rate)		
Valley Water (\$3.71/Ccf FY22 rate)		

The water utility financial plan consists of three sub-funds:

- **Operating Fund.** Funds activities associated with annual operation and maintenance of the utility, maintaining emergency and rate stabilization reserves, and transfers of any surplus to the Capital Fund.
- **Capital Fund.** Tracks activities associated with debt service on bond issues, previously adopted CIP projects, and projects identified in the master plan. Sources of funding include capital fees, transfers from the operating fund, and debt issuance proceeds.
- **TASP Fund.** Tracks funding and projects that have specifically been identified as being funded by TASP or future METRO development fees³.

³ Future METRO fees have not been adopted as of the date of this memorandum

Separation of these sub-funds ensures that sources of funds were being used for their appropriate purposes. For example, capital fees and bond issues fund the capital improvement program but should not fund operations.

Operating Fund

Sources of Funds

Sources of funds consist primarily of rate revenue, other operating income, and non-operating income. Rate revenue consists of a bimonthly base charge and a uniform volume rate. Rate revenues with proposed increases is projected to increase from \$33.0 million in FY 2023 to \$44.2 million in FY 2040. This includes an average annual account growth of 2.2% from FY 2023 to FY 2040 based on future METRO plan development forecasts.

Uses of Funds

Uses of Funds consist of operation and maintenance expense and transfers to the capital fund to assist in funding the capital improvement program. O&M consists of the items required to distribute water to customers as well costs associated with administration of the utility, and customer services.

Water purchases make up approximately 70% of O&M. The City purchases water from San Francisco Public Utilities Commission (SFPUC) and Santa Clara Valley Water District (Valley Water) on an annual basis. The wholesale rate is set annually by each wholesale water agency. The City expects the water purchase rate from SFPUC to increase by 15.9% in 2023 and 11.2% in 2024; 0.0% in FY 2025 and FY 2026, 0.8% in FY 2027, and 4.5% from FY 2028 through FY 2040. Valley Water purchased water rates are expected to increase by 15.0% each year from FY 2023 through FY 2025, 9.1% from FY 2026 to FY 2029, and 5.0% annually from FY 2030 through FY 2040.

O&M expenses for the City's core operations (personnel services, general supplies, contractual services excluding water purchases, etc.) will increase by 4.0% from FY 2023 through FY 2025. This short-term inflation estimates are based on publications from the Philadelphia Federal Reserve. Inflation from FY 2026 through FY 2040 is estimated at 3.0% based on historical trends of Consumer Price Index (CPI). Total O&M including water purchases will increase by an average of 5.7% annually over the study period or from \$31.2 million in FY 2023 to \$84.9 million in FY 2040.

Capital Fund

Sources of Funds

Funding includes the capital surcharge, transfers from the operating fund, and bond proceeds. The capital surcharge currently collects approximately \$4.0 million per year. Transfers from the operating fund are made in years where operating revenue exceeds operating expenses and required transfers to reserve funds.

Uses of Funds

Expenditures include debt service on the City's existing Series 2019 bonds and capital projects identified in the adopted FY 2023 – FY 2040 capital budget and master plan. Capital improvement program costs total \$82.0 million for the study period which includes an annual inflation of 6.0% from FY 2023 through FY 2025 and 4.0% from FY 2026 through FY 2040.

Revenue Requirement

Revenue from rates and other miscellaneous revenue should be sufficient to meet annual revenue requirements in the operating and capital funds. Revenue requirements include operation and maintenance expenses, capital project funding, and meeting target reserves. Raftelis and City staff developed a financial plan to fully fund expenses, including the master plan projects, using revenue derived from user rates and the capital surcharge.

Proposed Financial Plan

The financing plan developed by Raftelis and City staff proposes to fully fund the expenses described above using rate revenue.

- **Operating Fund.** Annual increases to water user charges of 6.0% are required in FY 2024 through FY 2026, 4.0% from FY 2027 through FY 2031, and 3.0% from FY 2031 through FY 2040. The revenue from these increases will adequately fund O&M, water purchases, reserve requirements, and provide surplus revenue to transfer to the CALPERS and capital funds.
- **Capital Fund.** The proposed financing plan does not require the use of bonds in any year of the forecast. Payment on existing debt service, the adopted CIP projects, and master plan projects can be fully funded by the capital surcharge with annual increases of 10.0% from FY 2024 through 2030.
- **TASP Fund.** Several projects in the master plan, including Curtis Well and assets associated with the Valley Water Second Water Supply, have been identified as requiring funding from the TASP fund. However, the existing fund balance and expected 2023 proceeds from TASP development fees are insufficient to fully fund all identified projects. This plan assumes that future METRO development fees will be able to provide an additional \$4.1 million by FY 2027 to fully finance these projects.
- **Water Monthly Bill Impact.** Based on the rate increases proposed in this financial plan, the bimonthly bill for typical single-family residential customer with a 5/8" meter is projected to increase \$9.19 from \$143.02 to \$152.51 based on usage of 14 hcf.

Reliance on City Provided Data

During this project, the City (and/or its representatives) provided Raftelis with a variety of technical information, including cost and revenue data. Raftelis did not independently assess or test for the accuracy of such data – historic or projected. Raftelis has relied on this data in the formulation of our findings and subsequent recommendations, as well as in the preparation of this memorandum.

There are often differences between actual and projected data. Some of the assumptions used for projections in this memorandum will not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the data or results projected in this memorandum and actual results achieved, and those differences may be material. As a result, Raftelis takes no responsibility for the accuracy of data or projections provided by or prepared on behalf of the City, nor do we have any responsibility for updating this memorandum for events occurring after the date of this memorandum.

Table A-1
City of Milpitas, CA
Water Utility Cash Flow Analysis

Line No.	Operating Fund	Budget FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031
Sources of Funds											
1	Revenue from Adopted Water Rates	\$ 31,013,210	\$ 32,994,216	\$ 33,108,574	\$ 33,783,900	\$ 34,458,744	\$ 35,133,589	\$ 35,808,434	\$ 36,483,279	\$ 37,158,124	\$ 37,861,346
2	Add'l Revenue from Proposed Rate Increases	-	-	1,986,514	4,175,690	6,582,172	8,384,864	10,320,095	12,394,502	14,615,043	17,001,754
3	Total Water Rate Revenue	31,013,210	32,994,216	35,095,088	37,959,590	41,040,916	43,518,454	46,128,529	48,877,781	51,773,167	54,863,099
4	Investment Interest	\$ 372,000	\$ 369,729	\$ 187,521	\$ 202,530	\$ 220,657	\$ 231,585	\$ 244,112	\$ 260,891	\$ 279,020	\$ 294,383
5	Other Misc. Revenue	17,601	-	-	-	-	-	-	-	-	-
6	Total Sources	\$ 31,402,811	\$ 33,363,945	\$ 35,282,609	\$ 38,162,120	\$ 41,261,573	\$ 43,750,038	\$ 46,372,641	\$ 49,138,671	\$ 52,052,187	\$ 55,157,482
Uses of Funds											
7	Operation and Maintenance Expense	\$ 25,734,839	\$ 28,566,070	\$ 31,737,245	\$ 33,869,560	\$ 35,603,584	\$ 37,601,626	\$ 40,305,556	\$ 43,231,859	\$ 45,694,157	\$ 48,324,559
8	Transfer to General Fund	2,571,407	2,687,393	2,794,889	2,906,684	2,993,885	3,083,701	3,176,212	3,271,499	3,369,644	3,470,733
9	Total Uses of Funds	\$ 28,306,246	\$ 31,253,463	\$ 34,532,133	\$ 36,776,244	\$ 38,597,469	\$ 40,685,328	\$ 43,481,769	\$ 46,503,358	\$ 49,063,801	\$ 51,795,292
10	Operating Surplus	\$ 3,096,565	\$ 2,110,482	\$ 750,476	\$ 1,385,876	\$ 2,664,105	\$ 3,064,711	\$ 2,890,872	\$ 2,635,313	\$ 2,988,386	\$ 3,362,190
Reserve Fund Summary											
11	Capital for Emergencies	\$ 8,614,458	\$ 9,376,039	\$ 10,126,515	\$ 11,032,873	\$ 11,579,241	\$ 12,205,598	\$ 13,044,531	\$ 13,951,007	\$ 14,719,140	\$ 15,538,588
12	Rate Stabilization	4,718,651	5,209,952	5,209,952	5,689,469	6,434,198	6,782,244	7,248,411	7,752,110	8,178,936	8,634,275
13	CALPERS	545,038	716,558	716,558	716,558	991,160	1,409,221	1,726,376	1,971,403	2,330,089	2,747,569
14	Infrastructure	13,464,473	16,625,757	7,629,326	3,827,790	2,689,612	5,059,757	5,306,748	6,426,325	11,413,754	12,457,408
15	Total Reserves	\$ 27,342,620	\$ 31,928,306	\$ 23,682,351	\$ 21,266,690	\$ 21,694,210	\$ 25,456,820	\$ 27,326,065	\$ 30,100,845	\$ 36,641,919	\$ 39,377,840
Line No.	Reserve Fund Detail	Budget FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031
Capital Reserve for Emergencies											
1	Beginning Balance	\$ 8,614,458	\$ 8,614,458	\$ 9,376,039	\$ 10,126,515	\$ 11,032,873	\$ 11,579,241	\$ 12,205,598	\$ 13,044,531	\$ 13,951,007	\$ 14,719,140
2	Contribution		761,581	750,476	906,358	546,367	626,358	838,932	906,477	768,133	819,447
3	Use		-	-	-	-	-	-	-	-	-
4	Ending Balance	\$ 8,614,458	\$ 9,376,039	\$ 10,126,515	\$ 11,032,873	\$ 11,579,241	\$ 12,205,598	\$ 13,044,531	\$ 13,951,007	\$ 14,719,140	\$ 15,538,588
5	Target	8,491,874	9,376,039	10,359,640	11,032,873	11,579,241	12,205,598	13,044,531	13,951,007	14,719,140	15,538,588
Rate Stabilization Reserve											
6	Beginning Balance	\$ 4,347,276	\$ 4,718,651	\$ 5,209,952	\$ 5,209,952	\$ 5,689,469	\$ 6,434,198	\$ 6,782,244	\$ 7,248,411	\$ 7,752,110	\$ 8,178,936
7	Contribution	371,375	491,301	-	479,517	744,729	348,046	466,167	503,699	426,826	455,340
8	Ending Balance	\$ 4,718,651	\$ 5,209,952	\$ 5,209,952	\$ 5,689,469	\$ 6,434,198	\$ 6,782,244	\$ 7,248,411	\$ 7,752,110	\$ 8,178,936	\$ 8,634,275
9	Target	4,718,651	5,209,952	5,756,507	6,130,600	6,434,198	6,782,244	7,248,411	7,752,110	8,178,936	8,634,275
CALPERS Reserve											
10	Beginning Balance	\$ -	\$ 545,038	\$ 716,558	\$ 716,558	\$ 716,558	\$ 991,160	\$ 1,409,221	\$ 1,726,376	\$ 1,971,403	\$ 2,330,089
11	Contribution	545,038	171,520	-	-	274,602	418,061	317,155	245,027	358,686	417,481
12	Ending Balance	\$ 545,038	\$ 716,558	\$ 716,558	\$ 716,558	\$ 991,160	\$ 1,409,221	\$ 1,726,376	\$ 1,971,403	\$ 2,330,089	\$ 2,747,569
13	Transfer to Infrastructure Replacement	\$ 2,180,152	\$ 686,080	\$ -	\$ -	\$ 1,098,407	\$ 1,672,246	\$ 1,268,619	\$ 980,110	\$ 1,434,742	\$ 1,669,923
	Check	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Infrastructure Replacement											
14	Beginning Balance	\$ 13,199,527	\$ 13,464,473	\$ 16,625,757	\$ 7,629,326	\$ 3,827,790	\$ 2,689,612	\$ 5,059,757	\$ 5,306,748	\$ 6,426,325	\$ 11,413,754
15	Contribution	264,946	3,161,284	(8,996,431)	(3,801,537)	(1,138,178)	2,370,145	246,991	1,119,577	4,987,430	1,043,653
16	Ending Balance	\$ 13,464,473	\$ 16,625,757	\$ 7,629,326	\$ 3,827,790	\$ 2,689,612	\$ 5,059,757	\$ 5,306,748	\$ 6,426,325	\$ 11,413,754	\$ 12,457,408
17	Target	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
18	Annualized Water Service Revenue Increase	0.0%	0.0%	6.0%	6.0%	6.0%	4.0%	4.0%	4.0%	4.0%	4.0%
19	Cumulative Revenue Increase	0.0%	0.0%	6.0%	12.4%	19.1%	23.9%	28.8%	34.0%	39.3%	44.9%
20	Debt Service Coverage	6.71	5.77	4.87	5.98	7.78	8.79	9.33	9.41	10.10	10.61

Table A-1
City of Milpitas, CA
Water Utility Cash Flow Analysis

Line No.	Operating Fund	Projected								
		FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040
Sources of Funds										
1	Revenue from Adopted Water Rates	\$ 38,565,143	\$ 39,269,521	\$ 39,974,483	\$ 40,680,033	\$ 41,386,178	\$ 42,092,920	\$ 42,800,265	\$ 43,508,218	\$ 44,216,783
2	Add'l Revenue from Proposed Rate Increases	19,553,114	22,277,434	25,183,430	28,280,236	31,577,431	35,085,056	38,813,634	42,774,199	46,978,313
3	Total Water Rate Revenue	58,118,257	61,546,955	65,157,912	68,960,270	72,963,609	77,177,976	81,613,900	86,282,417	91,195,096
4	Investment Interest	\$ 310,772	\$ 328,230	\$ 346,630	\$ 366,013	\$ 386,608	\$ 408,284	\$ 431,281	\$ 455,659	\$ 481,282
5	Other Misc. Revenue	-	-	-	-	-	-	-	-	-
6	Total Sources	\$ 58,429,029	\$ 61,875,185	\$ 65,504,542	\$ 69,326,282	\$ 73,350,217	\$ 77,586,260	\$ 82,045,181	\$ 86,738,075	\$ 91,676,378
Uses of Funds										
7	Operation and Maintenance Expense	\$ 51,130,227	\$ 54,089,550	\$ 57,209,530	\$ 60,528,366	\$ 64,023,861	\$ 67,735,937	\$ 71,674,528	\$ 75,817,014	\$ 80,206,062
8	Transfer to General Fund	3,574,855	3,682,101	3,792,564	3,906,341	4,023,531	4,144,237	4,268,564	4,396,621	4,528,519
9	Total Uses of Funds	\$ 54,705,082	\$ 57,771,651	\$ 61,002,093	\$ 64,434,707	\$ 68,047,392	\$ 71,880,174	\$ 75,943,092	\$ 80,213,635	\$ 84,734,581
10	Operating Surplus	\$ 3,723,947	\$ 4,103,535	\$ 4,502,449	\$ 4,891,575	\$ 5,302,826	\$ 5,706,086	\$ 6,102,089	\$ 6,524,441	\$ 6,941,796
Reserve Fund Summary										
11	Capital for Emergencies	\$ 16,411,524	\$ 17,331,495	\$ 18,300,628	\$ 19,330,412	\$ 20,414,218	\$ 21,564,052	\$ 22,782,928	\$ 24,064,090	\$ 25,420,374
12	Rate Stabilization	9,119,337	9,630,534	10,169,049	10,741,266	11,343,500	11,982,425	12,659,713	13,371,613	14,125,255
13	CALPERS	3,220,759	3,755,232	4,354,193	5,012,108	5,735,465	6,518,930	7,360,115	8,266,391	9,232,765
14	Infrastructure	13,577,145	14,785,579	16,085,586	17,444,638	18,877,091	20,344,739	21,825,055	23,328,490	24,825,865
15	Total Reserves	\$ 42,328,765	\$ 45,502,841	\$ 48,909,456	\$ 52,528,423	\$ 56,370,274	\$ 60,410,147	\$ 64,627,811	\$ 69,030,584	\$ 73,604,258
Line No.	Reserve Fund Detail	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040
Capital Reserve for Emergencies										
1	Beginning Balance	\$ 15,538,588	\$ 16,411,524	\$ 17,331,495	\$ 18,300,628	\$ 19,330,412	\$ 20,414,218	\$ 21,564,052	\$ 22,782,928	\$ 24,064,090
2	Contribution	872,937	919,971	969,133	1,029,784	1,083,805	1,149,835	1,218,875	1,281,163	1,356,284
3	Use	-	-	-	-	-	-	-	-	-
4	Ending Balance	\$ 16,411,524	\$ 17,331,495	\$ 18,300,628	\$ 19,330,412	\$ 20,414,218	\$ 21,564,052	\$ 22,782,928	\$ 24,064,090	\$ 25,420,374
5	Target	16,411,524	17,331,495	18,300,628	19,330,412	20,414,218	21,564,052	22,782,928	24,064,090	25,420,374
Rate Stabilization Reserve										
6	Beginning Balance	\$ 8,634,275	\$ 9,119,337	\$ 9,630,534	\$ 10,169,049	\$ 10,741,266	\$ 11,343,500	\$ 11,982,425	\$ 12,659,713	\$ 13,371,613
7	Contribution	485,062	511,197	538,515	572,217	602,235	638,925	677,288	711,899	753,642
8	Ending Balance	\$ 9,119,337	\$ 9,630,534	\$ 10,169,049	\$ 10,741,266	\$ 11,343,500	\$ 11,982,425	\$ 12,659,713	\$ 13,371,613	\$ 14,125,255
9	Target	9,119,337	9,630,534	10,169,049	10,741,266	11,343,500	11,982,425	12,659,713	13,371,613	14,125,255
CALPERS Reserve										
10	Beginning Balance	\$ 2,747,569	\$ 3,220,759	\$ 3,755,232	\$ 4,354,193	\$ 5,012,108	\$ 5,735,465	\$ 6,518,930	\$ 7,360,115	\$ 8,266,391
11	Contribution	473,190	534,473	598,960	657,915	723,357	783,465	841,185	906,276	966,374
12	Ending Balance	\$ 3,220,759	\$ 3,755,232	\$ 4,354,193	\$ 5,012,108	\$ 5,735,465	\$ 6,518,930	\$ 7,360,115	\$ 8,266,391	\$ 9,232,765
13	Transfer to Infrastructure Replacement Check	\$ 1,892,759 TRUE	\$ 2,137,894 TRUE	\$ 2,395,841 TRUE	\$ 2,631,659 TRUE	\$ 2,893,428 TRUE	\$ 3,133,861 TRUE	\$ 3,364,740 TRUE	\$ 3,625,103 TRUE	\$ 3,865,496 TRUE
Infrastructure Replacement										
14	Beginning Balance	\$ 12,457,408	\$ 13,577,145	\$ 14,785,579	\$ 16,085,586	\$ 17,444,638	\$ 18,877,091	\$ 20,344,739	\$ 21,825,055	\$ 23,328,490
15	Contribution	1,119,737	1,208,434	1,300,008	1,359,052	1,432,453	1,467,648	1,480,316	1,503,435	1,497,375
16	Ending Balance	\$ 13,577,145	\$ 14,785,579	\$ 16,085,586	\$ 17,444,638	\$ 18,877,091	\$ 20,344,739	\$ 21,825,055	\$ 23,328,490	\$ 24,825,865
17	Target	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
18	Annualized Water Service Revenue Increase	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
19	Cumulative Revenue Increase	50.7%	56.7%	63.0%	69.5%	76.3%	83.4%	90.7%	98.3%	106.2%
20	Debt Service Coverage	11.08	11.57	12.10	12.63	13.20	13.71	14.24	14.75	15.34

Table A-2
City of Milpitas, CA
Water Utility
Water Capital Improvement Plan (CIP)

Line No.	Capital Financing Plan	Budget FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Projected				
							FY 2027	FY 2028	FY 2029	FY 2030	FY 2031
Sources of Funds											
1	Beginning Balance	\$ 13,199,527	\$ 13,464,473	\$ 16,625,757	\$ 7,629,326	\$ 3,827,790	\$ 2,689,612	\$ 5,059,757	\$ 5,306,748	\$ 6,426,325	\$ 11,413,754
2	Revenue Bonds	-	-	-	-	-	-	-	-	-	-
4	Capital Charge Revenue	3,913,678	3,926,784	4,333,879	4,868,338	5,466,553	6,135,726	6,884,069	7,229,405	7,589,265	7,737,742
5	Development Fees	297,000	1,002,155	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
6	Misc. Revenue	7,216	7,215	7,431	7,654	7,884	8,121	8,364	8,615	8,874	9,140
7	Interest	221,000	192,000	332,515	152,587	76,556	53,792	101,195	106,135	128,526	228,275
8	Transfer of Surplus from O&M	2,180,152	686,080	-	-	1,098,407	1,672,246	1,268,619	980,110	1,434,742	1,669,923
9	Subtotal: Sources	\$ 19,818,573	\$ 19,278,707	\$ 21,599,583	\$ 12,957,905	\$ 10,777,189	\$ 10,859,496	\$ 13,622,004	\$ 13,931,013	\$ 15,887,732	\$ 21,358,834
Uses of Funds											
10	CIP Projects	\$ 5,310,050	\$ 1,605,900	\$ 12,925,806	\$ 8,083,666	\$ 7,043,128	\$ 4,753,039	\$ 7,267,306	\$ 6,456,488	\$ 3,426,528	\$ 7,855,726
11	Debt Service	1,044,050	1,047,050	1,044,450	1,046,450	1,044,450	1,046,700	1,047,950	1,048,200	1,047,450	1,045,700
12	Subtotal: Uses	\$ 6,354,100	\$ 2,652,950	\$ 13,970,256	\$ 9,130,116	\$ 8,087,578	\$ 5,799,739	\$ 8,315,256	\$ 7,504,688	\$ 4,473,978	\$ 8,901,426
13	Ending Balance	\$ 13,464,473	\$ 16,625,757	\$ 7,629,326	\$ 3,827,790	\$ 2,689,612	\$ 5,059,757	\$ 5,306,748	\$ 6,426,325	\$ 11,413,754	\$ 12,457,408
CIP Adjustments											
15	Completion Percentage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
16	Annual Cost Inflation	0.0%	6.0%	6.0%	6.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
17	Cumulative Inflation Rate	100.0%	106.0%	112.4%	119.1%	123.9%	128.8%	134.0%	139.3%	144.9%	150.7%

Table A-2
City of Milpitas, CA
Water Utility
Water Capital Improvement Plan (CIP)

Line No.	Capital Financing Plan	Projected									
		FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	
Sources of Funds											
1	Beginning Balance	\$ 12,457,408	\$ 13,577,145	\$ 14,785,579	\$ 16,085,586	\$ 17,444,638	\$ 18,877,091	\$ 20,344,739	\$ 21,825,055	\$ 23,328,490	
2	Revenue Bonds	-	-	-	-	-	-	-	-	-	
4	Capital Charge Revenue	7,886,322	8,035,005	8,183,791	8,332,683	8,481,679	8,630,781	8,779,990	8,929,307	9,078,731	
5	Development Fees	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	
6	Misc. Revenue	9,414	9,696	9,987	10,287	10,595	10,913	11,241	11,578	11,925	
7	Interest	249,148	271,543	295,712	321,712	348,893	377,542	406,895	436,501	466,570	
8	Transfer of Surplus from O&M	1,892,759	2,137,894	2,395,841	2,631,659	2,893,428	3,133,861	3,364,740	3,625,103	3,865,496	
9	Subtotal: Sources	\$ 22,795,050	\$ 24,331,282	\$ 25,970,910	\$ 27,681,927	\$ 29,479,234	\$ 31,330,189	\$ 33,207,605	\$ 35,127,544	\$ 37,051,213	
Uses of Funds											
10	CIP Projects	\$ 8,169,955	\$ 8,496,754	\$ 8,836,624	\$ 9,190,089	\$ 9,557,692	\$ 9,940,000	\$ 10,337,600	\$ 10,751,104	\$ 11,181,148	
11	Debt Service	1,047,950	1,048,950	1,048,700	1,047,200	1,044,450	1,045,450	1,044,950	1,047,950	1,044,200	
12	Subtotal: Uses	\$ 9,217,905	\$ 9,545,704	\$ 9,885,324	\$ 10,237,289	\$ 10,602,142	\$ 10,985,450	\$ 11,382,550	\$ 11,799,054	\$ 12,225,348	
13	Ending Balance	\$ 13,577,145	\$ 14,785,579	\$ 16,085,586	\$ 17,444,638	\$ 18,877,091	\$ 20,344,739	\$ 21,825,055	\$ 23,328,490	\$ 24,825,865	
CIP Adjustments											
15	Completion Percentage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
16	Annual Cost Inflation	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	
17	Cumulative Inflation Rate	156.7%	163.0%	169.5%	176.3%	183.4%	190.7%	198.3%	206.2%	214.5%	

Table A-3
City of Milpitas, CA
Water Utility
Water TASP Capital Improvement Plan (CIP)

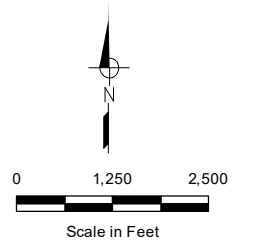
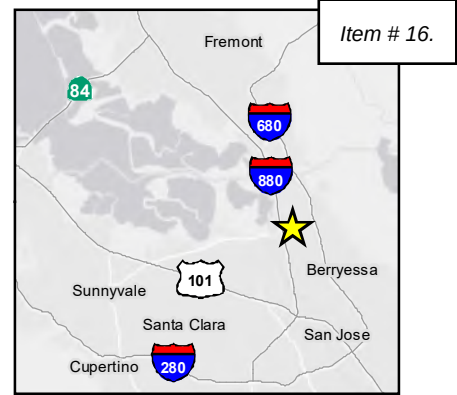
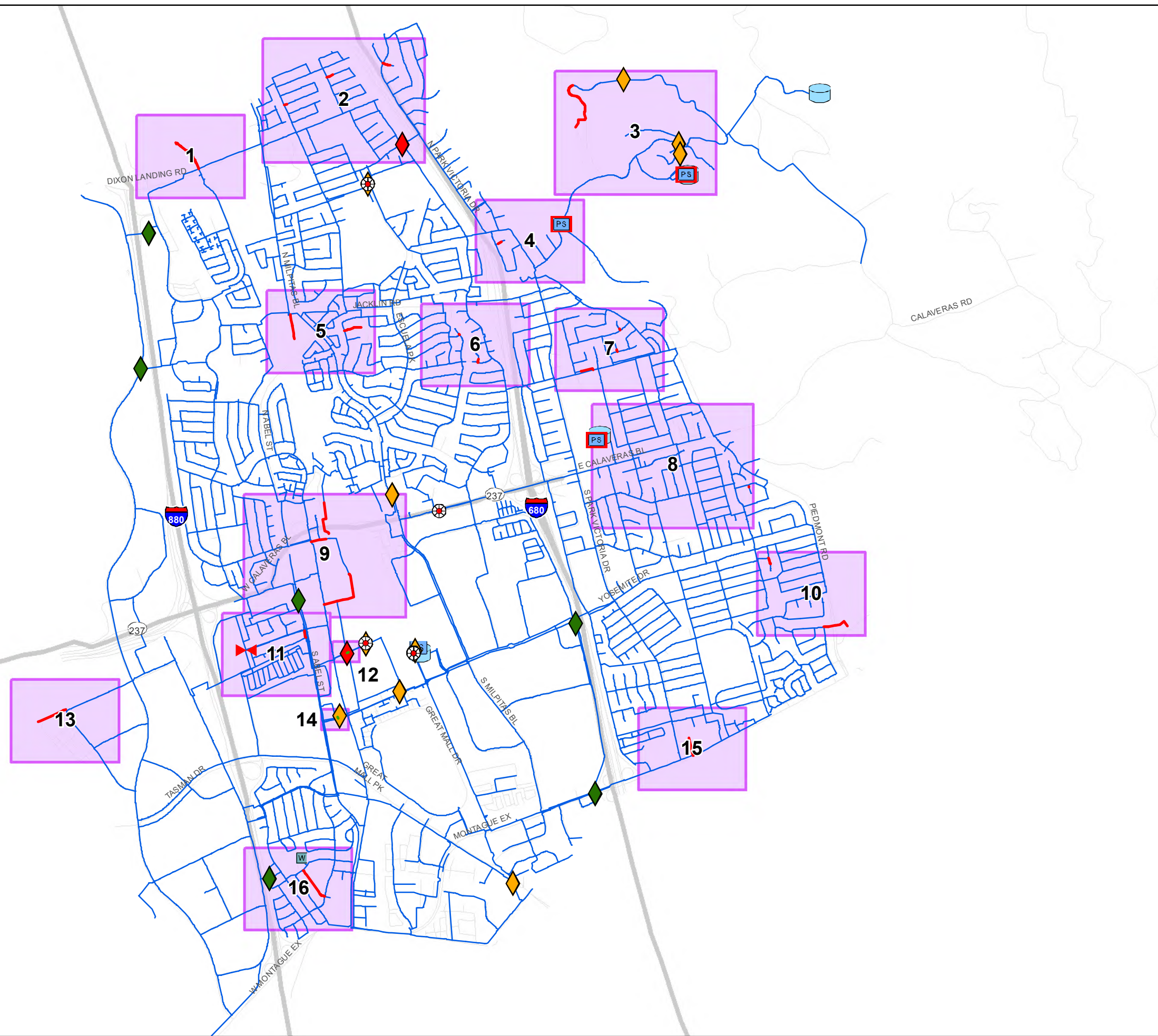
Line		Budget	Projected								
No.	Capital Financing Plan - TASP	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031
Sources of Funds											
1	Beginning Balance	\$ 17,869,842	\$ 17,869,842	\$ 24,484,221	\$ 17,798,801	\$ 17,798,801	\$ 17,798,801	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)
2	TASP Development Fees	-	6,932,379	-	-	-	-	-	-	-	\$ -
3	Subtotal: Sources	\$ 17,869,842	\$ 24,802,221	\$ 24,484,221	\$ 17,798,801	\$ 17,798,801	\$ 17,798,801	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)
Uses of Funds											
4	CIP Projects	\$ -	\$ 318,000	\$ 6,685,420	\$ -	\$ -	\$ 21,836,327	\$ -	\$ -	\$ -	\$ -
5	Subtotal: Uses	\$ -	\$ 318,000	\$ 6,685,420	\$ -	\$ -	\$ 21,836,327	\$ -	\$ -	\$ -	\$ -
6	Ending Balance	\$ 17,869,842	\$ 24,484,221	\$ 17,798,801	\$ 17,798,801	\$ 17,798,801	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)
7	Cumulative Inflation Rate	100.0%	106.0%	112.4%	119.1%	123.9%	128.8%	134.0%	139.3%	144.9%	150.7%

Table A-3
City of Milpitas, CA
Water Utility
Water TASP Capital Improvement Plan (CIP)

Line No.	Capital Financing Plan - TASP	Projected								
		FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040
Sources of Funds										
1	Beginning Balance	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)
2	TASP Development Fees	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3	Subtotal: Sources	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)
Uses of Funds										
4	CIP Projects	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5	Subtotal: Uses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	Ending Balance	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)	\$ (4,037,526)
7	Cumulative Inflation Rate	156.7%	163.0%	169.5%	176.3%	183.4%	190.7%	198.3%	206.2%	214.5%

Appendix G

Capital Improvement Program Mapbook and Project Summary Sheets



Recommended Facilities

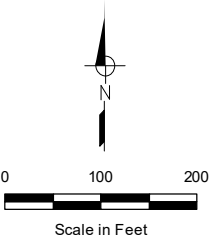
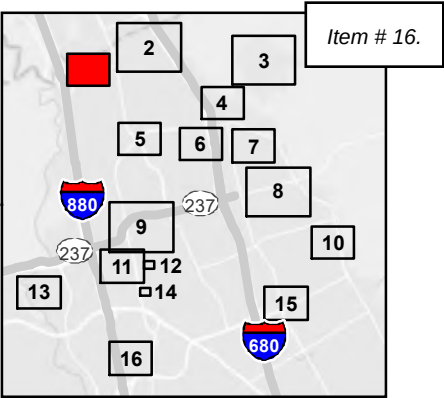
- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

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



Recommended Facilities

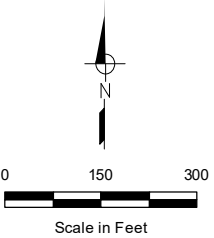
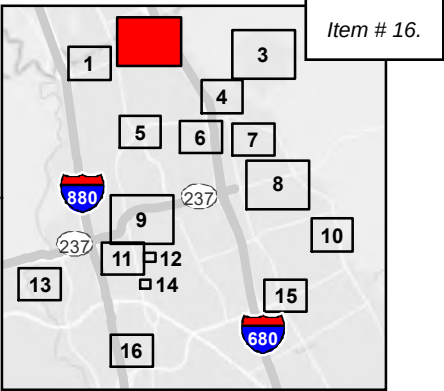
- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

Existing Facilities

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline



Figure G-1.1
Recommended Improvements
for Existing Water System



Recommended Facilities

- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

Existing Facilities

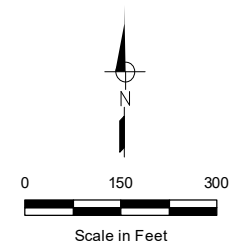
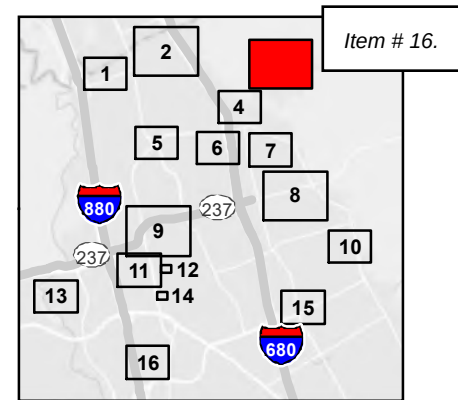
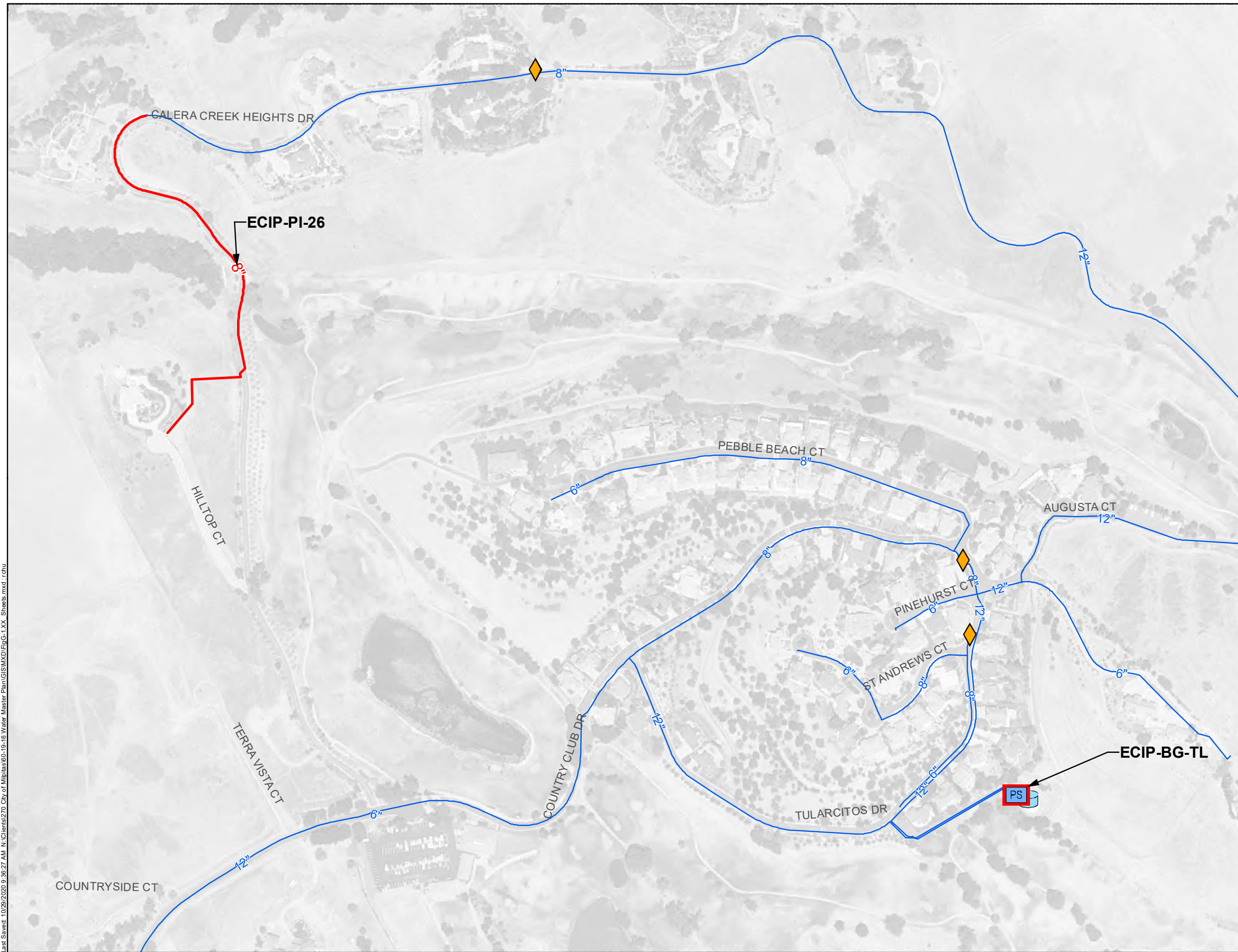
- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline



Figure G-1.2
Recommended Improvements
for Existing Water System

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Recommended Facilities

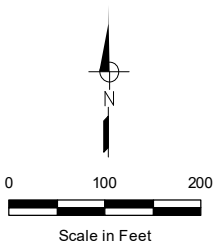
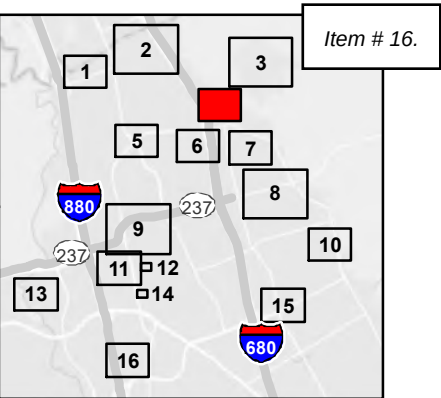
-  Emergency PRV
-  Improvement at Pump Station
-  Isolation Valve
-  Pipeline Upsize
-  New Pipeline

Existing Facilities

-  Existing Turnout
-  Existing Groundwater Well
-  Existing Pressure Reducing Valve
-  Existing Emergency PRV
-  Existing Pump Station
-  Existing Storage Reservoir
-  Existing Pipeline



Figure G-1.3
Recommended Improvements
for Existing Water System



Recommended Facilities

- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

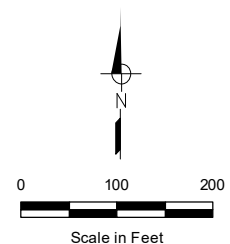
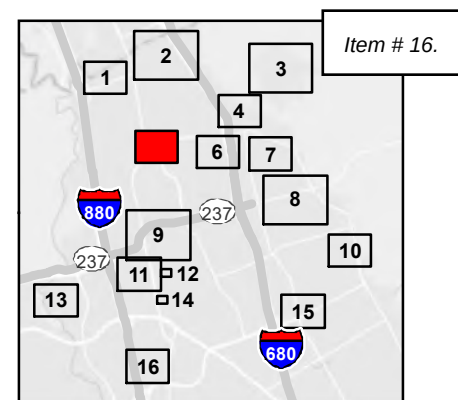
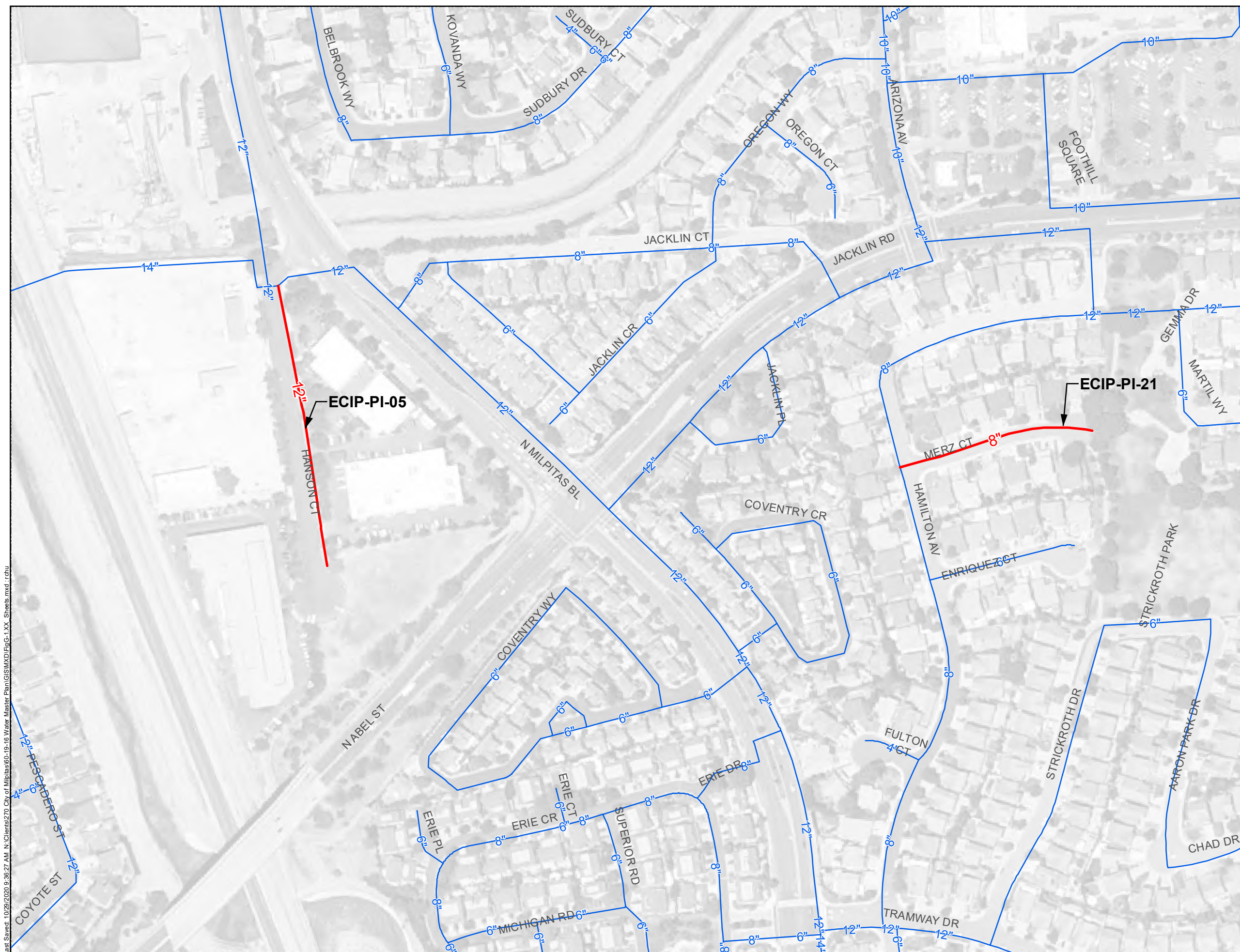
Existing Facilities

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline



Figure G-1.4
Recommended Improvements
for Existing Water System

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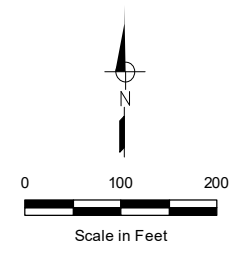
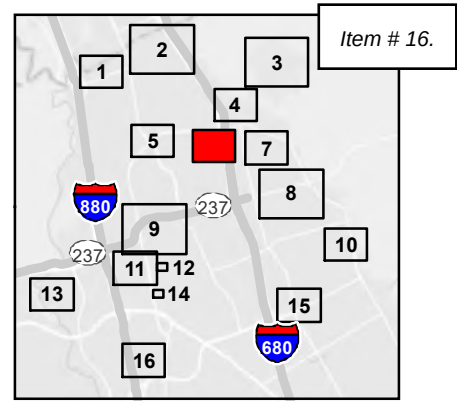
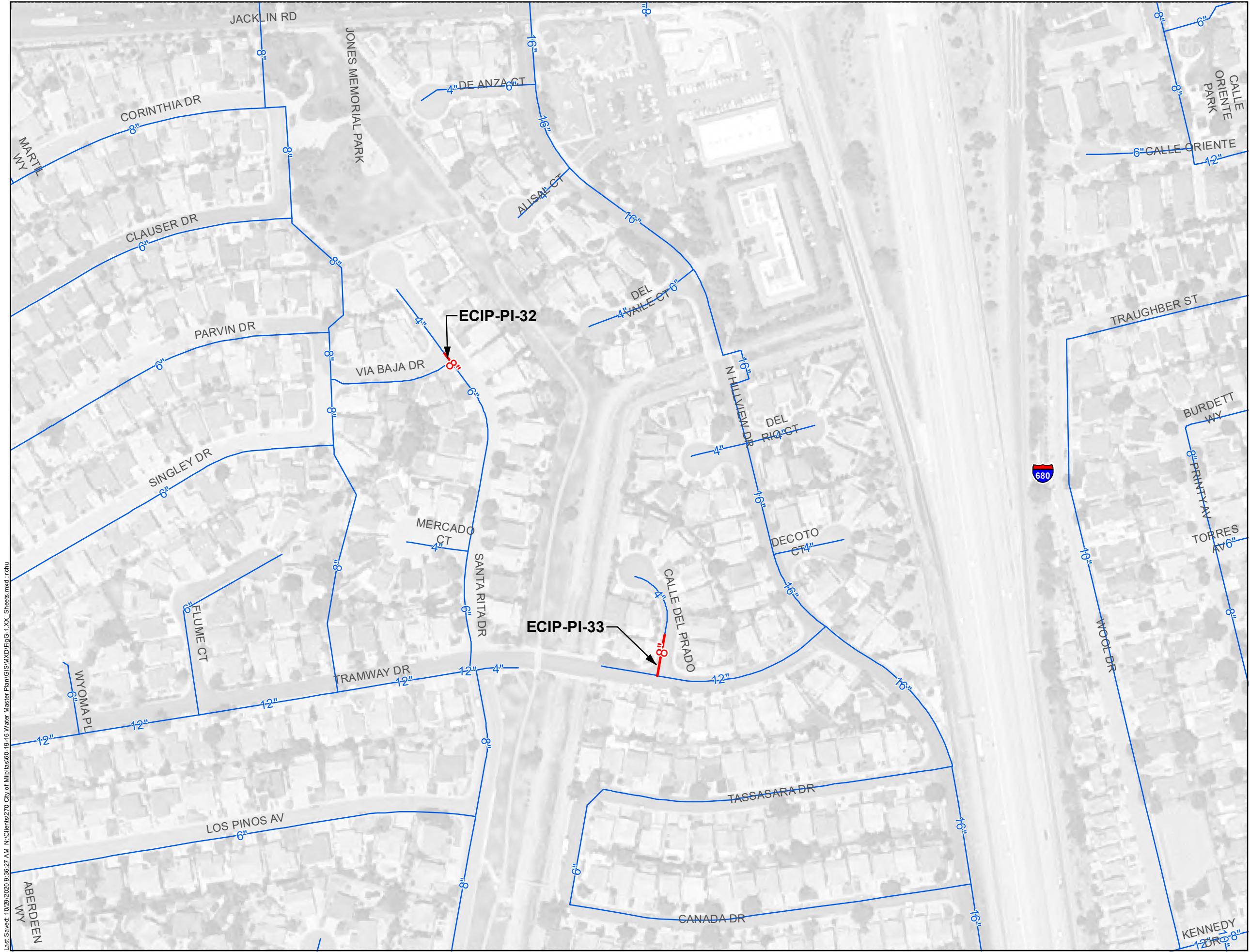
Recommended Facilities



Existing Facilities



Figure G-1.5



Recommended Facilities

-  Emergency PRV
-  Improvement at Pump Station
-  Isolation Valve
-  Pipeline Upsize
-  New Pipeline

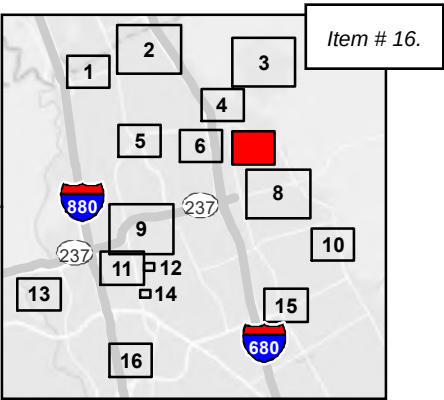
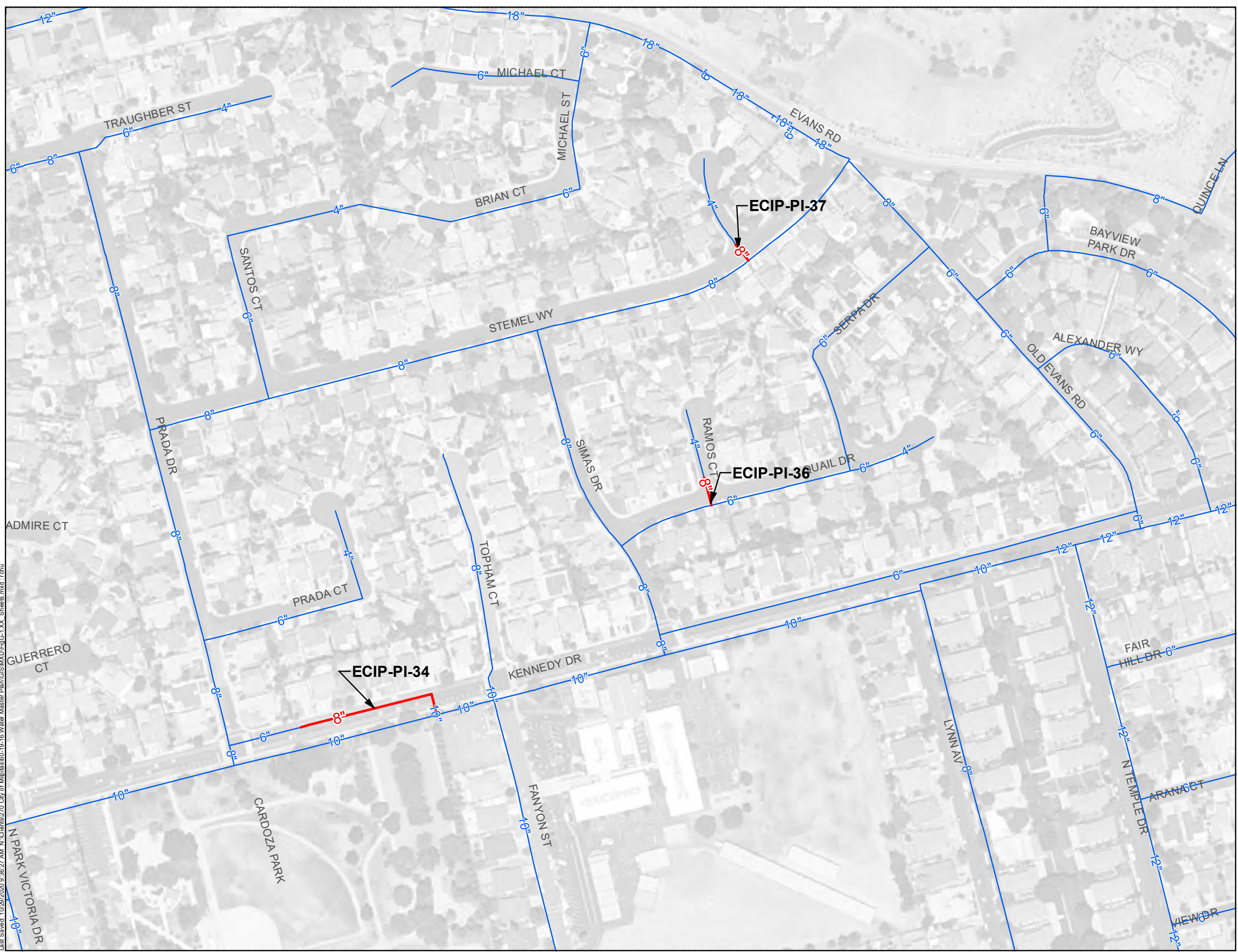
Existing Facilities

-  Existing Turnout
-  Existing Groundwater Well
-  Existing Pressure Reducing Valve
-  Existing Emergency PRV
-  Existing Pump Station
-  Existing Storage Reservoir
-  Existing Pipeline



Figure G-1.6
Recommended Improvements
for Existing Water System

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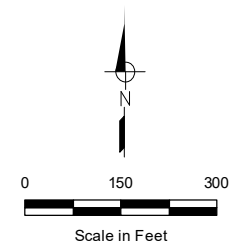
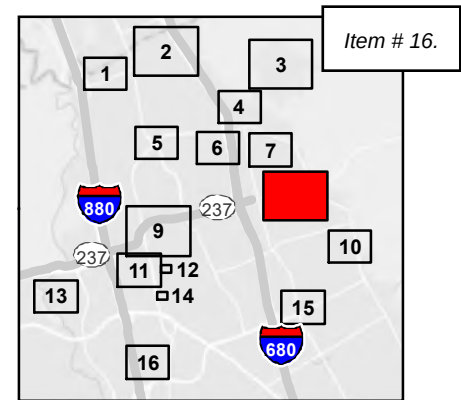


Recommended Facilities

-  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



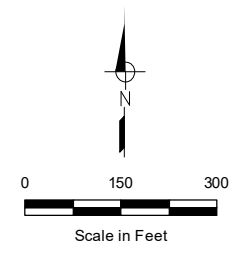
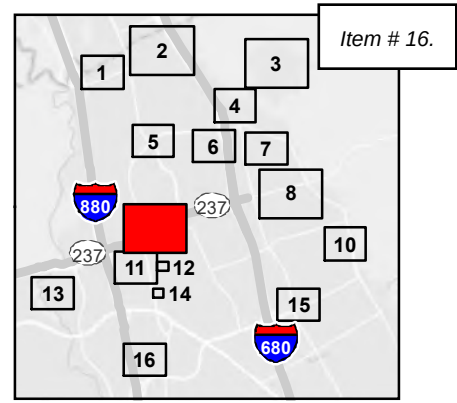
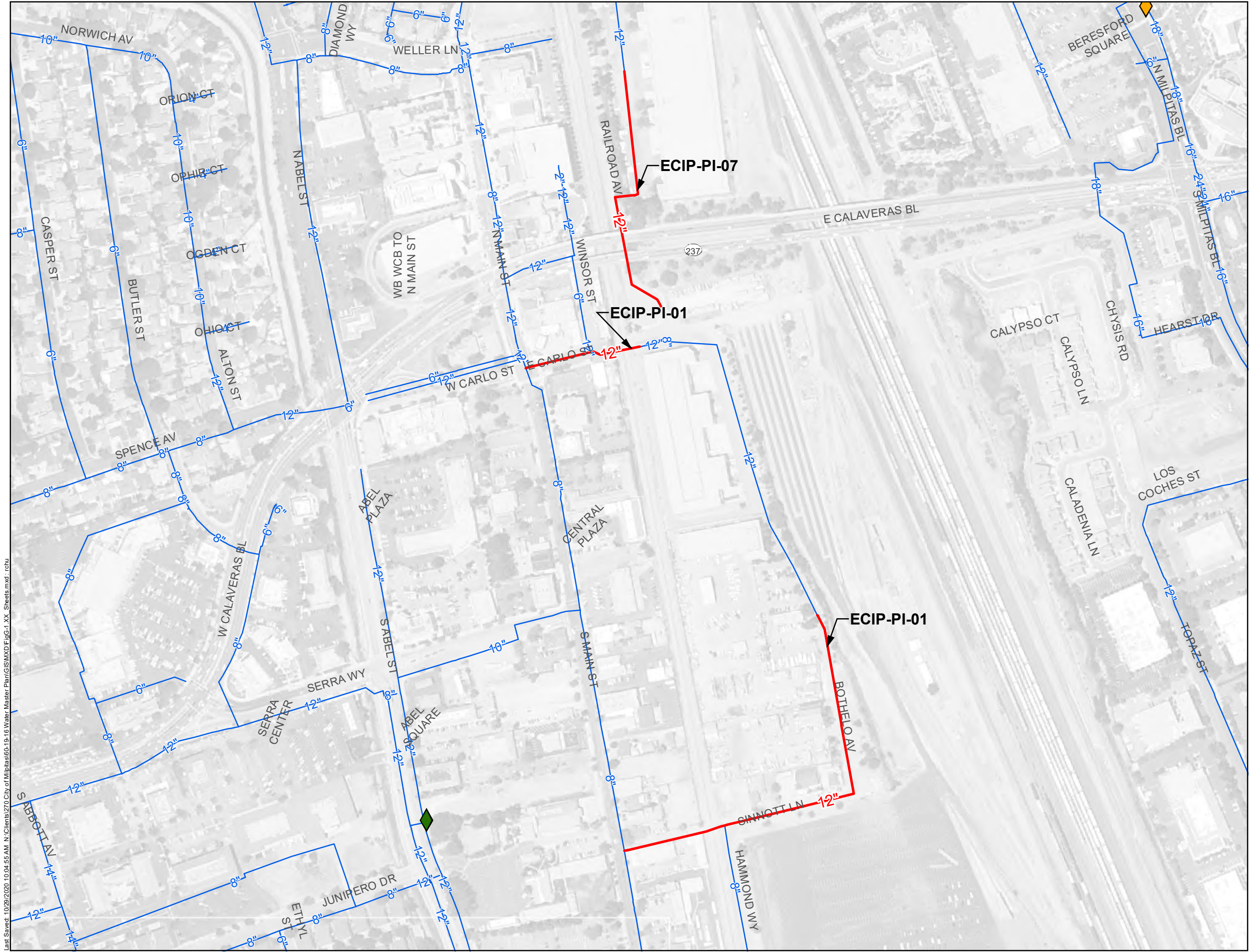
Figure G-1.7
Recommended Improvements
for Existing Water System



- ### 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-1.8
Recommended Improvements
for Existing Water System



Recommended Facilities

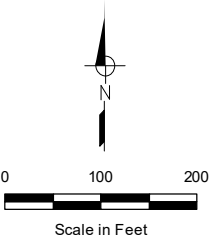
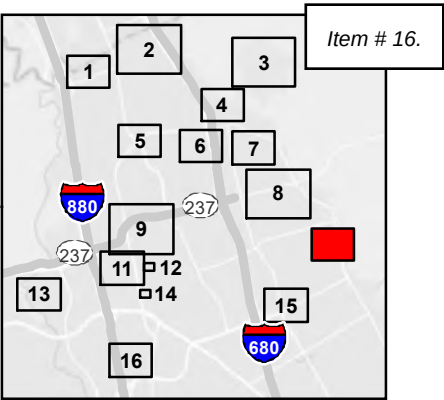
- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

Existing Facilities

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline



Figure G-1.9
Recommended Improvements
for Existing Water System



Recommended Facilities

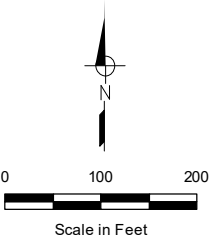
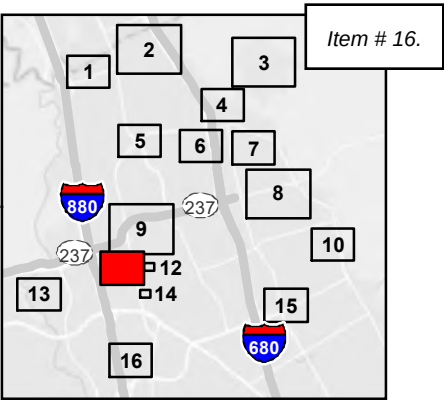
-  Emergency PRV
-  Improvement at Pump Station
-  Isolation Valve
-  Pipeline Upsize
-  New Pipeline

Existing Facilities

-  Existing Turnout
-  Existing Groundwater Well
-  Existing Pressure Reducing Valve
-  Existing Emergency PRV
-  Existing Pump Station
-  Existing Storage Reservoir
-  Existing Pipeline



Figure G-1.10
Recommended Improvements
for Existing Water System



Recommended Facilities

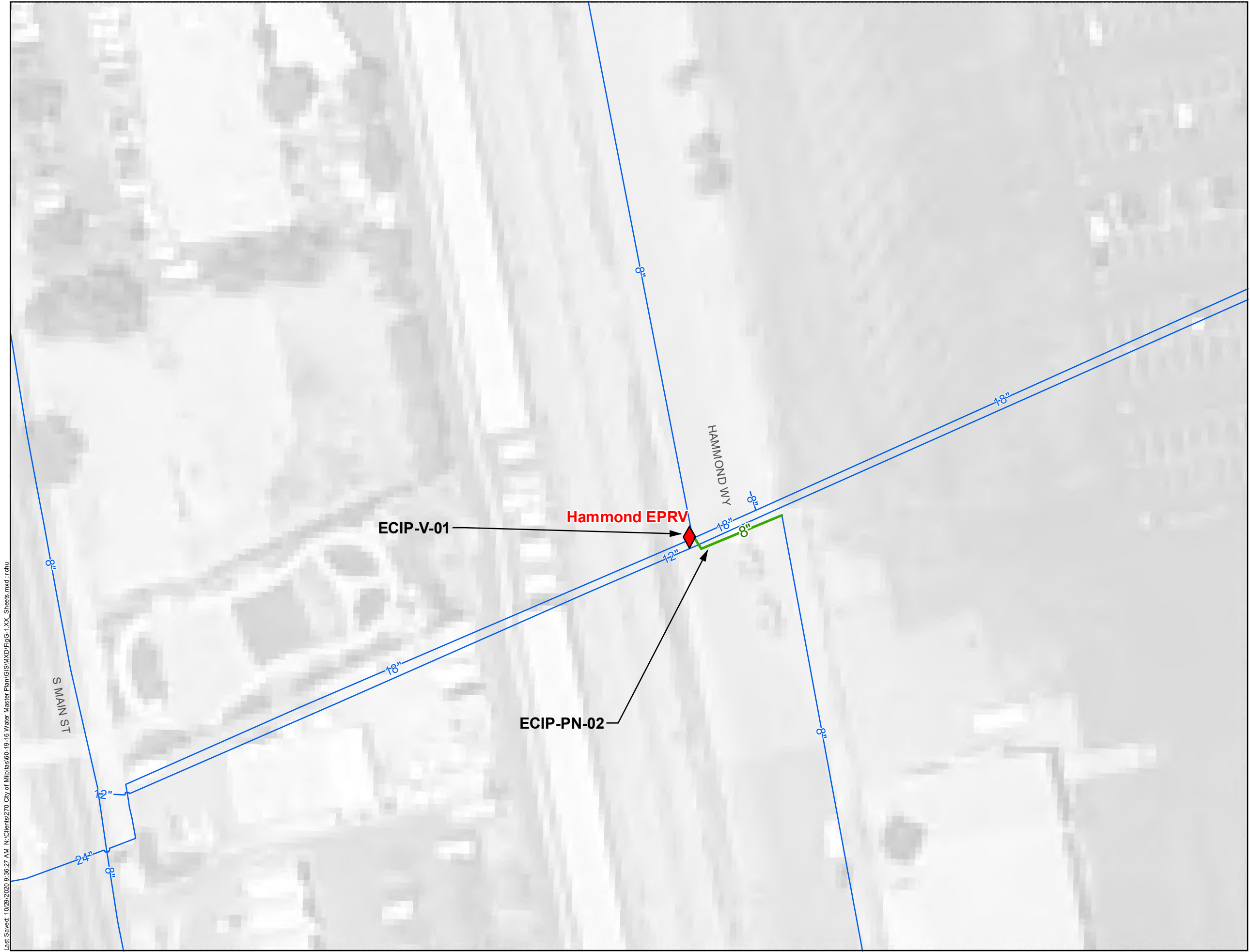
- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

Existing Facilities

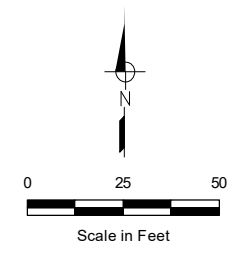
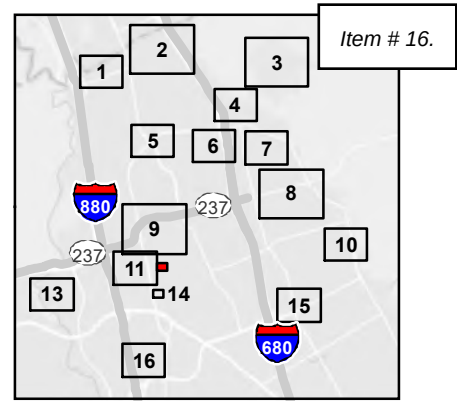
- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline



Figure G-1.11
Recommended Improvements
for Existing Water System



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Recommended Facilities

- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

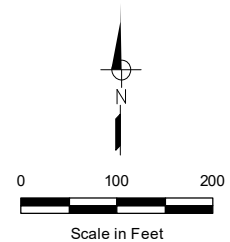
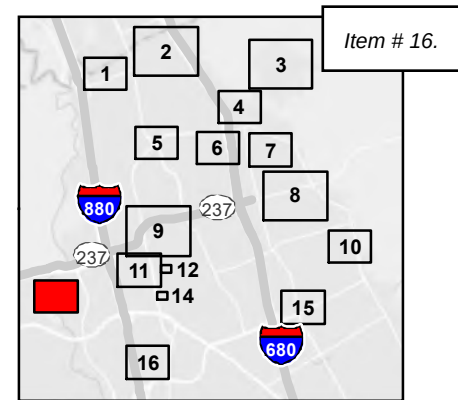
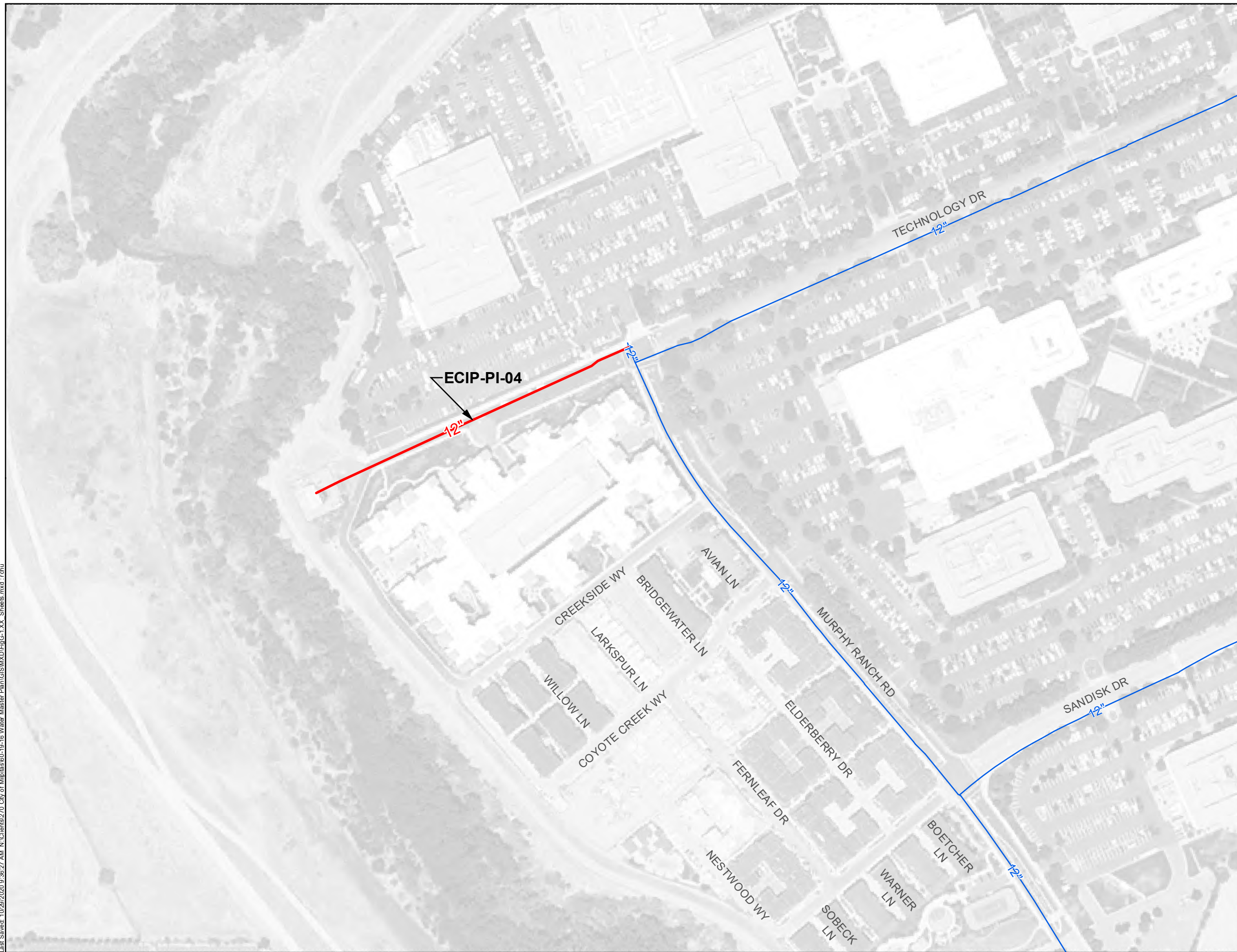
Existing Facilities

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline



Figure G-1.12
Recommended Improvements
for Existing Water System

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Recommended Facilities

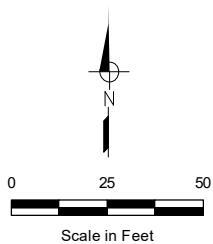
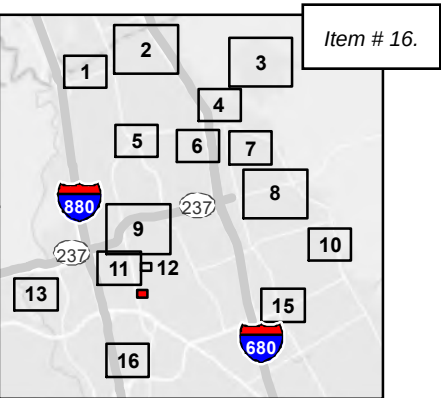
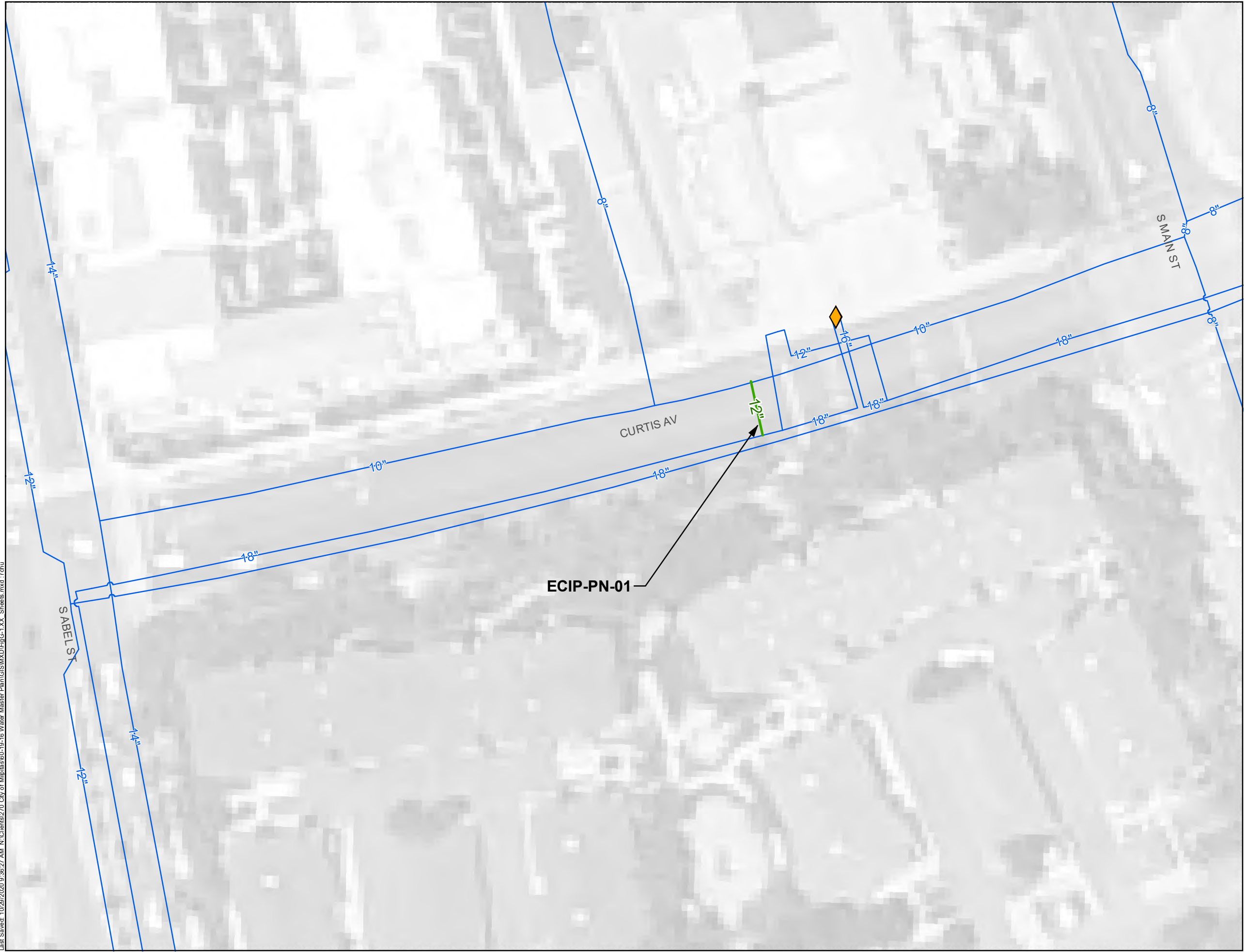
- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

Existing Facilities

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline



Figure G-1.13
Recommended Improvements
for Existing Water System



Recommended Facilities

- Emergency PRV
- Improvement at Pump Station
- Isolation Valve
- Pipeline Upsize
- New Pipeline

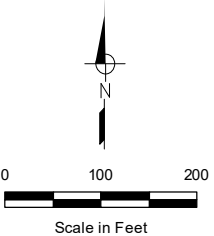
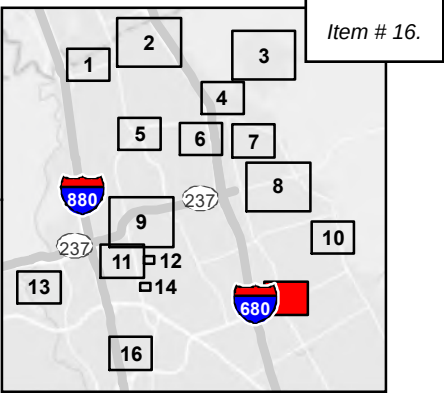
Existing Facilities

- Existing Turnout
- Existing Groundwater Well
- Existing Pressure Reducing Valve
- Existing Emergency PRV
- Existing Pump Station
- Existing Storage Reservoir
- Existing Pipeline



Figure G-1.14
Recommended Improvements
for Existing Water System

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Recommended Facilities

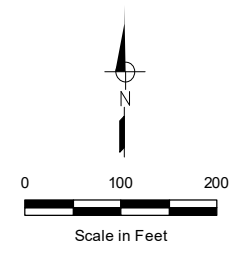
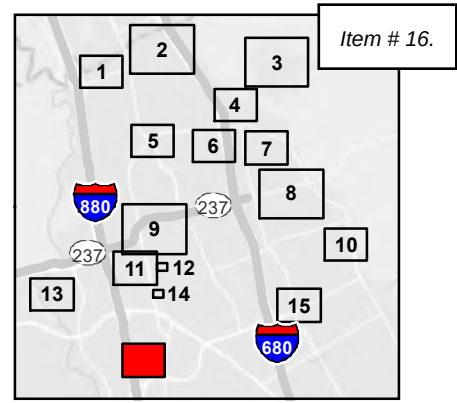
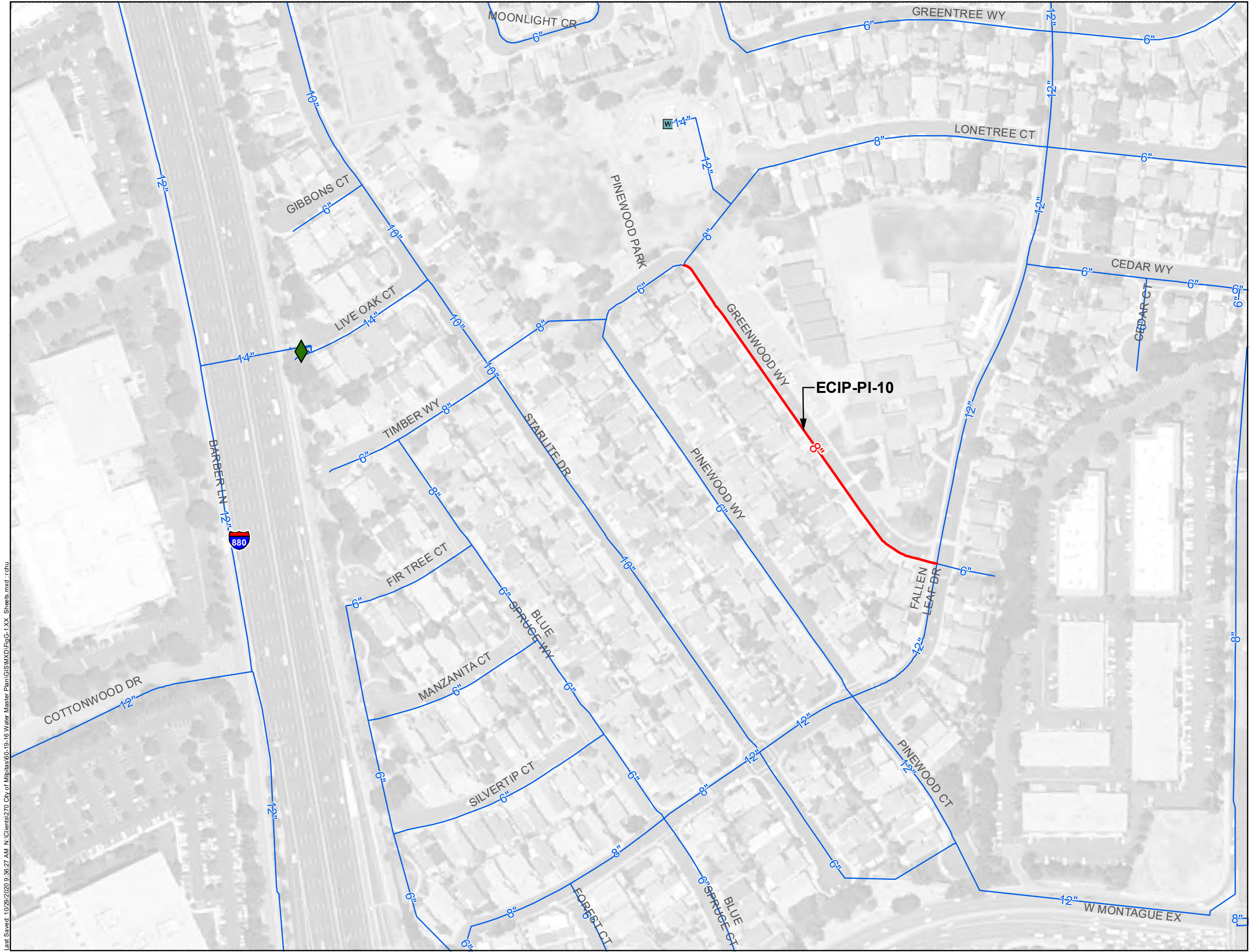
-  Emergency PRV
-  Improvement at Pump Station
-  Isolation Valve
-  Pipeline Upsize
-  New Pipeline

Existing Facilities

-  Existing Turnout
-  Existing Groundwater Well
-  Existing Pressure Reducing Valve
-  Existing Emergency PRV
-  Existing Pump Station
-  Existing Storage Reservoir
-  Existing Pipeline



Figure G-1.15
Recommended Improvements
for Existing Water System



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-1.16
Recommended Improvements
for Existing Water System

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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

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 Design: 10 percent; Construction Management: 15 percent; and Permitting and 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.



Legend

-  Emergency PRV
-  Existing SF1 Pipeline
-  Existing VW1 Pipeline

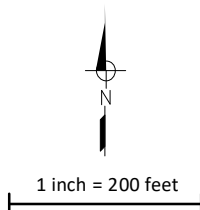


Figure G-2.1
City of Milpitas
Project Summary Sheet (ECIP-V-01)



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

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)).

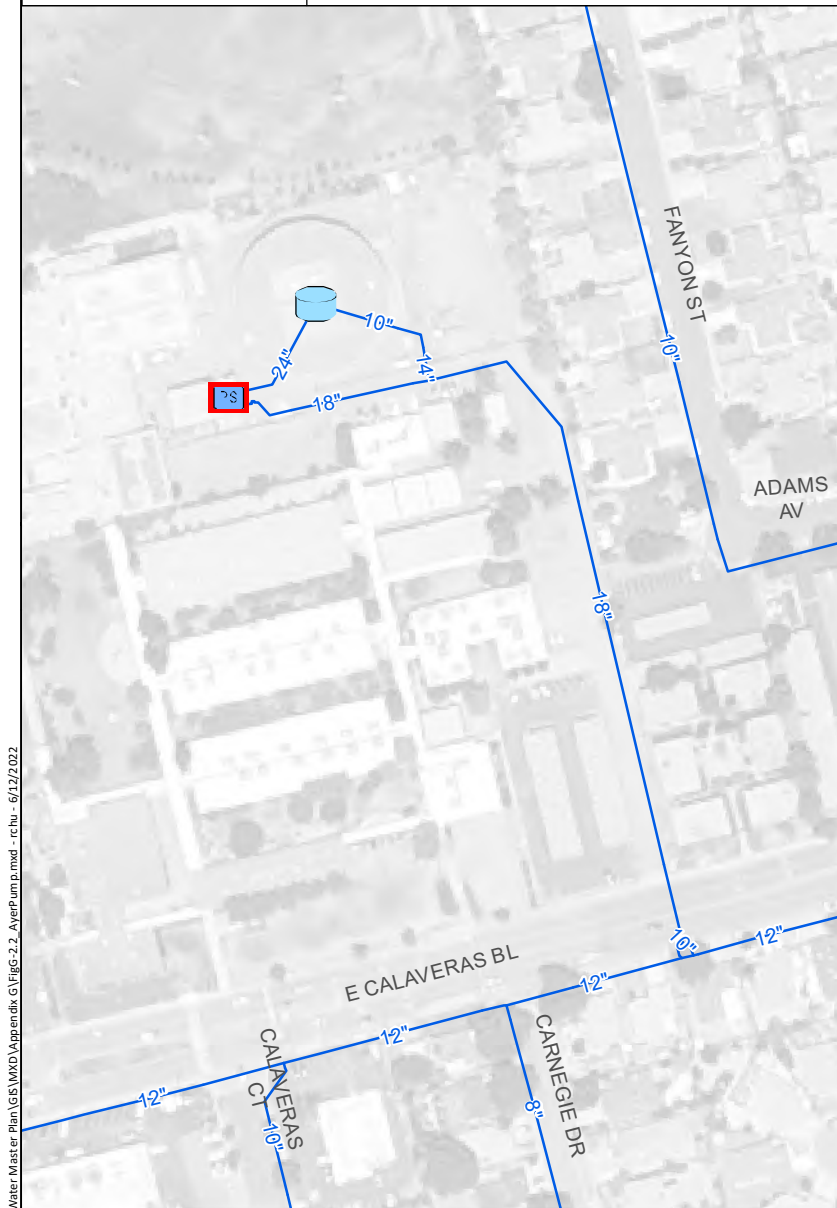
REASON FOR IMPROVEMENT

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 Design: 10 percent; Construction Management: 15 percent; and Permitting and 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.



Legend



Improvement at Pump Station



Existing Storage Reservoir



Existing Pipeline

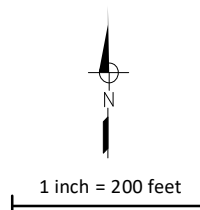


Figure G-2.2
City of Milpitas
Project Summary Sheet (ECIP-PS-AY)



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

RECOMMENDED IMPROVEMENT SIZE

8-inch diameter PRV and piping.

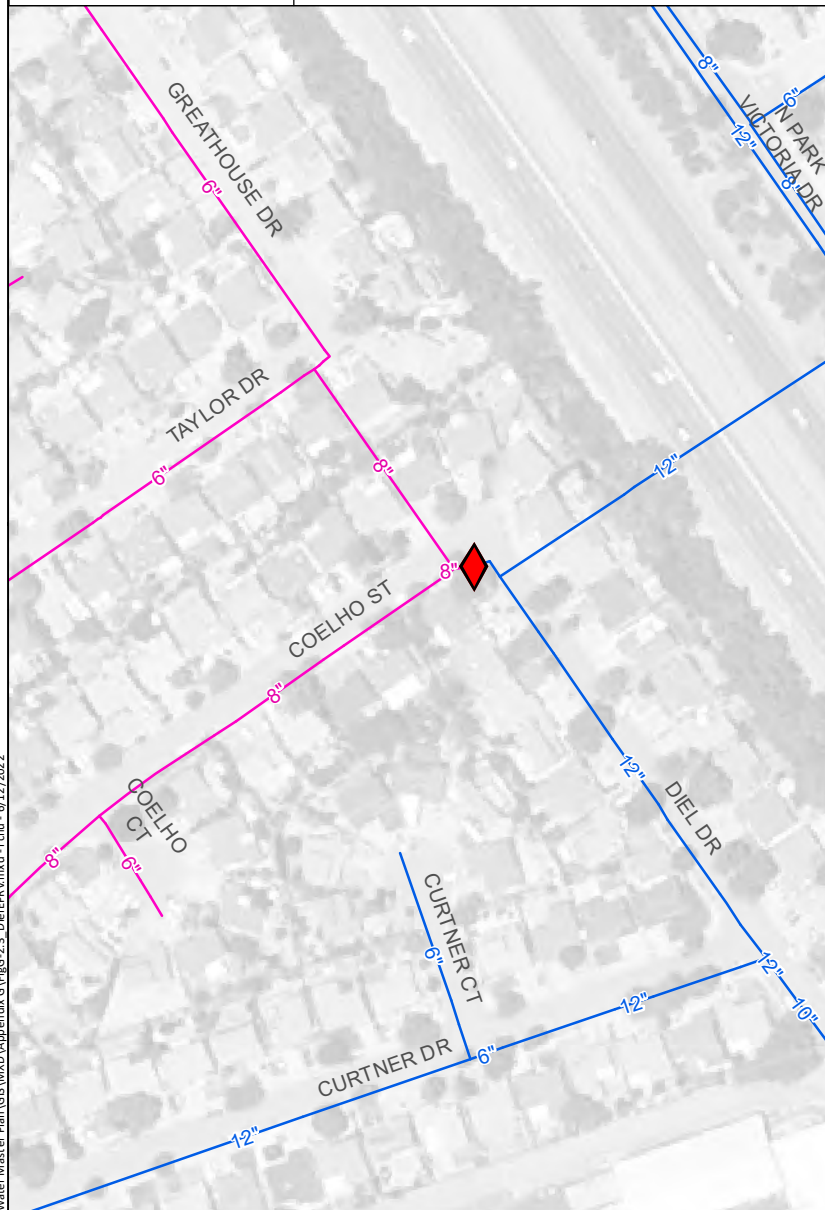
REASON FOR IMPROVEMENT

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 Design: 10 percent; Construction Management: 15 percent; and Permitting and 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.



Legend

-  Emergency PRV
-  Existing SF1 Pipeline
-  Existing SF2 Pipeline

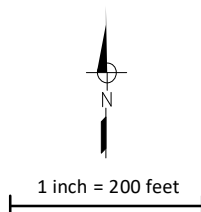


Figure G-2.3
City of Milpitas
Project Summary Sheet (ECIP-V-03)



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

RECOMMENDED IMPROVEMENT SIZE

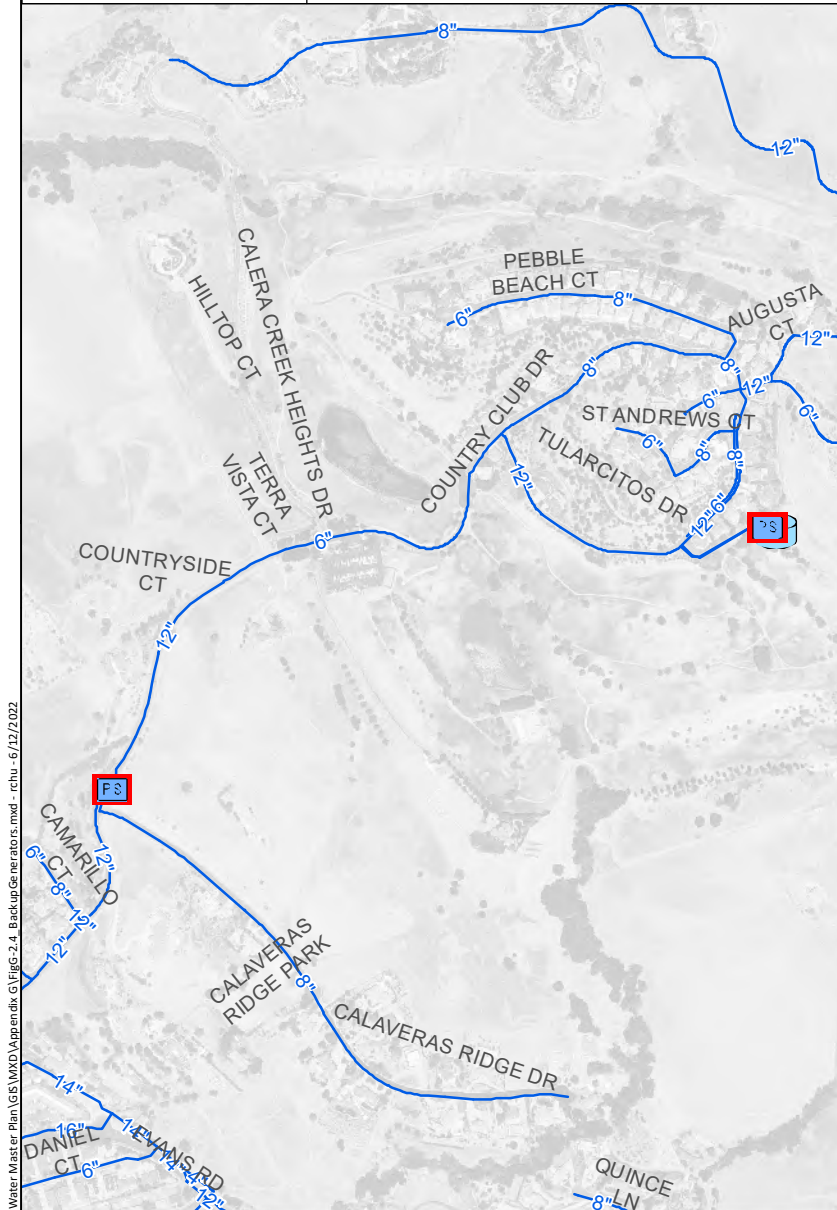
Generators shall be sized to meet the power demands of each pump station.

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 Design: 10 percent; Construction Management: 15 percent; and Permitting and Implementation: 10 percent).



Legend

-  Improvement at Pump Station
-  Existing Storage Reservoir
-  Existing Pipeline

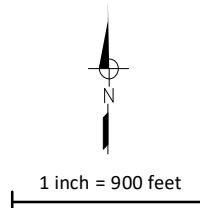


Figure G-2.4
City of Milpitas - Project Summary Sheet
(ECIP-BG-CC and ECIP-BG-TL)



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

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.

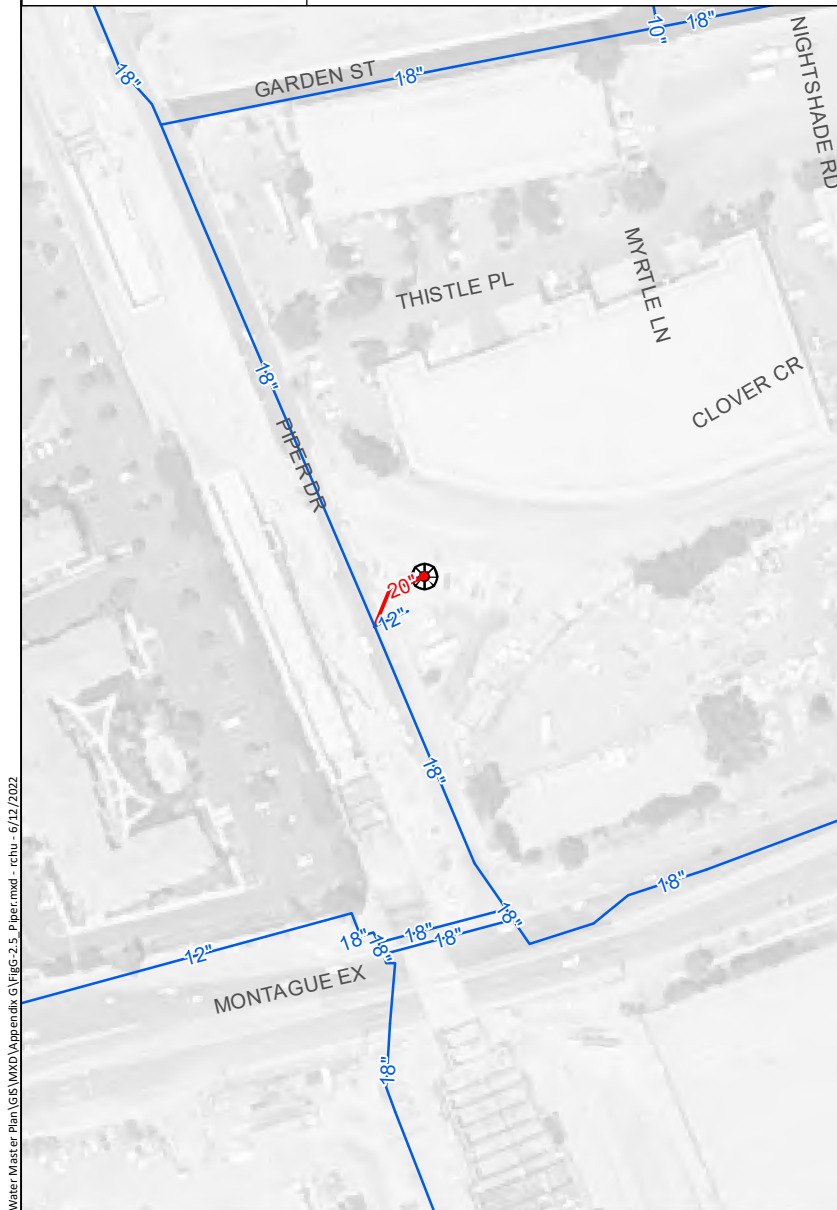
REASON FOR IMPROVEMENT

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 Design: 10 percent; Construction
Management: 15 percent; and Permitting and
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.



Legend

-  Turnout
-  Turnout Pipeline
-  Existing Pipeline

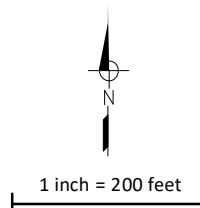


Figure G-2.5
City of Milpitas
Project Summary Sheet (BCIP-TO-01)



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

RECOMMENDED IMPROVEMENT SIZE

2.0 million gallons (MG).

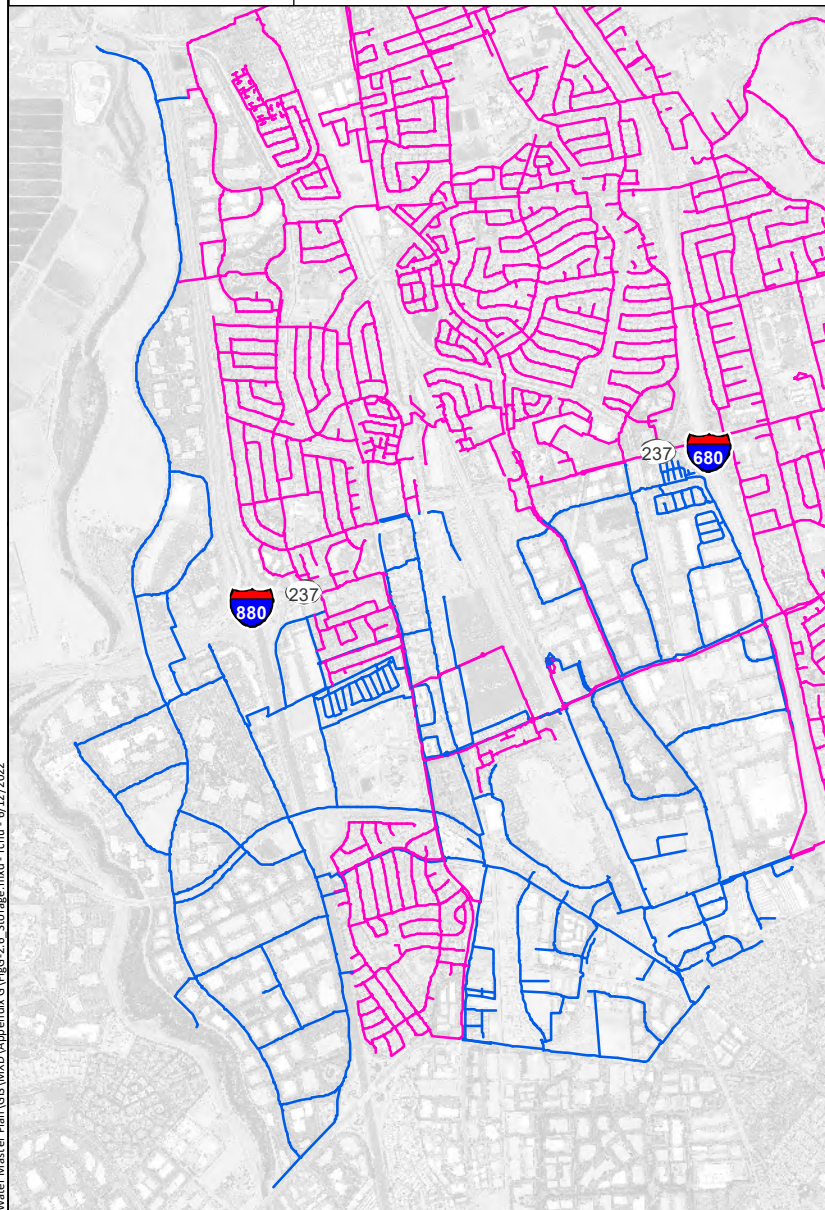
REASON FOR IMPROVEMENT

Insufficient storage capacity in the Valley Water service area at buildout.

PLANNING ASSUMPTIONS

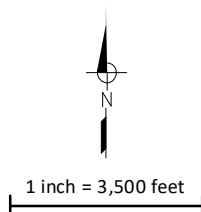
Costs are in 2020 dollars and assume normal construction conditions. Special or difficult conditions would significantly increase costs. Capital costs are rounded to the nearest thousand dollars and include mark-ups equal to 70 percent (Design and Construction Contingency: 35 percent; Engineering Design: 10 percent; Construction Management: 15 percent; and Permitting and 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.



Legend

- Existing SFPUC Pipeline
- Existing VW Pipeline



**Figure G-2.6
City of Milpitas
Project Summary Sheet (BCIP-S-01)**



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

RECOMMENDED IMPROVEMENT SIZE

4,000 gallons per minute (gpm) firm capacity.

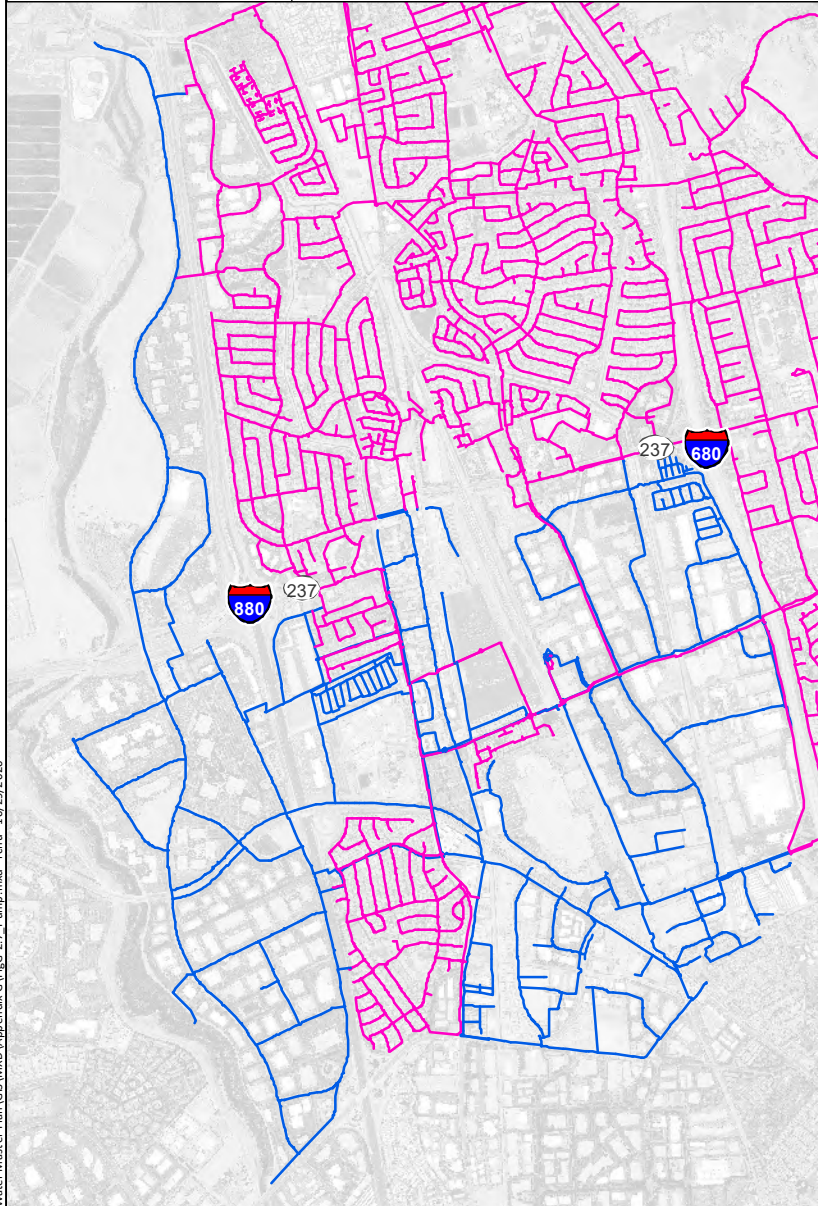
REASON FOR IMPROVEMENT

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 Design: 10 percent; Construction Management: 15 percent; and Permitting and Implementation: 10 percent).

Costs assume an enclosed pump station with architectural and landscaping treatment suitable for residential areas.



Legend

- Existing SFPUC Pipeline
- Existing VW Pipeline

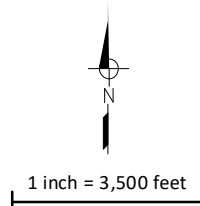


Figure G-2.7
City of Milpitas
Project Summary Sheet (BCIP-PS-01)



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

RECOMMENDED IMPROVEMENT SIZE

Well capacity will be based on subsequent groundwater analysis that is not part of this report.

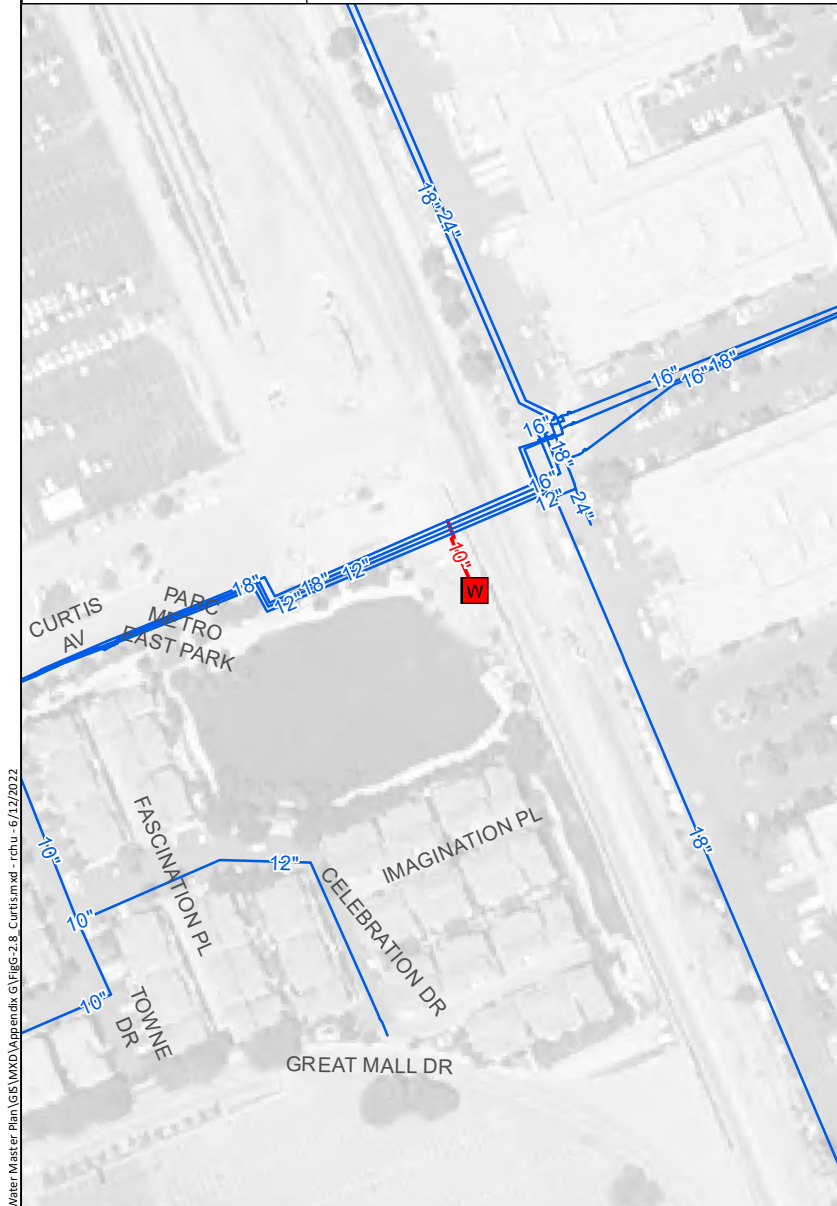
REASON FOR IMPROVEMENT

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 Design: 10 percent; Construction Management: 15 percent; and Permitting and 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.



Legend

- Groundwater Well
- Well Pipeline
- Existing Pipeline

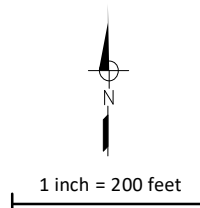


Figure G-2.8
City of Milpitas
Project Summary Sheet (BCIP-W-01)



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.

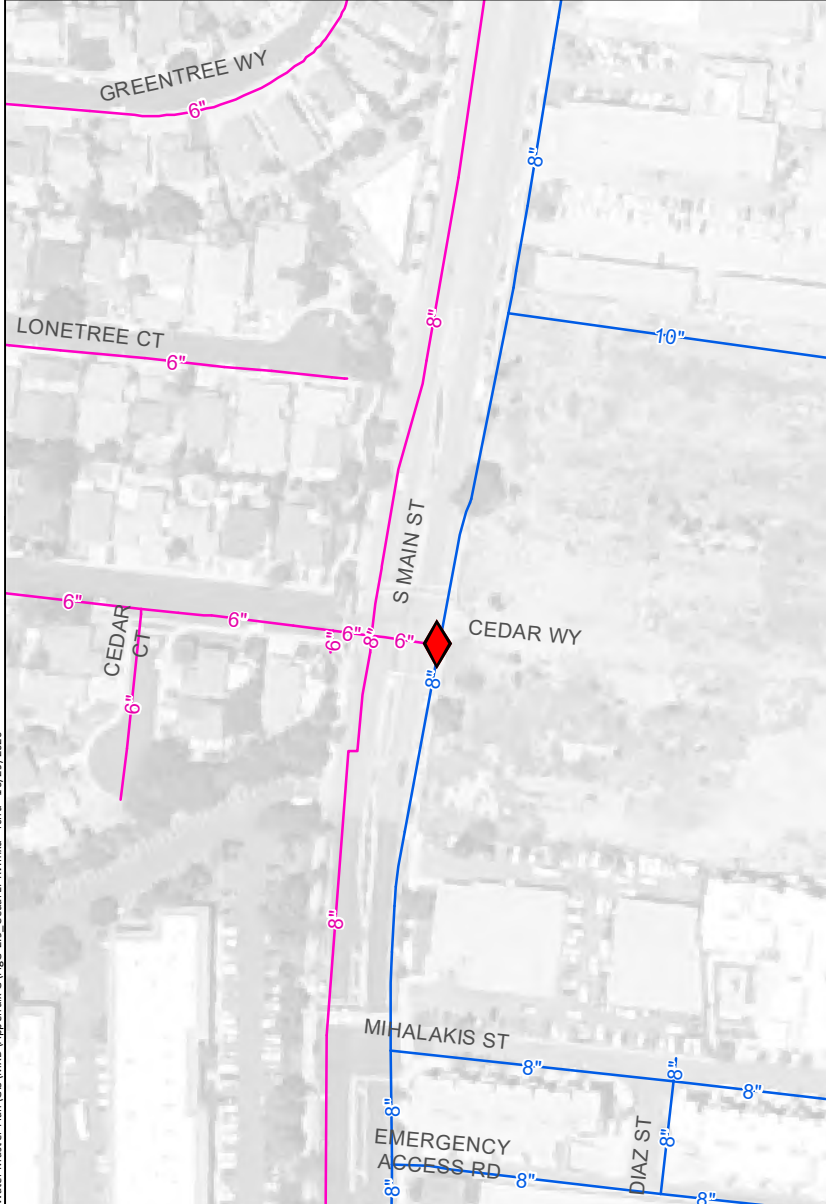
REASON FOR IMPROVEMENT

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 Design: 10 percent; Construction Management: 15 percent; and Permitting and 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.



Legend

-  Emergency PRV
-  Existing SF1 Pipeline
-  Existing VW1 Pipeline

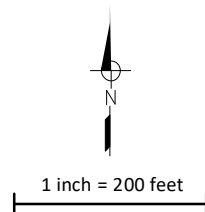


Figure G-2.9
City of Milpitas
Project Summary Sheet (BCIP-V-01)



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





City of Milpitas Sewer Master Plan

City of Milpitas

Sewer Master Plan

Prepared by HydroScience Engineers, Inc.



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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).

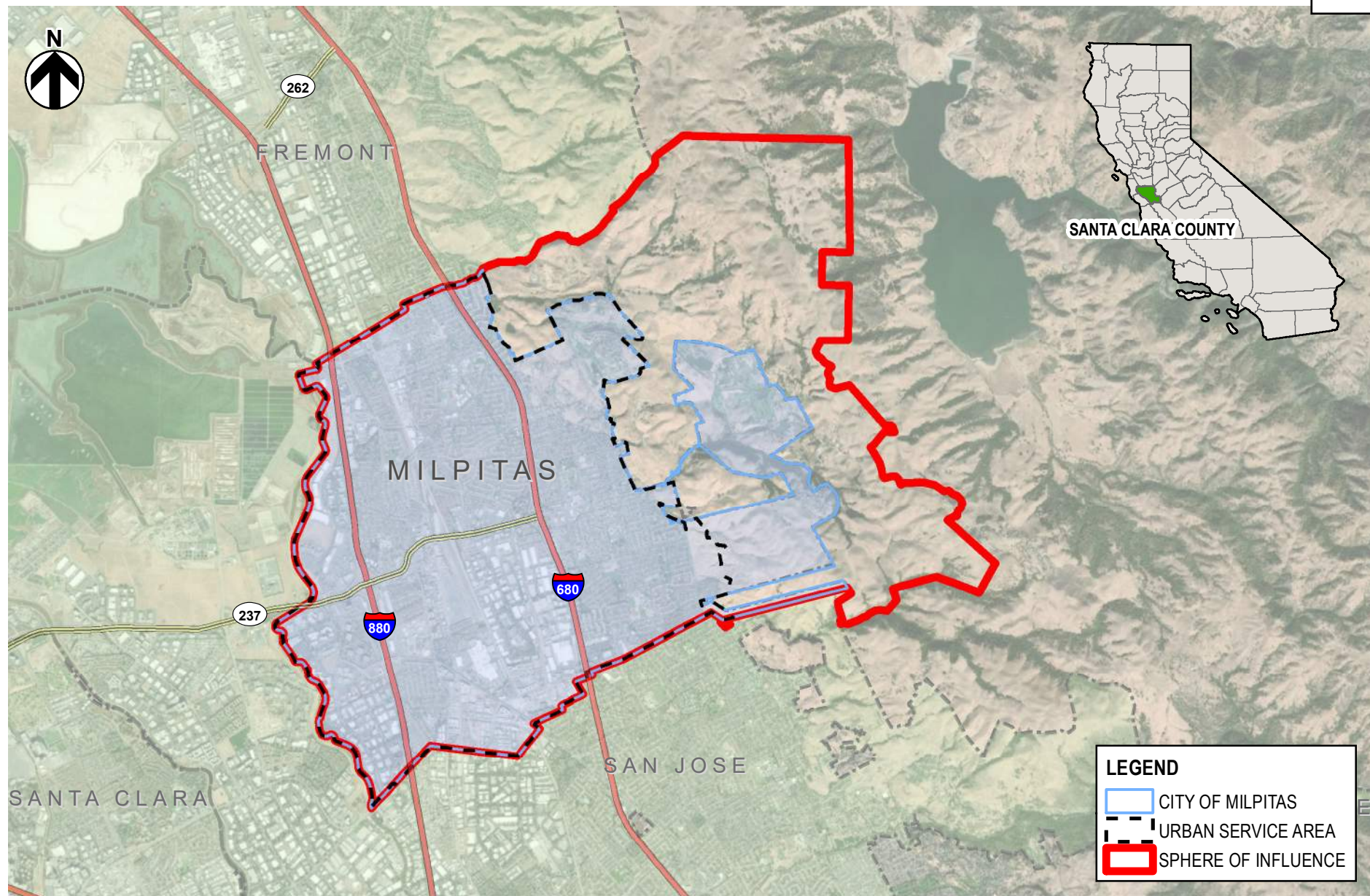


FIGURE ES-1
CITY OF MILPITAS
SEWER MASTER PLAN
PROJECT LOCATION MAP

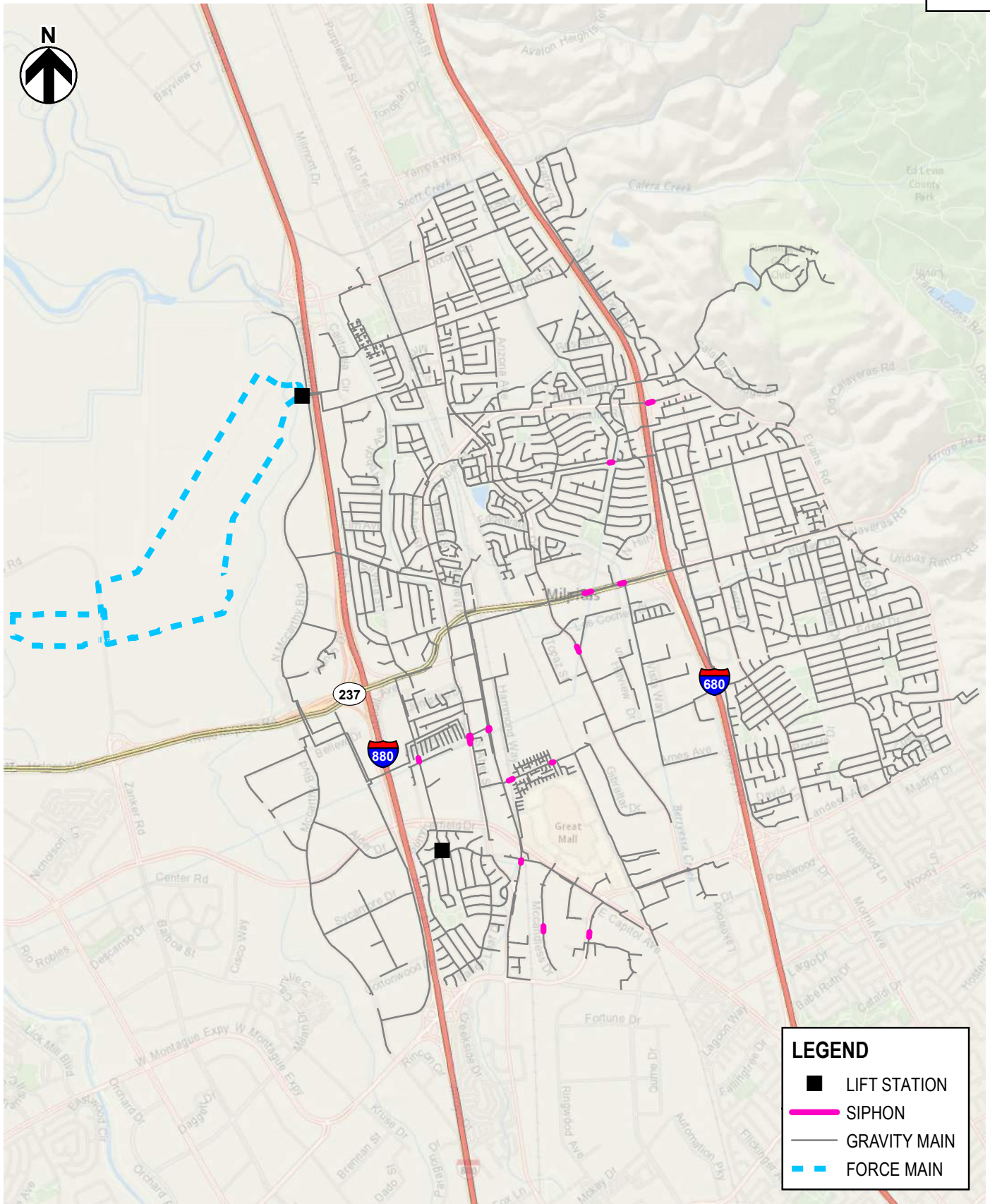


FIGURE ES-2
CITY OF MILPITAS
SEWER MASTER PLAN
WASTEWATER COLLECTION SYSTEM OVERVIEW

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:

$$\text{Risk (BRE)} = \text{LoF Score} \times \text{CoF Score}$$

$$\text{LoF Score} = \sum (\text{LoF Rating} \times \text{LoF Weighting})$$

$$\text{CoF Score} = \sum (\text{CoF Rating} \times \text{CoF Weighting})$$

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.

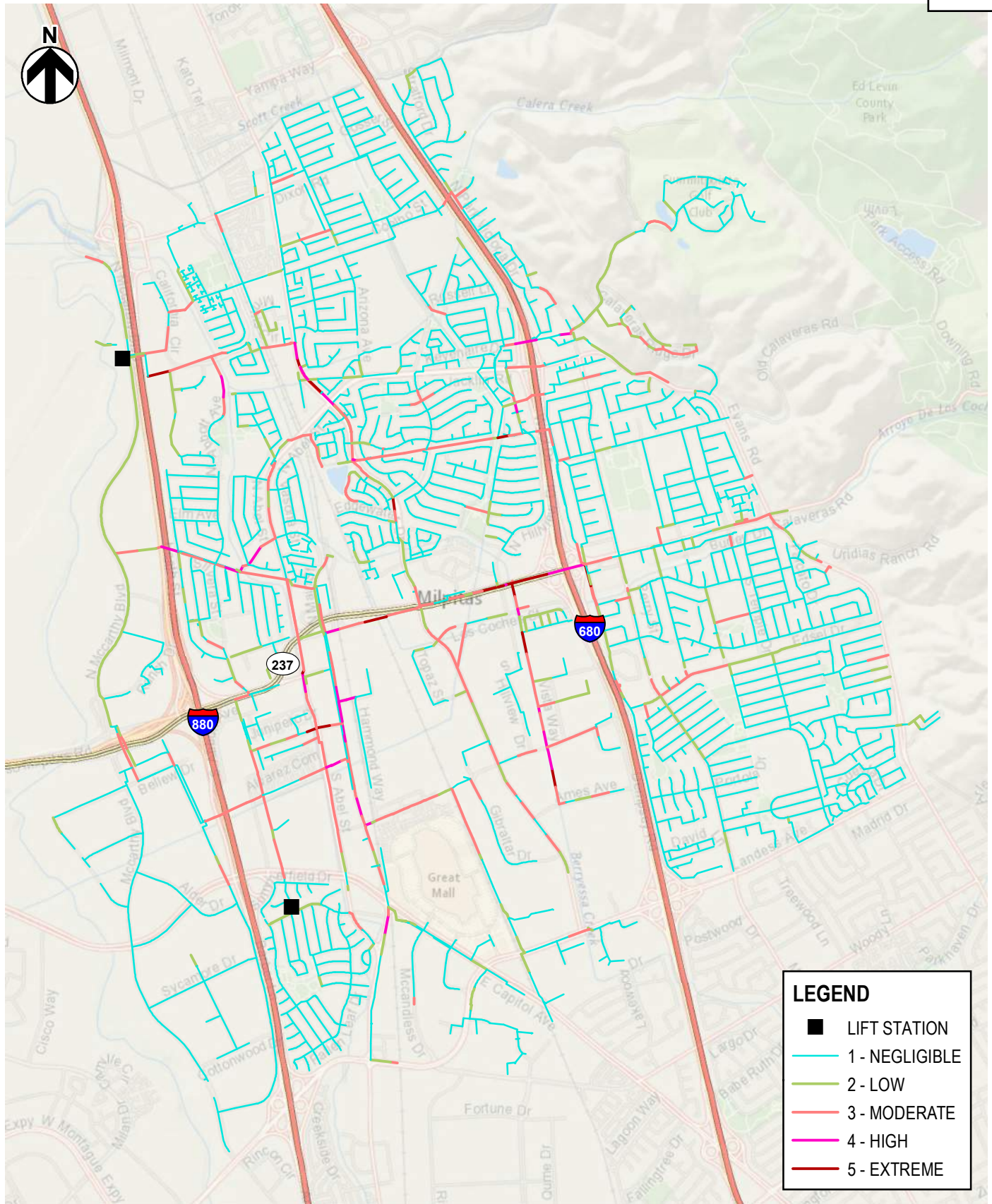


FIGURE ES-3
CITY OF MILPITAS
SEWER MASTER PLAN
BUSINESS RISK EXPOSURE SCORE MAP

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.

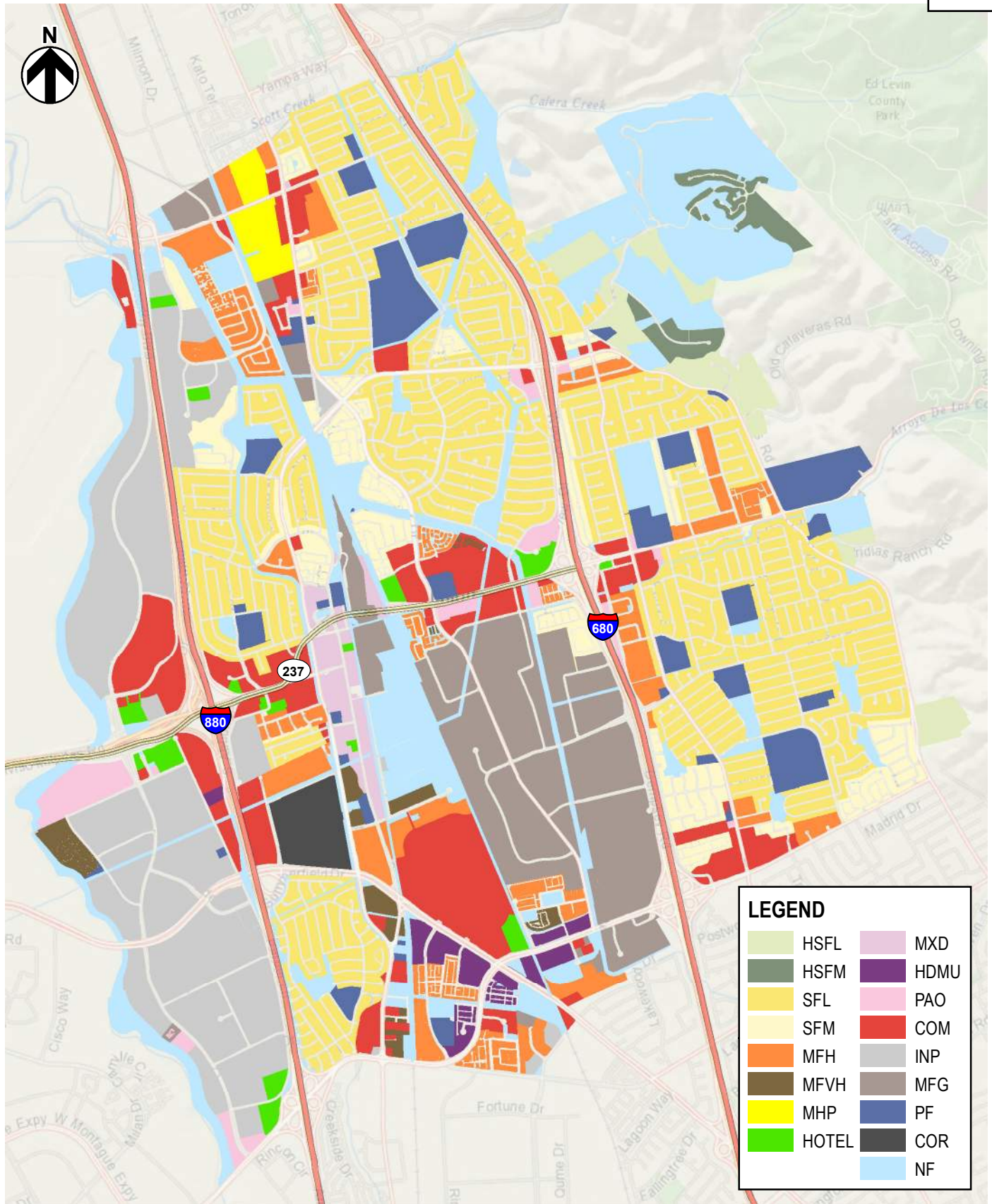


FIGURE ES-4
CITY OF MILPITAS
SEWER MASTER PLAN
MODEL-BASED LAND USE DESIGNATIONS - EXISTING

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	-	-	-	-	6.157³	6.249³

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.

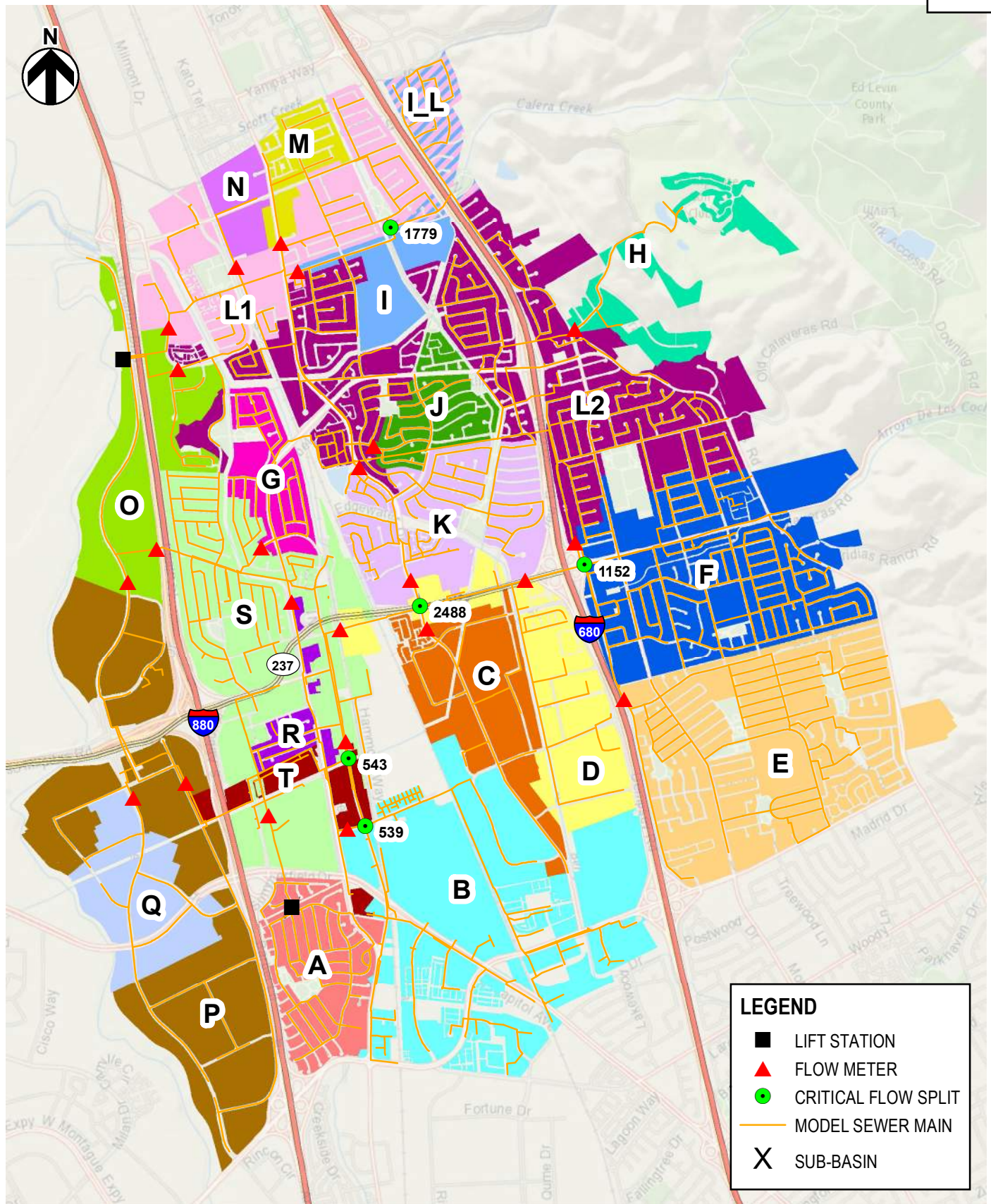


FIGURE ES-5
CITY OF MILPITAS
SEWER MASTER PLAN
SUB-BASIN DELINEATION

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	\$1,240,000
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.

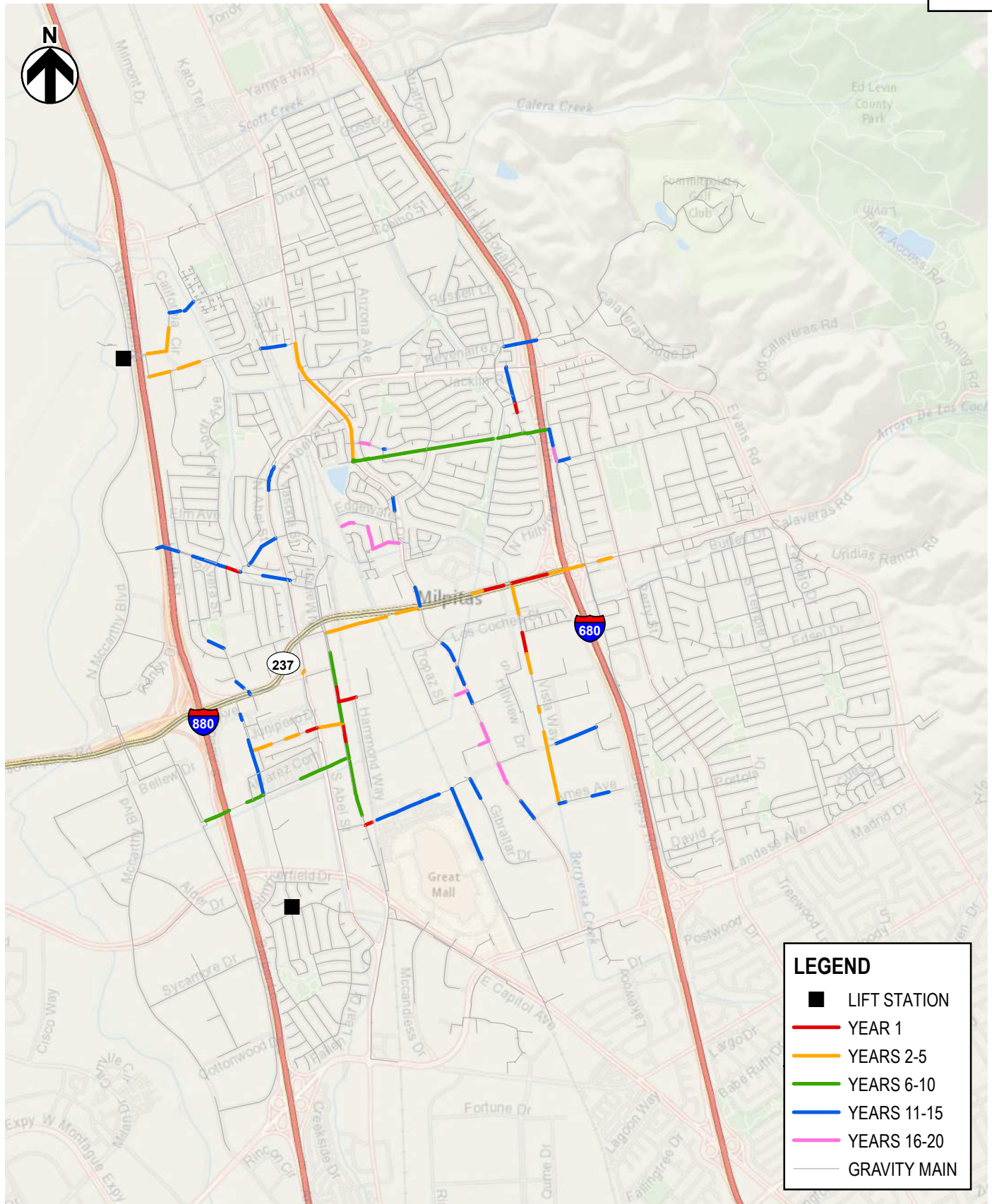


FIGURE ES-6
CITY OF MILPITAS
SEWER MASTER PLAN
CAPITAL IMPROVEMENT PROJECTS

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.

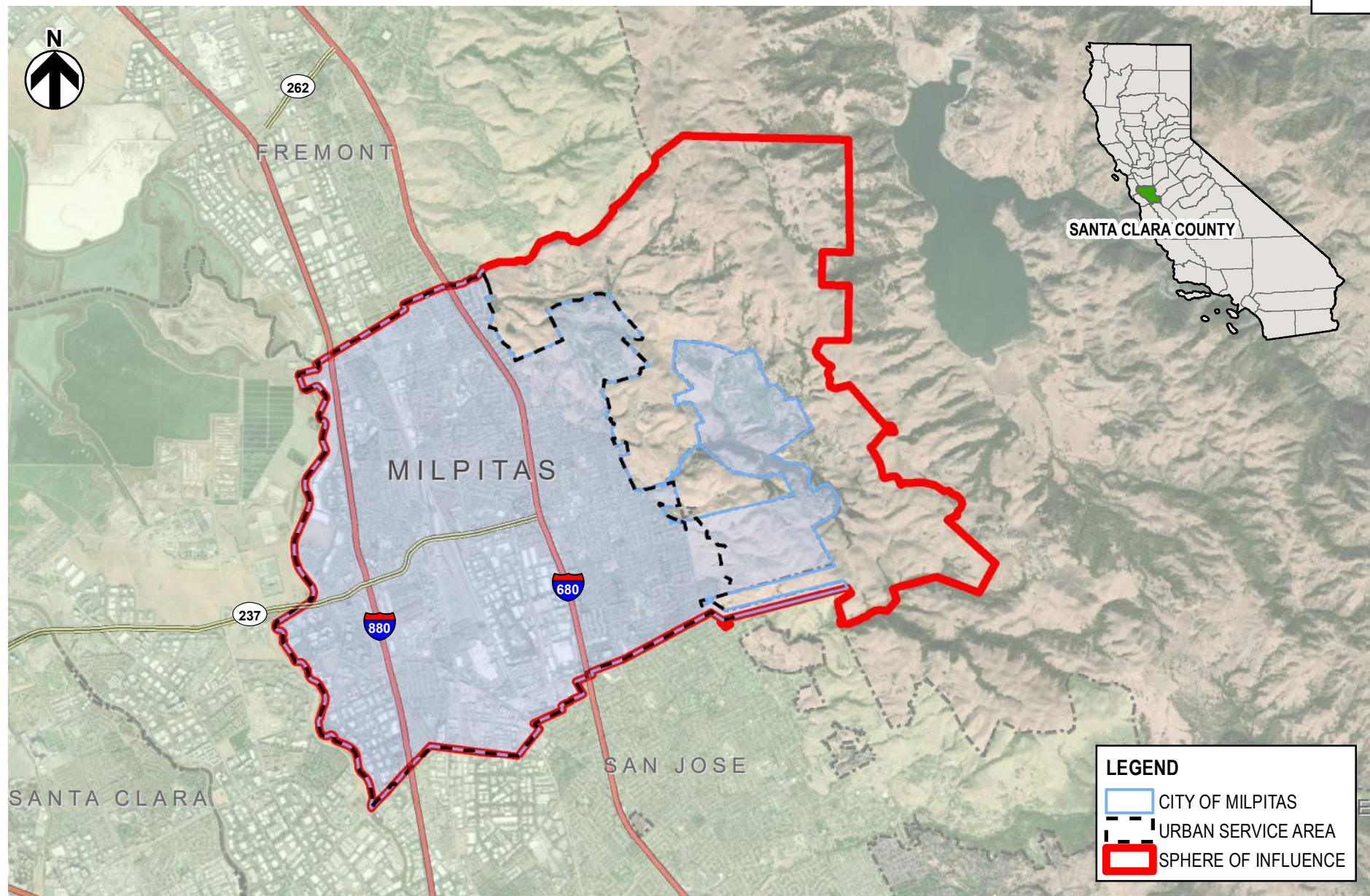


FIGURE 2-1
CITY OF MILPITAS
SEWER MASTER PLAN
PROJECT LOCATION MAP

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.

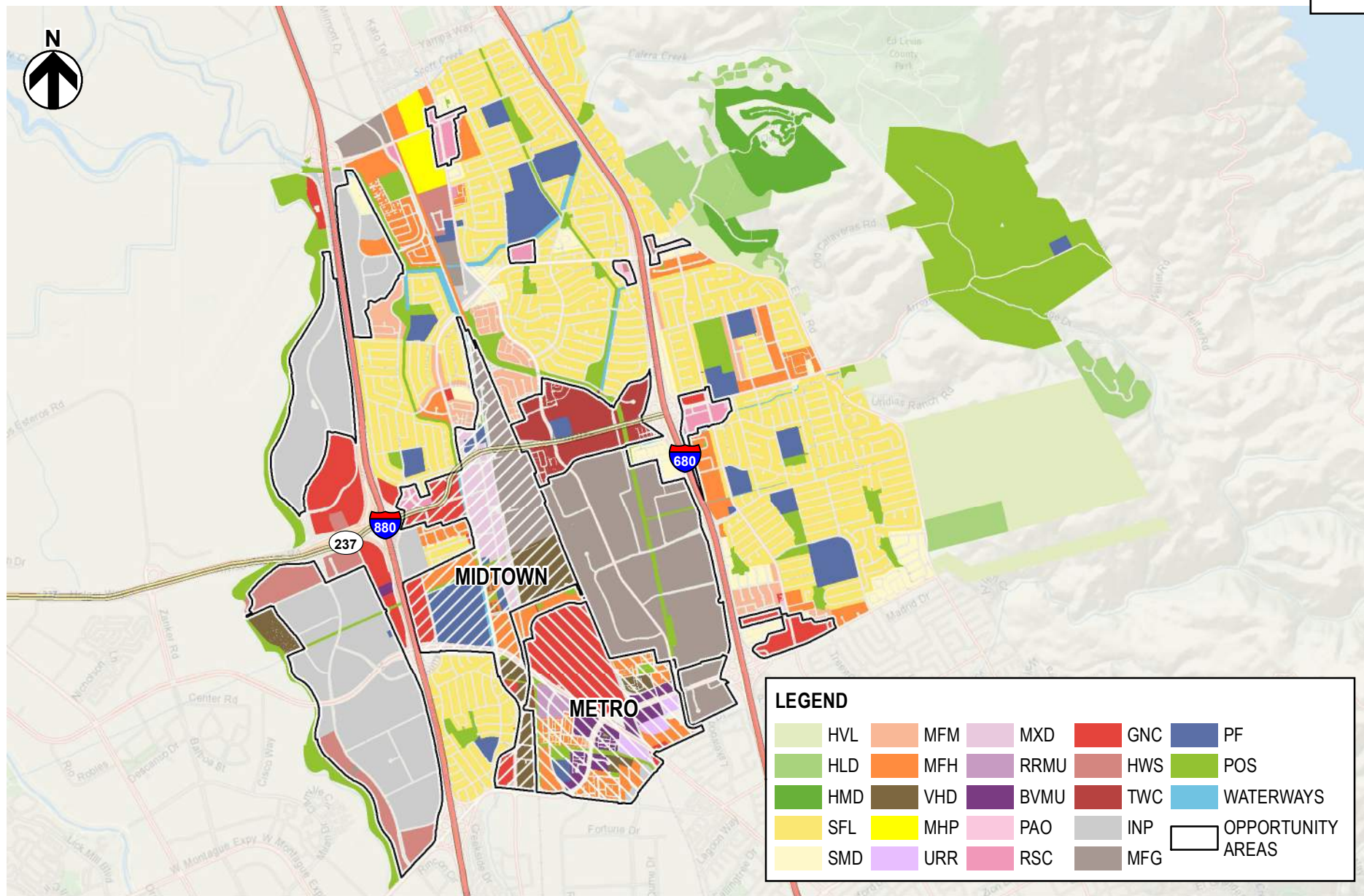


FIGURE 2-2
CITY OF MILPITAS
SEWER MASTER PLAN
CITY GENERAL PLAN LAND USE

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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.

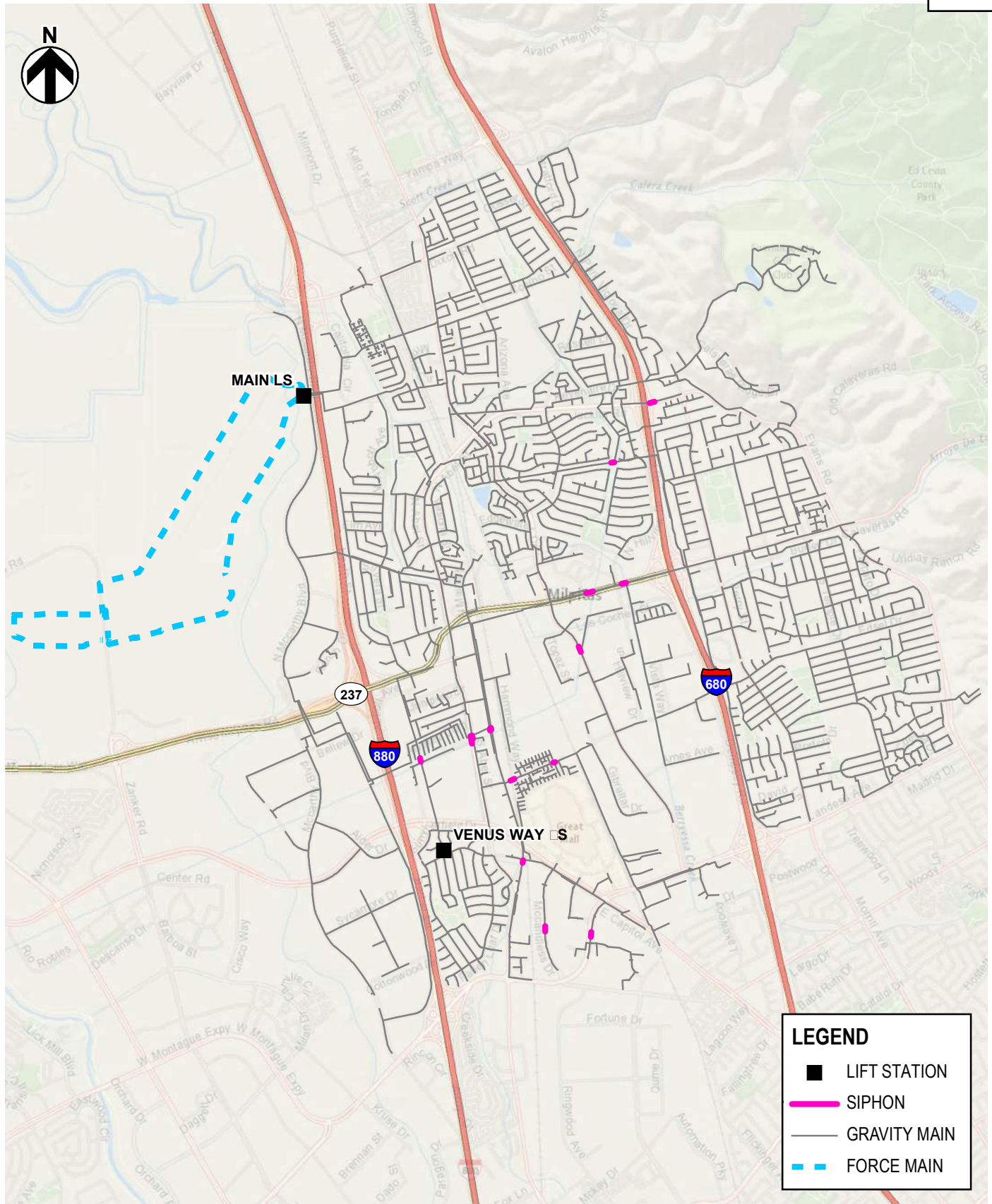


Table 3-1: Collection System Pipeline Material

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%

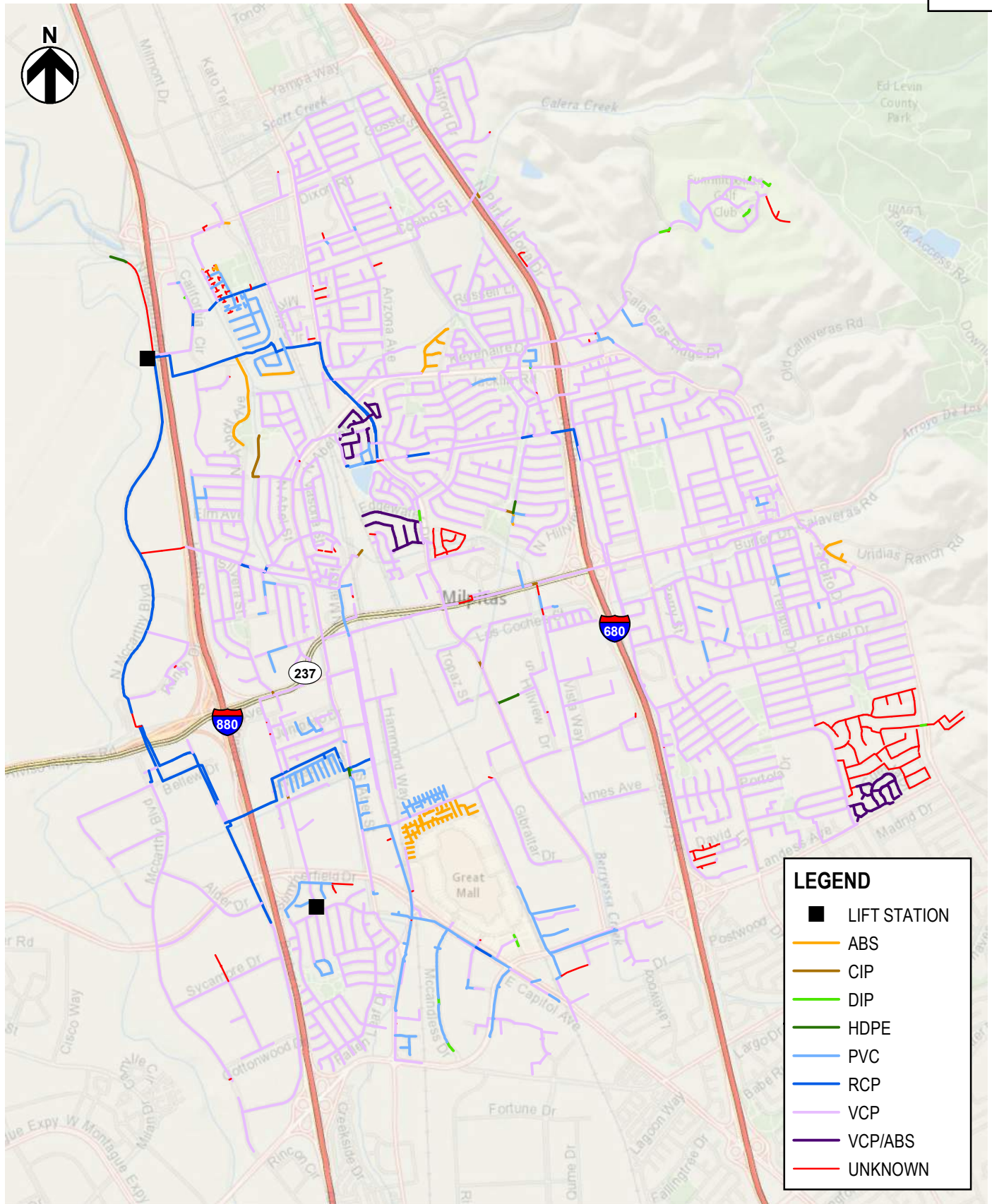


FIGURE 3-2
CITY OF MILPITAS
SEWER MASTER PLAN
COLLECTION SYSTEM PIPELINE MATERIAL

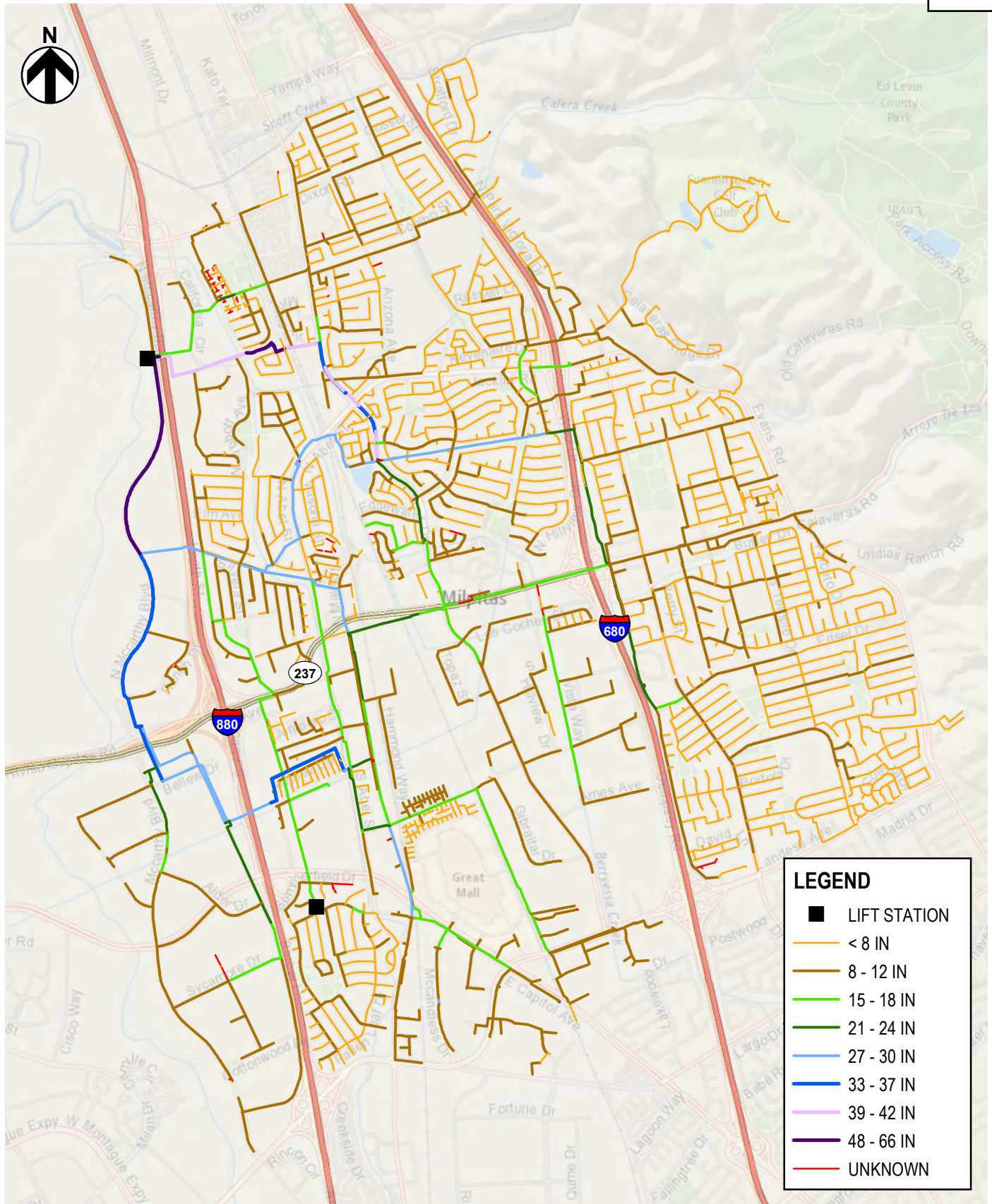


FIGURE 3-3
CITY OF MILPITAS
SEWER MASTER PLAN
COLLECTION SYSTEM PIPELINE DIAMETER

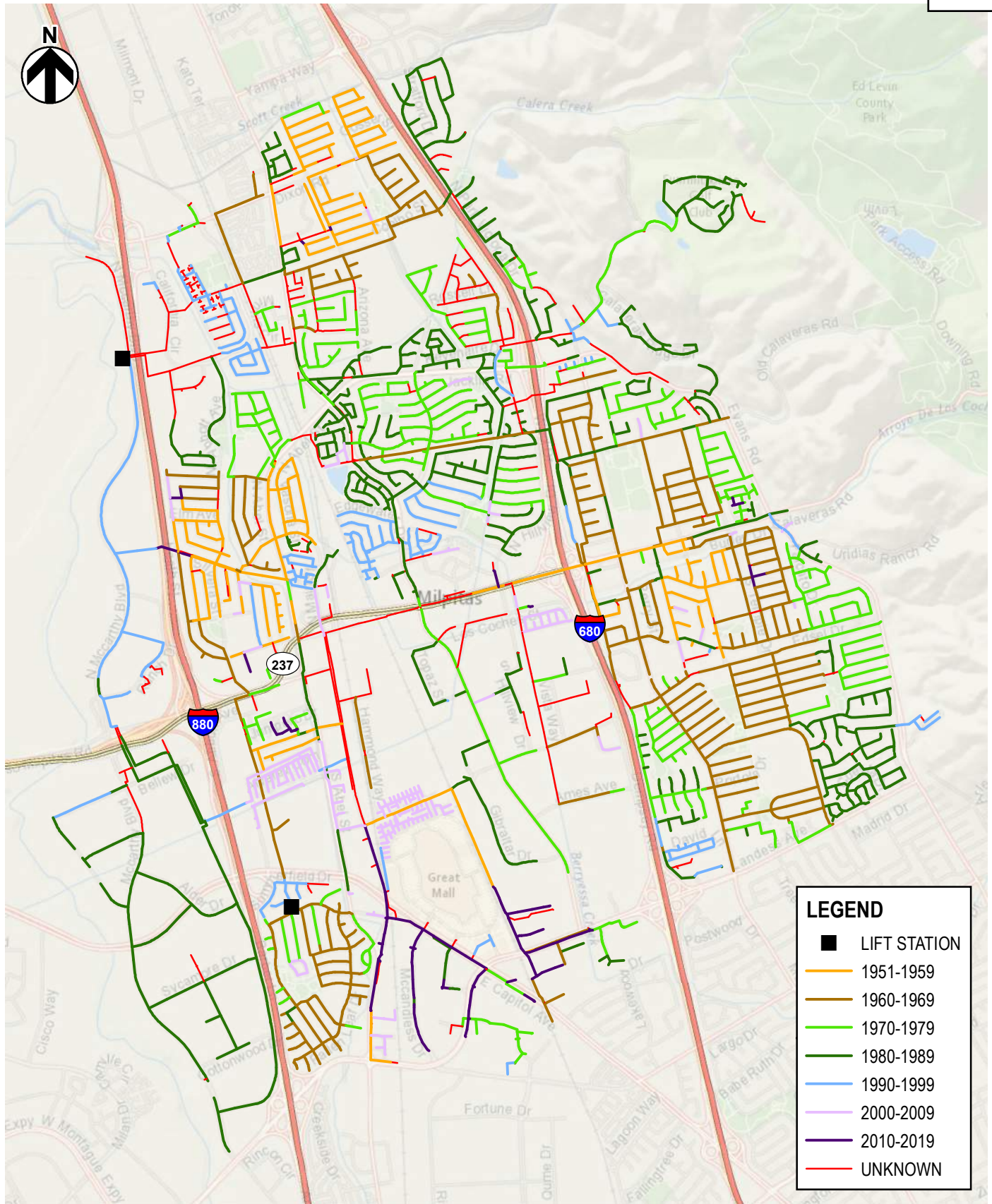


FIGURE 3-4
CITY OF MILPITAS
SEWER MASTER PLAN
COLLECTION SYSTEM PIPELINE AGE

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

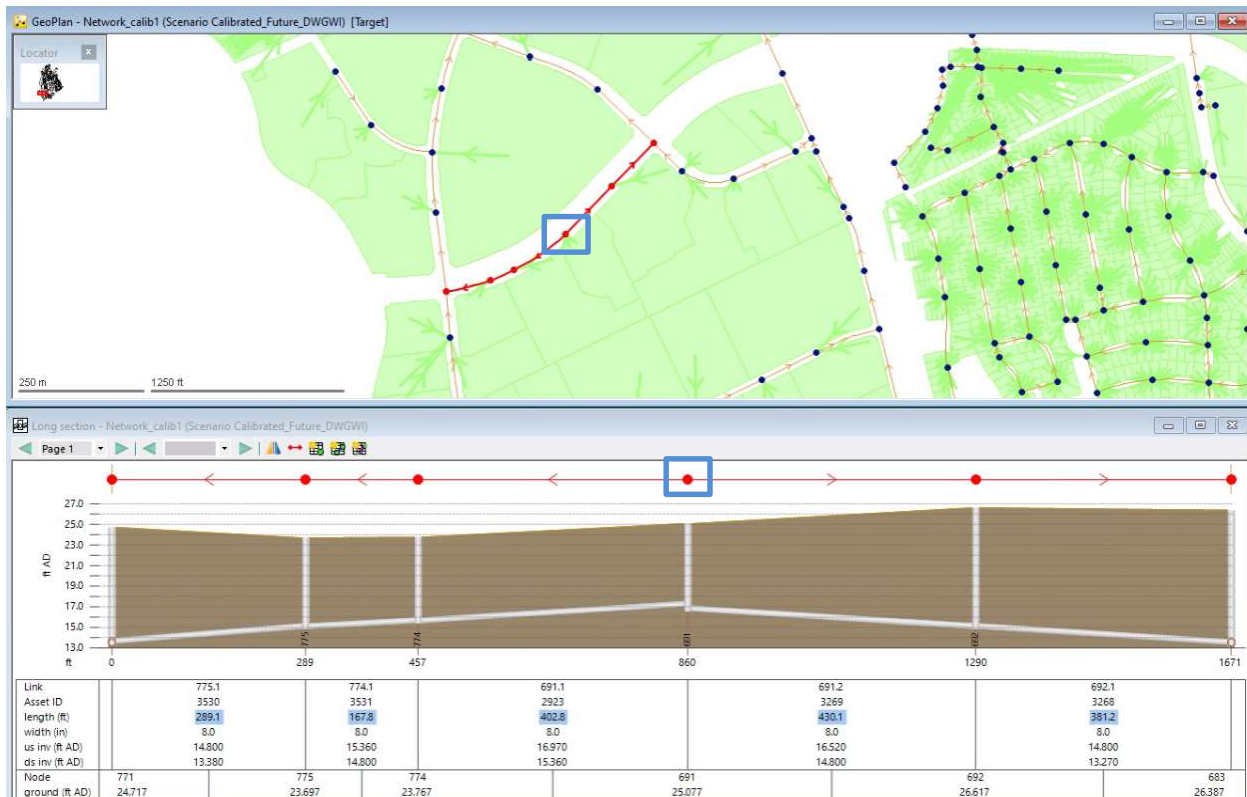


Figure 3-6: Example Even Flow Split

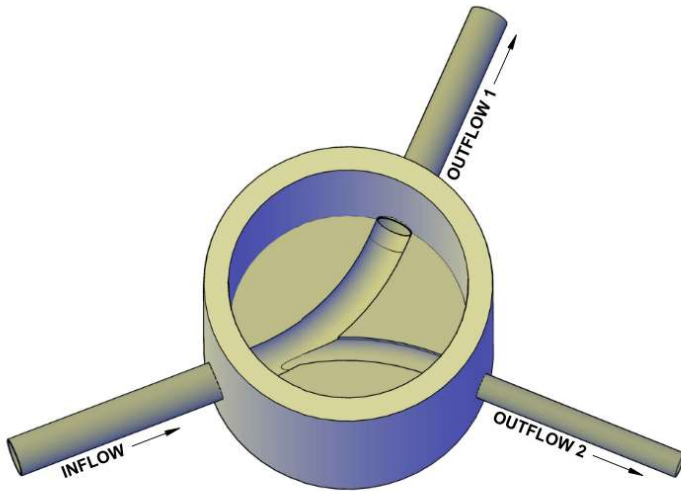


Figure 3-7: Example Overflow Flow Split

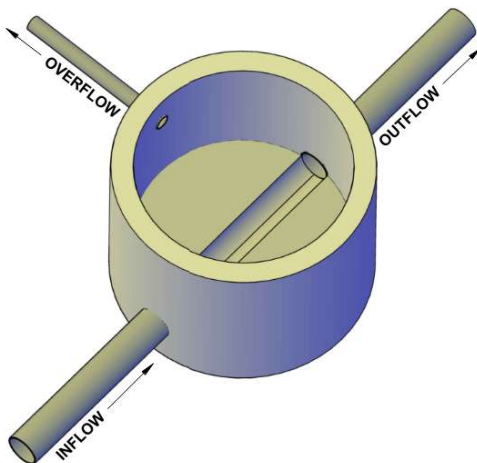
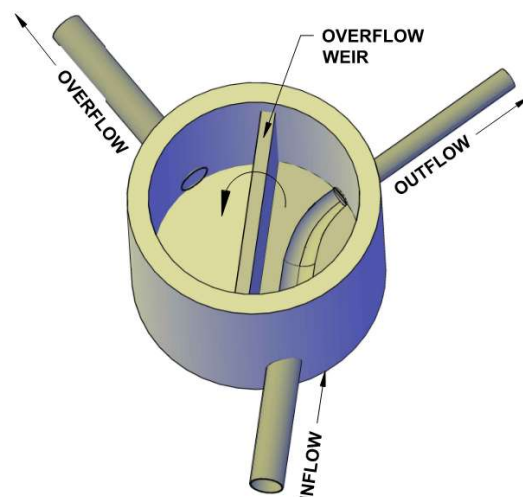


Figure 3-8: Example Flow Diversion Structure



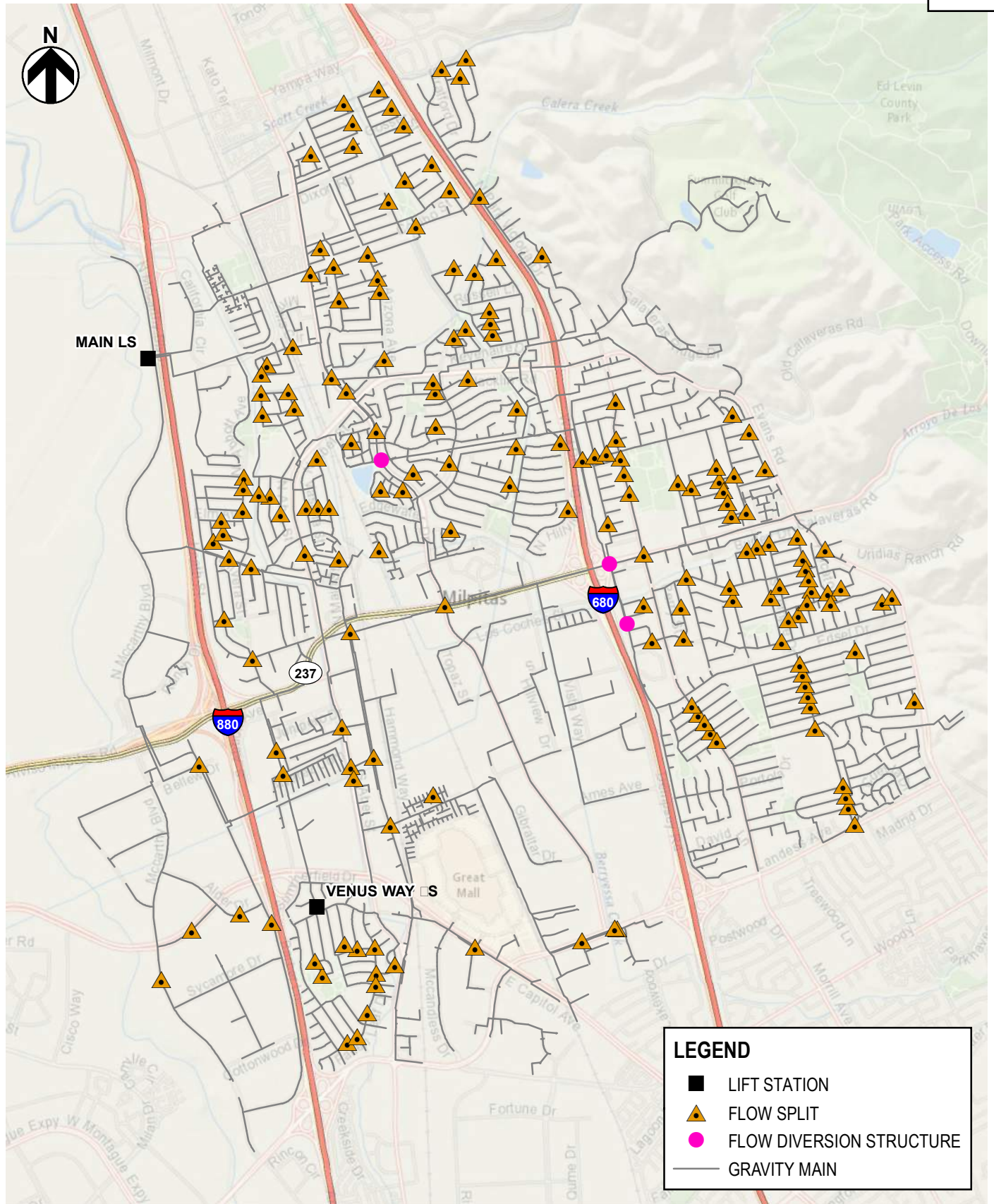


FIGURE 3-9
CITY OF MILPITAS
SEWER MASTER PLAN
FLOW SPLITS AND DIVERSION STRUCTURES

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.

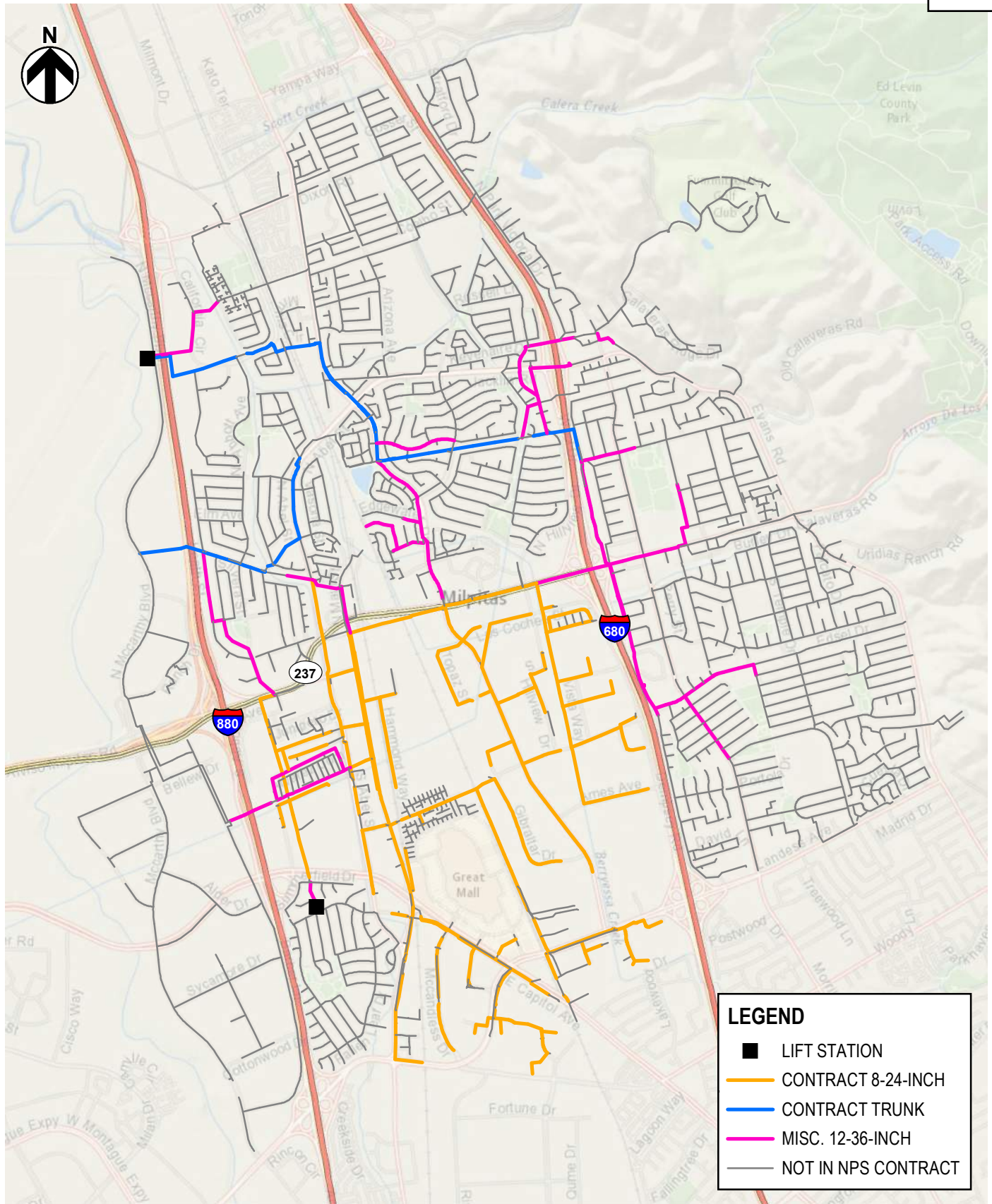


FIGURE 4-1
CITY OF MILPITAS
SEWER MASTER PLAN
NPS CCTV INSPECTION PLAN

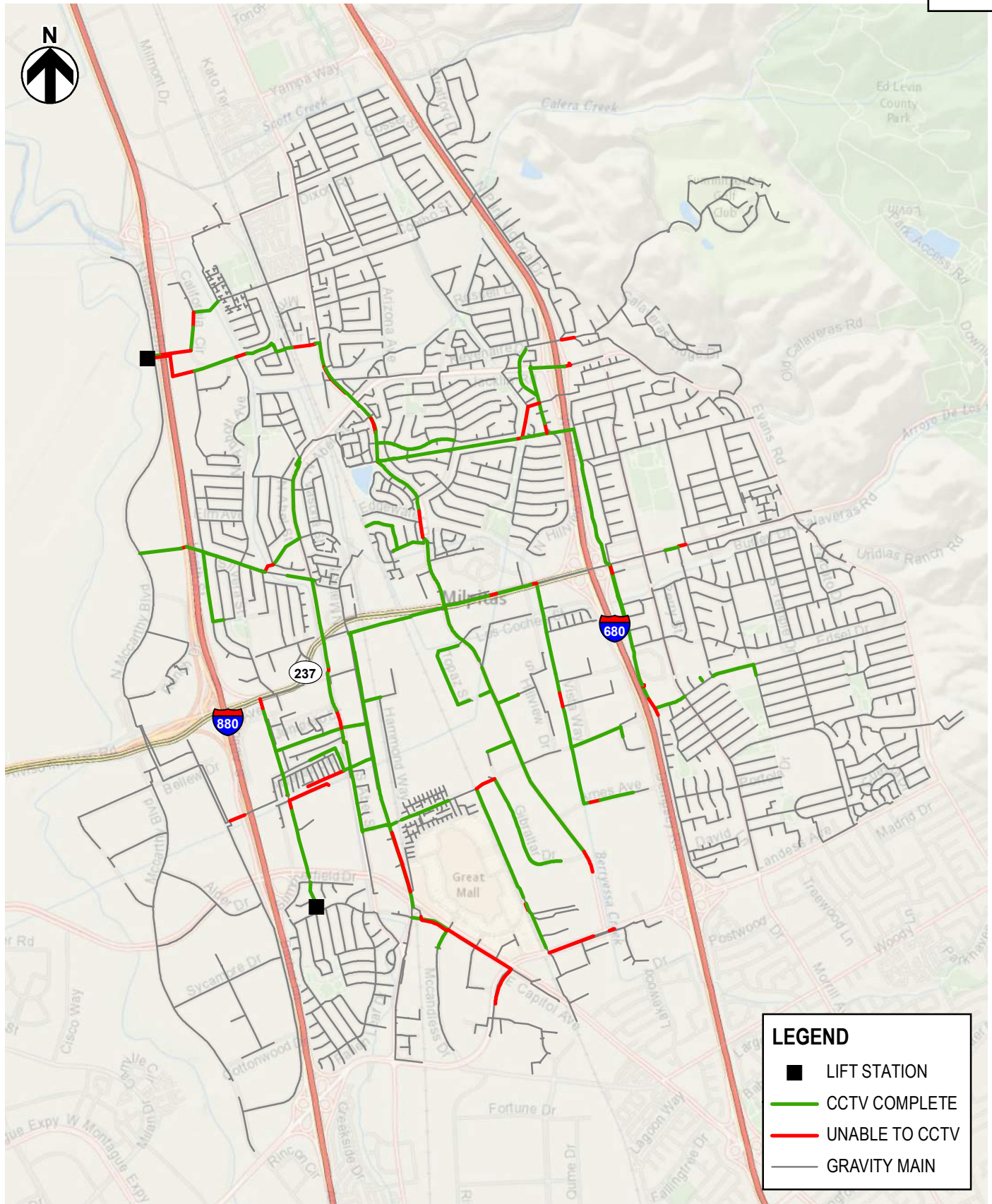


FIGURE 4-2
CITY OF MILPITAS
SEWER MASTER PLAN
COMPLETED CCTV INSPECTION

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).

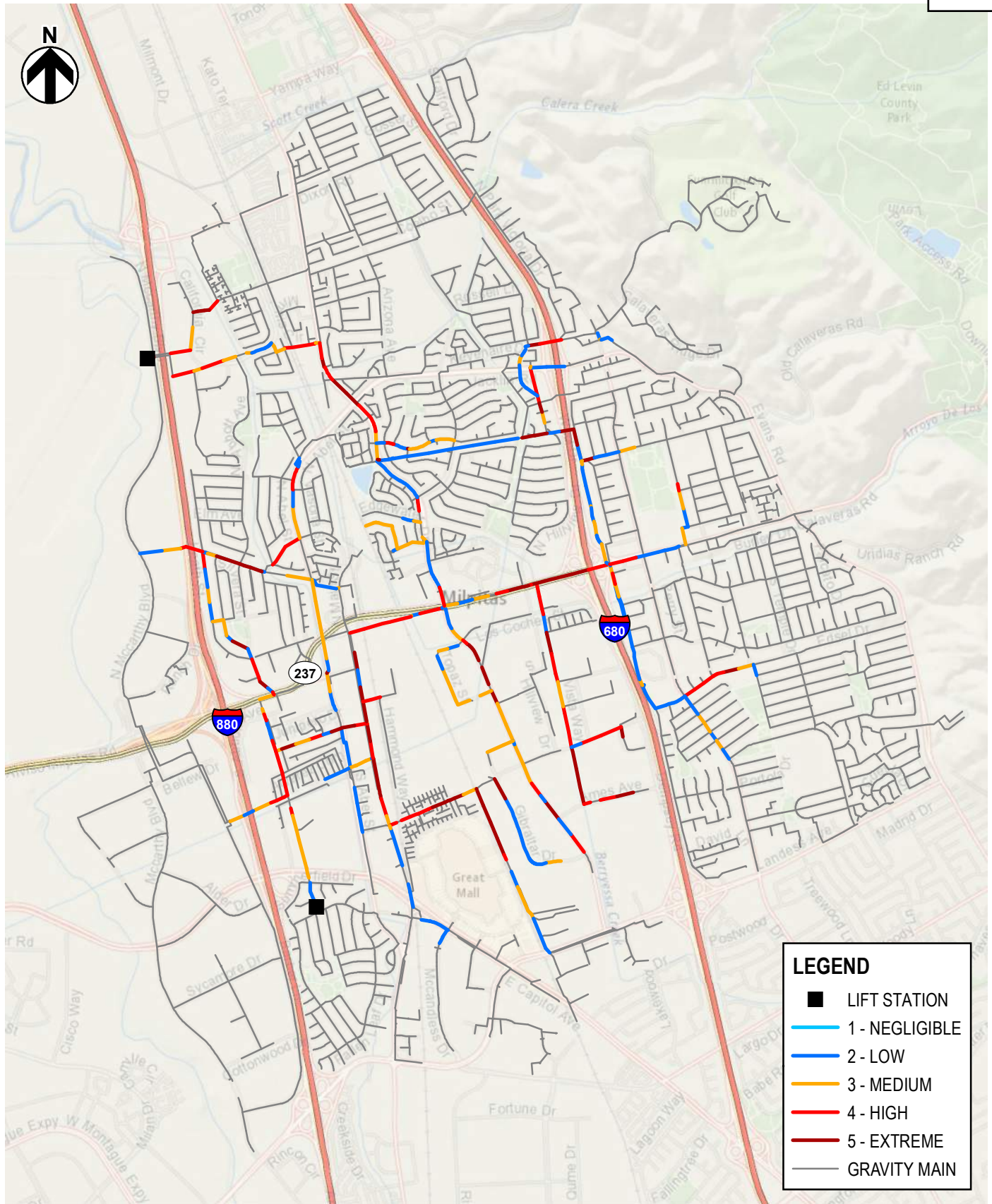


FIGURE 4-3
CITY OF MILPITAS
SEWER MASTER PLAN
PACP OVERALL PEAK SCORES

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:

$$\begin{aligned} \text{Risk (BRE)} &= \text{LoF Score} \times \text{CoF Score} \\ \text{LoF Score} &= \sum (\text{LoF Rating} \times \text{LoF Weighting}) \\ \text{CoF Score} &= \sum (\text{CoF Rating} \times \text{CoF Weighting}) \end{aligned}$$

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					Criteria Weighting
		(← Least likely to fail				Most likely to fail →)	
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	CoF Rating						Criteria Weighting
		(< Negligible consequence			Critical consequence >)			
		Criteria	1	2	3	4	5	
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

	Low LOF Score → High LOF Score				
High COF Score ↑ Low COF Score	Medium	Medium	High	Extreme	Extreme
	Medium	Medium	Medium	High	Extreme
	Low	Medium	Medium	Medium	High
	Negligible	Low	Medium	Medium	Medium
	Negligible	Negligible	Low	Medium	Medium

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

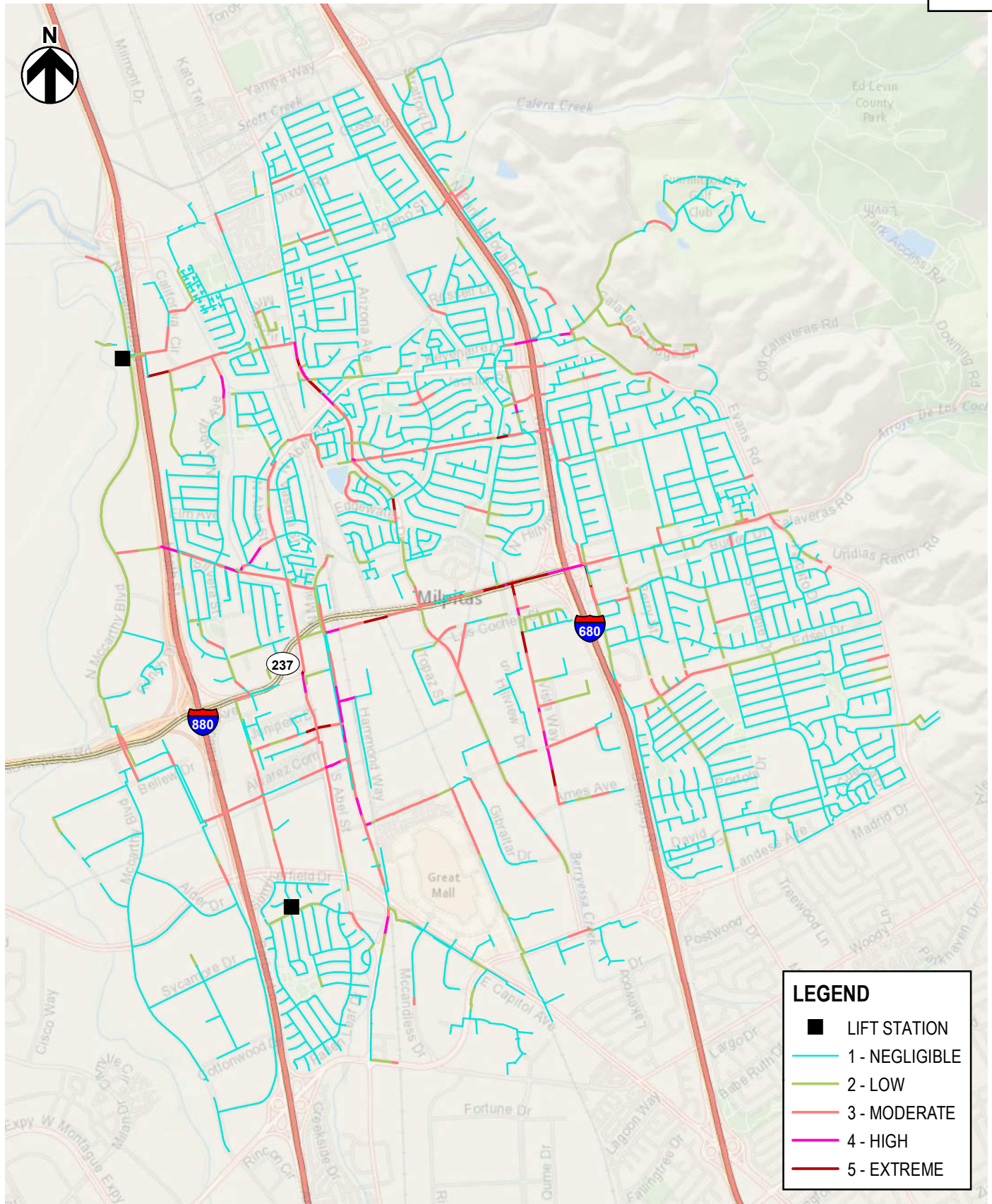


FIGURE 4-5
CITY OF MILPITAS
SEWER MASTER PLAN
BUSINESS RISK EXPOSURE SCORE MAP

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.

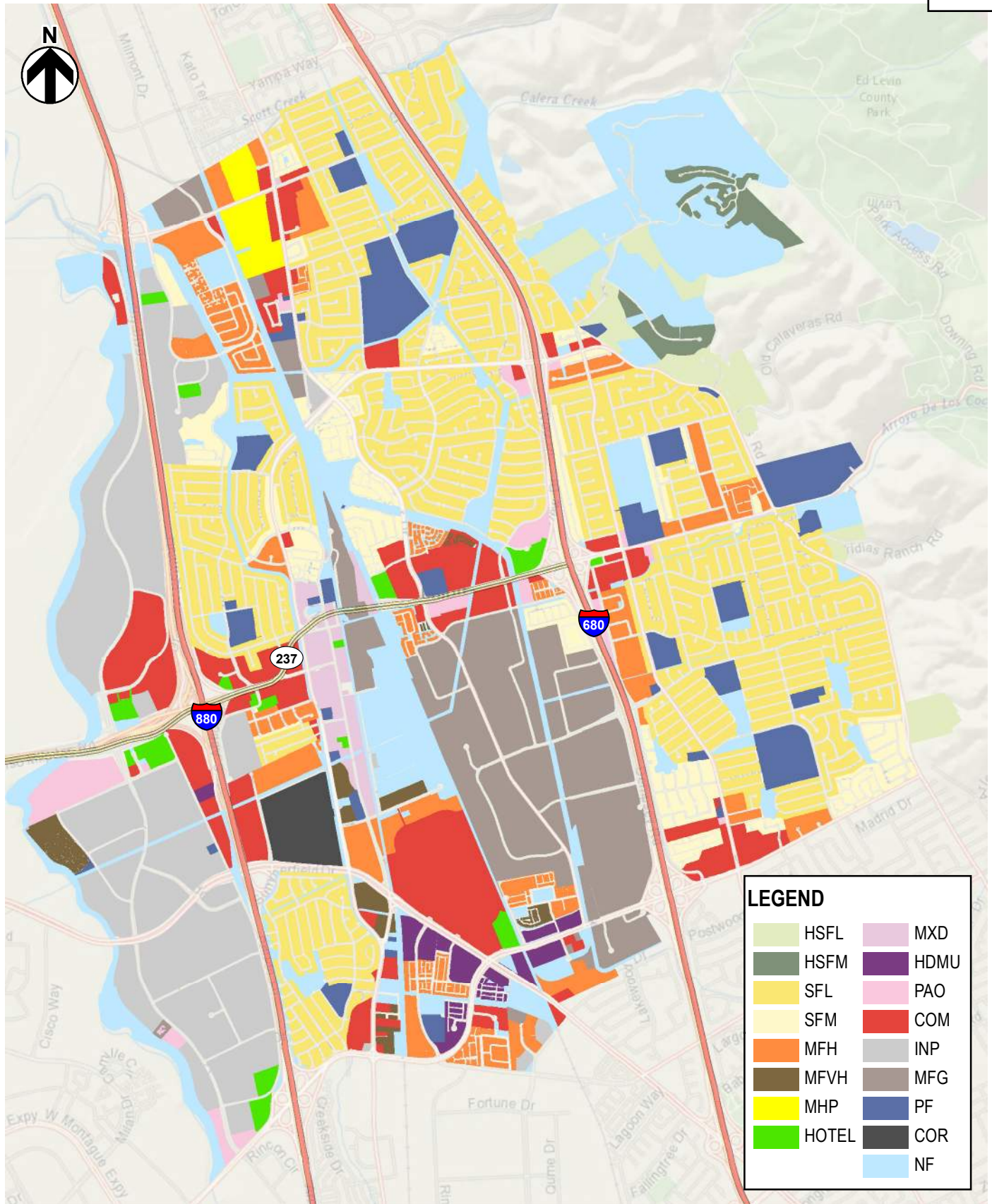


FIGURE 5-1
CITY OF MILPITAS
SEWER MASTER PLAN
MODEL-BASED LAND USE DESIGNATIONS - EXISTING

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

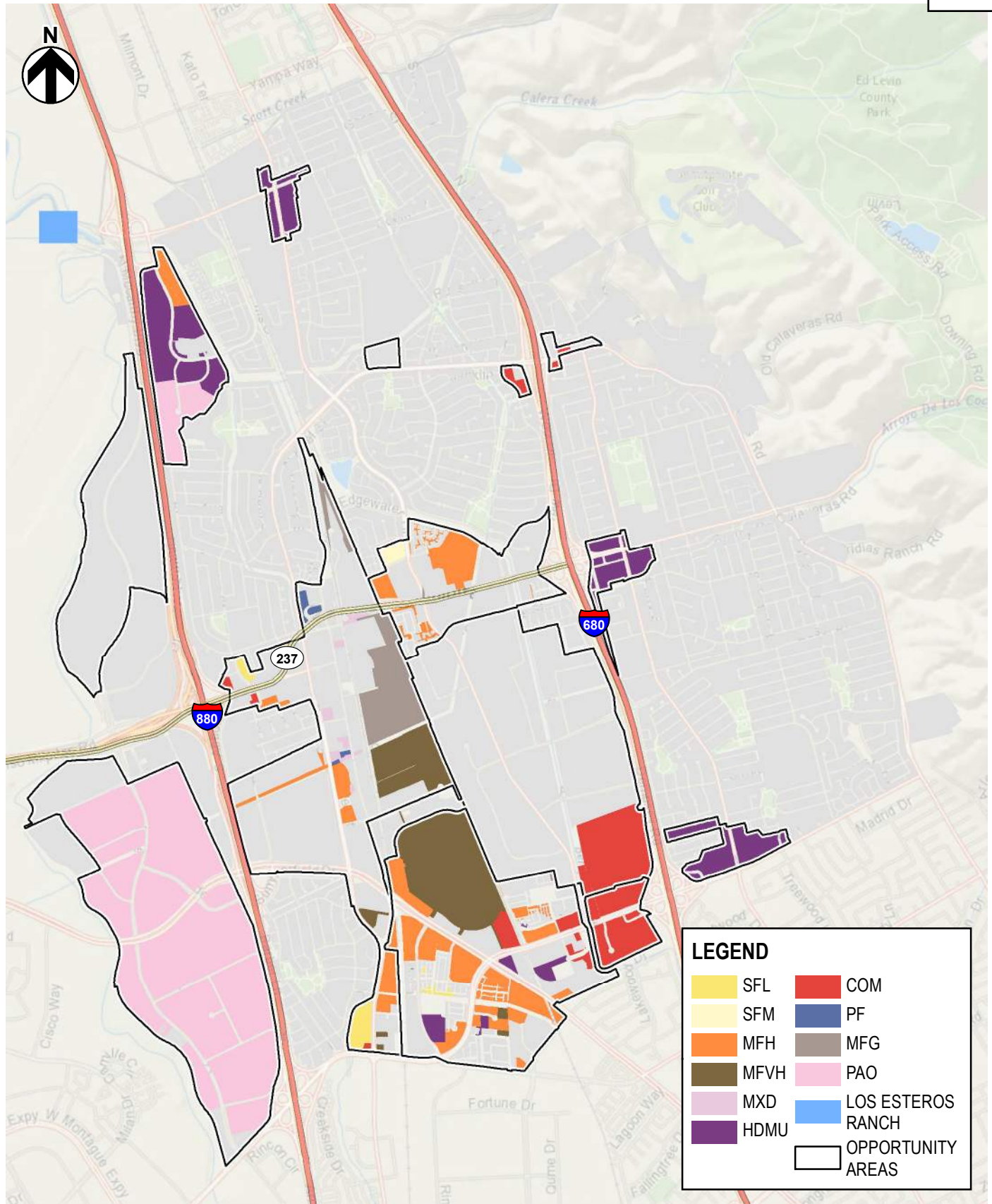


FIGURE 5-2
CITY OF MILPITAS
SEWER MASTER PLAN
MODEL-BASED LAND USE DESIGNATIONS - FUTURE

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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.

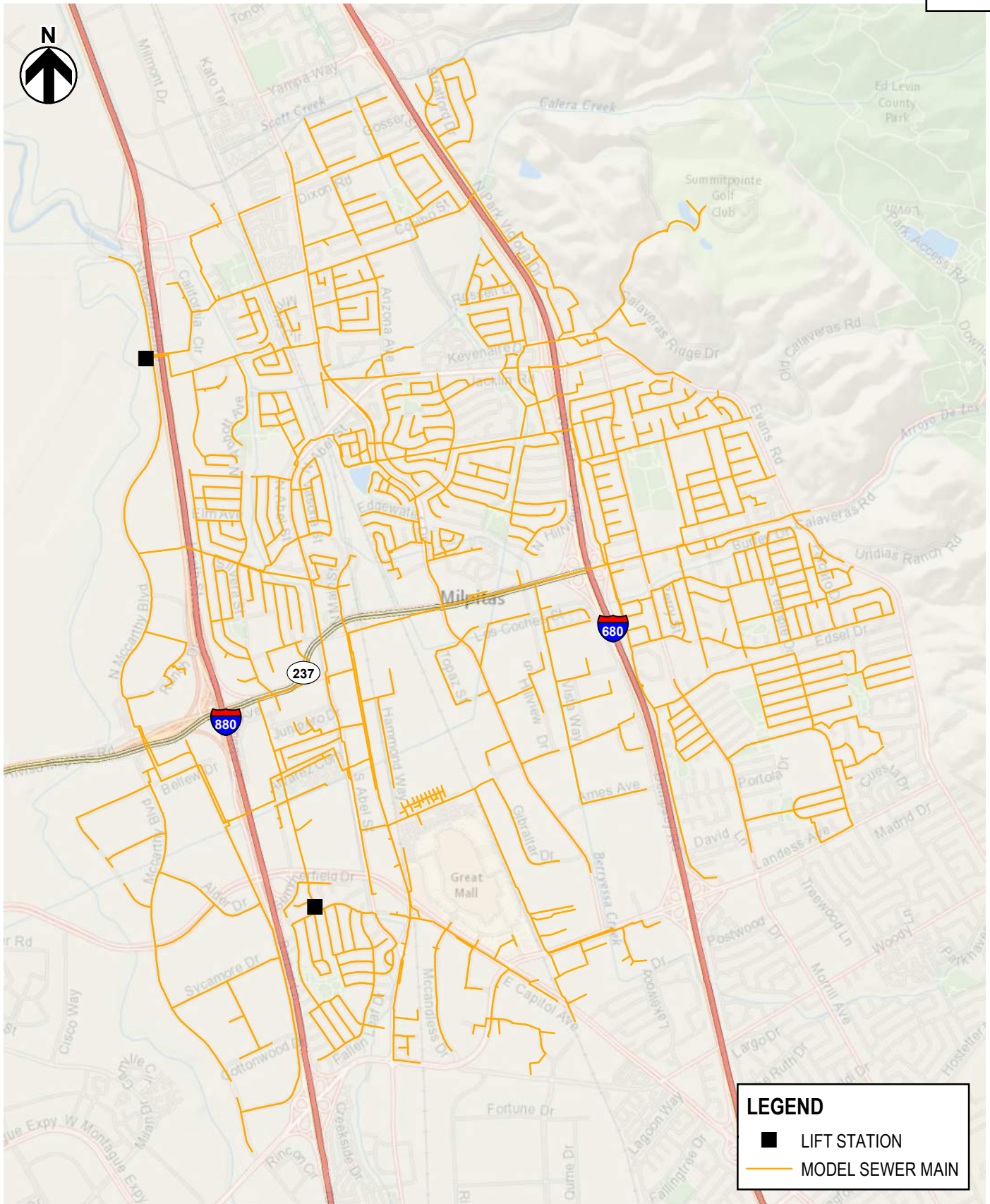


FIGURE 6-1
CITY OF MILPITAS
SEWER MASTER PLAN
MODEL NETWORK

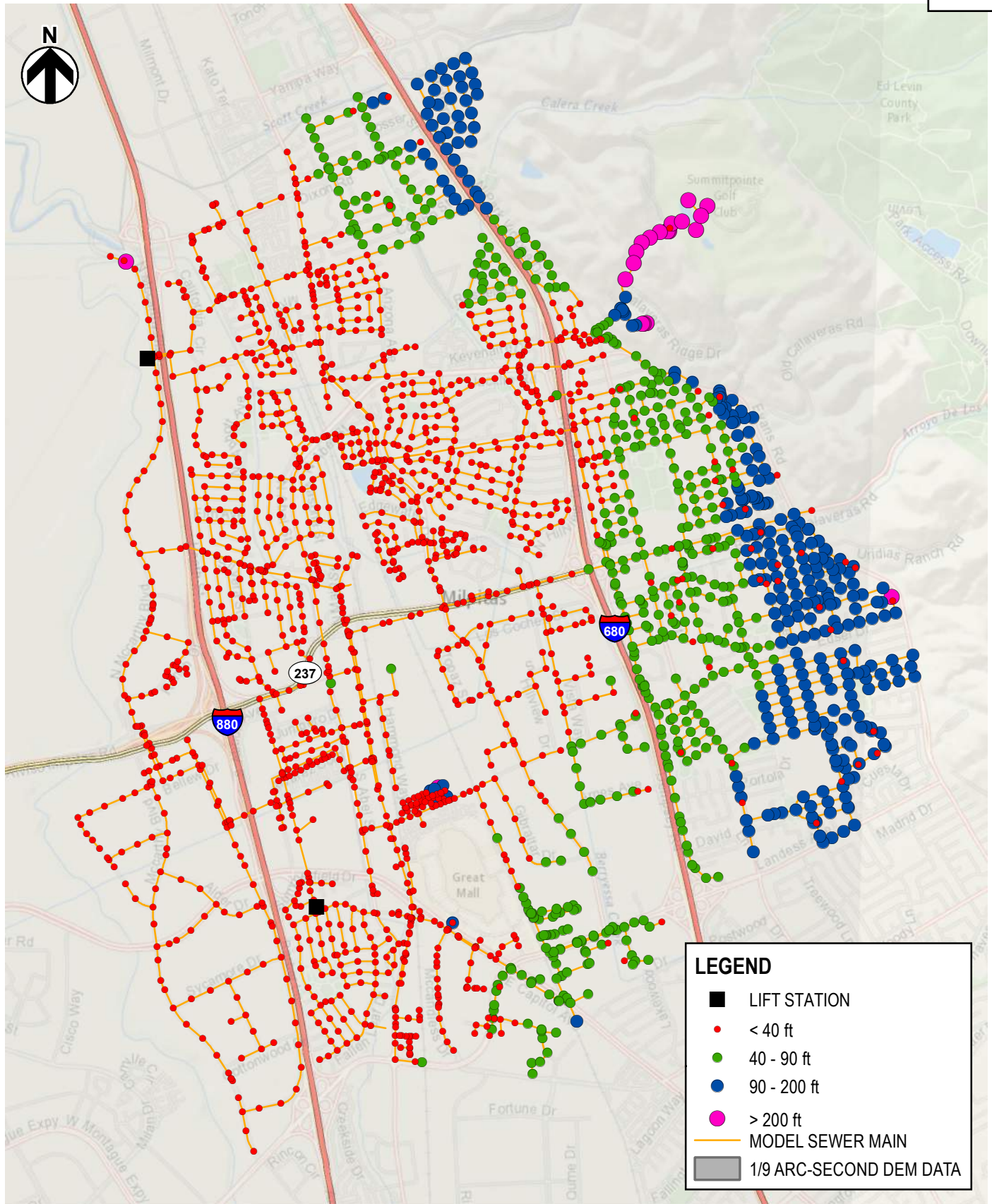


FIGURE 6-2
CITY OF MILPITAS
SEWER MASTER PLAN
MANHOLE RIM ELEVATIONS

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.

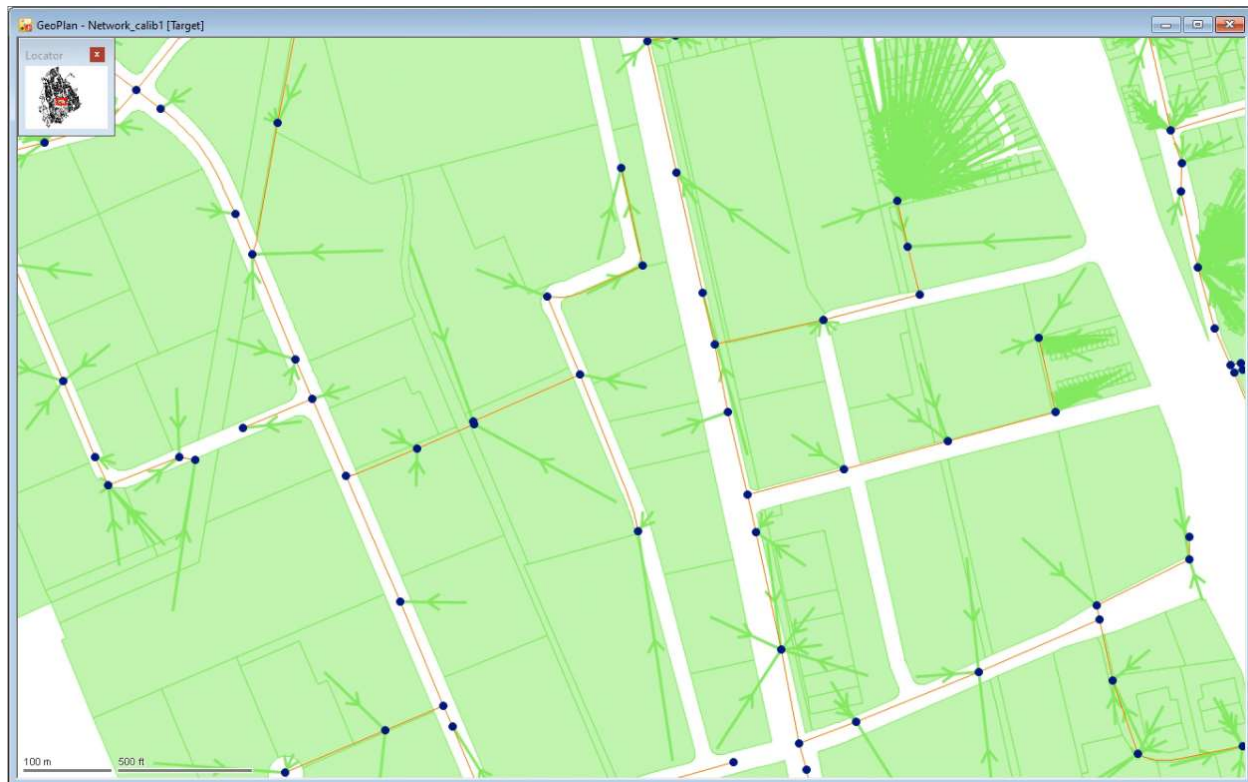
Figure 6-4: InfoWorks Data Flags

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

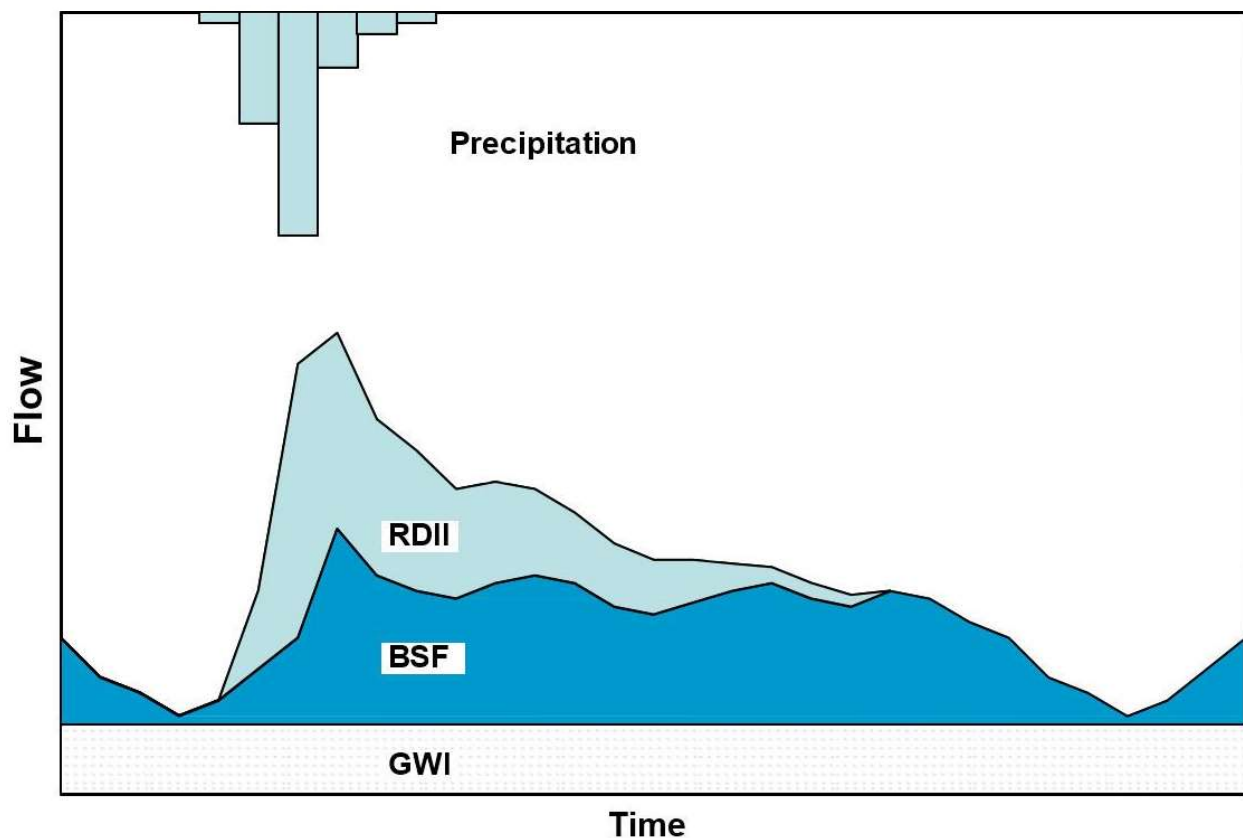
For this study, the flow monitoring data collected by the City was used for model calibration. This section summarizes typical wastewater flow components, summarizes the City's flow monitoring program, describes the basis for developing design wastewater flows used to model the City's collection system, 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.

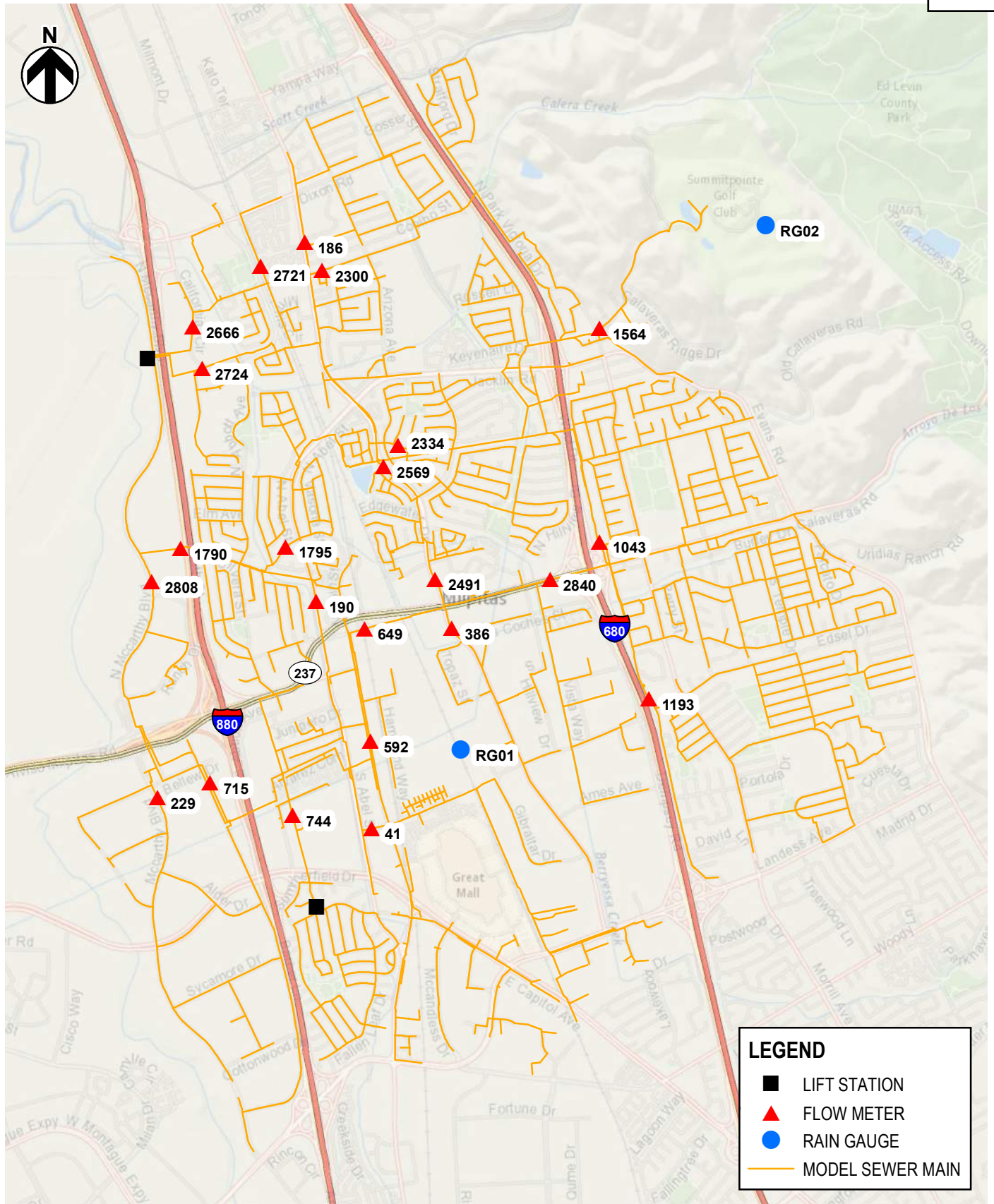


FIGURE 7-2
CITY OF MILPITAS
SEWER MASTER PLAN
FLOW MONITORS AND RAIN GAUGES

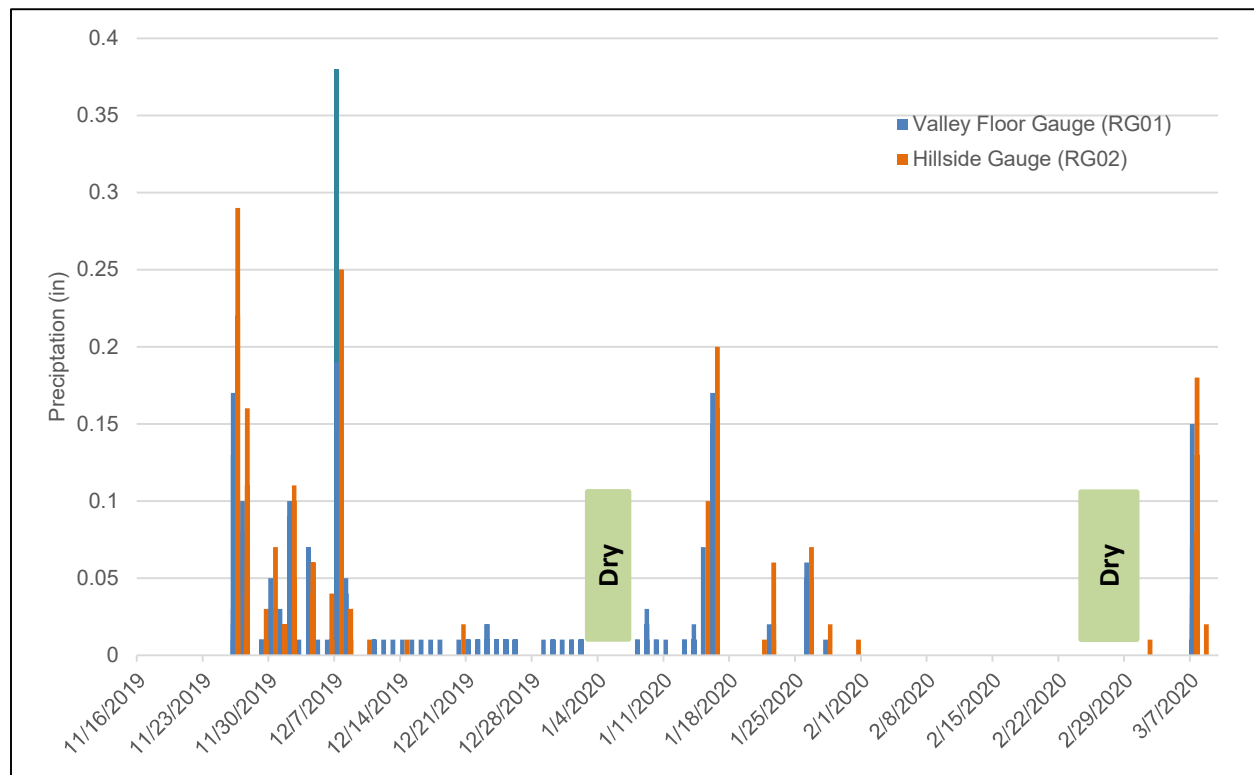
Table 7-1: Flow Monitoring Data Summary

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.

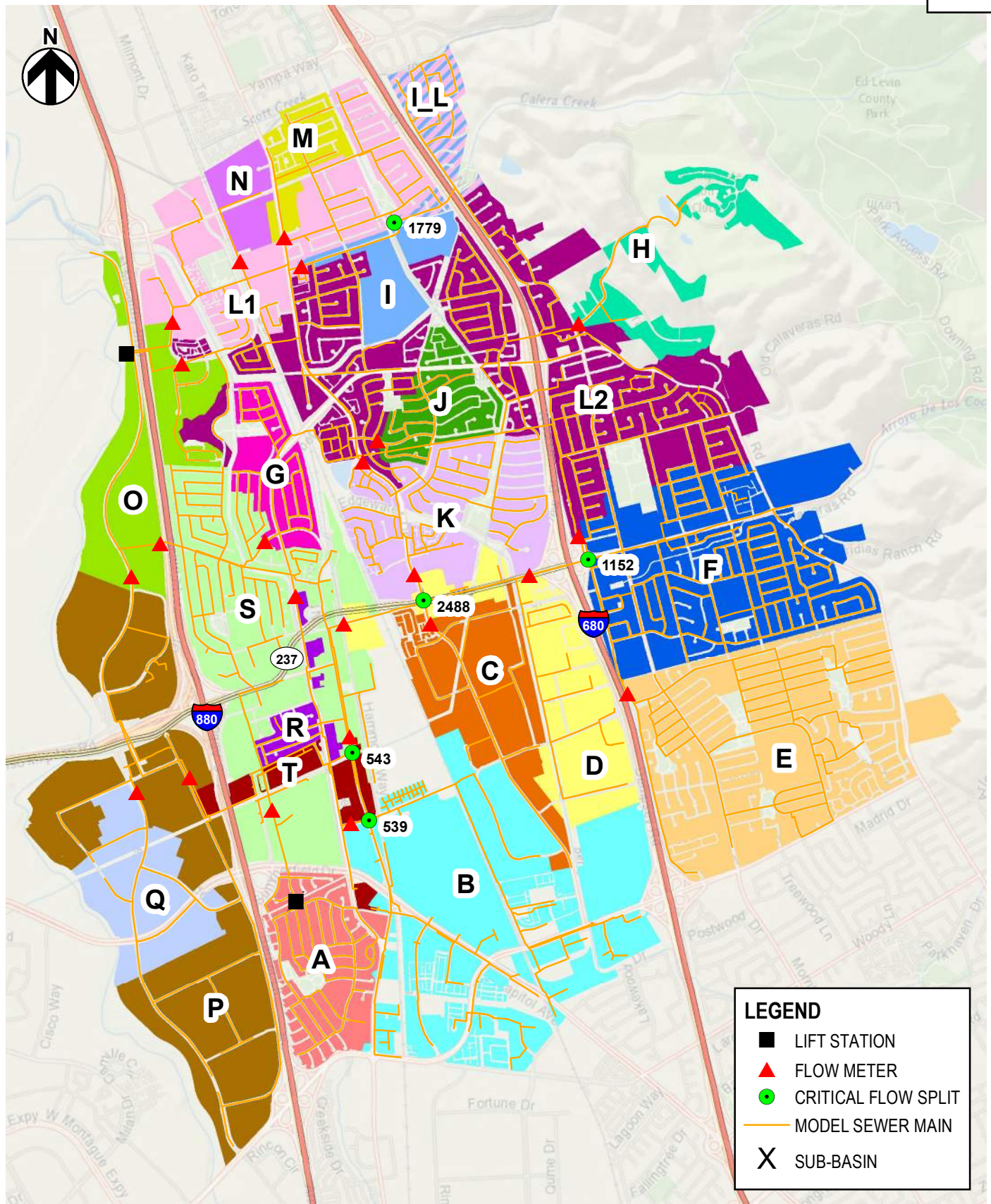


FIGURE 7-4
CITY OF MILPITAS
SEWER MASTER PLAN
SUB-BASIN DELINEATION

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.

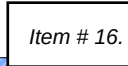


Table 7-4: Total Acreage of Each Land Use by Sub-Basin

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)

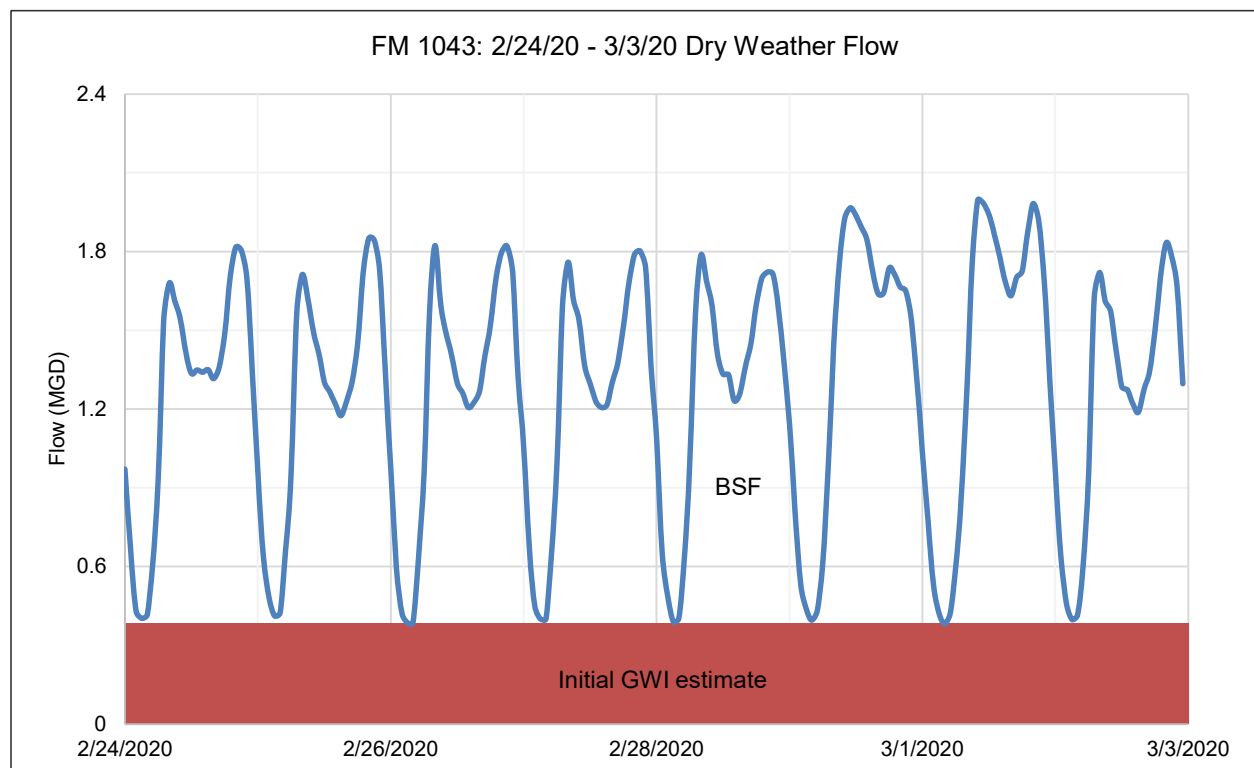
The dry weather periods were analyzed to establish dry weather GWI and BSF inclusive of the diurnal patterns for groups of land uses. The process for developing each of the components and the results are discussed below.

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.

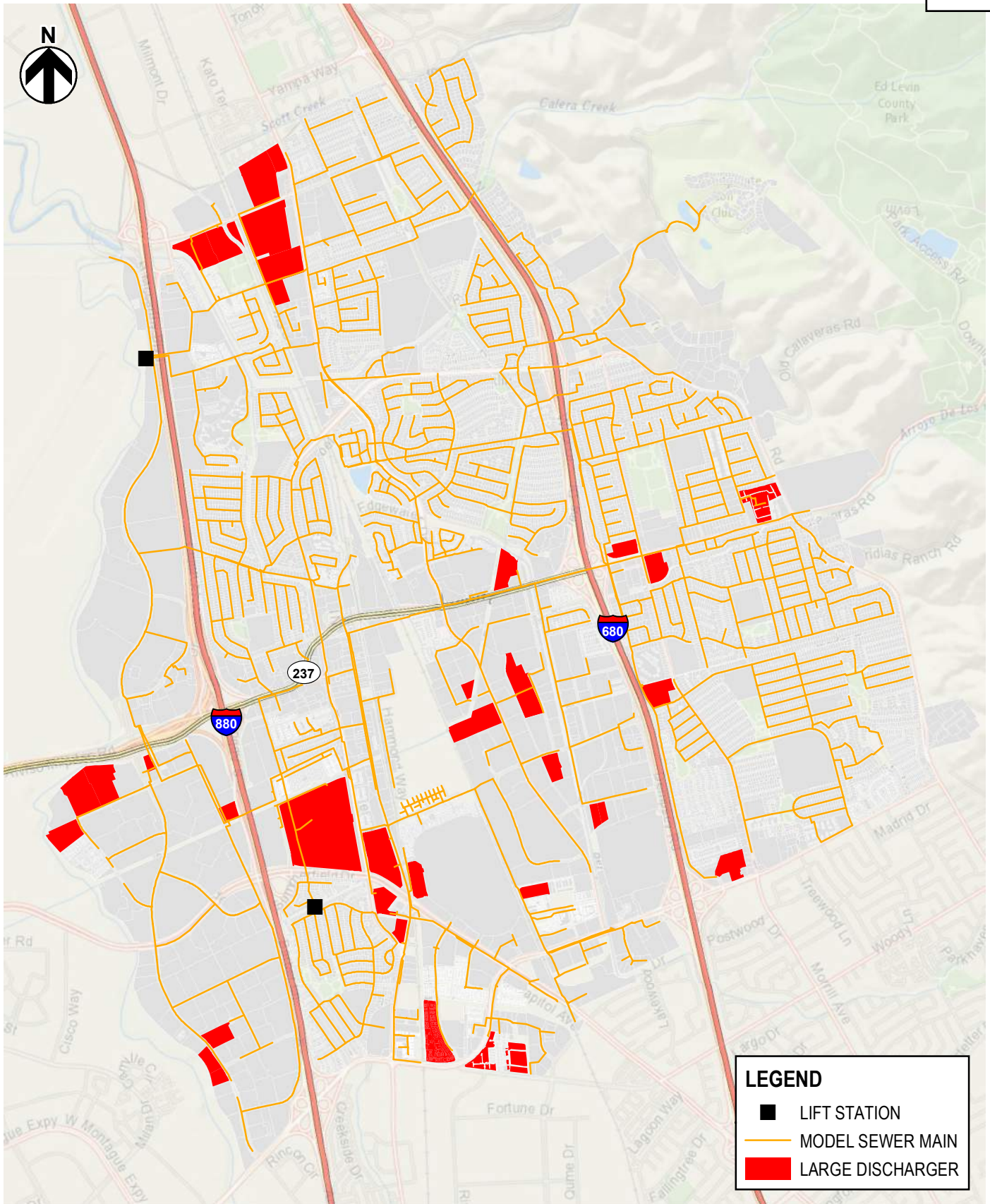


FIGURE 7-7
CITY OF MILPITAS
SEWER MASTER PLAN
LARGE DISCHARGERS

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.

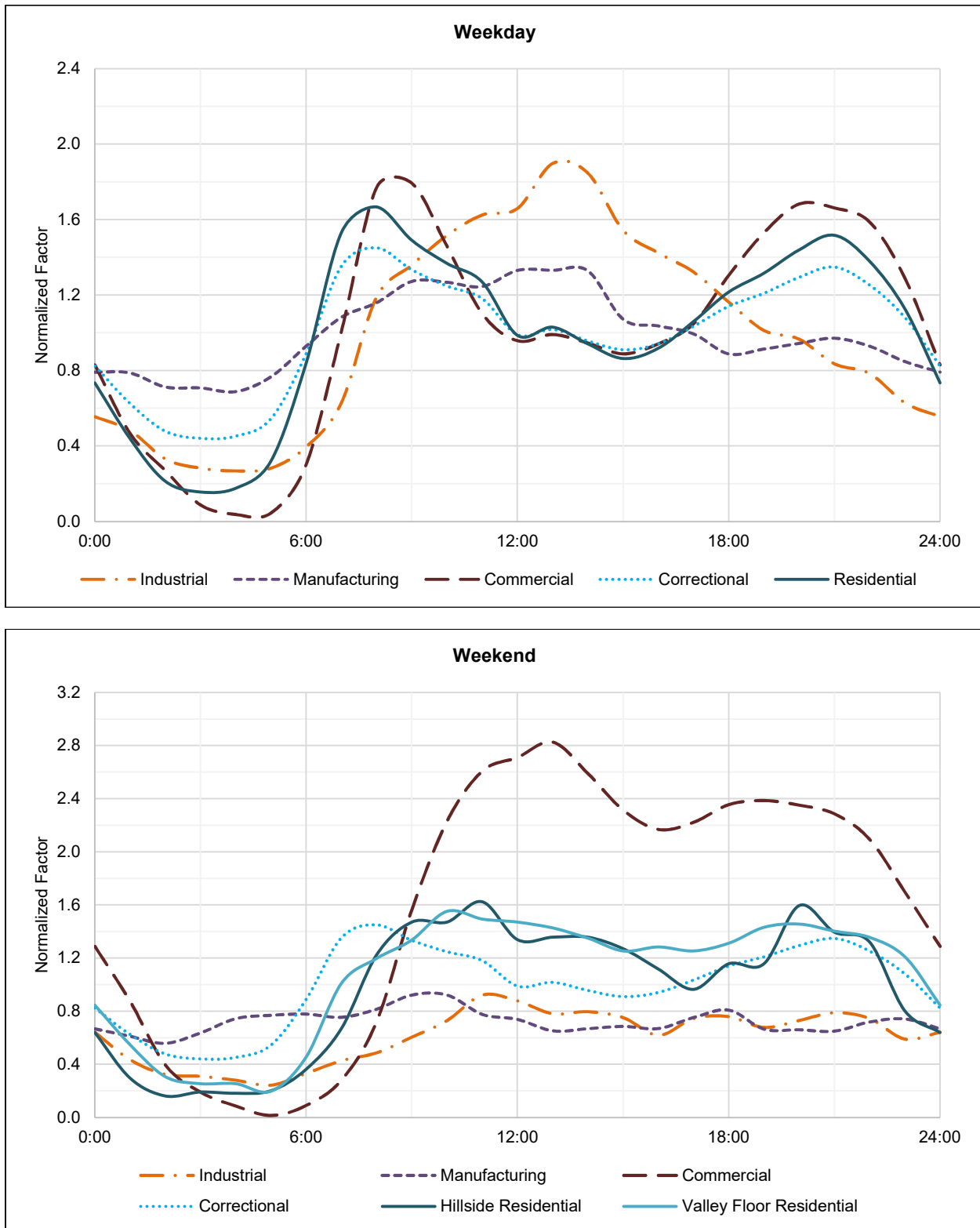
Diurnal patterns were adjusted iteratively for weekday and weekend to match measured flows during the calibration process discussed below.

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.

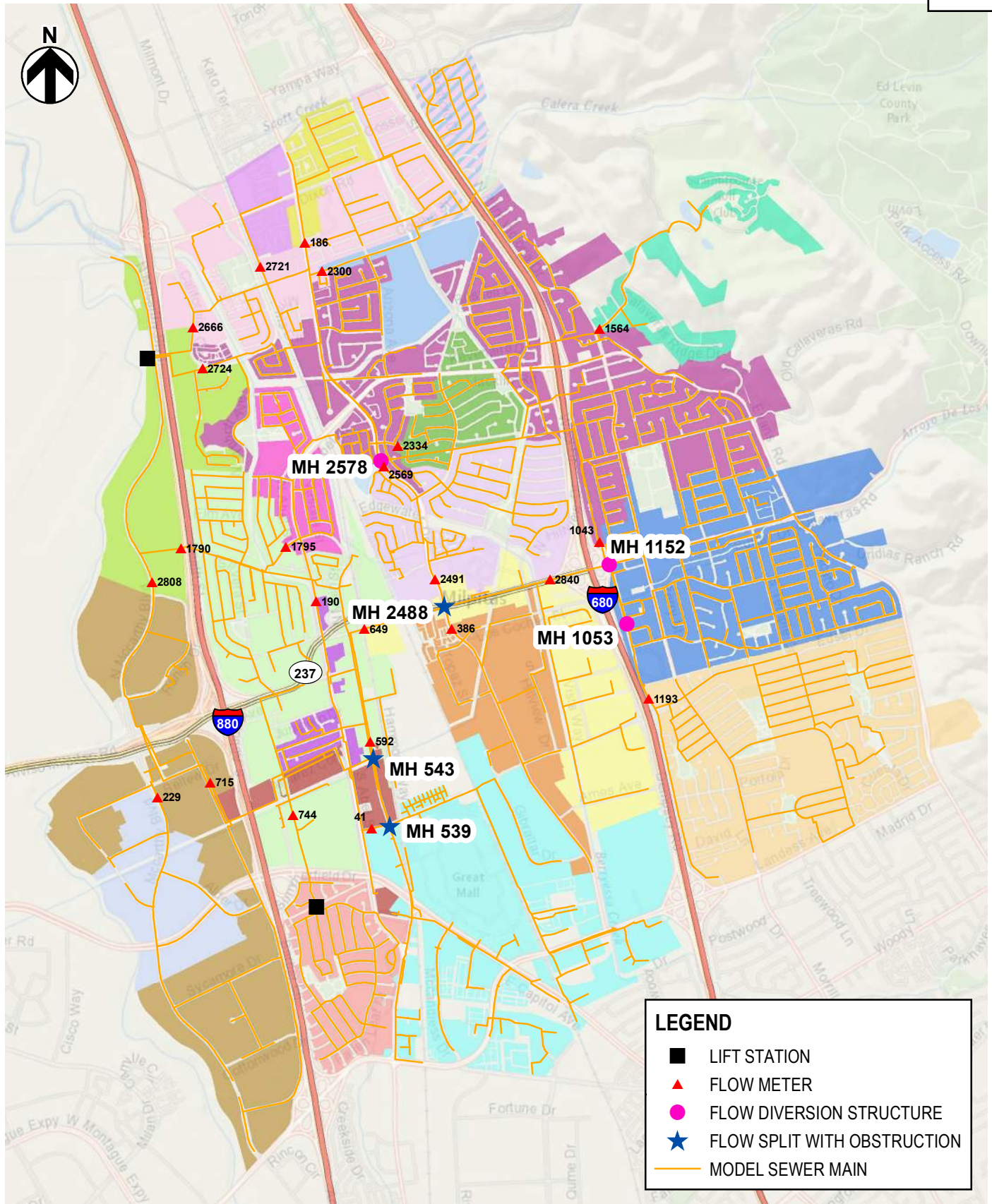


FIGURE 7-9
CITY OF MILPITAS
SEWER MASTER PLAN
FLOW DIVERSION AND OBSTRUCTION

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	-	-	-	6.157³	-

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

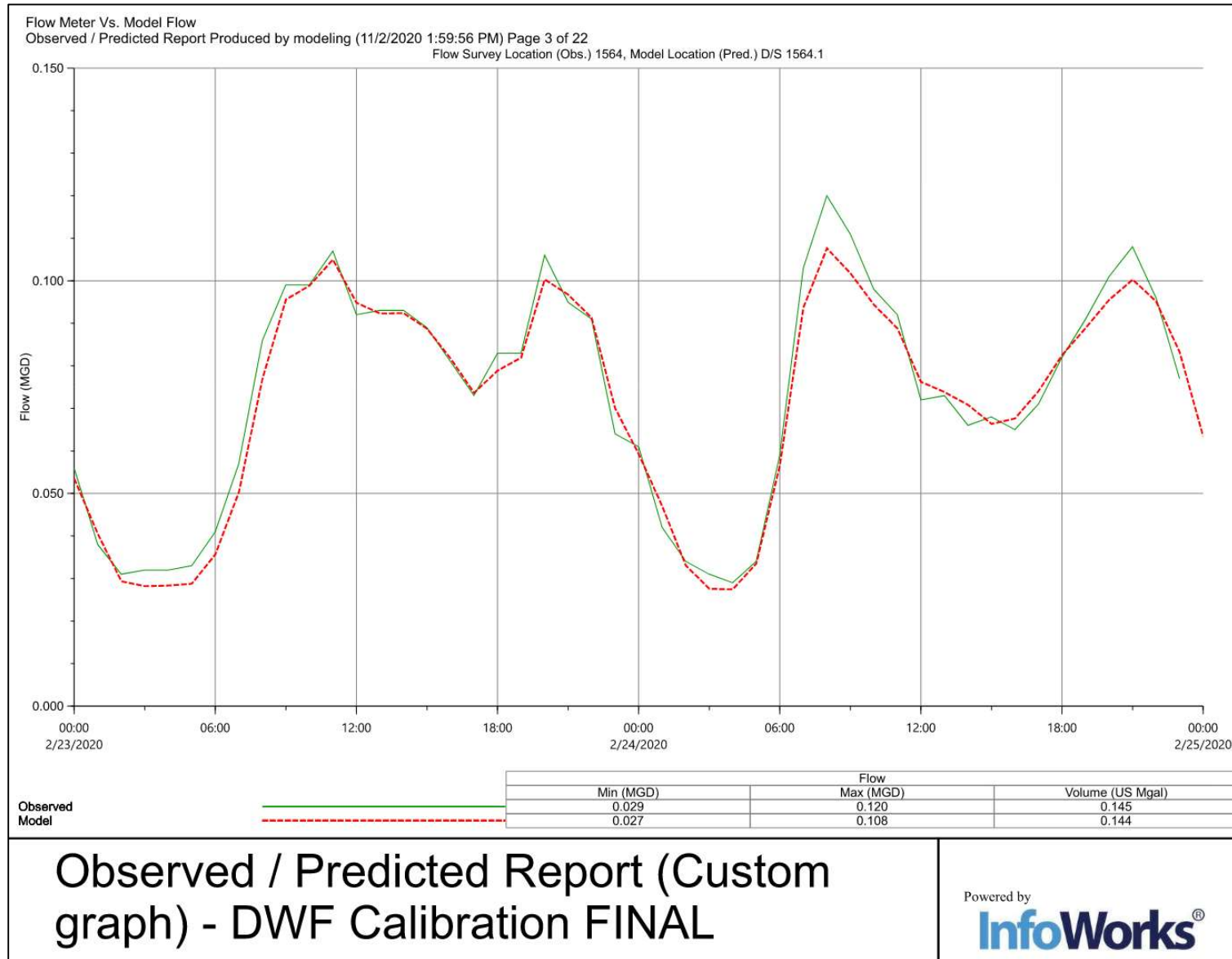


Figure 7-10 presents a comparison between modeled and observed dry weather weekday flows. For the overall system, modeled flows are 3.4% higher than the observed flows on an average dry weekday and are within 10% (higher) of the measured flows on the average dry weekend. A calibration within 5% is considered 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

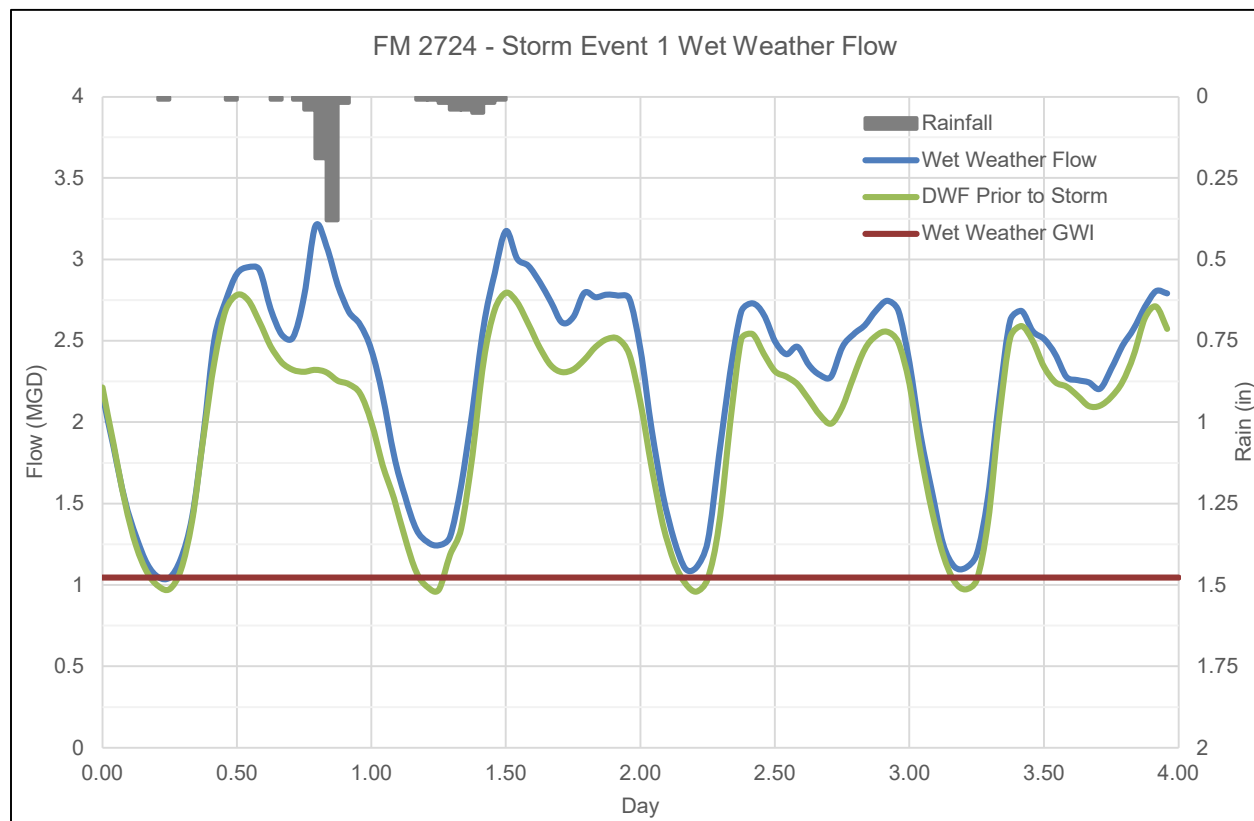
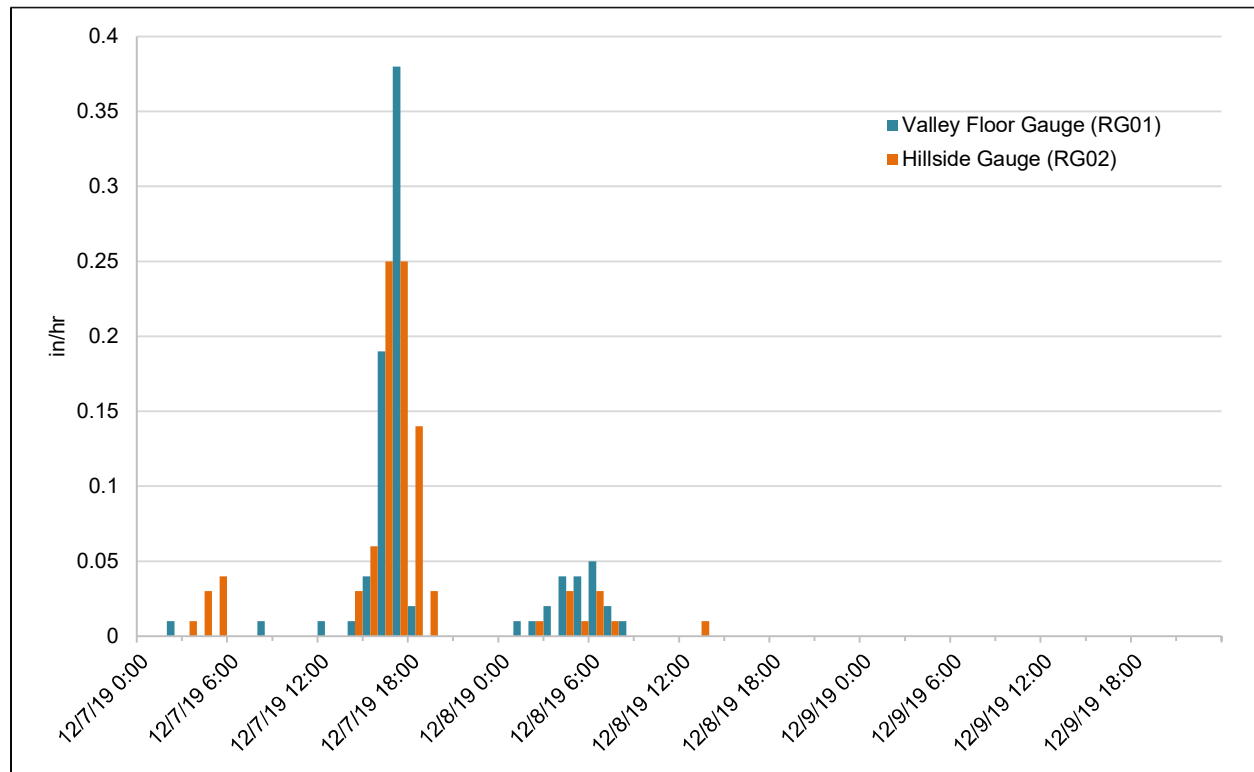


Figure 7-12: Storm Rainfall



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

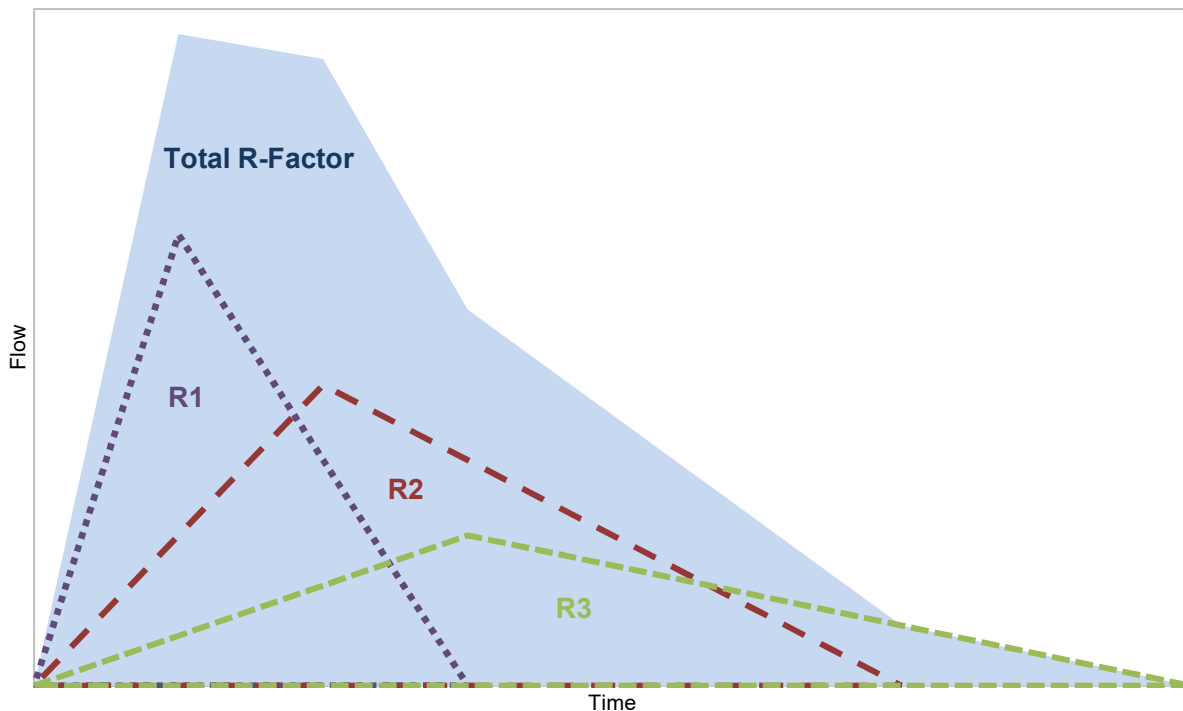
GWI fluctuates over the course of the year, increasing during the wet season as the water table rises. The extent that the water table rises and falls is site specific and can be affected by geology, surface water features, and tides. By extension, wet weather GWI changes are also site specific and can 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

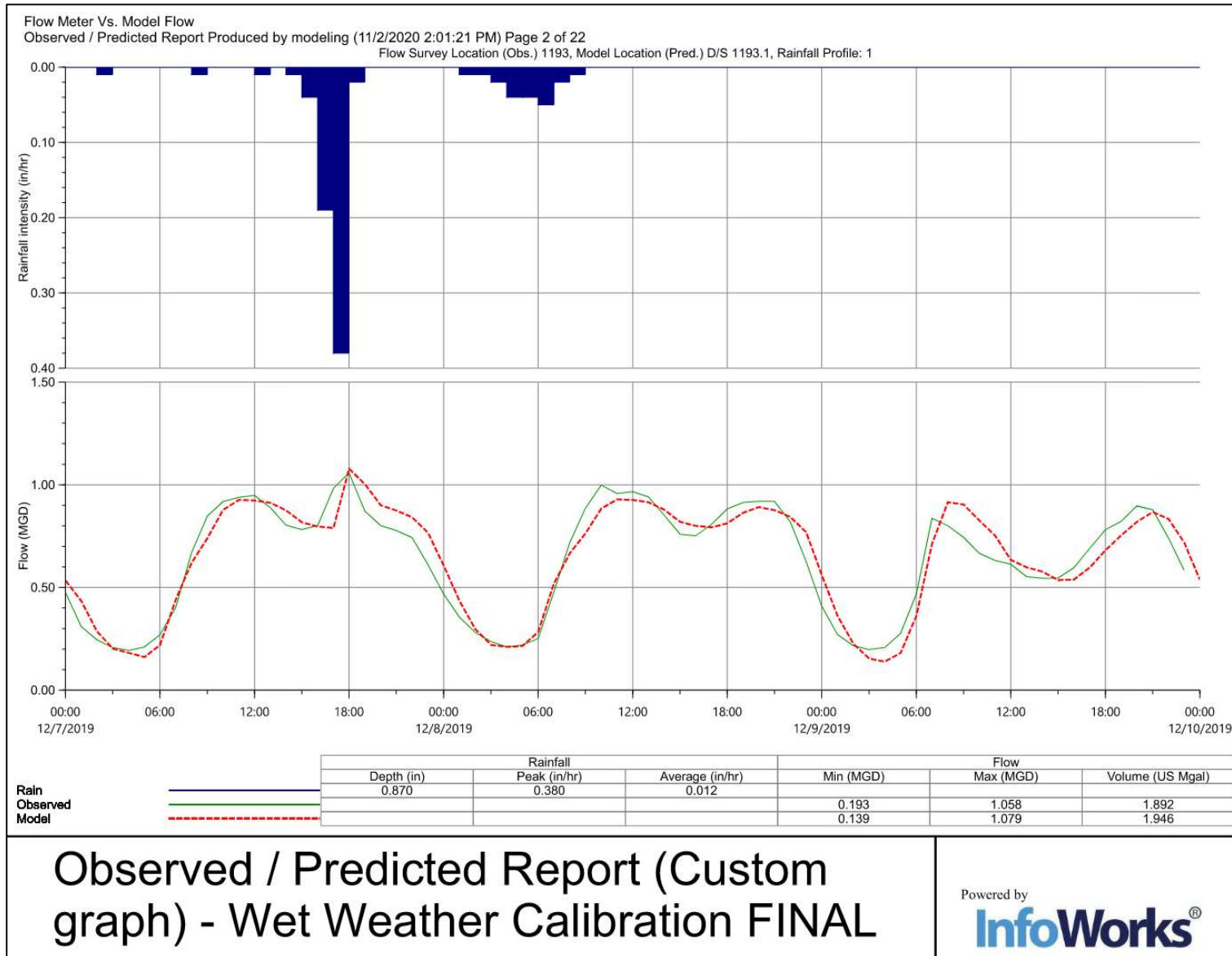
Sub-Basin	Acreage	R1	R2	R3	Total R-Factor
A	138	0.40%	0.85%	0.23%	1.48%
B	433	0.80%	0.66%	0.13%	1.59%
C	192	0.27%	0.00%	0.02%	0.30%
D	208	0.26%	1.64%	0.00%	1.90%
E	455	0.53%	0.00%	0.07%	0.60%
F	414	0.67%	0.00%	0.19%	0.86%
G	78	1.27%	2.14%	0.00%	3.40%
H	110	0.24%	0.00%	0.00%	0.24%
I	81	0.08%	0.35%	0.00%	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%
Average²	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

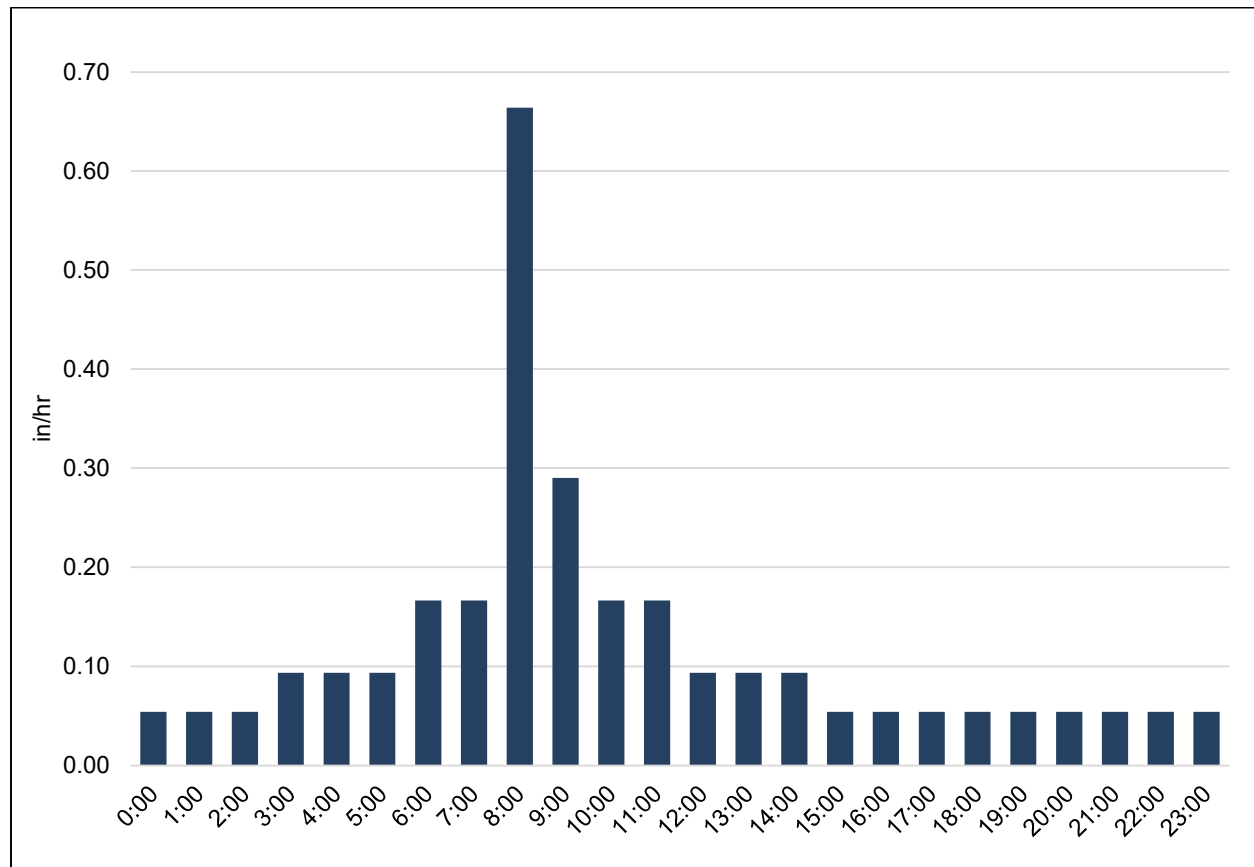
The hydraulic analysis for the collection system was evaluated under design storm for existing and future land use conditions. This section describes the analysis and the resulting deficiencies.

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

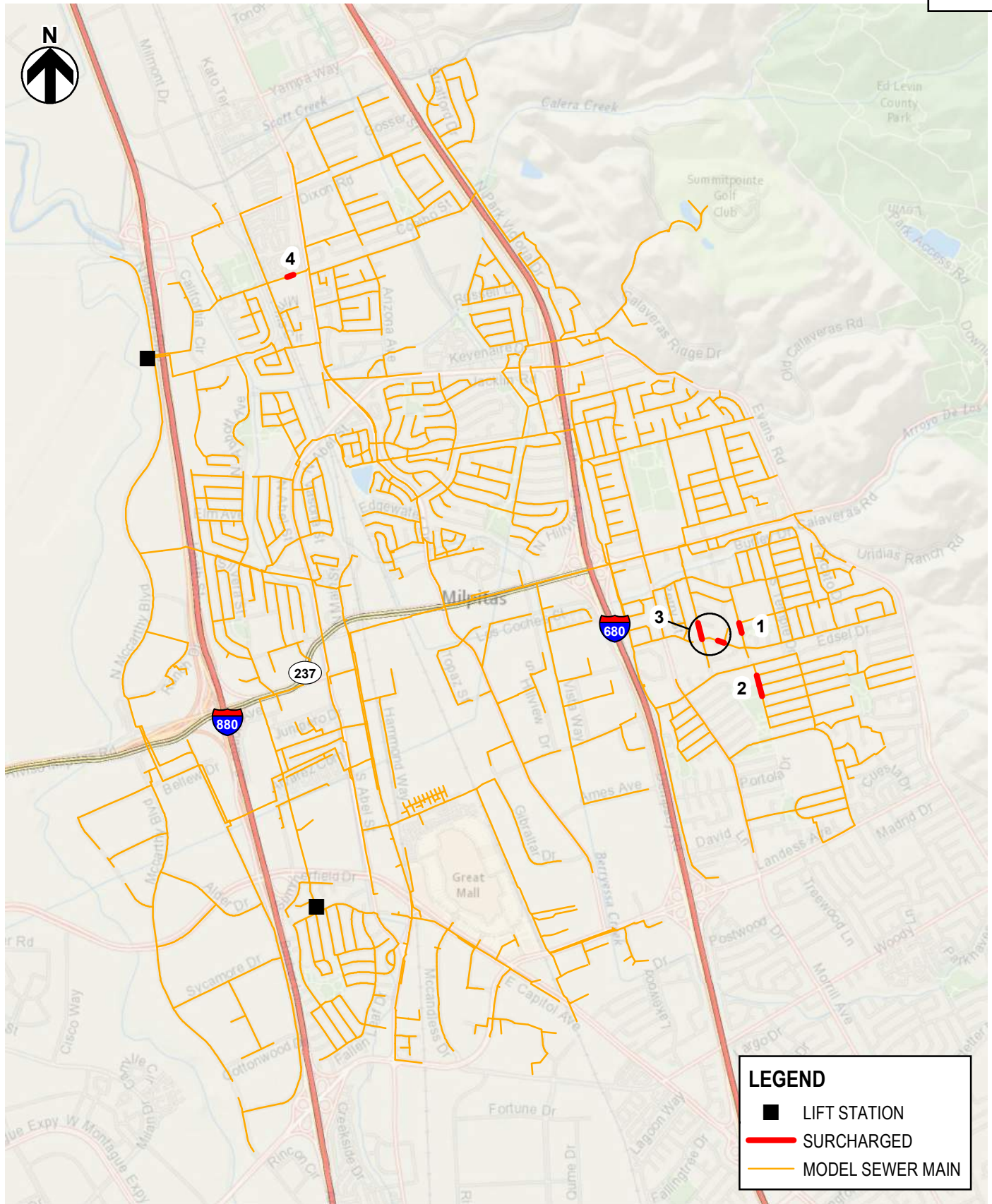


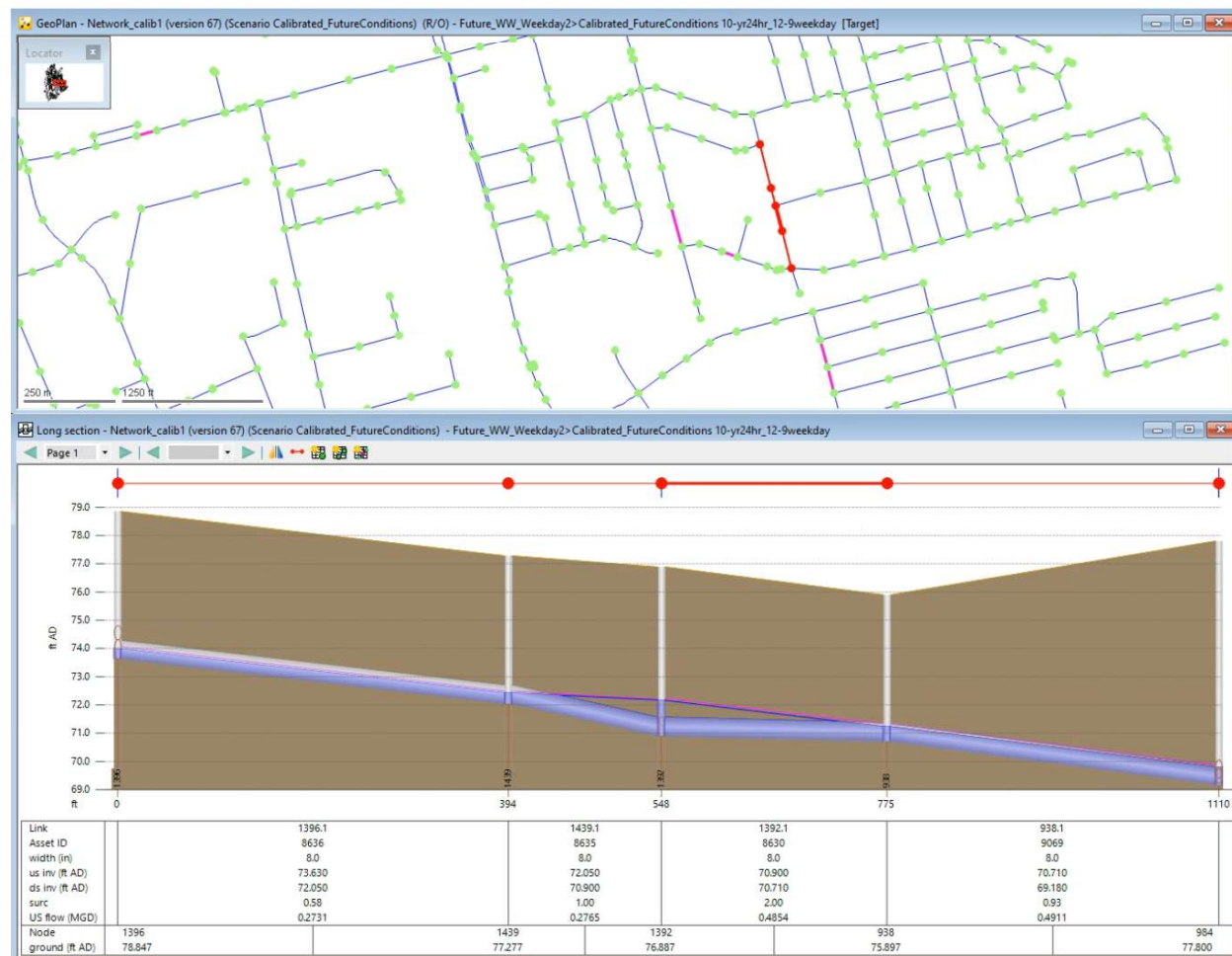
FIGURE 8-2
CITY OF MILPITAS
SEWER MASTER PLAN
SURCHARGED PIPELINE SEGMENTS

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.


```

graph TD
    Start([Start]) --> HasCCTVData{[Has CCTV Data]}
    HasCCTVData -- No --> RiskMedium{[Risk] >= (Medium)}
    RiskMedium -- Yes --> CCTV[CCTV]
    RiskMedium -- No --> GravityMainDiameter{[Gravity/Main Diameter] >= (24)}
    GravityMainDiameter -- Yes --> CCTV
    GravityMainDiameter -- No --> NoAction1[No Action]

    HasCCTVData -- Yes --> StructuralPeakScore{[Structural Peak Score] >= (4)}
    StructuralPeakScore -- Yes --> NumRehabilitations1{[Number of Rehabilitations] ["RehabMethod" = "POINT REPAIR"] > (0)}
    NumRehabilitations1 -- Yes --> Replace1[Replace]
    NumRehabilitations1 -- No --> PeakScore{[Peak Score] >= (4)}
    PeakScore -- Yes --> NumRehabilitations2{[Number of Rehabilitations] ["RehabMethod" = "POINT REPAIR"] > (4)}
    NumRehabilitations2 -- Yes --> Replace1
    NumRehabilitations2 -- No --> CountDefects1{[Count of Defects] ["Def_Code" IN ("JOM", "JAM", "JOMD", "JSM")] > (1)}
    CountDefects1 -- Yes --> TotalDefectLength1{[Total Defect Length] ["Score" >= 4 AND ("Reh_Method" IN ("POINT REPAIR", "LINING"))] > (50% of [GravityMain.PipeLength])}
    TotalDefectLength1 -- Yes --> NumRehabilitations3{[Number of Rehabilitations] ["RehabMethod" = "POINT REPAIR"] > (0)}
    NumRehabilitations3 -- Yes --> NumRehabilitations4{[Number of Rehabilitations] ["RehabMethod" = "POINT REPAIR"] > (4)}
    NumRehabilitations4 -- Yes --> Replace1
    NumRehabilitations4 -- No --> TotalDefectLength2{[Total Defect Length] ["Score" >= 3 AND ("Reh_Method" IN ("POINT REPAIR", "LINING"))] > (50% of [GravityMain.PipeLength])}
    TotalDefectLength2 -- Yes --> NumRehabilitations5{[Number of Rehabilitations] ["RehabMethod" = "POINT REPAIR"] > (0)}
    NumRehabilitations5 -- Yes --> Replace1
    NumRehabilitations5 -- No --> LengthMajorDefects{[Length of Major Defects] = (0)}
    LengthMajorDefects -- Yes --> NoAction2[No Action]
    LengthMajorDefects -- No --> NumRehabilitations6{[Number of Rehabilitations] ["RehabMethod" = "LINING"] > (0)}
    NumRehabilitations6 -- Yes --> NoAction2
    NumRehabilitations6 -- No --> NoAction3[No Action]

    CountDefects1 -- No --> CountDefects2{[Count of Defects] ["Def_Code" IN ("B", "BSV", "BVV") OR ("Def_Code" LIKE "O%" AND "Score" >= 4) OR ("Def_Code" LIKE "J%" AND "Score" >= 4) OR "Def_Code" IN ("DR", "DT")] > (1)}
    CountDefects2 -- Yes --> CountDefects3{[Count of Defects] ["Def_Code" = "ID"] > (0)}
    CountDefects3 -- Yes --> CountDefects4{[Count of Defects] ["Def_Code" = "ID"] > (1)}
    CountDefects4 -- Yes --> CountDefects5{[Count of Defects] ["Def_Code" IN ("SZC", "SMWC", "SSSC", "SAVC", "SCP", "SZZ", "SSSM", "SZM", "SRVC", "SAV", "SRI", "SSS", "SSSZ")] > (0)}
    CountDefects5 -- Yes --> CountDefects6{[Count of Defects in 100 unit length] ["Def_Code" IN ("RBC", "RB", "RBL", "RBM", "RTC", "RTJ", "RTL", "RTM", "RB") AND "OMScore" >= 4] > (5)}
    CountDefects6 -- Yes --> FullCIPP1[Full CIPP]
    CountDefects6 -- No --> NoAction4[No Action]
    CountDefects3 -- No --> CountDefects5
    CountDefects2 -- No --> NoAction4

    NumRehabilitations3 -- No --> LengthMajorDefects
    NumRehabilitations5 -- No --> LengthMajorDefects
    NumRehabilitations6 -- No --> NumRehabilitations7{[Number of Rehabilitations] ["RehabMethod" = "LINING"] > (0)}
    NumRehabilitations7 -- Yes --> NoAction3
    NumRehabilitations7 -- No --> NoAction3

    NumRehabilitations4 -- No --> TotalDefectLength3{[Total Length of Rehabilitations] ["RehabMethod" = "LINING"] > (50% of [GravityMain.PipeLength])}
    TotalDefectLength3 -- Yes --> PointRepairFullLiningCost{[Point Repair - Full Lining Cost] < (80% of [Full Lining Cost])}
    PointRepairFullLiningCost -- Yes --> FullCIPP2[Full CIPP+Point Repair Exc(s)]
    PointRepairFullLiningCost -- No --> PointRepairPartialLiningCost{[Point Repair - Partial Lining Cost] < (80% of [Replacement Cost])}
    PointRepairPartialLiningCost -- Yes --> SecLiner{[Sec Liner(s)+Point Repair Exc(s)]}
    PointRepairPartialLiningCost -- No --> Replace2[Replace]

    TotalDefectLength3 -- No --> Replace2
    TotalDefectLength3 -- Yes --> PointRepairFullLiningCost

    NumRehabilitations6 -- No --> TotalLengthRehabilitations{[Total Length of Rehabilitations] ["RehabMethod" = "LINING"] > (50% of [GravityMain.PipeLength])}
    TotalLengthRehabilitations -- Yes --> PartialLiningCost{[Partial Lining Cost] < (80% of [Full Lining Cost])}
    PartialLiningCost -- Yes --> SectionalLiner{[Sectional Liner(s)]}
    PartialLiningCost -- No --> FullCIPP3[Full CIPP]
    TotalLengthRehabilitations -- No --> FullCIPP3

    NumRehabilitations7 -- No --> TotalLengthRehabilitations
    NumRehabilitations7 -- Yes --> SectionalLiner
  
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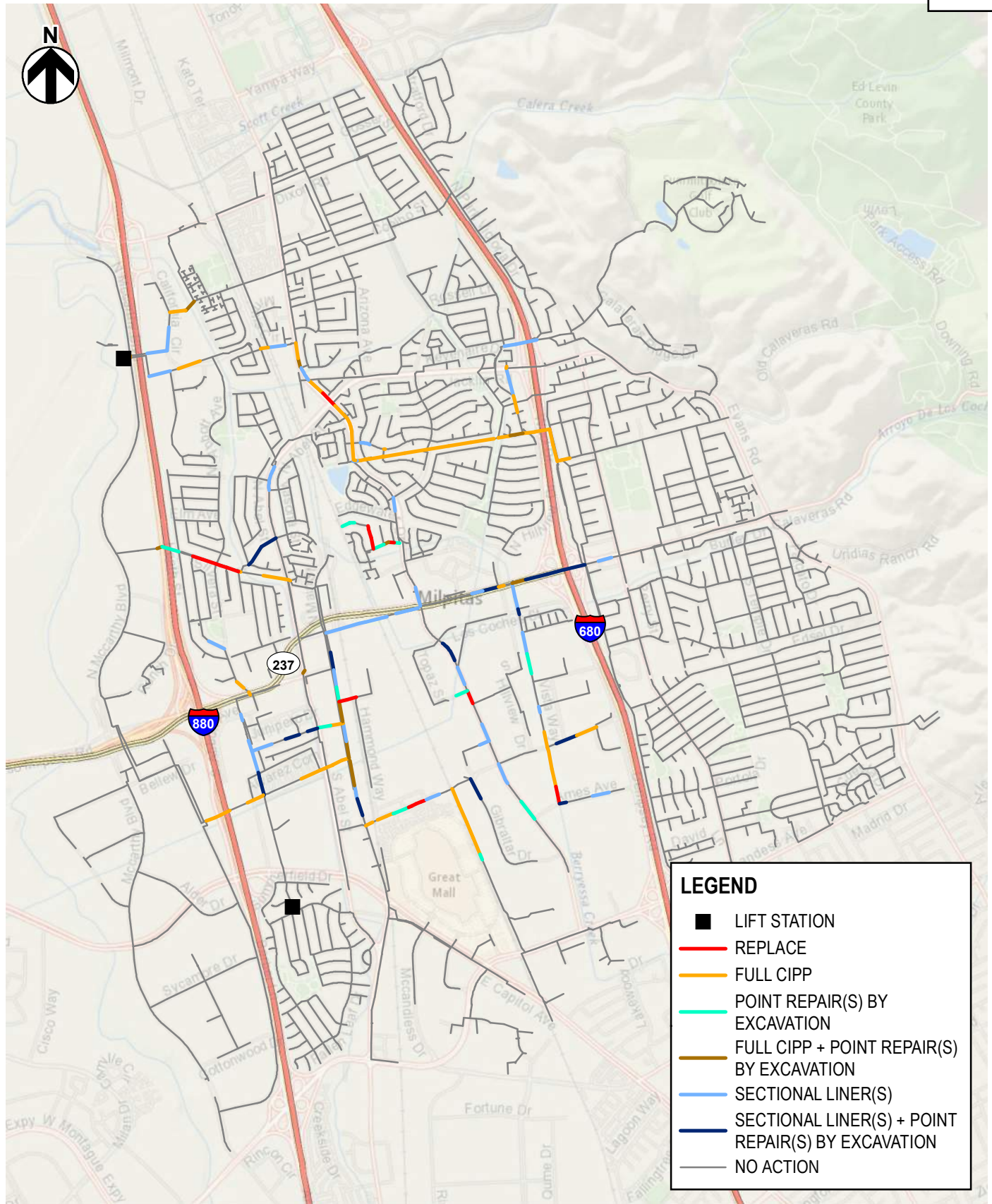



FIGURE 9-2
CITY OF MILPITAS
SEWER MASTER PLAN
RECOMMENDED REHABILITATION METHOD

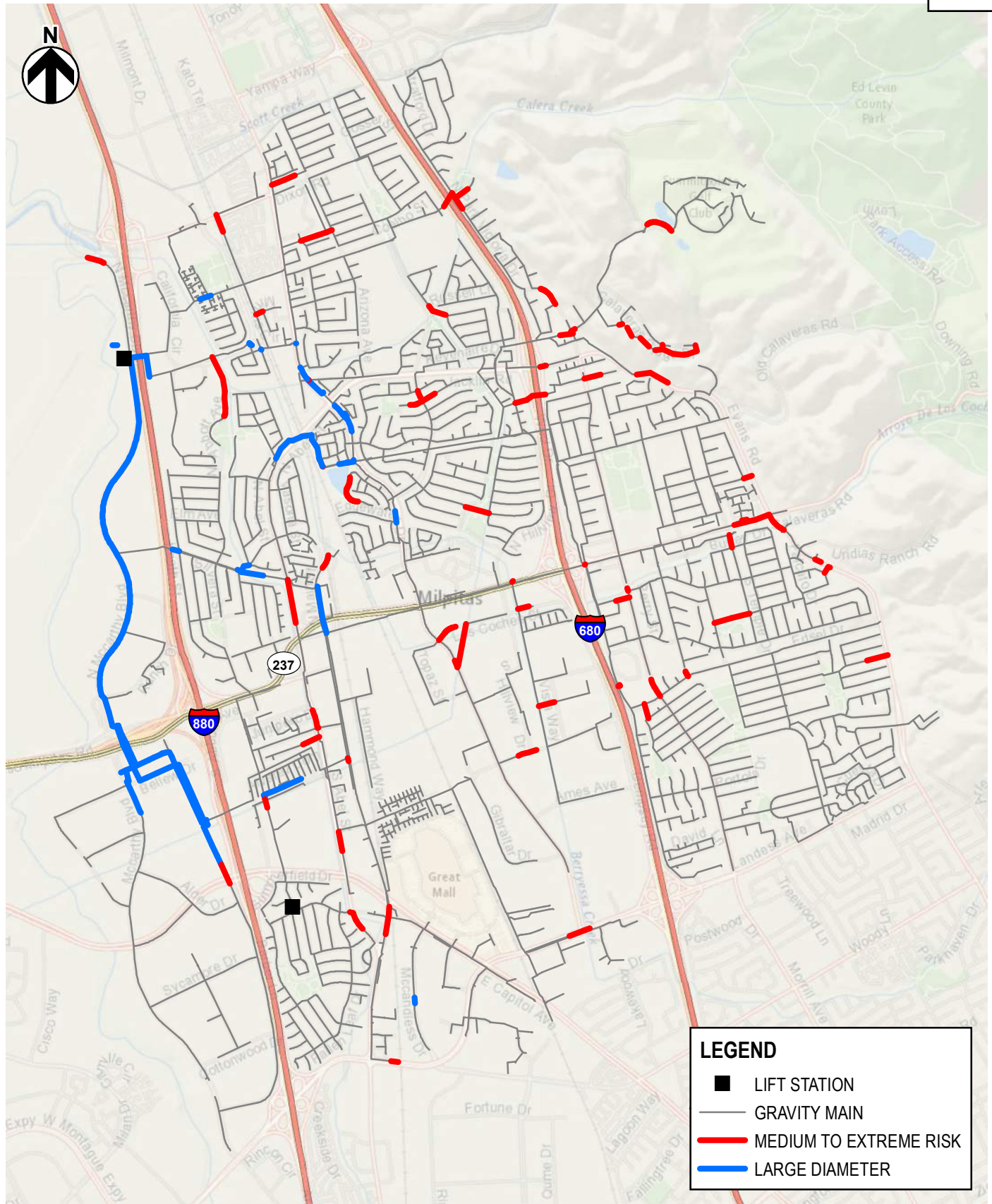


FIGURE 9-3
CITY OF MILPITAS
SEWER MASTER PLAN
RECOMMENDED CCTV PRIORITY

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 Costs

Pipeline construction costs were developed in coordination with the City according to the City's cost criteria.

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 9-3 provides a summary of the parameters used for estimating the soft costs. Soft costs were applied to all projects.

Table 9-3: 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)	\$61,000
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	\$103,000
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)	\$131,000
4.0	N Hillview Dr	12	218	VCP	Sectional Liner(s)	\$44,000
4.0	S Main St	18, 21	733	VCP	Sectional Liner(s), Point Repair(s)	\$147,000
4.0	Sinnot Ln	12	398	VCP	Full CIPP, Point Repair(s)	\$139,000
Construction Subtotal						\$936,000
Construction Contingency					30%	\$281,000
Engineering Design and Consulting Services					15%	\$140,000
Permitting and Right of Way (ROW)					7%	\$66,000
ESDC, Construction Management, & Inspection Services					12%	\$112,000
Total Year 1 Project Costs						\$1,536,000

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)	\$1,168,000
3.2	Coming Ave ¹	8	1,374	VCP	Full CIPP	\$358,000
Construction Subtotal						\$4,311,000
Contingency					30%	\$1,293,000
Engineering Design and Consulting Services					15%	\$647,000
Permitting and Right of Way (ROW)					7%	\$302,000
ESDC, Construction Management, & Inspection Services					12%	\$517,000
Total Year 2-5 Project Costs						\$7,070,000

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)	\$576,000
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						\$4,066,000
Contingency					30%	\$1,220,000
Engineering Design and Consulting Services					15%	\$610,000
Permitting and Right of Way (ROW)					7%	\$285,000
ESDC, Construction Management, & Inspection Services					12%	\$488,000
Total Year 6-10 Project Costs						\$6,669,000

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)	\$107,000
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)	\$100,000
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)	\$339,000
3.0	Fwy Crossing near Fox Hollow Ct	12	748	VCP	Sectional Liner(s)	\$150,000
3.0	Smithwood St	15	388	VCP	Sectional Liner(s)	\$78,000
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)	\$194,000
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)	\$369,000
2.3	N Hillview Dr	12	833	VCP, DIP	Full CIPP, Sectional Liner(s)	\$208,000
Construction Subtotal						\$5,090,000
Contingency					30%	\$1,527,000
Engineering Design and Consulting Services					15%	\$764,000
Permitting and Right of Way (ROW)					7%	\$356,000
ESDC, Construction Management, & Inspection Services					12%	\$611,000
Total Year 11-15 Project Costs						\$8,348,000

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)	\$179,000
2.0	Turquoise St	10	275	VCP	Point Repair(s)	\$55,000
2.0	Tramway Dr	12	220	VCP	Sectional Liner(s)	\$44,000
1.0	Connection b/w S Milpitas Blvd and Gibraltar Ct	12	231	VCP	Sectional Liner(s)	\$46,000
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)	\$161,000
1.0	Wool Dr	24	368	RCP	Full CIPP	\$169,000
Construction Subtotal						\$1,008,000
Contingency					30%	\$302,000
Engineering Design and Consulting Services					15%	\$151,000
Permitting and Right of Way (ROW)					7%	\$71,000
ESDC, Construction Management, & Inspection Services					12%	\$121,000
Total Year 16-20 Project Costs						\$1,653,000

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.

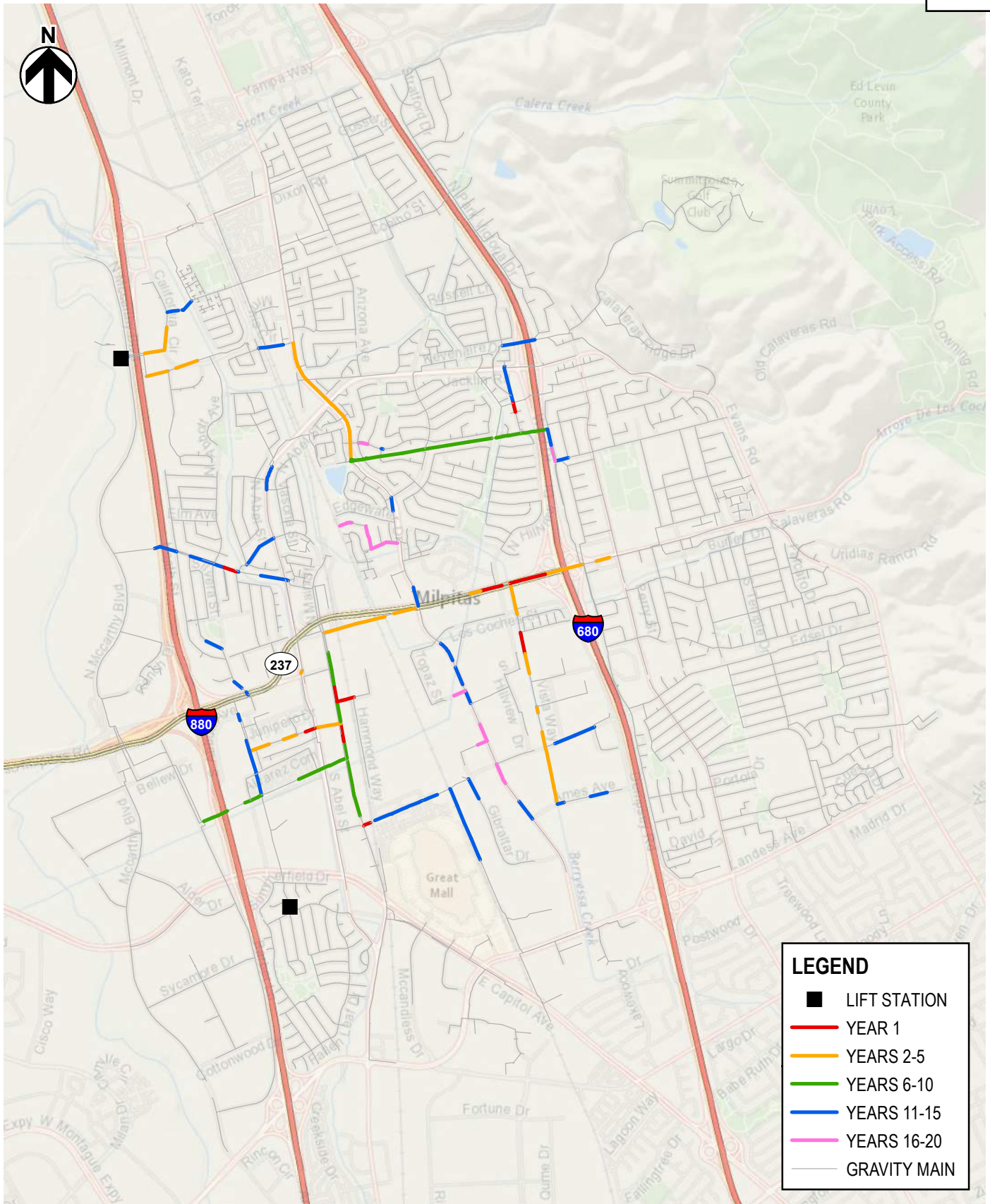


FIGURE 10-1
CITY OF MILPITAS
SEWER MASTER PLAN
CAPITAL IMPROVEMENT PROJECTS

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	\$1,536,000	--	--	--
Medium- to High- Priority Improvements	\$7,070,000	\$6,669,000	--	--
Low Priority Improvements	--	--	\$8,348,000	\$1,653,000
Allocation for improvements identified from ongoing CCTV	\$1,250,000	\$1,250,000	\$1,250,000	\$1,250,000
Total Proposed Projects	\$10,256,000	\$7,919,000	\$9,598,000	\$2,903,000
Existing and Proposed Projects	\$11,454,000	\$7,919,000	\$9,598,000	\$2,903,000

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.
3. It is noted that costs were reviewed and updated during 2022 to reflect recent cost increases associated with sewer infrastructure projects.

After the projects above were developed, the City contracted with the financial consulting firm Raftelis to develop fiscal impact models and to assess the financial feasibility of the Master Plan projects, beginning FY 2024 through FY 2040. The financial models are intended to evaluate the sewer utility fund revenues and expenses and analyze the impacts of the Master Plan projects on City funds. The Wastewater Financial Plan Options Report is attached as **Appendix G**.

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 H**.

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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Final Report

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Prepared for: HydroScience Engineers and City of Milpitas

Project Title: Milpitas Sewer Master Plan

Project No.: 154251

Final Report

Subject: Sewer Utility Asset Renewal and Replacement Study

Date: November 23, 2020

From: Brown and Caldwell

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Approved by: Manjit Saini, PE, C-61948, Exp 09-30-21

Limitations:

This document was prepared solely for HydroScience Engineers/City of Milpitas in accordance with professional standards at the time the services were performed and in accordance with the contract between HydroScience Engineers/City of Milpitas and Brown and Caldwell dated October 16, 2019. This document is governed by the specific scope of work authorized by HydroScience Engineers/City of Milpitas; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by HydroScience Engineers/City of Milpitas and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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Executive Summary

As a part of the City of Milpitas' (City) Sewer Master Plan, Brown and Caldwell (BC) has been retained to develop a Sewer Utility Asset Renewal and Replacement (R&R) Study. The intent of the R&R Study is to provide the City with priorities for upcoming asset renewal and replacement projects given a fixed yearly budget.

Closed-circuit television (CCTV) was utilized to visually assess the sewer's condition. Resulting CCTV review was summarized and cataloged according to National Association of Sewer Service Company's (NASSCO) Pipeline Assessment and Certification Program (PACP) structural and operations and maintenance (O&M) grades in Section 2. Additionally, a desktop condition assessment was performed for all pipe segments using likelihood of failure (LOF) and consequence of failure (COF) criteria described in Section 3. This collective analysis revealed that of the approximately 105,000 linear feet (LF) (449 sewer segments) of sewer gravity pipeline inspected, approximately 50,000 LF (178 sewer segments) require system improvements totaling approximately \$17 million of construction costs. Of the remaining 685,000 LF segments with no inspection data, desktop risk assessment determined that 55,000 LF of medium to extreme risk pipes and/or large diameter pipes (24-inch diameter pipe or larger) require CCTV or sonar inspection totaling approximately \$400,000. System improvements and CCTV inspection recommendations total to \$17.4 million. These proposed improvements are illustrated on Figure ES-1.

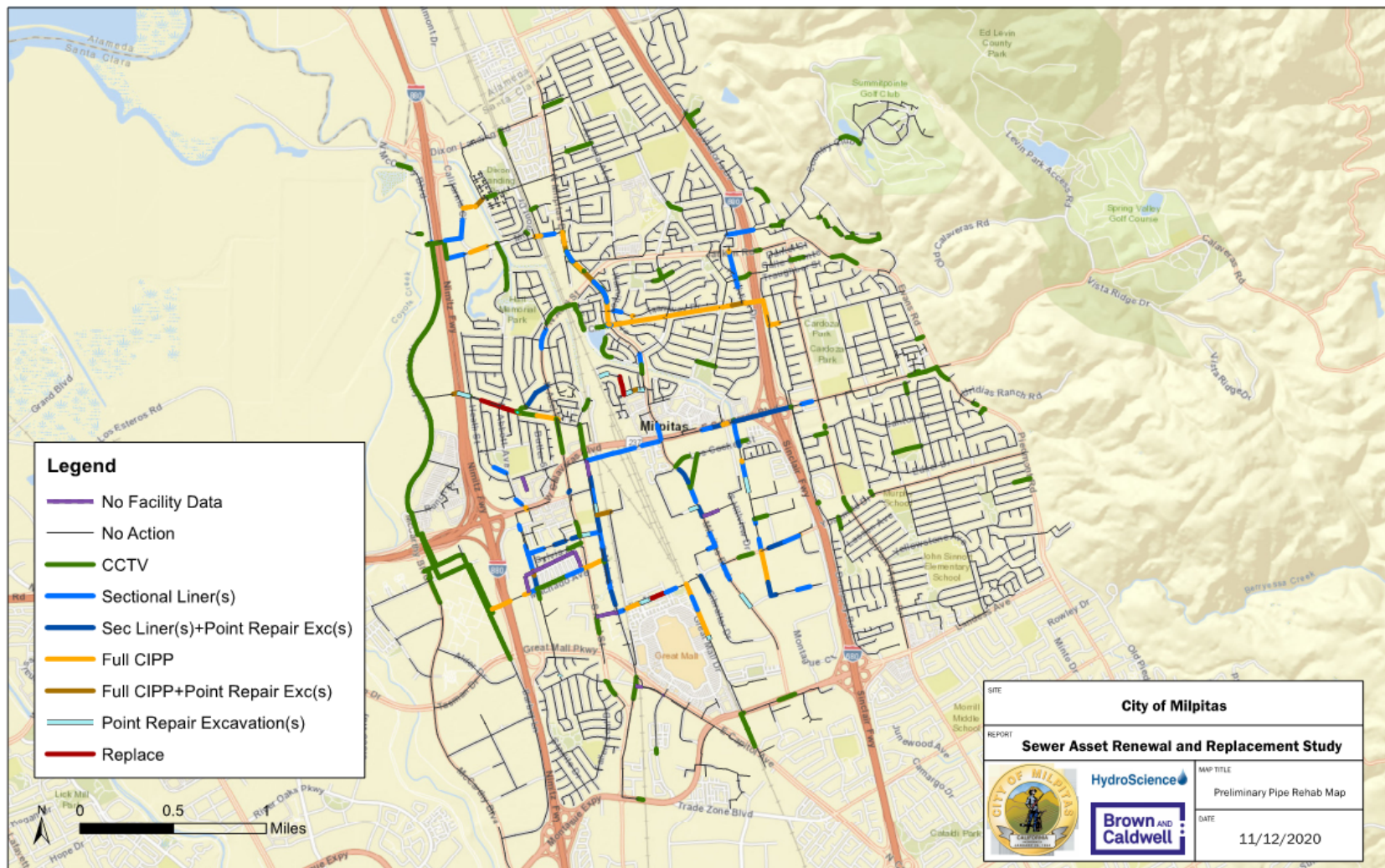


Figure ES-1: Preliminary Pipe Rehabilitation Recommendations Map

Table ES-1 presents a summary of the overall CCTV and rehabilitation recommendations with associated Association for the Advancement of Cost Engineering (AACE) Class 5 cost estimate. Note that the presented costs are budgetary construction costs and do not include engineering, permitting, legal, administrative, or other planning costs typical of budgetary capital improvement planning.

Table ES-1. Detailed Rehabilitation Recommendations for Sewer Improvement	
Rehabilitation Action	Construction Cost
CCTV	\$400,000
Full Cured-In-Place Pipe (CIPP)	\$8,900,000
Full CIPP+Point Repair Exc(s)	\$1,400,000
No Action	\$0
Point Repair Excavation(s)	\$300,000
Pipe Replacement ¹	\$2,400,000
Sec Liner(s)+Point Repair Exc(s)	\$1,400,000
Sectional Liner(s)	\$2,600,000
Total Construction Cost² (Class 5 Estimate)	\$17,400,000

¹Loaded 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.

²Contingencies amounting to 45% are included in the estimate (5% Mobilization/Demobilization, 10% Sewer Bypassing, 30% Construction Cost and Market Contingency). Additionally, traffic control during construction amounting to \$10,000 to \$30,000 depending on roadway traffic rating was also assumed. Administrative, engineering, or other planning costs typical of CIP planning are not included.

These rehabilitation recommendations are divided into capital improvement program (CIP) phases below in Table ES-2 in correspondence with the City's \$2,000,000 annual rehabilitation budget when feasible. Although years 2 and 3 propose rehabilitations exceeding the budget, crucial rehabilitation of extreme and select high risk pipes help to minimize costly pipe failures. In addition, years 4 through 8 feature a rehabilitation plan requiring less budget to offset the previous expenditures.

Table ES-2. Preliminary Sewer Pipeline Capital Improvement Plan			
Year	Description	Construction Cost¹	Construction Cost Per Year
1	Rehabilitate Extreme and High Risk Pipes with Significant Defects	\$1,300,000	\$3,000,000
	CCTV Large Diameter and Medium to Extreme Risk Pipes	\$400,000	
1-3	Rehabilitate Extreme Risk Pipes and Pipes Along the Same Street Requiring Rehabilitation	\$7,400,000	
4	Rehabilitate High Risk Pipes and Pipes Along the Same Street	\$1,900,000	-
5-7	Rehabilitate Medium Risk Pipes and Pipes Along the Same Street	\$5,400,000	\$1,800,000
8	Rehabilitate Low Risk Streets	\$1,000,000	-

¹Assets are rated from 1 (negligible) to 5 (extreme) based on available survey data and desktop condition assessment results.

²Contingencies amounting to 45% are included in the cost estimate (5% Mobilization/Demobilization, 10% Sewer Bypassing, 30% Construction Cost and Market Contingency). Additionally, traffic control during construction amounting to \$10,000 to \$30,000 depending on roadway traffic rating was also assumed. Administrative, engineering, or other planning costs typical of CIP planning are not included.

The CIP phases are described in more detail in Section 4.5. Additionally, the rehabilitation recommendations for each asset is included in graphic information system (GIS) and tabular format in Appendix A. Recommendations are subject to change depending on future discussions with operational staff to determine rehabilitation preferences of the various levels and types of defects. The methodology and rehabilitation selection process is detailed in Section 4.1. The cost assumptions and sources are listed in Section 4.2 and Appendix J; detailed cost estimates are recommended when further CIP budgeting and planning takes place.

Section 1: Introduction

The intent of this Sewer Utility Asset Renewal and Replacement (R&R) Study is to provide the City of Milpitas (City) with priorities for asset renewal and replacement. A part of the evaluation included developing an understanding of the relative risk of failure for the City's sewer gravity pipeline segments by performing a likelihood and consequence of failure analysis. Understanding the relative risk of failure for various sewer pipeline sections is critical to effectively plan sewer capital improvement projects by prioritizing the highest risk projects. Brown and Caldwell (BC) worked closely with City staff and HydroScience Engineers (HSE) to develop an appropriate failure ranking and weighting system to predict risk of failure. In general, overall risk of failure was determined by considering both pipe characteristics (age, material, depth, location, presence of obstructions, etc.) and internal pipe video inspection findings.

1.1 Background

The City of Milpitas is located within the San Francisco Bay Area, north of San Jose, California. All wastewater produced in the City is treated at the San Jose–Santa Clara Regional Wastewater Facility (RWF), the largest advanced wastewater treatment facility in the western United States. The City's sewer system serves over 77,000 customers and consists of 0.95 million linear feet (LF) of underground pipeline, including 26,400 LF of force main pipeline (Milpitas Wastewater Fact Sheet, Water and Sewer System Information). Wastewater is conveyed to RWF through two large pump stations, the Venus station and the Main Sewer pump station (Milpitas Wastewater Fact Sheet). A map of RWF's tributary agencies, provided by the City of San Jose, can be found in Figure 1-1 (City of San Jose). Recycled water, which is produced at RWF, is returned to the City for use in non-drinking water applications, such as irrigation of golf courses and agricultural land. Recycled water pipelines, shown as purple pipes in Figure 1-1, are not included in this analysis.

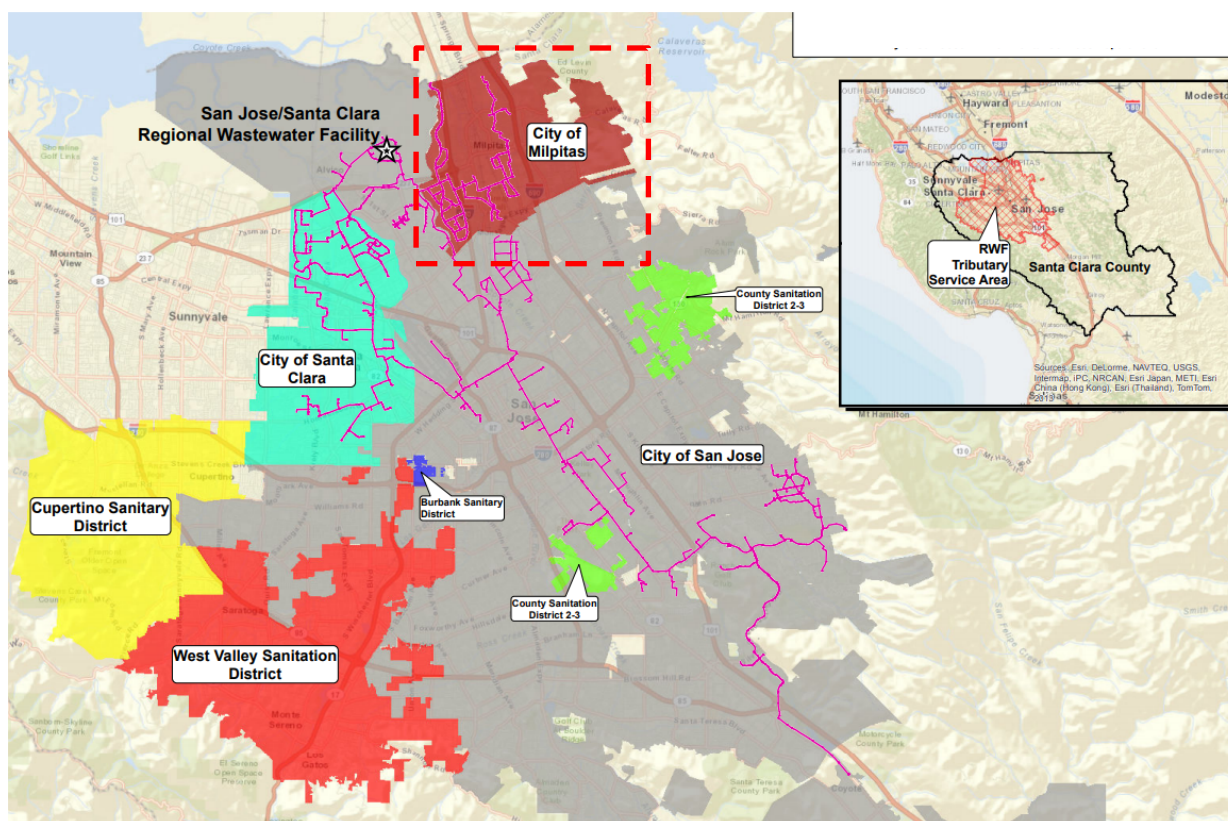


Figure 1-1: San Jose-Santa Clara Regional Wastewater Facility Tributary Service Area

1.2 Objectives

The objective of the Sewer Utility Asset R&R Study is to provide the City with applicable sewer condition and risk information to support prioritization of asset renewal and replacement. Core values and priority areas, established by City Council, guide the evaluation of risk and consequence in order to meet the City's mission and performance levels.

Objectives associated with this report are presented below.



Section 2: Inspection Condition Assessment

Understanding the internal pipe condition (presence of structural and operational & maintenance (O&M) defects) is critical to understanding asset condition and likelihood of failure. Closed-circuit television (CCTV) inspection was utilized to assess the internal condition of the key pipeline segments. Key pipeline segments were defined as follows:

- Diameters greater than 8 inches
- Located within traffic impacted areas
- Located within commercial/industrial areas.

Due to budget limitations, the CCTV efforts were divided between a subcontractor, National Plant Services, Inc (NPS), and the City. NPS completed their portion of CCTV inspections between March and May of 2020. The City was unable to complete its portion of the CCTV inspection due to Coronavirus restrictions, therefore that portion of the information was not available for this analysis. Approximately 105,000 LF of CCTV inspection data was collected by NPS.

2.1 Planned Segments and Scope

NPS' work was subdivided into six planned inspection contracts shown in Table 2-1. Figure 2-1 details the division of the contracts, as well as the sewer segments scheduled to be inspected by the City. The detailed planned CCTV inspection scope can be found in Appendix B.

Table 2-1. CCTV Inspection Scope					
Inspection Responsibility	Inspection Contract	Pipe Material	Pipe Diameter	Number of Segments	Total Length
NPS	Contract Trunk 1	RCP	33-inch, 36-inch, 39-inch, 42-inch, 54-inch and 66-inch	37	8,830 LF
	Contract Trunk 2	RCP and VCP	27-inch and 33-inch	24	5,760 LF
	Contract Trunk 3	RCP and VCP	24-inch and 30-inch	15	4,850 LF
	Contract 16-24 Inch	Mostly VCP	16-inch, 18-inch, 21-inch and 24-inch	62	16,610 LF
	Contract 10-15 Inch	Mostly VCP	10-inch, 12-inch and 15-inch	119	34,930 LF
	Contract 8-Inch	Mostly VCP	8-inch	184	51,350 LF
	Subcontractor Total			441	122,330 LF
City	N/A	VCP	Primarily 6-inch and 8-inch	389	98,750 LF

*RCP = reinforced concrete pipe

*VCP = vitrified clay pipe

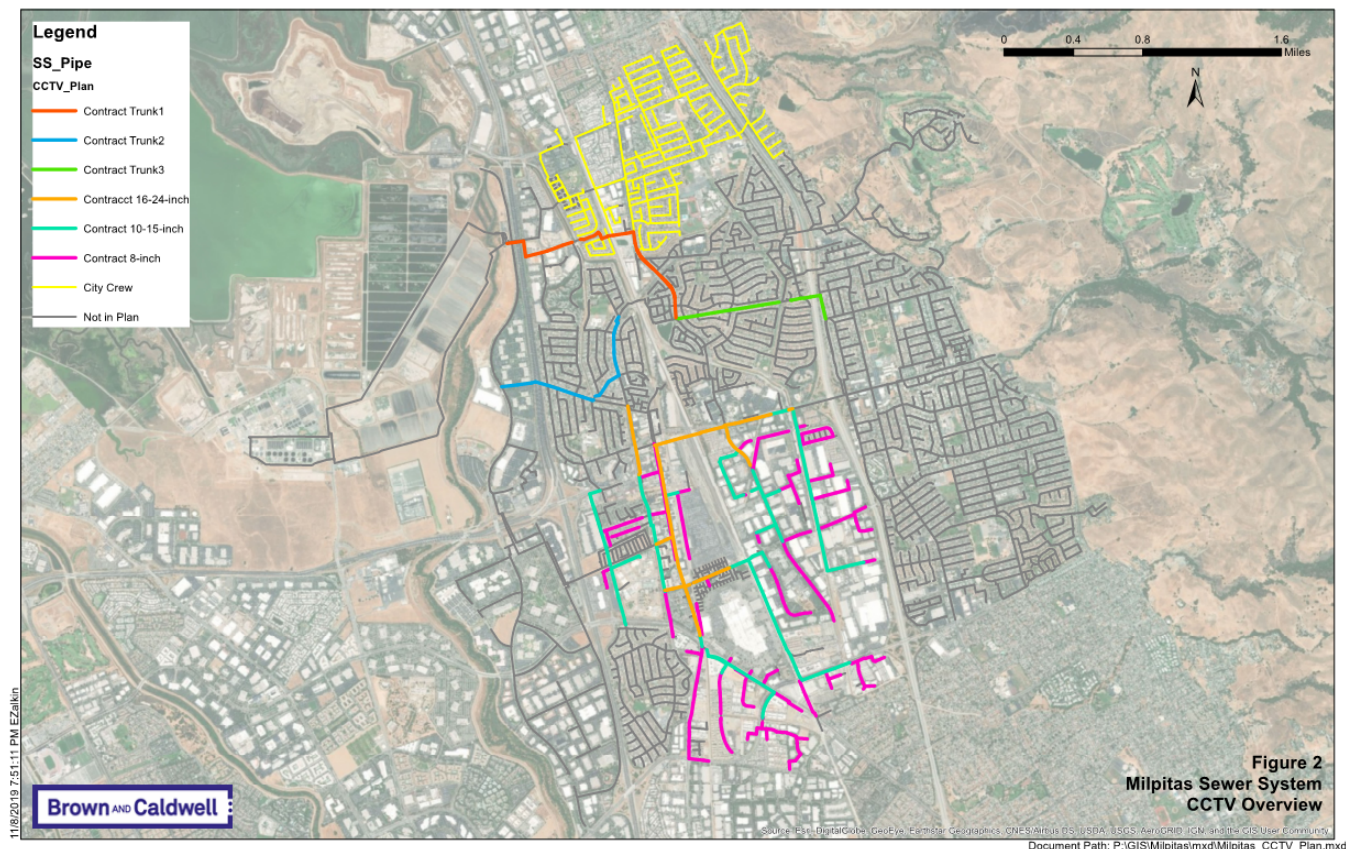


Figure 2-1: CCTV Inspection Map by Contract

In addition to CCTV, a two-dimensional laser and sonar inspection was to be performed as part of Contract Trunk 1. Due to scheduling conflicts, this work was not completed.

2.2 Inspection Results (NPS)

NPS successfully inspected 105,221 LF of their contracted 122,330 LF of sewer pipeline. NPS reported that pipes were unable to be completely inspected for multiple reasons, including presence of siphons (requiring extra equipment), root balls, grease, rocks, and other debris preventing complete inspection. The inspected segments are shown in green on Figure 2-2.

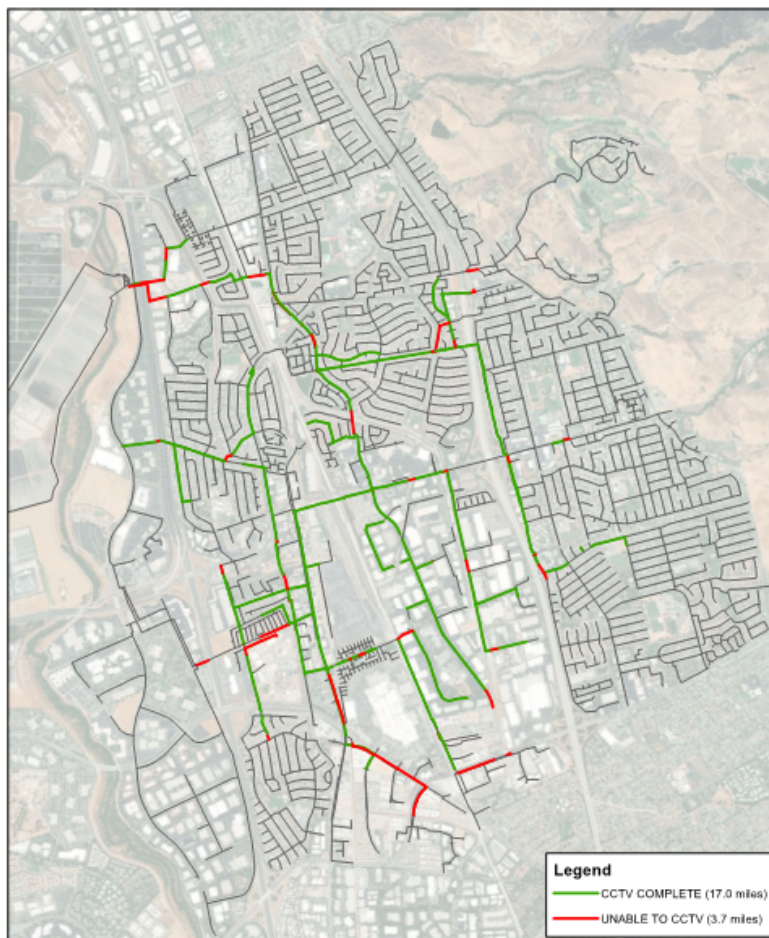


FIGURE 2
CITY OF MILPITAS SEWER SYSTEM
PIPELINES RECEIVING CCTV
MAY 28, 2020



Figure 2-2: NPS Completed CCTV Inspection

Details of the NPS CCTV inspection performed by pipe diameter are presented in Table 2-2.

Table 2-2. NPS CCTV Inspection Results	
Pipe Diameter	Distance of Inspection Performed
6-Inch	N/A
8-Inch	8,211 LF
10-Inch	3,540 LF
12-Inch	19,003 LF
15-Inch	25,552 LF
16-Inch	195 LF
18-Inch	15,292 LF
21-Inch	10,268 LF

Table 2-2. NPS CCTV Inspection Results	
Pipe Diameter	Distance of Inspection Performed
24-Inch	1,995 LF
27-Inch	5,337 LF
30-Inch	7,393 LF
33-Inch	574 LF
36-Inch	0 LF
39-Inch	2,487 LF
42-Inch	2,547 LF
48-Inch	0 LF
54-Inch	0 LF
66-Inch	1,037 LF
Size Unknown	1,788 LF
Total Pipe Inspected	105,221 LF

2.2.1 Defect Coding

The National Association of Sewer Service Company's (NASSCO) Pipeline Assessment Certification Program (PACP) was utilized to assess sewer pipeline condition and identify defects. All pipeline segments were coded by NPS staff who had been PACP-certified. Additionally, approximately 20 percent of the pipe (89 out of 449 pipe segments) CCTV and PACP reports were reviewed by PACP-certified BC personnel, as part of BC's quality control (QC) process. BC noted minor issues with the condition assessment data collection or data review and forwarded summary of this review to HSE. Further details regarding the QC process can be found in Section 2.3.

The condition assessment of pipelines consists of:

- Identifying defects along each pipeline segment through visual inspection
- Assigning individual grades to each defect based on the type and severity
- Developing an overall Condition Grade for each pipeline segment by assessing type and number of defects along the pipeline segment
- Assigning a final Condition Rating to each pipeline segment based on the condition grades and the potential for further deterioration and/or failure

Under PACP, defects are categorized as either structural or O&M related. Structural defects are those that directly impair the structural condition of the pipeline, such as joint separation, joint deflections, cracks, fractures, broken and collapsed pipe or wall, corrosion, worn inverts, and sag conditions. Structural defects are those that are typically addressed through repairs, rehabilitation, or replacement. O&M defects include a range of conditions that can either directly affect the performance of the sewer or are indicators of potential future structural defects. O&M conditions include debris, grease, infiltration, intrusions (root or service laterals), and hydraulic problems. O&M defects are typically addressed through maintenance, although some (such as infiltration) may require additional rehabilitation.

In general, PACP grades range from 1 to 5, with 1 being a minor defect grade and 5 being the most significant defect grade. Table 2-3 provides a description of the defect related to the condition grade it receives.

Table 2-3. Structural Condition Grade Implications

Condition Grade	Condition Rating	Defect Description
1	Mild	Minor defects
2		Defects that have not begun to deteriorate
3	Moderate	Moderate defects that will continue to deteriorate
4	Severe	Severe defects that will become Grade 5 defects within the foreseeable future
5		Defects requiring attention soon

When rating the condition of a pipe, three factors best characterize the inspection results.

- **Structural Peak Score** - The highest rated condition grade for structural defects present in a pipe
- **O&M Peak Score** - The highest rated condition grade for O&M defects present in a pipe
- **Peak Score** - The greater of structural peak score and O&M peak score

Table 2-4 presents the peak structural and O&M scores by pipe diameter.

Table 2-4. Peak Structural and O&M Scores by Pipe Diameter (NPS CCTV)

Pipe Diameter	Structural Peak Score	Total Pipe Length (LF)	O&M Peak Score	Total Pipe Length (LF)	Pipe Diameter, Continued	Structural Peak Score	Total Pipe Length (LF)	O&M Peak Score	Total Pipe Length (LF)
8-Inch	0	514	0	0	27-Inch	0	149	0	40
	1	0	1	340		1	0	1	486
	2	5,177	2	3,541		2	3,010	2	1,167
	3	1,915	3	860		3	1,087	3	1,834
	4	46	4	2,415		4	0	4	1,808
	5	560	5	1,055		5	1,090	5	0
10-Inch	0	117	0	511	30-Inch	0	598	0	1,226
	1	0	1	0		1	24	1	622
	2	1,769	2	2,095		2	4,738	2	3,627
	3	1,654	3	934		3	2,034	3	832
	4	0	4	0		4	0	4	522
	5	0	5	0		5	0	5	564
12-Inch	0	2,047	0	367	33-Inch	0	0	0	0
	1	0	1	347		1	0	1	0
	2	11,782	2	7,766		2	574	2	0
	3	2,956	3	3,339		3	0	3	0
	4	1,692	4	4,262		4	0	4	374
	5	526	5	2,922		5	0	5	201

Table 2-4. Peak Structural and O&M Scores by Pipe Diameter (NPS CCTV)

Pipe Diameter	Structural Peak Score	Total Pipe Length (LF)	O&M Peak Score	Total Pipe Length (LF)	Pipe Diameter, Continued	Structural Peak Score	Total Pipe Length (LF)	O&M Peak Score	Total Pipe Length (LF)
15-Inch	0	2,269	0	800	39-Inch	0	0	0	0
	1	0	1	0		1	0	1	0
	2	11,898	2	11,980		2	1,073	2	0
	3	5,680	3	3,450		3	1,415	3	634
	4	1,409	4	6,909		4	0	4	1,049
	5	4,296	5	2,413		5	0	5	805
16-Inch	0	127	0	0	42-Inch	0	399	0	268
	1	0	1	0		1	0	1	0
	2	0	2	0		2	977	2	0
	3	69	3	0		3	1,171	3	569
	4	0	4	69		4	0	4	1,709
	5	0	5	127		5	0	5	0
18-Inch	0	1,368	0	716	66-Inch	0	609	0	0
	1	66	1	826		1	0	1	0
	2	7,774	2	4,616		2	0	2	917
	3	3,996	3	3,610		3	428	3	120
	4	996	4	3,124		4	0	4	0
	5	1,093	5	2,399		5	0	5	0
21-Inch	0	852	0	0	Unknown Diameter	0	169	0	106
	1	0	1	0		1	0	1	124
	2	7,113	2	6,136		2	1,274	2	672
	3	1,977	3	1,682		3	346	3	7
	4	326	4	1,721		4	0	4	824
	5	0	5	728		5	0	5	55
24-Inch	0	0	0	305	Total	0	9,218	0	4,339
	1	85	1	368		1	175	1	3,113
	2	1,543	2	35		2	58,702	2	42,552
	3	368	3	537		3	25,096	3	18,408
	4	0	4	0		4	4,469	4	24,786
	5	0	5	750		5	7,565	5	12,019

A map of the overall peak score by pipe segment can be found in Figure 2-3. Appendices D and E provide Structural and O&M score maps, respectively.

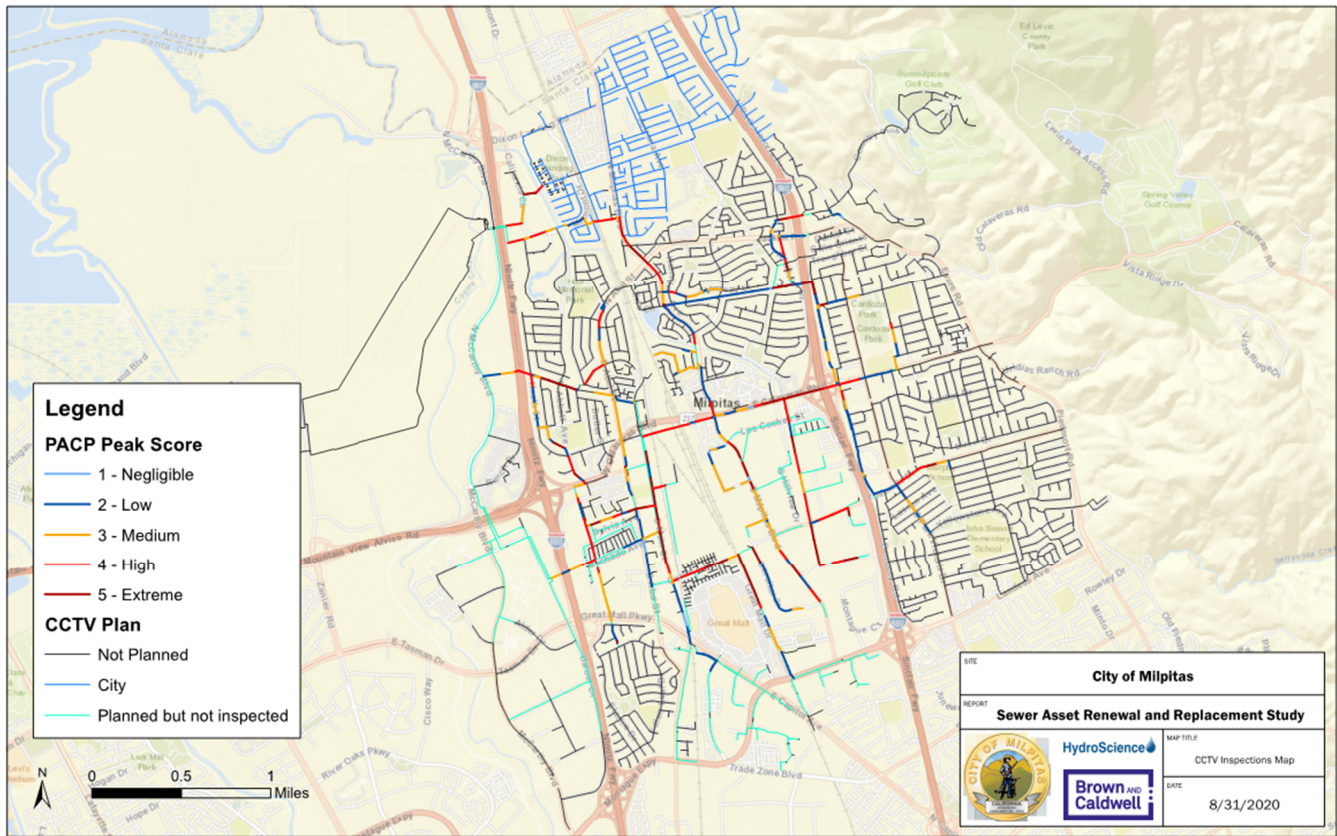


Figure 2-3: Overall PACP Peak Score

2.3 Quality Control Review

Following CCTV inspection, the CCTV database was imported into InfoAsset Manager (IAM) to compare CCTV data to existing geographic information system (GIS) data. After the import, several QC queries were performed to confirm that CCTV data was appropriately matched with existing GIS data. For example, a conflict between CCTV data and GIS data can occur when a new structure is found in the field, or when a structure in the GIS is verified to not to exist on CCTV. Once QC in IAM was completed, the data with updated manhole and pipe connectivity (as confirmed by CCTV) was exported for use in InfoAsset Planner (IAP). Updated GIS data was made available for HSE to update their model and maps.

The QC review of CCTV and PACP reports was performed on approximately 20 percent of the pipe segments. In general, several videos were found to be blurry or unfocused. These were noted in the QC Comment Log, included as Appendix C. Primary QC efforts targeted pipe segments with structural peak grades of four or five because of the high likelihood of these segments requiring repair or improvements. Pipe wall loss due to corrosion, of varying severities, was found throughout the collection system, which is not unexpected in sanitary systems comprised of concrete pipes. Infiltration was observed in some locations, and a few pipe breaks and holes with visible voids were identified. Specific QC comments can be found in the QC Comment Log (Appendix C).

Section 3: Desktop Condition Assessment Task

For all pipe segments, a desktop condition assessment analysis was performed to assess asset risk. The overall risk of pipeline failure is determined by considering both the *likelihood* that an asset is unable to provide the function for which it was installed, as well as the *consequence* or impacts resulting from failure of the asset.

Overall likelihood of failure (LOF) and consequence of failure (COF) scores were determined by considering both **factor ratings** and **factor weightings**. The LOF factor rating predicts how likely an asset is to fail and the consequence factor rating predicts how consequential an asset failure would be. Assigned factor ratings range between one and five, with one being the least likely to fail/least consequential and five being the most likely to fail/most consequential.

The likelihood/consequence factor weighting is an assigned value which reflects the relative importance of a specific factor category compared to other factor categories. Critical factors are assigned greater weighting values than less critical factors.

The following equations provide basis for determining risk scores.

$$\text{Risk} = \text{LOF Score} \times \text{COF Score}$$

$$\text{LOF Score} = \sum (\text{LOF Rating} \times \text{LOF Weighting})$$

$$\text{COF Score} = \sum (\text{COF Rating} \times \text{COF Weighting})$$

3.1 Likelihood of Failure

The LOF analysis predicts the likelihood that an asset is unable to provide the function for which it was installed determined by assigned ratings and weightings. The factors selected for analysis are typical for sewer renewal/replacement projects.

Asset characteristics, asset condition and asset location were all considered during the LOF analysis. In all cases, unknown data was assigned medium risk. Specifically, the following factors were used (data sources included in parentheses):

- **Pipe Age** - In general, as a pipe ages, it has a higher likelihood to fail (pipe age provided by City GIS).
- **Pipe Material** – Different pipe material has different life expectancy and failure modes (pipe material provided by City GIS).
- **Structural Condition, if available** – Known structural defects based on 2020 CCTV survey performed by NPS.
- **Presence of Pipe Obstructions (roots, grease, debris, infiltration, etc.), if available** - Known O&M related defects based on 2020 CCTV survey performed by NPS.
- **Required Pipe Cleaning** – Pipes requiring higher cleaning frequency oftentimes experience problems when not maintained. However, the act of cleaning (with high pressure jets of water at a minimum) can cause premature failure and inadvertently remove the top layer of potentially corroded concrete or metal pipe (cleaning frequency provided by City).

- **Proximity to Landslide Zones** - Landslides can pose a threat to pipe segments which are surface pipelines or buried at a depth of three feet or less (Baum, 2008). This factor also accounts for the impact of smaller seismic events on pipe structural integrity ((Landslide Zone) County of Santa Clara Department of Planning and Development).
- **Proximity to Earthquake Faults** – Pipes located in the Hayward Fault zone are rated higher likelihood to fail. This factor also accounts for the impact of smaller seismic events on pipe structural integrity ((Fault Zone) County of Santa Clara Department of Planning and Development).
- **Local Geology (Liquefaction)** – A liquefaction layer from County GIS provides soil resiliency ratings to seismic events. This factor accounts for the impact of smaller seismic events on pipe structural integrity ((Liquefaction Rating) County of Santa Clara Department of Planning and Development).

Details and scoring basis for each factor are elaborated in Table 3-1.

Table 3-1. LOF Factors and Ratings							
Broad Category	LOF Factor	LOF Rating					Factor Weighting
		1 (Least Likely to Fail)	2	3	4	5 (Most Likely to Fail)	
Asset Characteristics	Age (Installation Year)	Installed after 2000	Installed between 1985 and 1999	Installed between 1970 and 1984 ¹	Installed between 1955 and 1969	Installed 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 greater than 10%) or multiple Grade 4 defects or Grade 4 hinge defect	Multiple Grade 5 defects or one Grade 5 defects (soil/void/collapse deformation greater than 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	-	Requires 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

¹If characteristic is unknown, classify as this rating.

ABS = Acrylonitrile Butadiene Styrene

ACP = Asbestos Cement Pipe

CIP = Cast Iron Pipe

DIP = Ductile Iron Pipe

HDPE = High-Density Polyethylene

PPR = Polypropylene Pipe

PVC = Polyvinyl Chloride

RCP = Reinforced Concrete Pipe

STL = Steel Pipe

VCP = Vitrified Clay Pipe

Figures 3-1 and 3-2 display the LOF Factors in relation with the sewer main pipelines. CCTV inspection data was previously shown in Section 2.2.

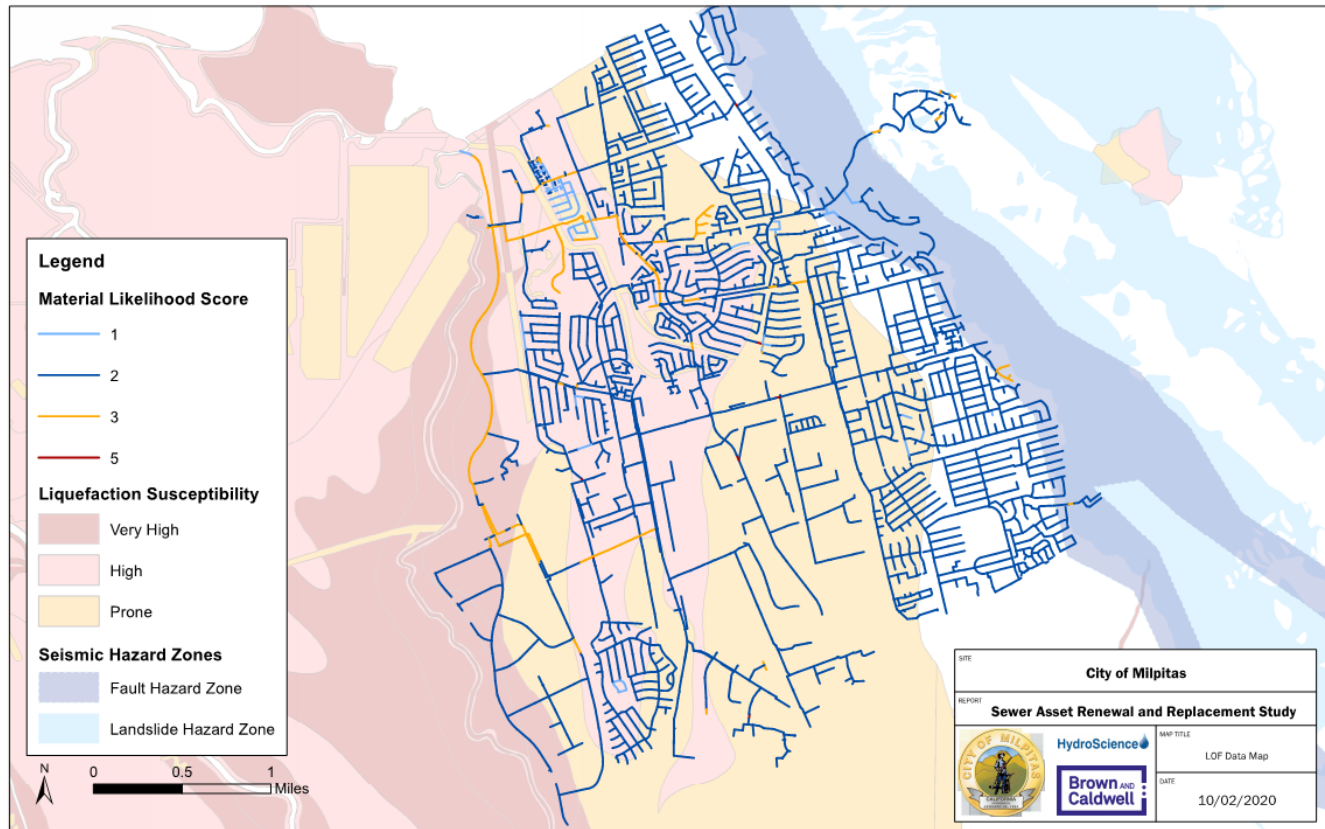


Figure 3-1: LOF Data Map – Material, Liquefaction, Seismic Hazard Zones

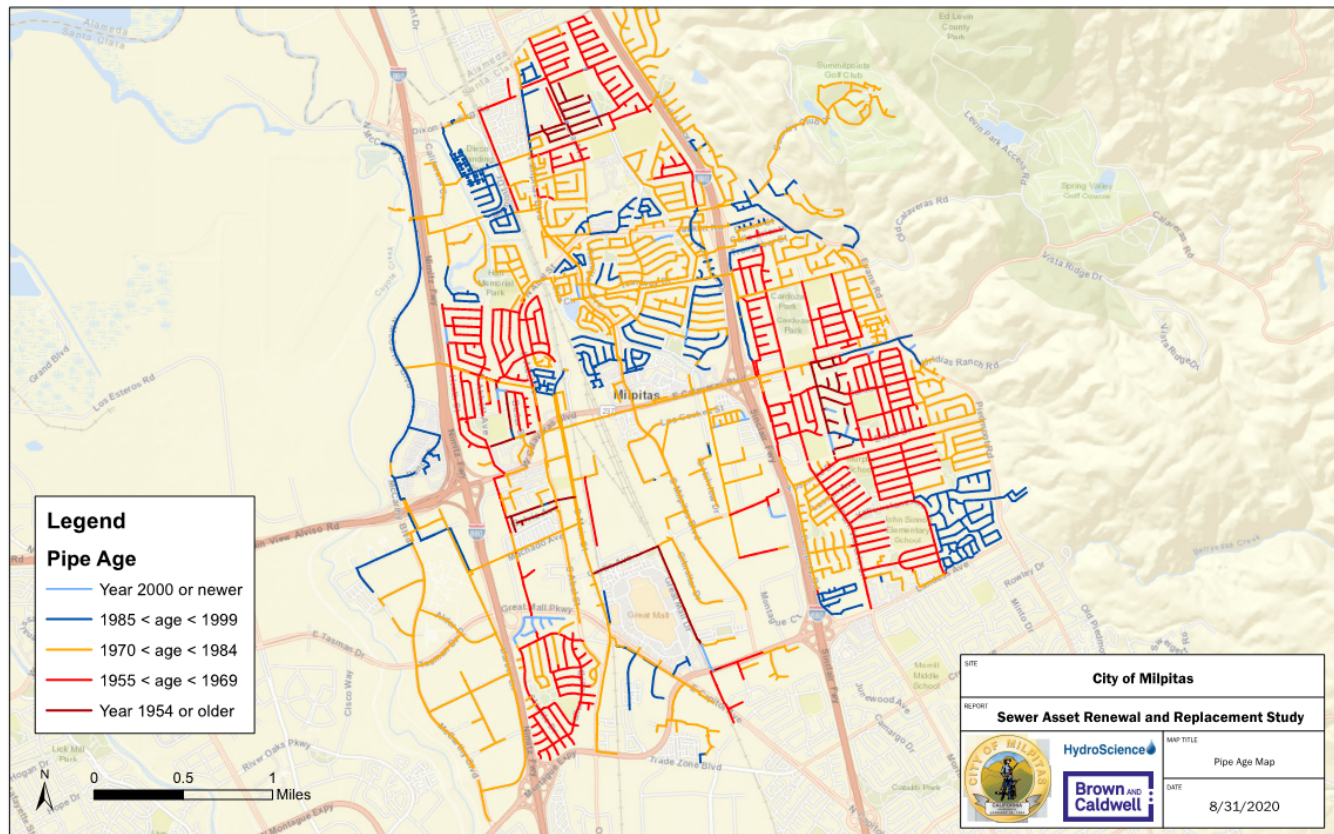


Figure 3-2: LOF Data Map – Pipe Age

Figure 3-3 provides the LOF scores.

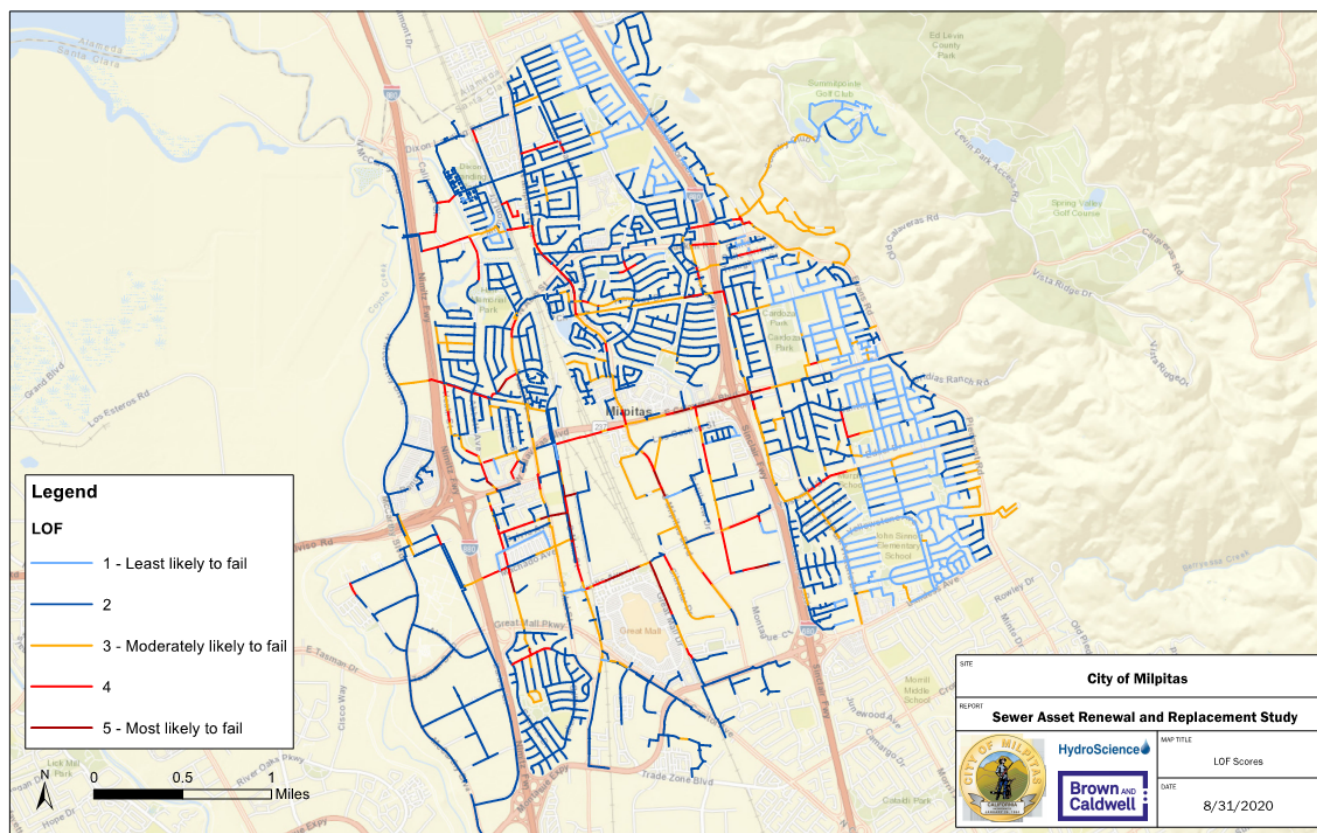


Figure 3-3: LOF Scores Map

3.2 Consequence of Failure

The COF analysis predicts the impact resulting from the failure of an asset by assigned ratings and weightings. Service interruptions, repair/overflow potential, transportation/transit, response time of potential failure, cost of potential failure, and environmental impacts were all considered during the COF analysis.

In a similar fashion to the LOF analysis, the factors selected for analysis are typical for sewer renewal/replacement projects and were selected to ensure the pipe rehabilitation prioritization aligned with City Council core values and priorities. The COF and City Council core values and priorities are shown in Table 3-2. Certain consequence factors, such as pipe diameter or road type, quantify multiple council core values. As a result, these factors received a higher factor weighting value.

Table 3-2. COF and Council Core Value/Priorities			
Council Core Value/ Priority Area	Organization Category	Measure of Failure	Consequence Factor
Superior Customer Service	Community	(1) Sewer service interruptions to large areas	Pipe diameter
Integrity and Accountability		(2) Sewer service interruptions to critical and educational facilities	Critical facilities (proximity)
Trust and Respect		(3) Magnitude and method of public response (sewer size)	Pipe diameter
Transportation and Transit		(4) Public transit service and traffic interruptions	Road type

Table 3-2. COF and Council Core Value/Priorities			
Council Core Value/ Priority Area	Organization Category	Measure of Failure	Consequence Factor
		(5) Railroad interruptions	Railroad proximity
Governance and Administration	Financial	(6) Response time to restore an asset	Easement (access restriction), road type
		(7) Restoration costs or impact on utility rates	Pipe diameter and depth
Environment	Environment	(8) State and Federal regulatory violations or public response (discharge to surface water)	Waterway/waterbody (proximity)

Due to public health and environmental concerns, the potential for waterway/waterbody leaks and road type were weighted most heavily followed by pipe diameter and access restriction. Additional COF factor descriptions and data sources are provided below:

- **Sewer Size (Pipe Diameter)** – Larger diameter pipes are more expensive to replace and provide a greater service area than smaller diameter pipes (pipe diameter provided by City GIS).
- **Proximity to Critical Facilities** – Pipe proximity to an educational, police, fire, or health facility was calculated and rated for COF. Facilities were searched from Google Maps and geocoded onto the ArcGIS platform. 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, pipe intersections with major traffic conveyance routes such as the Bay Area Rapid Transit Milpitas station, freeways, state routes, arterial streets, or major roads were determined. The GIS used for major roads was downloaded from County of Santa Clara ((Major Roads) County of Santa Clara Department of Planning and Development). The BART GIS was downloaded from BART website and a buffer of 800 feet was applied to the geocoded coordinate point to capture the frontage and segments adjacent to the frontage. A buffer of 35 feet was applied to the major roads layer to capture potential overflow impact and GIS alignment differences between the road type and pipe layers.
- **Railroad Proximity** – Impacts to railroad operations and repairs on railroad property have significant cost and permitting impacts (railroad GIS provided by United States Geological Survey (USGS) (USGS National Transportation Dataset for California)).
- **Easement (Access Restriction)** – Access restrictions were determined by overlaying the city GIS over an aerial base map and manually assigning pipes which appeared to be in 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** – Calculated by subtracting pipe inverts from manhole rim elevations from City GIS.
- **Proximity to Waterway or Waterbody** – Significant permitting impacts for repair or cleanup of failed pipe (waterway/waterbody GIS provided by USGS (National Hydrography Dataset, 2019)).

Details and scoring basis for each factor are elaborated in Table 3-3.

Table 3-3. COF Factors and Ratings

Broad Category	Group	COF Factor	COF Rating					Factor Weighting
			1 (Negligible Consequence)	2 (Minimal Consequence)	3 (Moderate Consequence)	4 (Severe Consequence)	5 (Critical Consequence)	
Community	Service Interruptions and Over-flow Potential	Pipeline Diameter ^{1,3}	Less than 6-inches	8- to 12-inches ⁴	14- to 18-inches	18- to 24-inches	Greater than 24-inches	1
		Critical Facilities	-	-	School	Fire/Police	Hospital	1
	Transportation/Transit	Road Type ^{1,2}	Neighborhood streets	Collector streets	Arterial streets	Expressway and state routes	Freeway or BART	1
		Railroad Proximity	Not crossing or within 50 feet of railroad	-	-	-	Crossing or within 50 feet of railroad	1
Financial	Response Time	Access Restriction	Public ROW	-	Private property	-	Limited access	2
		Road Type ^{1,2}	Neighborhood streets	Collector streets	Arterial streets	Expressway and state routes	Freeways	2
	Pipeline Cost	Pipeline Diameter ^{1,3}	Less than 6-inches	8- to 12-inches ⁴	14- to 18-inches	18- to 24-inches	Greater than 24-inches	1
		Pipeline Depth	All others	-	-	-	Greater than 10 feet (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

¹Pipe diameter and road type affect the consequence of a pipe failure in both the community and financial broad categories

²Road type weighting = 1+2 = 3; 1 (Transportation/transit) + 2 (Response Time) = 3 (Overall Road Type weighting).

³Pipe diameter weighting=1+1=2; 1 (Service Interruptions and Overflow Potential) + 1 (Pipeline Cost) = 2 (Overall Pipe Diameter weighting).

⁴If characteristic is unknown, classify as this rating.

ROW = right-of-way

Figure 3-4 shows COF factors on a map and Figure 3-5 provides COF Scores.

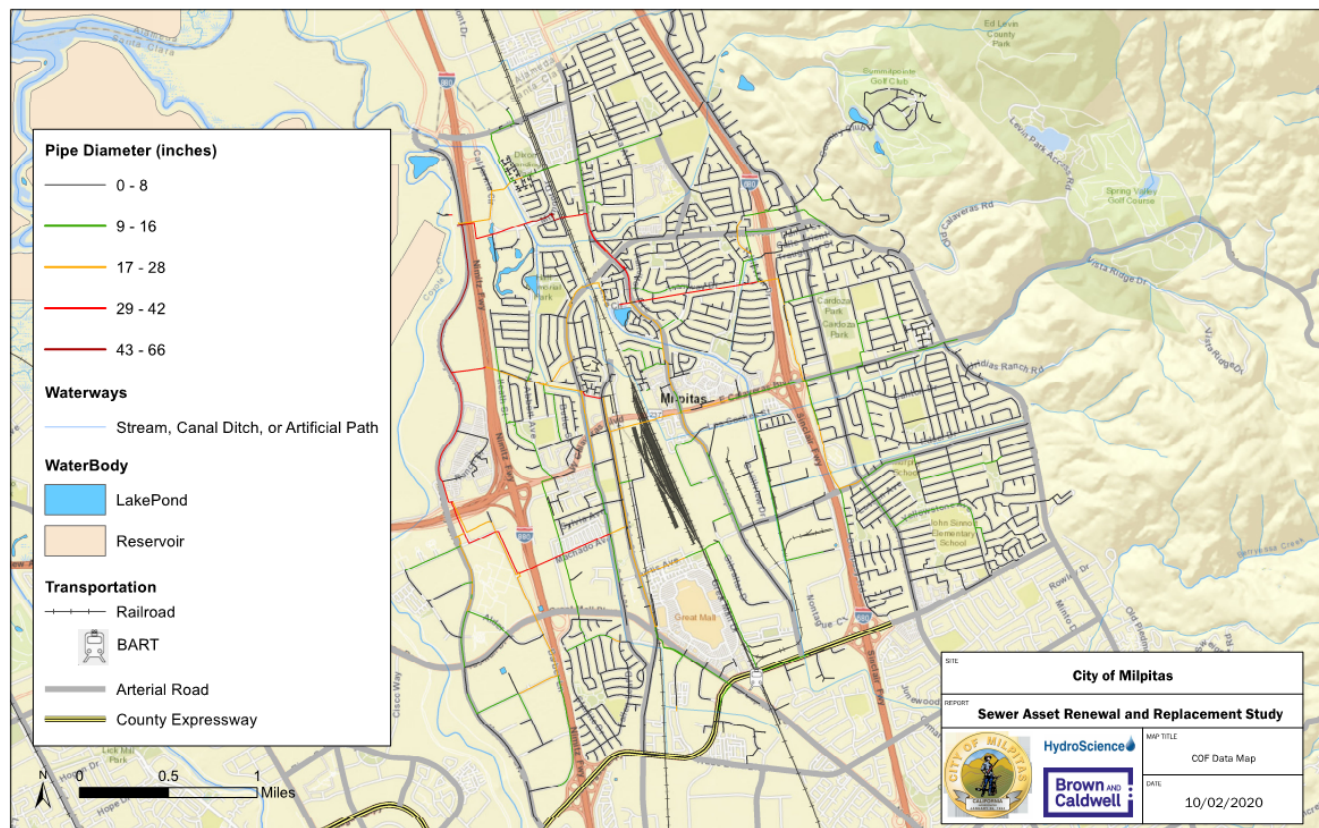


Figure 3-4: COF Data Map

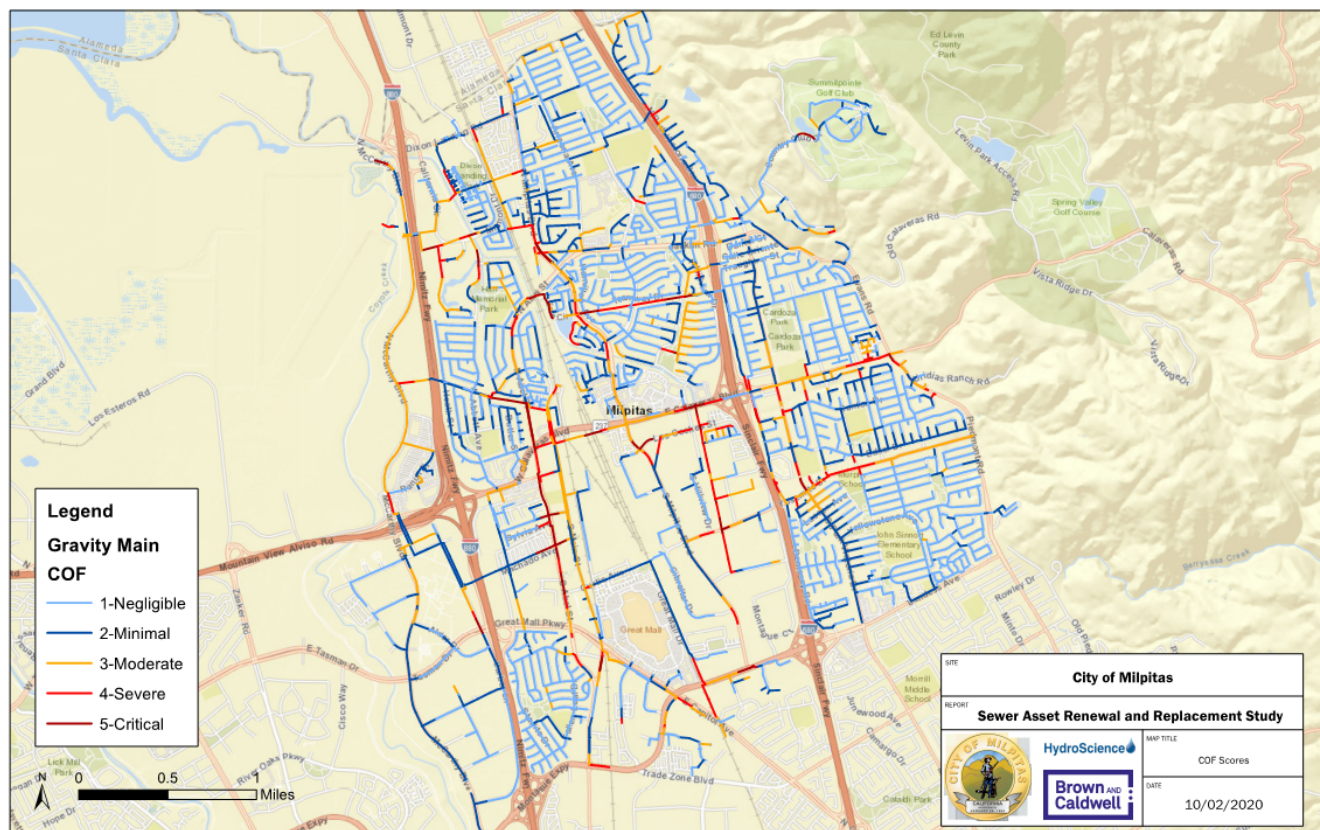


Figure 3-5: COF Scores

3.3 Asset Risk

Once the LOF and COF rating and weighting have been determined for individual factors, an overall LOF score and overall COF score can be determined by summing the factor scores. Multiplying the two overall scores determines the overall asset risk ($\text{Risk} = \text{LOF} \times \text{COF}$). Asset risk is considered negligible, low, medium, high or extreme based on the paired LOF and COF data. The matrix below illustrates the risk assignments for varying LOF and COF pairings.

		Low LOF Score → High LOF Score				
High COF Score ↑ Low COF Score		Medium	Medium	High	Extreme	Extreme
		Medium	Medium	Medium	High	Extreme
		Low	Medium	Medium	Medium	High
		Negligible	Low	Medium	Medium	Medium
		Negligible	Negligible	Low	Medium	Medium

3.4 Staff Input

A risk assessment workshop between HSE, BC and City staff was conducted on April 24, 2020. The purpose of this workshop was to provide an overview of the risk assessment approach and to receive City input regarding specific risk assessment criteria and weighting. At this workshop the final LOF and COF criteria and weighting were reviewed. Following the workshop, BC sent a proposed criteria and weighting document, to which the City agreed on. Key comments were summarized below:

- Seismic events are fairly unlikely; use caution to weigh the proximity to earthquake faults factor too highly.
 - o Noted. City to confirm draft LOF and COF weighting shown in this draft report.
- Bay Area Rapid Transit (BART) is very critical. This is regarding discussion of “road type/transit” COF factor.
 - o Draft report #1 comment - the addition of BART will be investigated in between draft and final report.
 - o Final report - BART was added to the road type/transit COF factor and report content was revised accordingly.
- City confirmed that repairs to pipe on freeway/highway is challenging.
 - o Action - Incorporated in criteria. Pipes within 35 feet of freeways are assigned the highest COF factor for the road type.
- Sewer pipelines are relatively new, so it may be hard to provide much input on historical data.
 - o Noted. CCTV survey and other desktop condition assessment factors will drive pipe rehabilitation and inspection recommendations.
- City decided to rate pipes that would go directly to a waterway/waterbody higher.
 - o Action - Incorporated in rating and weighting. Pipelines near waterway/waterbodies are rated by proximity. The factor measuring waterway/waterbody proximity was most highly weighted.

3.5 InfoAsset Planner (IAP)

A desktop risk assessment was performed using Innovyze’s IAP program, a GIS extension tool. Using the criteria described in Sections 3.1 and 3.2, LOF analysis predicts the probability that each asset could fail based on its GIS data and spatial interaction with other GIS layers. All assets, with or without CCTV data, were evaluated in detail using:

- 1) GIS data, such as age, material, and diameter
- 2) County or USGS GIS layers such as seismic hazards, soil stability, waterways, and other factors
- 3) Maintenance data - required pipe cleaning factor
- 4) CCTV data when available

For example, for the structural condition and presence of pipe obstruction LOF factors, CCTV data was analyzed to mass compute LOF for each of the approximate 3,200 pipes based on structural and O&M defects. Likewise, COF analysis determines the severity of each asset if it were to fail. The tool scores each pipe for COF based on asset data such as diameter and proximity to other GIS layers such as waterways or hospitals. Each LOF and COF factor is first set up in individual modules by choosing to use asset data, CCTV survey results, or spatial analysis with other GIS layers. Then, buffers and score criteria are defined. Once this is setup, the risk analysis takes user input for weighting of these factors relative to one another and

produces a holistic risk score for each pipe GIS asset. Screenshots of IAP modules can be found in Figures 3-6 to 3-8.

Consequence of Failure Wizard (Gravity Main - "Diameter")

Step2: Choose a Category

Category

☒ Pipe Attribute
 ☐ Inspection

☐ Population Density
 ☐ Work Order

☐ Critical Facilities
 ☐ Pipe Inventory

☐ Intersection
 ☐ Multi-Parameter

☐ Pavement

Description

Use Pipe attributes to estimate the consequence of failure. (e.g. Age, Material)

Consequence of Failure Wizard (Gravity Main - "Diameter")

Step3: Set Parameter (Facility Attributes)

Attributes

☐ Material
 ☐ Slope

☐ Install Date
 ☐ Depth

☒ Diameter
 ☐ Lifecycle Status

☐ Roughness
 ☐ Other

Choose a field

Figure 3-6: IAP LOF/COF Setup Example - Diameter (1 of 2)

Consequence of Failure Wizard (Gravity Main - "Diameter")

Step4: Calculate Value - Diameter

Facility ID	Value	Normalize Value	Effective Value
12376-12375	6		
10461-12493	8		
10464-10461	8		
10463-12494	24		
10541-10575	15		
11175-11173	6		
10284-10289	8		
12489-12373	8		
12493-12489	8		
12492-12376	6		
10028-10026	27		
10043-10045	27		

☐ Normalize value by

Consequence of Failure Wizard (Gravity Main - "Diameter")

Step5: Set Score Range - Diameter

Scoring Range

Breaker	Score	No.	Length (Miles)
0	2	134	3.12
10	2	143	7.51
12	2	122	5.83
15	3	107	5.46
16	3	3	0.06
18	3	71	3.87
21	4	50	2.46
23	4	1	0.00
24	4	28	1.15
27	5	55	2.33

☐ Normalize score by

Figure 3-7: IAP LOF/COF Setup Example - Diameter (2 of 2)

Assess Risk

Facility Scope

☒ Full Network

☐ Selection

☐ Zone

Select Whole Network or choose a selection, consequences and likelihood of failures with the same selection will be listed on right side.

Then choose consequences and likelihood of failures which you want, and set weight and exponent.

Consequence of Failures

ID	Weight	Exponent	Category	Parameter	Description	
1 ☒	Depth	1	1	Pipe Attribute	Depth	
2 ☒	Waterbodies	3	1	Critical Facilities	Critical Facilities - NHDWaterBody_Clip	
3 ☒	Easements	2	1	Pipe Inventory	Access_restrictions	Access Restrictions
4 ☒	Waterway	3	1	Critical Facilities	Critical Facilities - Waterway	
5 ☒	Facilities	1	1	Multi-Parameter	PoliceFire,Education,Hospitals	Combination of Hospitals, Edu, Poli
6 ☒	Traffic	3	1	Intersection	Intersection - Roads_Major_Clip	
7 ☒	Railroad	1	1	Intersection	Intersection - Trans_RailFeature_Clip	
8 ☒	Diameter	2	1	Pipe Attribute	Diameter	
9 ☐	Mode of Vertical Asset	1	1		Mode of Vertical Asset COF	Mode of Vertical Asset COF
10 ☐	Median of Vertical Asset	1	1		Median of Vertical Asset COF	Median of Vertical Asset COF
11 ☐	Avg of Vertical Asset	1	1		Avg of Vertical Asset COF	Avg of Vertical Asset COF

Likelihood of Failures

ID	Weight	Exponent	Category	Parameter	
1 ☒	SEW_LOF2_Combined	5	1	Multi-Parameter	SEW_LOF2a,SEW_LOF2b,SEW_LOF2c,SEW_LOF2d,SEW_LOF2e,SEW
2 ☒	SEW_LOF1_combined	5	1	Multi-Parameter	SEW_LOF1a,SEW_LOF1b,SEW_LOF1c,SEW_LOF1d,SEW_LOF1e,SEW
3 ☒	HotSpots	5	1	Pipe Inventory	Repeat_period
4 ☒	Liquefaction	3	1	Intersection	Intersection - LiquefactionHazardZone_Intersect
5 ☒	Fault	3	1	Intersection	Intersection - FaultRuptureHazardZone_Clip
6 ☒	SlideArea	3	1	Intersection	Intersection - LandslideHazrdZone_Clip
7 ☒	Material	2	1	Pipe Attribute	Material
8 ☒	Age	2	1	Pipe Attribute	InstallDate
9 ☐	Mode of Vertical Asset	1	1		Mode of Vertical Asset LOF
10 ☐	Median of Vertical Asset	1	1		Median of Vertical Asset LOF
11 ☐	Avg of Vertical Asset	1	1		Avg of Vertical Asset LOF

< Back Finish Close

Figure 3-8: IAP LOF/COF Weighting and Risk Setup Example

3.6 Risk Assessment Results

Overall LOF and COF score assignments were determined for all pipe segments, based on the criteria outlined in Tables 3-1 and 3-3. A total risk score was then determined from the product of the overall LOF and COF scores, which was then normalized within the dataset from one (negligible risk) to five (extreme risk).

Figure 3-9 presents the risk scores for all gravity main pipelines.

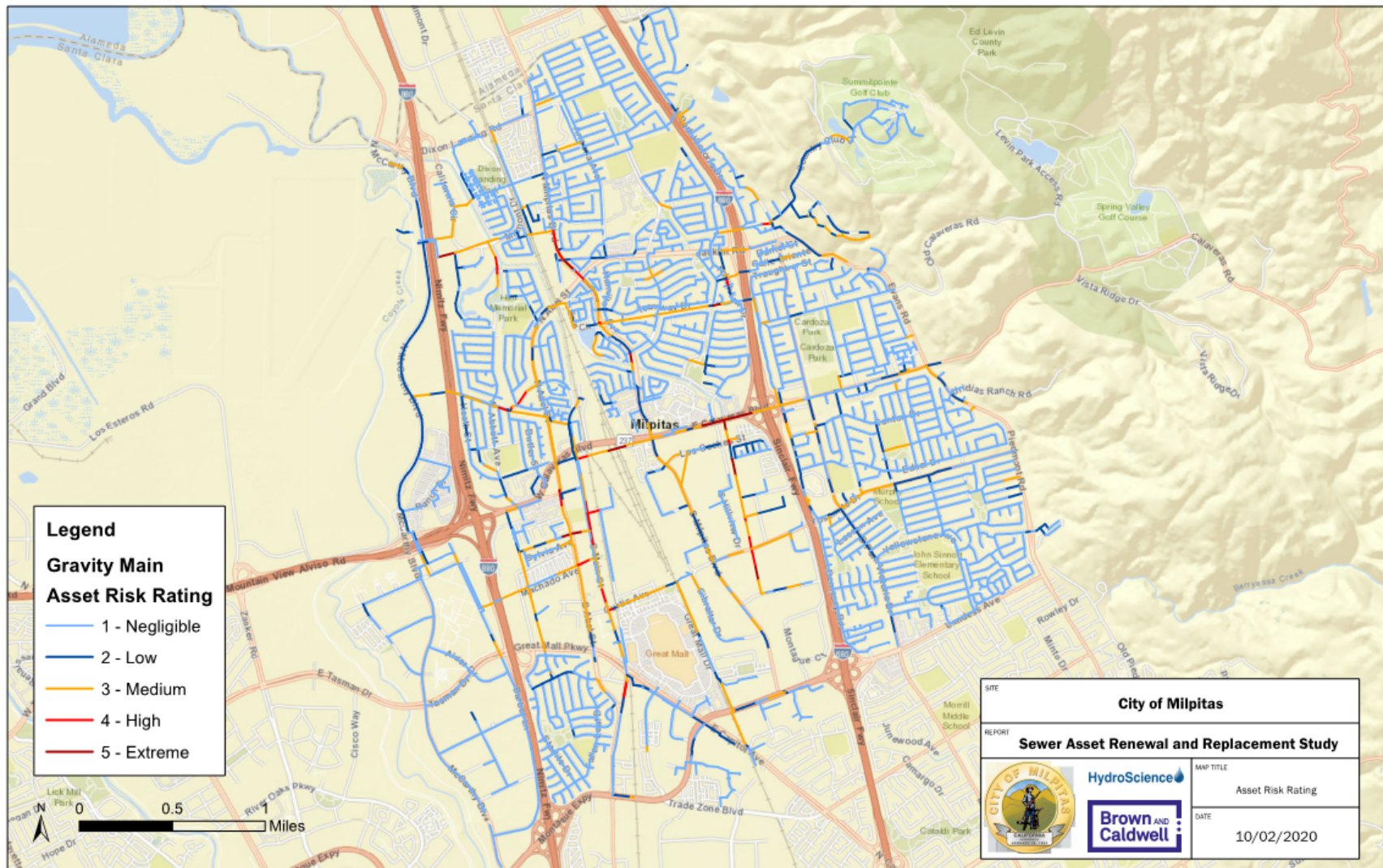


Figure 3-9: Asset Risk Rating

A risk matrix for the pipe segments is presented in Figure 3-10. The bottom left tile represents the subset of pipes with the least risk while the top right tile represents the subset of pipes with the most risk. Risk is colorized as follows:

- **Blue** – Negligible risk
- **Green** – Low risk
- **Peach** – Medium risk
- **Magenta** – High risk
- **Dark Red** – Extreme risk

	LOF - Low	LOF - M. Low	LOF - Medium	LOF - M. High	LOF - High
COF - High	32 Gravity Mains, ...	19 Gravity Mains,...	12 Gravity Mains,...	6 Gravity Mains, ...	7 Gravity Mains, ...
COF - M. High	40 Gravity Mains, ...	18 Gravity Mains,...	16 Gravity Mains,...	6 Gravity Mains, ...	6 Gravity Mains, ...
COF - Medium	165 Gravity Mains,...	29 Gravity Mains,...	28 Gravity Mains,...	13 Gravity Mains,...	15 Gravity Mains,...
COF - M. Low	473 Gravity Mains,...	73 Gravity Mains,...	40 Gravity Mains,...	10 Gravity Mains,...	17 Gravity Mains,...
COF - Low	1962 Gravity Main...	96 Gravity Mains,...	70 Gravity Mains,...	13 Gravity Mains,...	16 Gravity Mains,...

Figure 3-10: Pipeline Risk LOF COF Matrix

Figure 3-11 provides the risk distribution for the pipe segments. The majority of the pipe segments are classified as negligible or low risk; twelve percent are medium to extreme risk pipe segments.

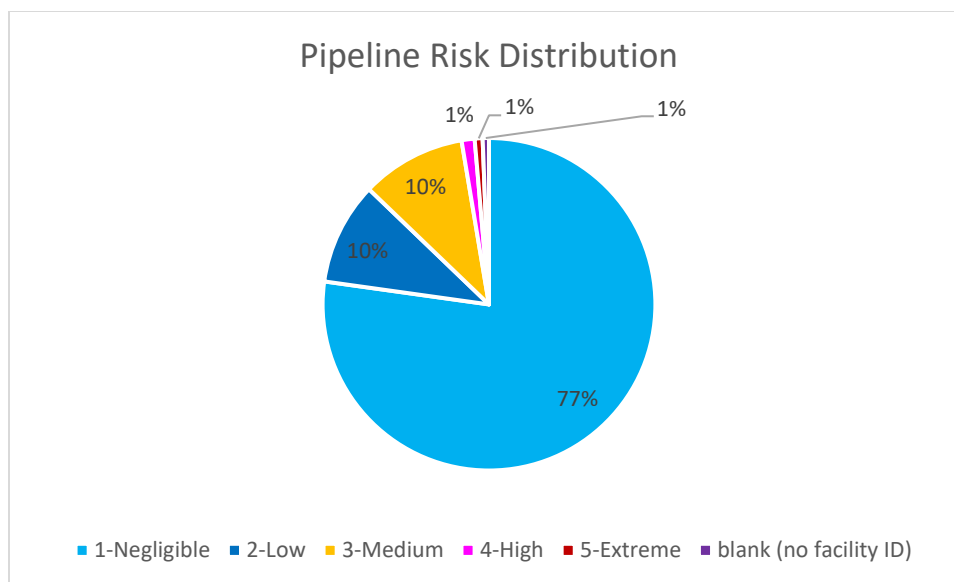


Figure 3-11: Pipeline Risk Distribution by Length

For the pipeline risk distribution figure, the “blank” category is attributed to 22 pipes whose GIS segments had blank facility ID, diameter, installation date, and material fields. Table 3-4 below shows the pipe segments with the highest risk scores. This includes all pipes with risk scores of 4 or 5. Appendix F provides the risk scores for all pipe segments. LOF and COF scores are calculated based on the equation figure at the beginning of Section 3 and the rating and weighting criteria described in Table 3-1 and 3-3 in previous sections. The risk score column is calculated by multiplying the LOF score and COF score, which is then normalized from 1 through 5 in the last column (1- negligible, 2-low, 3- medium, 4- high or 5- extreme). The table is sorted by descending risk score.

Table 3-4. At-Risk Pipes

Segment ID	Street Name	Install Year	Pipe Diameter	Pipe Material	Segment Length (LF)	LOF Score	COF Score	Risk Score (LOF x COF)	Asset Risk (Normalized from 1 to 5)
10395-10396	Coming Ave	1954	8	VCP	284	76	39	2964	5 - Extreme
12717-12718	E Calaveras Blvd	-	15	VCP	312	59	43	2537	5 - Extreme
12719-12720	E Calaveras Blvd	-	16	CIP	127	50	46	2300	5 - Extreme
10012-10394	Coming Ave	1954	8	VCP	234	61	36	2196	5 - Extreme
12721-12722	E Calaveras Blvd	-	15	VCP	116	59	37	2183	5 - Extreme
12721-12722*	E Calaveras Blvd	-	15	VCP	16	59	37	2183	5 - Extreme
12043-12021	Between Tramway & Los Pinos Ave	-	30	RCP	258	56	36	2016	5 - Extreme
12716-12719	Slightly East of S Hillview Dr	-	0	UNK	302	49	41	2009	5 - Extreme
12232-12251	N Milpitas Blvd	-	39	RCP	434	54	36	1944	5 - Extreme
12589-12601	Cadillac Ct / Nimitz Fwy Crossing	-	42	RCP	494	52	37	1924	5 - Extreme
10395-10394	Coming Ave	1954	8	VCP	15	51	36	1836	5 - Extreme
12722-12711	E Calaveras Blvd	-	15	VCP	362	59	31	1829	5 - Extreme
12729-12717	E Calaveras Blvd	-	15	VCP	500	59	31	1829	5 - Extreme
10176-10177	Slightly East of S Hillview Dr	-	15	VCP	408	54	33	1782	5 - Extreme
12218-12522	N Milpitas Blvd	-	33	RCP	201	54	33	1782	5 - Extreme
10185-10184	Slightly East of S Hillview Dr	-	15	VCP	448	54	33	1782	5 - Extreme
10185-10184*	Slightly East of S Hillview Dr	-	15	VCP	43	54	33	1782	5 - Extreme
10883-10972	Sinclair Fwy	1965	21	VCP	495	56	31	1736	5 - Extreme
10480-10481	S Abel Ave	1982	18	VCP	66	47	35	1645	5 - Extreme
12488-12496	E Calaveras Blvd	-	21	VCP	501	47	35	1645	5 - Extreme
12457-12154	N Milpitas Blvd	1981	21	VCP	310	47	34	1598	5 - Extreme
10968-12729	E Calaveras Blvd	-	15	VCP	388	69	29	2001	4 - High
11647-11695	Marylinn Dr	1959	27	VCP	500	74	27	1998	4 - High
11781-12608	Hall Memorial Park Connection	1980	8	ABS	329	44	43	1892	4 - High

Table 3-4. At-Risk Pipes

11786-11781	Hall Memorial Park Connection	1980	8	ABS	144	44	43	1892	4 - High
10972-10968	E Calaveras Blvd	-	15	VCP	482	64	29	1856	4 - High
12251-12219	N Milpitas Blvd	-	39	RCP	319	44	42	1848	4 - High
10404-10398	S Main St	-	18	VCP	407	67	26	1742	4 - High
10179-10159	Slightly East of S Hillview Dr	-	15	VCP	349	44	39	1716	4 - High
10178-10179	Slightly East of S Hillview Dr	-	15	VCP	100	44	39	1716	4 - High
11661-11656	Marylinn Dr	1959	27	RCP	133	46	36	1656	4 - High
12088-12081	N Hillview Dr	-	12	VCP	218	54	30	1620	4 - High
12218-12219	N Milpitas Blvd	-	33	RCP	25	49	33	1617	4 - High
10177-10178	Slightly East of S Hillview Dr	-	15	VCP	397	49	33	1617	4 - High
10472-10467	Sinnot Ln	-	12	VCP	219	57	28	1596	4 - High
10467-10474	S Main St	-	21	VCP	326	57	28	1596	4 - High
10478-10480	S Abel Ave	1982	15	VCP	420	42	38	1596	4 - High
10472-10467*	Sinnot Ln	-	12	VCP	179	57	28	1596	4 - High
10333-10347	Curtis Ave	1954	18	VCP	172	51	31	1581	4 - High
12720-12721	E Calaveras Blvd	-	15	VCP	60	39	40	1560	4 - High
11525-20134	Marylinn Dr	1981	27	VCP	393	47	33	1551	4 - High
12706-12733	Slightly East of S Hillview Dr	-	0	UNK	118	44	35	1540	4 - High
11389-11377	Sinclair Crossing to Country Club Dr	1988	8	VCP	250	53	29	1537	4 - High
12522-12526	N Milpitas Blvd	-	33	RCP	349	49	31	1519	4 - High
10462-10463	E Calaveras Blvd	-	21	VCP	334	52	29	1508	4 - High
11657-11678	Marylinn Dr	-	27	RCP	19	54	27	1458	4 - High
11936-11935	Sinclair Crossing to Country Club Dr	1983	12	VCP	489	54	27	1458	4 - High
12248-12233	N Milpitas Blvd	-	39	RCP	370	54	27	1458	4 - High
12439-12446	N Milpitas Blvd	-	24	VCP	42	47	31	1457	4 - High
12439-12446*	N Milpitas Blvd	-	24	VCP	42	47	31	1457	4 - High

Table 3-4. At-Risk Pipes									
10403-10418	Machado Ave	-	24	RCP	260	39	37	1443	4 - High
10403-10418*	Machado Ave	-	24	RCP	138	39	37	1443	4 - High
10284-10289	S Main St	-	8	VCP	438	39	36	1404	4 - High
10188-10187	Slightly East of S Hillview Dr	-	15	VCP	141	39	36	1404	4 - High
10331-10350	S Main St	-	18	VCP	398	52	27	1404	4 - High
10284-10289*	S Main St	-	8	VCP	438	39	36	1404	4 - High
11678-11680	Marylinn Dr	-	27	VCP	273	52	27	1404	4 - High
10399-10467	S Main St	-	18	VCP	451	52	26	1352	4 - High

*Same facility ID, different GIS pipe segment.

Figure 3-12 provides the high and extreme risk pipelines shown in Table 3-4 in map format.

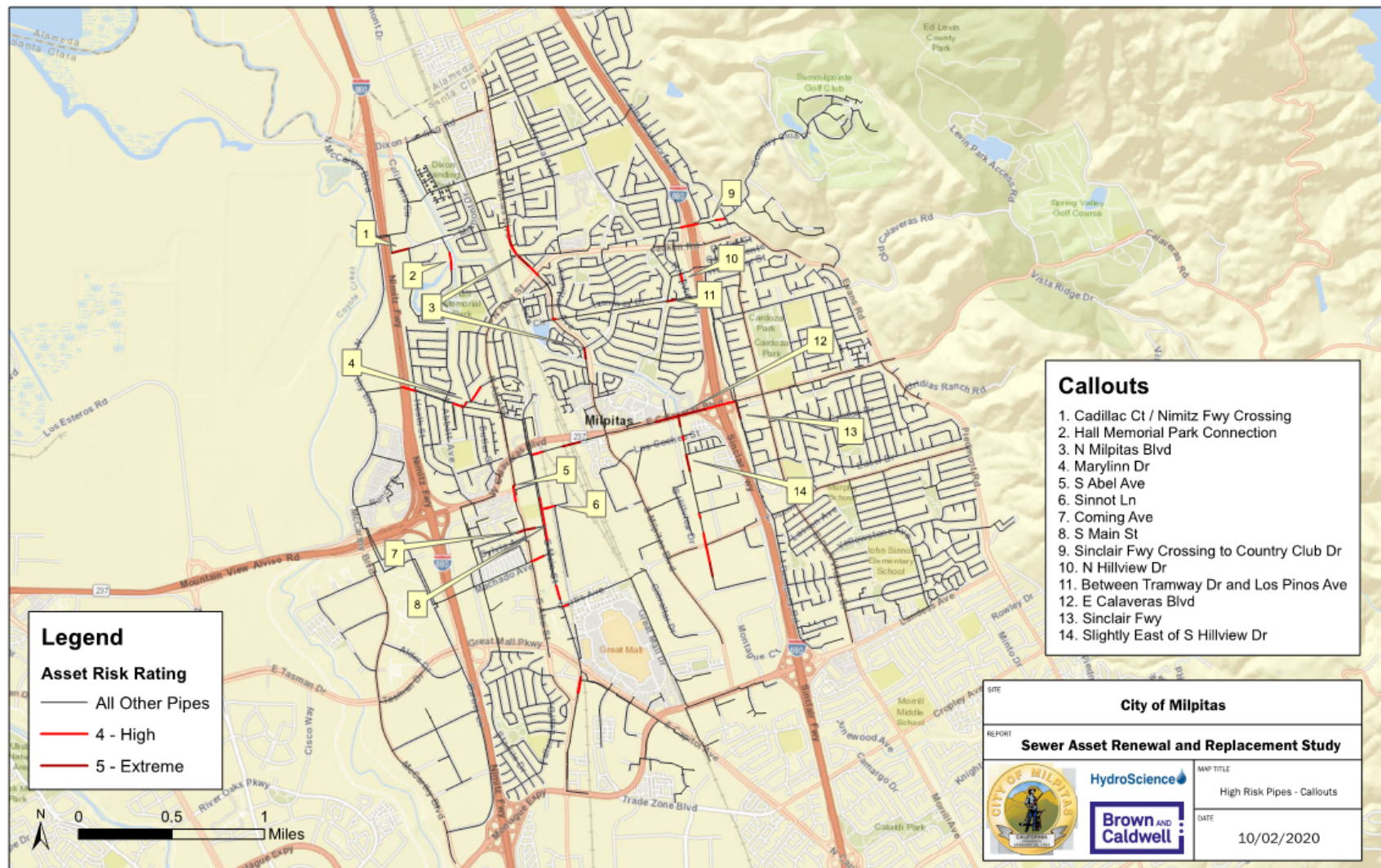


Figure 3-12: High Risk Pipes

Extreme risk pipes (21 segments) were further analyzed for drivers of high LOF and COF scores in Table 3-5. The top 3 (or 4 when tied) LOF and COF factors are noted for each pipe segment. The table is sorted alphabetically by street name

Table 3-5. Extreme Risk Pipes – Drivers of High LOF and COF Scores									
Street Name	Segment ID	Install Year	Pipe Diameter	Pipe Material	Segment Length (LF)	LOF Score	COF Score	LOF Drivers	COF Drivers
Between Tramway Dr and Los Pinos Ave	12043-12021	-	30	RCP	258	56	36	Pipe Obstruction Rating – 25/25 Structural Rating – 10/25 Liquefaction Susceptibility – 9/10	Waterway – 15/15 Diameter – 10/10 Depth – 5/5
Cadillac Ct / Nimitz Freeway Crossing	12589-12601	-	42	RCP	494	52	37	Pipe Obstruction Rating – 20/25 Liquefaction Susceptibility – 15/15 Age – 6/10 Material – 6/10	Waterbodies – 12/15 Diameter – 10/10 Easement – 6/10
Coming Ave	10395-10396	1954	8	VCP	284	76	39	Required Pipe Cleaning – 25/25 Pipe Obstruction Rating – 20/25 Liquefaction Susceptibility – 12/15	Waterway – 15/15 Traffic – 9/15 Depth – 5/5
	10012-10394	1954	8	VCP	234	61	36	Structural Rating – 25/25 Liquefaction Susceptibility – 12/15 Age – 10/10 Pipe Obstruction Rating – 10/25	Waterway – 12/15 Traffic – 9/15 Depth – 5/5
	10395-10394	1954	8	VCP	15	51	36	Required Pipe Cleaning – 25/25 Liquefaction Susceptibility – 12/15 Age – 10/10	Waterway – 12/15 Traffic – 9/15 Depth – 5/5
E Calaveras Blvd	12717-12718	-	15	VCP	312	59	43	Structural Rating – 25/25 Pipe Obstruction Rating – 15/25 Liquefaction Susceptibility – 9/15	Traffic – 12/15 Waterway – 12/15 Diameter – 6/10
	12719-12720	-	16	CIP	127	50	46	Pipe Obstruction Rating – 20/25 Material – 10/10 Liquefaction Susceptibility – 9/15	Waterway – 15/15 Traffic – 12/15 Diameter – 6/10
	12721-12722	-	15	VCP	116	59	37	Structural Rating – 25/25 Pipe Obstruction Rating – 15/25 Liquefaction Susceptibility – 9/15	Traffic – 12/15 Waterway – 6/15 Diameter – 6/10

Table 3-5. Extreme Risk Pipes – Drivers of High LOF and COF Scores

Street Name	Segment ID	Install Year	Pipe Diameter	Pipe Material	Segment Length (LF)	LOF Score	COF Score	LOF Drivers	COF Drivers
	12721-12722	-	15	VCP	16	59	37	Same as above. Same Segment ID	Same as above.
	12722-12711	-	15	VCP	362	59	31	Structural Rating – 25/25 Pipe Obstruction Rating – 15/25 Liquefaction Susceptibility – 9/15	Traffic – 12/15 Diameter – 6/10 Critical Facilities – 5/5 Depth – 5/5
	12729-12717	-	15	VCP	500	59	31	Structural Rating – 20/25 Pipe Obstruction Rating – 20/25 Liquefaction Susceptibility – 9/15	Traffic – 12/15 Diameter – 6/10 Critical Facilities – 5/5 Depth – 5/5
	12488-12496	-	21	VCP	501	47	35	Pipe Obstruction Rating – 15/25 Liquefaction Susceptibility – 12/15 Structural Rating – 10/25	Waterway – 12/15 Diameter – 8/10 Railroad – 5/5 Depth – 5/5
N Milpitas Blvd	12232-12251	-	39	RCP	434	54	36	Pipe Obstruction Rating – 20/25 Liquefaction Susceptibility – 12/15 Structural Rating – 10/25	Diameter – 10/10 Waterway – 9/15 Traffic – 9/15
	12218-12522	-	33	RCP	201	54	33	Pipe Obstruction Rating – 25/25 Liquefaction Susceptibility – 12/15 Age – 6/10 Material – 6/10	Diameter – 10/10 Traffic – 9/15 Waterway – 6/15
	12457-12154	1981	21	VCP	310	47	34	Pipe Obstruction Rating – 15/25 Liquefaction Susceptibility – 12/15 Structural Rating – 10/25	Waterway – 9/15 Traffic – 9/15 Diameter – 8/10
S Abel Ave	10480-10481	1982	18	VCP	66	47	35	Pipe Obstruction Rating – 20/25 Liquefaction Susceptibility – 12/15 Age – 6/10	Waterway – 12/15 Traffic – 9/15 Diameter – 6/10
Sinclair Freeway	10883-10972	1965	21	VCP	495	56	31	Required Pipe Cleaning – 20/25 Pipe Obstruction Rating – 10/25 Liquefaction Susceptibility – 9/15	Diameter – 8/10 Traffic – 9/15 Waterway – 6/15

Table 3-5. Extreme Risk Pipes – Drivers of High LOF and COF Scores

Street Name	Segment ID	Install Year	Pipe Diameter	Pipe Material	Segment Length (LF)	LOF Score	COF Score	LOF Drivers	COF Drivers
Slightly East of S Hillview Dr	12716-12719	-	0	UNK	302	49	41	Pipe Obstruction Rating – 20/25 Structural Rating – 10/25 Liquefaction Susceptibility – 9/15	Waterway – 12/15 Traffic – 12/15 Critical Facilities – 5/5 Depth – 5/5
	10176-10177	-	15	VCP	408	54	33	Pipe Obstruction Rating – 25/25 Structural Rating – 10/25 Liquefaction Susceptibility – 9/15	Waterway – 12/15 Diameter – 6/10 Railroad – 5/5 Depth – 5/5
	10185-10184	-	15	VCP	448	54	33	Structural Rating – 20/25 Pipe Obstruction Rating – 15/25 Liquefaction Susceptibility – 9/15	Waterway – 12/15 Diameter – 6/10 Railroad – 5/5 Depth – 5/5
	10185-10184	-	15	VCP	43	54	33	Same as above. Same Segment ID	Same as above.

Figures 3-13 and 3-14 summarize the LOF and COF drivers previously presented in Table 3-5.

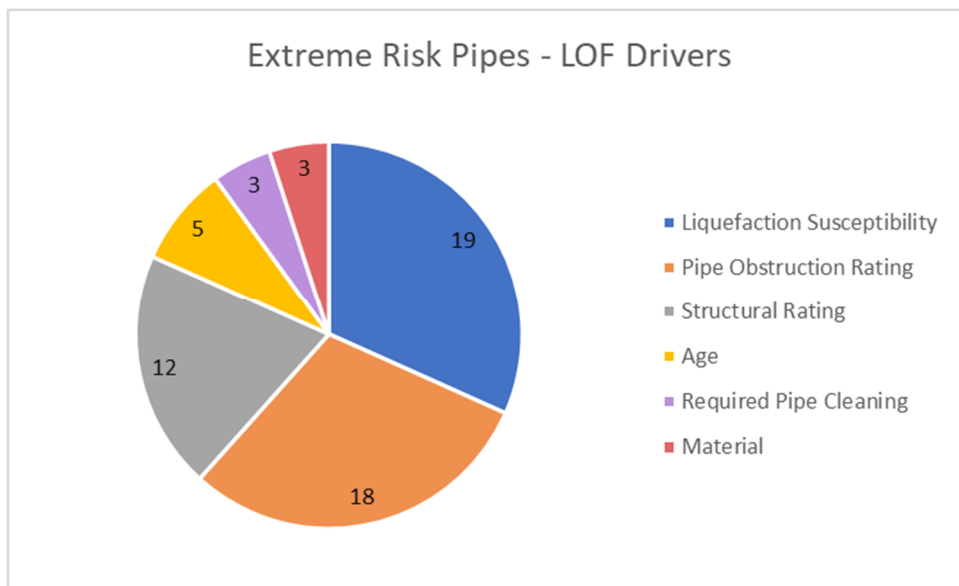


Figure 3-13: Extreme Risk Pipes – LOF Drivers

Liquefaction susceptibility, pipe obstruction rating, and structural rating are among the most common LOF drivers of extreme risk pipes. That is, of the extreme risk pipes, these LOF factors reoccur most often.

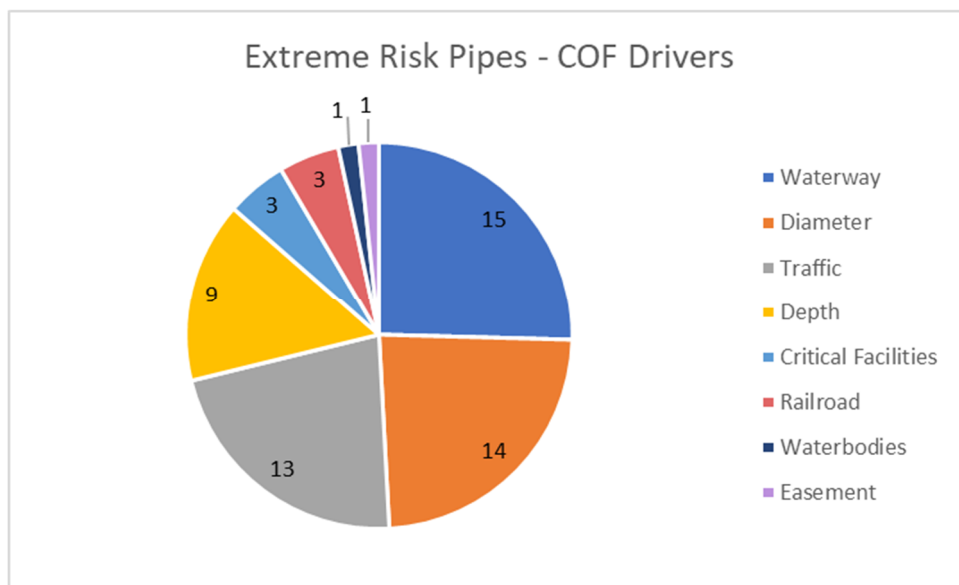


Figure 3-14: Extreme Risk Pipes – COF Drivers

Proximity to waterways, large pipe diameter, and proximity to high traffic flow areas are among the most common COF drivers of extreme risk pipes.

In summary, a desktop risk analysis of all pipe segments revealed that pipe mains located along E Calaveras Blvd, N Milpitas Blvd, S Main St, I-680 (crossing), Machado Ave, Sylvia Ave, Cadillac Ct, S Abel Ave, Coming Ave, Sinclair Freeway, S Hillview Drive, Sinnot Ln, and Tramway Dr were rated to be high or extreme risk. Pipe segments considered high or extreme risk are at the greatest likelihood of deterioration and/or have the highest consequence of failing. As such, pipe rehabilitation and inspection for these pipelines are prioritized in the R&R Plan (Section 4). The most common LOF drivers of high risk rating were liquefaction susceptibility, pipe obstruction rating, and structural rating. On the other hand, the most common COF drivers of high risk rating were proximity to waterways, large pipe diameter, and proximity to high traffic flow areas. Appendix F provides the risk rating for all pipes in shapefile and excel format for the City GIS department's use. See the "Risk column" located in the last few columns.

Section 4: Renewal and Replacement Plan

Based on desktop condition assessment and CCTV inspection results, sewer segments were analyzed for required system improvements and recommended CCTV surveys. The Renewal and Replacement Plan involves a discussion of methodology and costs, a review of the recent projects from the current CIP to ensure recommended improvements and inspections were aligned with the current efforts, a summary of the major deficiencies present in the Main and Venus Way Lift Stations, and a summary of project recommendations.

4.1 Rehabilitation Selection Methodology

For pipe segments without inspection data, risk and diameter was evaluated for CCTV prioritization. Pipe segments with a risk rating of medium or greater (three of five or greater) were recommended to be surveyed. In addition, large diameter pipes (24-inch diameter pipe or larger) of any risk rating were recommended to be surveyed. Figure 4-1 illustrates this risk and large diameter data consideration. While the initial plan was to CCTV high and extreme risk pipes outputted from the desktop risk analysis, further evaluation revealed that the budget allowed for medium risk pipelines to be included in the CCTV recommendations. Note that the CCTV prioritization map does not distinguish inspection data availability, and as such will differ from the rehabilitation recommendation map where pipe condition data (CCTV survey) allows for more fine-tuned rehabilitation recommendations.

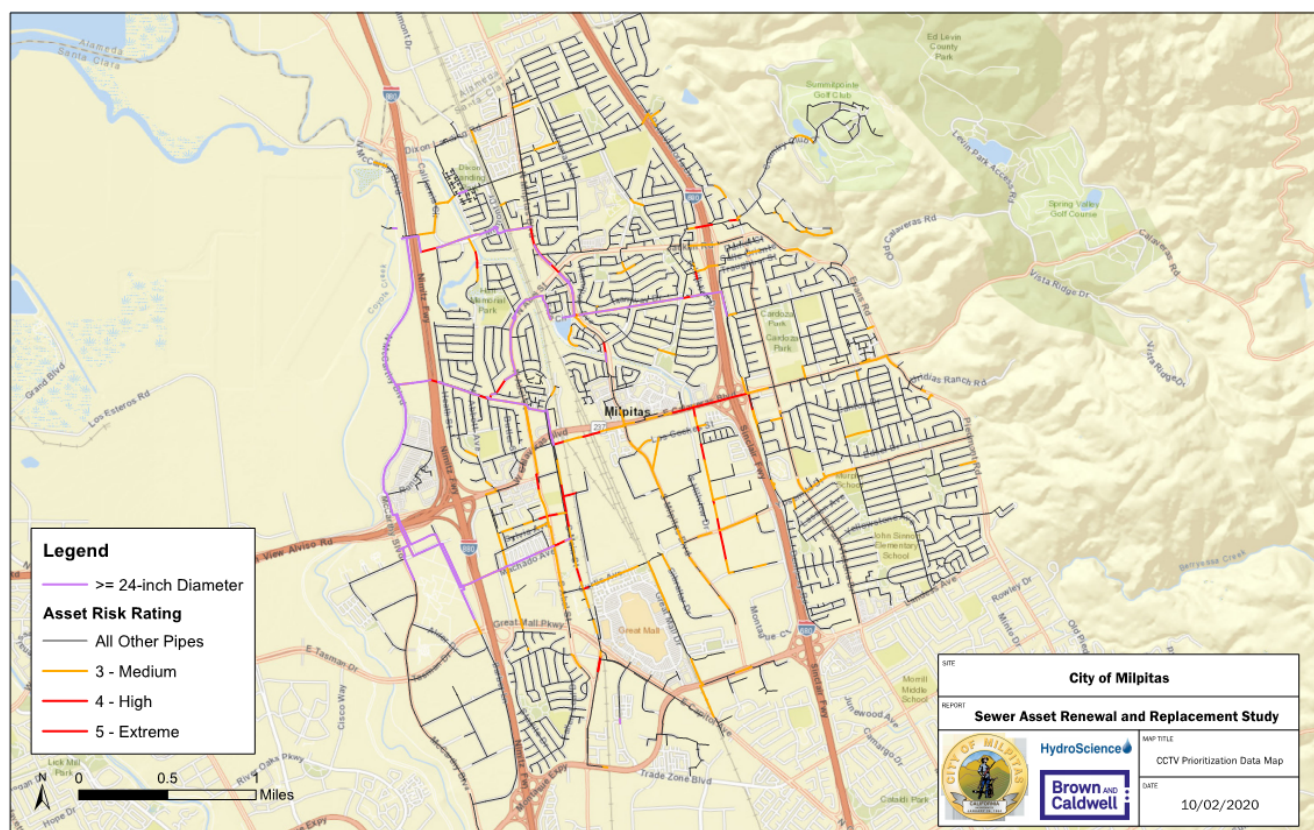


Figure 4-1: CCTV Prioritization Data Map

For pipe segments with survey data, a two-part process determined a pipe's final rehabilitation recommendation. First, defect-level rehabilitation methods such as point repair, lining, or no action (blank) are selected for each defect in the "defect codes" module. Second, a decision tree was prepared that determines the pipe rehabilitation recommendation by analyzing the following:

- CCTV structural peak score and overall peak score
- Number of point repairs and lining recommendations (output) by the defect-level rehabilitation methods or "defect codes" module
- Number of defects
- Length of major (score of four or five) and/or minor defects (score of three)
- Presence of specific defects such as ID (infiltration drippers) or SRCC (Reinforcement Corroded Chemical)

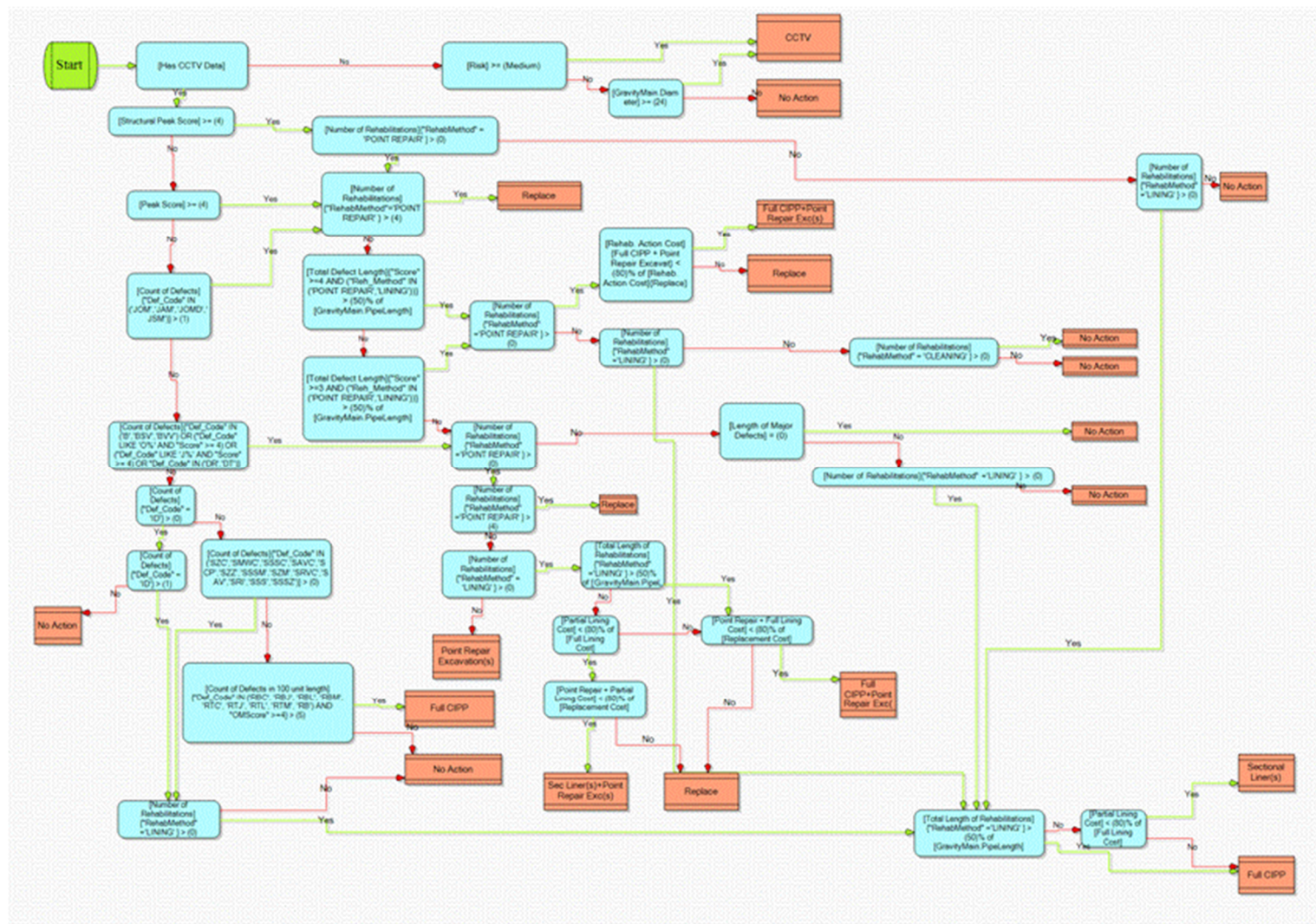
4.1.1 Defect Codes

Defect-level rehabilitation methods were selected and imported into the "Defect Codes" input window of the IAP program. Appendix H provides a full list of defect-level rehabilitation methods assigned for defects of all scores and all types. Table 4-1 presents a sample of the rehabilitation methods assigned for structural defects with a score of five.

Defect Code	Default 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 Mechanical	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

4.1.2 Rehabilitation Decision Tree

Figure 4-2 illustrates the rehabilitation selection process. First, survey data availability is checked in the “[Has CCTV Data]” condition box. Pipes without survey data are then evaluated for risk and large diameter pipes. Pipes with survey data are then screened for inspection score. As the decision tree progresses, each pipe is analyzed for its number of point repairs and lining recommendations outputted by the “defect codes” module, number of defects, length of defects, and presence of specific minor but not negligible defects. When multiple rehabilitation options are present, a cost comparison is done to determine the best action. This is to ensure that a pipe would not be recommended to have 10 sectional liners when a full liner would be more cost efficient. In another example, when multiple point repair(s) by excavation or sectional liner(s) are present, the cost to replace or cost to perform a “full liner + point repair(s) by excavation” is compared to ensure the best action is recommended.



4.1.3 Analysis Quality Check

For each decision tree branch, spot checks were performed to see if the rehabilitation recommendations matched engineering expectations. For example, Figure 4-3 illustrates a pipe which was recommended to be replaced. Using the IAP program, defects present in the pipe and suggested rehab methods were reviewed and validated. At least 20 percent of each decision tree branch was reviewed for each rehabilitation type except pipes with “No Action” which have received a risk score of one (negligible) or two (low).

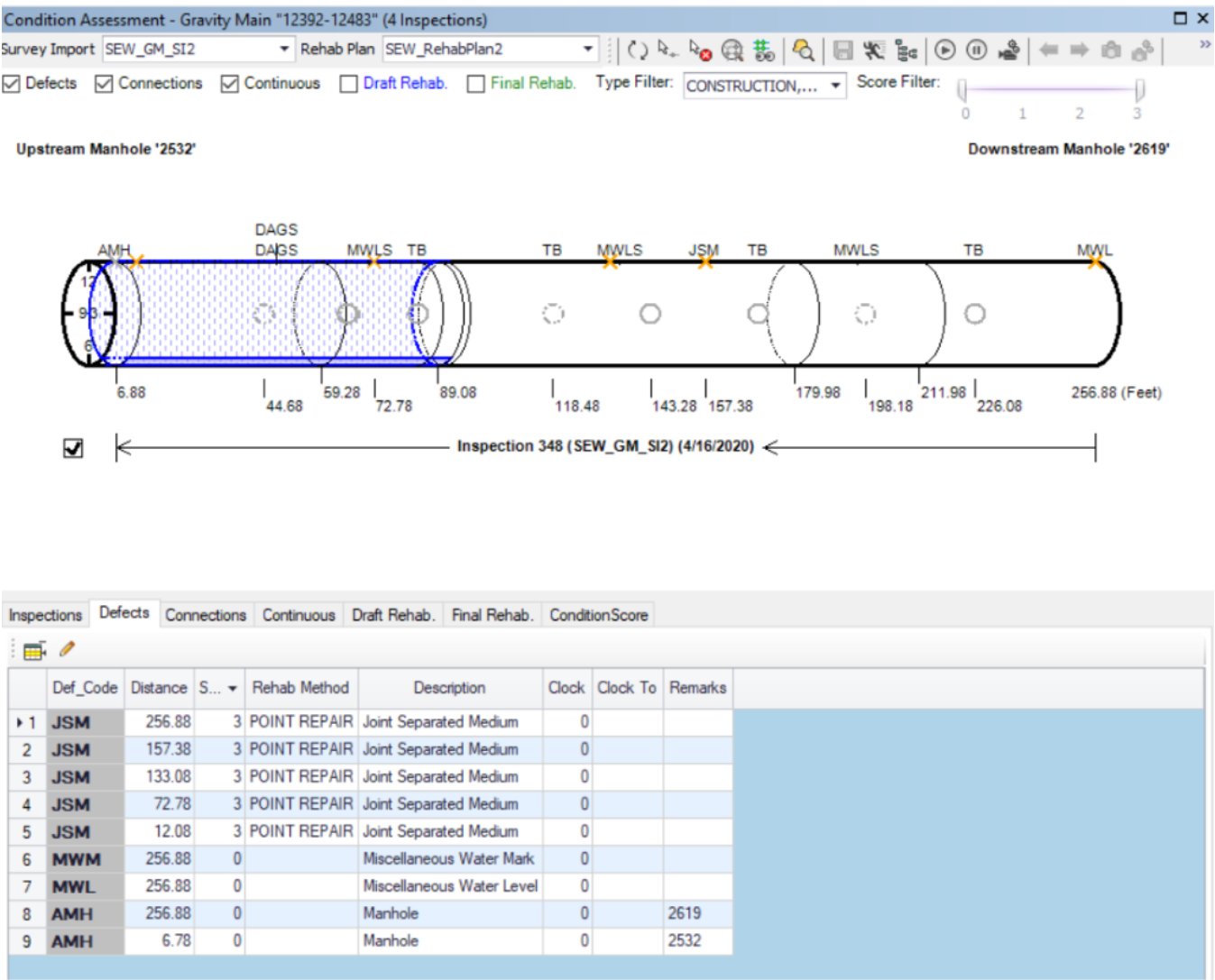


Figure 4-3: Example Analysis Quality Check in IAP

4.1.4 Staff Input

Prior to draft report submission, a preliminary rehabilitation decision tree was sent to the City in July 2020 in the event that preliminary staff input was desired. At the time, review was deferred until after draft report submission. Thus, recommendations are currently based on prior condition assessment projects and

engineering experience. Defect-level rehabilitation methods and decision tree can be adjusted to best suit City operational preferences.

4.2 Basis of Cost Assumptions

Detailed unit costs for the rehabilitation items used in the Class 5 cost estimate can be found in Appendix J. The cost per foot is specified by pipe size. Unit costs are provided for the following:

- CCTV
- Pipe Replacement
- Point Repair(s) by Excavation
- Sectional Liner(s)
- Full Pipe Length Cured in Place Pipe (Full CIPP)

In general, material costs were provided by vendor quotations and labor costs were estimated using RSMeans construction cost database. For pipes with unknown diameters, the average pipe diameter of nine inches was used for costing. For pipes with unknown depths, the average pipe depth of 11 feet was assumed. The unit costs used to develop rehabilitation recommendations are budgetary construction costs and do not include engineering, permitting, legal, administrative, or other planning costs typical of budgetary capital improvement planning. City input for CIP planning level costs either in the form of percentage breakdown or recent bid tabulations would further calibrate the model to ensure the best recommendations are made.

4.3 Review of Recent Projects

As a part of this renewal and replacement study, a review of recent City projects was performed to ensure our recommendations are aligned with recent and planned projects.

Table 4-2 presents recent or ongoing sewer utility and lift station improvement projects from the City's 2019-24 CIP.

Table 4-2. Recent Sewer Utility Improvement Projects			
Project ID	Project	Description	Status
6119	Sanitary Sewer Condition Assessment Program	Citywide CCTV	Ongoing. Summary of recommendations for CCTV are described in Section 4.5. For a full list of CCTV recommendations, see Appendix A
6123	Sanitary Sewer Overflow Improvements	Smart manholes	Ongoing
6124	Sewer Pump Station Rehabilitation Program	In Fiscal Year (FY)2018-19 and FY2019-20 Pump 3 replacement at Main Lift Station and assessment of Pumps 4 and 5	Per 2020 Lift Station Inspections (Task 2 submittal to HSE and briefly described in next section): • Pump 3 is in poor condition and requires replacement • Pumps 4 and 5 are in good condition
6126	Minor Sewer Projects	In FY 2018-19, replace Pump 2 at Main Lift Station and one pump at Venus Station	To be determined

Table 4-2. Recent Sewer Utility Improvement Projects

Project ID	Project	Description	Status
6131	Sanitary Sewer Cathodic Protection Improvements	Two magnetic flow meters at the Main Sewer Pump Station will to be replaced and isolated from cathodic protection to prevent reading interference. Design to start in FY2019-20	To be determined
6132	Sewer Master Plan 2019	This update will identify deficiencies in the collection system and recommend corrective actions. Funding is added to FY2019-20 to include assessment of City's main sewer pipes.	Ongoing. Summary of deficiencies and recommendations are reflected in this report.
Not Provided	Sewer Line Replacement at E. Curtis	This line is at full capacity and requires replacement/upgrades.	To be determined

4.4 Lift Station Rehabilitation

In early 2020, an inspection of the Main Lift Station and Venus Way Lift Station was completed, and deficiencies were catalogued. Table 4-3 summarizes the major lift station deficiencies that require attention. The *Main and Venus Way Lift Station Inspections Report* submitted to City in May 2020 (Appendix K) provides a more comprehensive scoring and inspection notes for lift station assets.

Table 4-3. Main Lift Station Deficiencies

Asset Name	Field Assessment/Comments	Condition Score	Performance Score
Mag Meter (Flow Meter A)	Not in Operation	4 - Poor Condition Major defects observed, asset integrity may be compromised.	4 - Poor Performance In service, but function is highly impaired.
Manifold PV #2 Actuator	Does not work	5 - Failing or Failed Asset integrity is compromised, asset may be out of service.	5 - Failing or Failed Asset is not functioning as intended or is out of service.
Pump #3	Has exceeded useful life	4 - Poor Condition Major defects observed, asset integrity may be compromised.	4 - Poor Performance In service, but function is highly impaired.
Grinder #1	Excessive vibration and inadequate supports	5 - Failing or Failed Asset integrity is compromised, asset may be out of service.	5 - Failing or Failed Asset is not functioning as intended or is out of service.
2" Combination Air/Vacuum Valve	N/A	4 - Poor Condition Major defects observed, asset integrity may be compromised.	4 - Poor Performance In service, but function is highly impaired.
Flow Meter B	Operable, but no accurate	4 - Poor Condition Major defects observed, asset integrity may be compromised.	4 - Poor Performance In service, but function is highly impaired.
Air Vacuum 1 to 15	Cavitation, coating failure, and inadequate supports	5 - Failing or Failed Asset integrity is compromised, asset may be out of service.	5 - Failing or Failed Asset is not functioning as intended or is out of service.
Variable Frequency	No corrosion identified, arc flash labels	4 - Poor Condition	2 - In service

Table 4-3. Main Lift Station Deficiencies

Asset Name	Field Assessment/Comments	Condition Score	Performance Score
Drive P2	missing	Asset integrity may be moderately compromised.	Higher than expected O&M.
Variable Frequency Drive P3	No corrosion identified, understood from City that IGBT was replaced a year ago, arc flash labels missing	4 - Poor Condition Asset integrity may be moderately compromised.	2 - In service Higher than expected O&M.
Variable Frequency Drive P4	No corrosion identified, arc flash labels missing	4 - Poor Condition Asset integrity may be moderately compromised.	2 - In service Higher than expected O&M.
Variable Frequency Drive P5	No corrosion identified, understood from City that cooling fans were replaced a year ago, arc flash labels missing	4 - Poor Condition Asset integrity may be moderately compromised.	2 - In service Higher than expected O&M.

4.5 Summary of Recommendations

Recommendations of system improvements and CCTV inspections total \$17.4 million in construction costs. Asset renewal and replacement priorities were assessed based on inspection data, desktop risk evaluation, and rehabilitation selection methodology described in previous sections. The results are presented below.

4.5.1 Sewer Main Pipelines

Of the approximately 105,000 LF (449 segments) of sewer inspected, about 50,000 LF (178 segments) require improvement. The construction cost of system improvements is estimated at approximately \$17 million. Of the remaining 685,000 LF segments with no inspection data, it is recommended that 55,000 LF of medium to extreme risk pipes and/or large diameter pipes receive CCTV inspection, with an estimated cost totaling approximately \$400,000. Recommendations of system improvements and CCTV inspections total \$17.4 million in construction costs. Large diameter pipe is currently defined as 24-inch diameter and can be adjusted. Recommended improvements include:

- Additional CCTV
- Pipe Replacement
- Full Cured-In-Place Pipe (CIPP)
- Full CIPP + Point Repair(s) by Excavation
- Point Repair(s) by Excavation
- Sectional Liner(s)
- Sectional Liner(s) + Point Repair(s) by Excavation

Figure 4-4 provides the sewer main pipeline rehabilitation recommendations. The capital improvement program (CIP) recommendations for each asset is also included in GIS and tabular format in Appendix A. Note that these recommendations are subject to change depending on future discussions with operational staff prefers to determine rehabilitation preferences of the various levels and types of defects. The Class 5 cost estimates are high level (1-2% planning level) and will be refined as project scopes are further defined. Detailed cost estimates are recommended when further CIP budgeting and planning takes place.

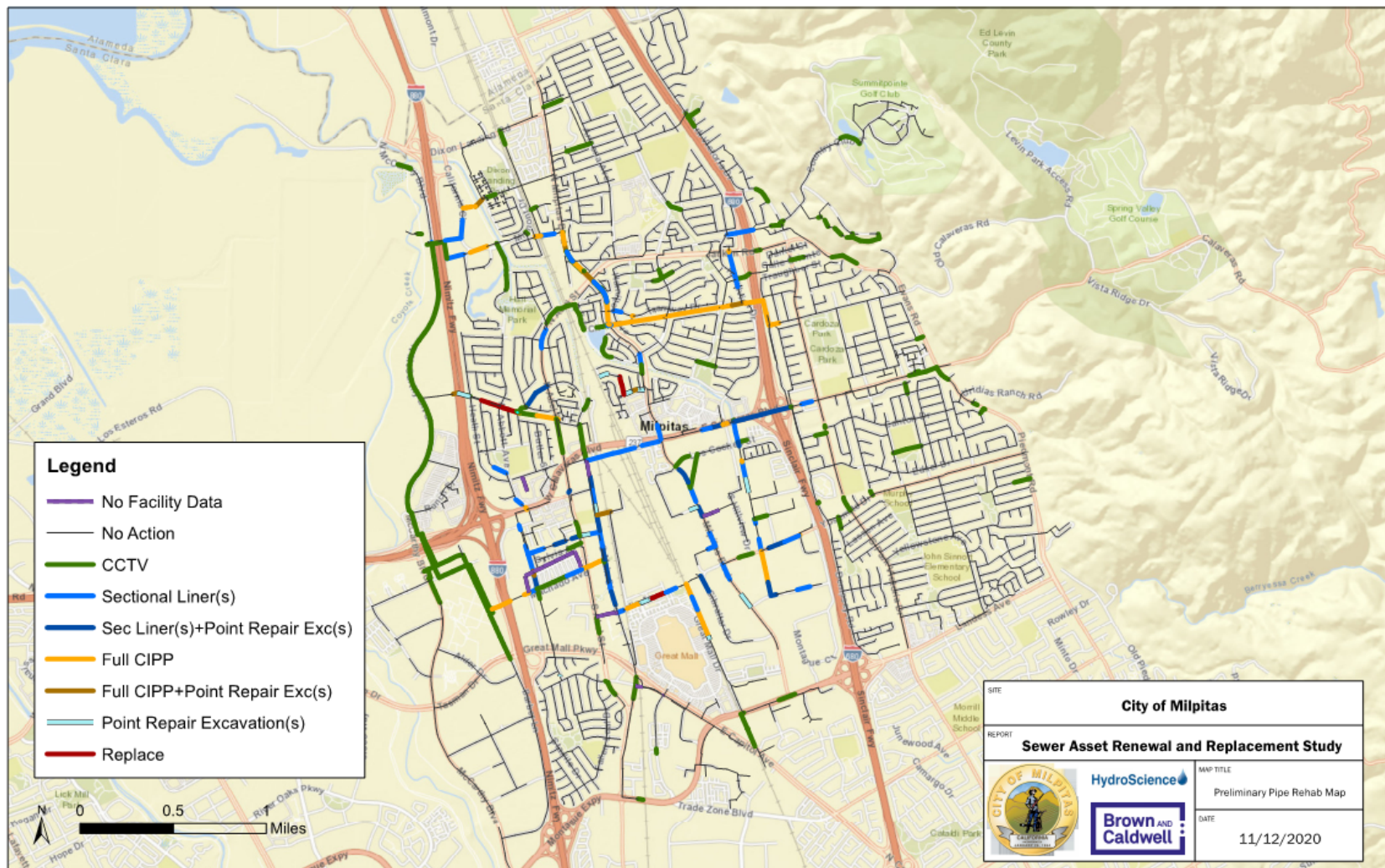


Figure 4-4: Preliminary Pipe Rehabilitation Recommendations Map

4.5.2 CCTV Inspection

Medium to extreme risk pipes and large diameter pipes are recommended for CCTV inspection. Large diameter pipe is currently defined as 24-inch diameter and can be adjusted. Figure 4-5 presents the CCTV inspection map of these highest priority areas. As shown on the figure, CCTV inspections include the long west-side pipeline stretch starting from Barber Lane through N McCarthy Boulevard and throughout the City. These inspections total 55,000 LF, with an estimated cost totaling approximately \$400,000.

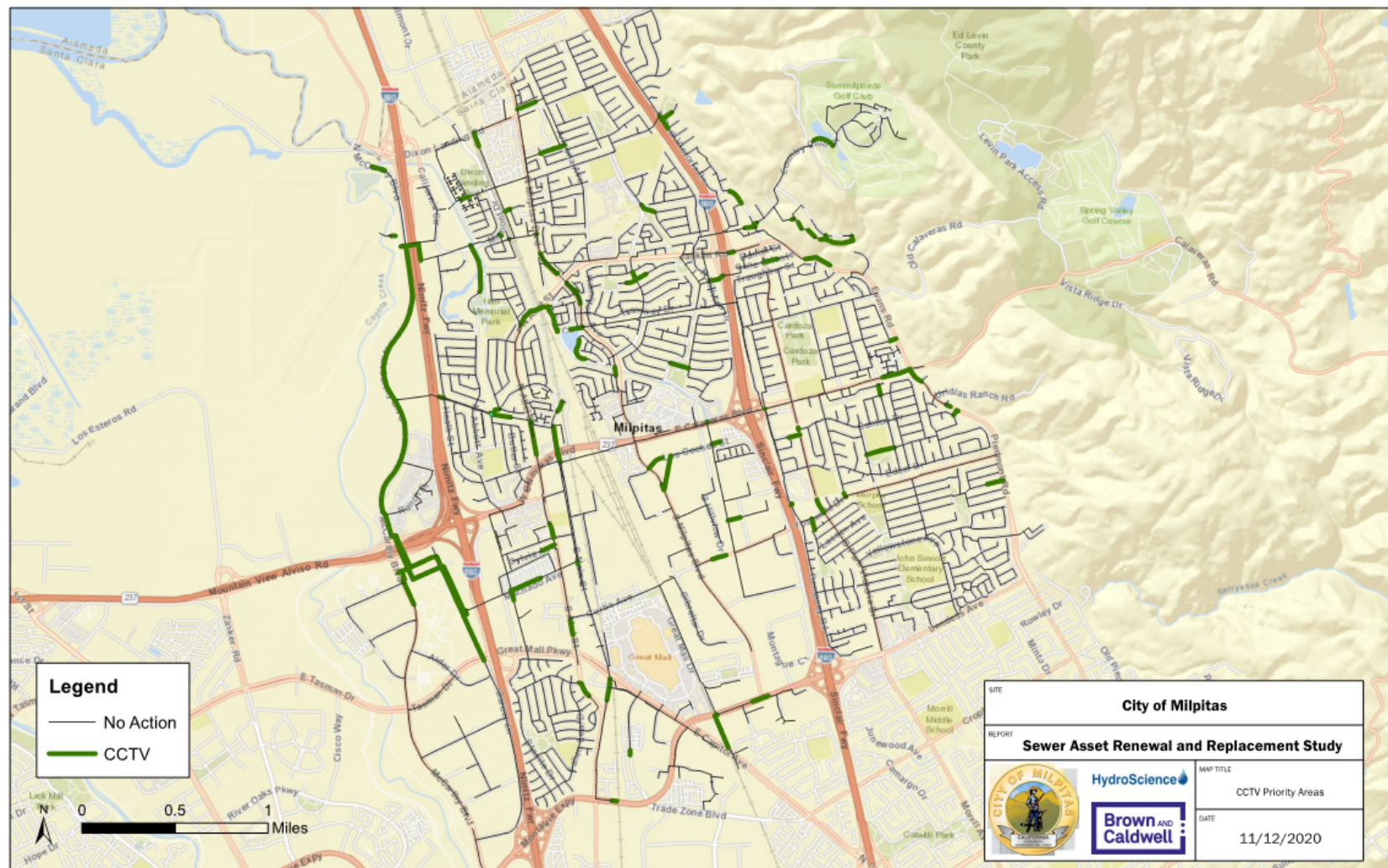


Figure 4-5: Priority CCTV Areas

4.5.3 Preliminary Capital Improvement Plan Alternatives Summary

BC has developed three distinct Capital Improvement Plan (CIP) alternatives to phase out the necessary rehabilitation efforts. Alternative A presents CIP grouping based on risk grades. Alternative B focuses rehabilitation geographically within the sewer basin. Alternative C is a hybrid approach wherein pipes with risk and significant defects are prioritized in the first year and after which a geographic approach is applied for ease of construction. With the given data, Alternative C is recommended among the three alternatives explored here.

However, note that the CIP grouping presented in Alternatives A, B, and C serve as preliminary groupings of sewer pipe rehabilitations. The alternatives presented at this stage are not exhaustive of other possibilities and modifications. Within Appendix A, you will find a “Preliminary Rehab Recommendation.shp” shapefile and excel export results to help facilitate further development of the CIP. The shapefile attribute table contains column “CIP_Phase” which match up with the 4 phases in Alternative A and B. The table also includes column “CIP_ST” which allows sorting of pipes along the same street to facilitate the development of visuals or further analysis of risk and rehabilitation data for CIP development.

4.5.4 Preliminary Sewer Pipeline Capital Improvement Plan – Alternative A

Alternative A presents CIP grouping based on risk grades. Table 4-4 provides an overview of Alternative A. Note that the same street may have GIS segments of various risk grades and may thus be split in this alternative.

Table 4-4. Preliminary Sewer Pipeline Capital Improvement Plan - Alternative A Summary

Year	Description	Construction Cost ¹	Construction Cost Per Year
1	Rehabilitate Extreme Risk Assets	\$1,700,000	-
	CCTV Large Diameter and Medium to Extreme Risk Assets	\$400,000	-
2	Rehabilitate High Risk Assets	\$2,600,000	-
3-7	Rehabilitate Medium Risk Assets	\$10,900,000	\$2,200,000
8	Rehabilitate Low Risk Assets	\$1,800,000	-
Total Cost		\$17,400,000	\$2,175,000

¹Contingencies amounting to 45% are included in the cost estimate (5% Mobilization/Demobilization, 10% Sewer Bypassing, 30% Construction Cost and Market Contingency). Additionally, traffic control during construction amounting to \$10,000 to \$30,000 depending on roadway traffic rating was also assumed. Administrative, engineering, or other planning costs typical of CIP planning are not included.

Year 1

The first year includes rehabilitating extreme risk assets (grade 5 out of 5) and CCTV inspection of the most critical assets as described in Section 4.5.2 involving the long west-side pipeline stretch starting from Barber Lane through N McCarthy Boulevard and throughout City. Table 4-5 presents the pipe rehabilitation details for year 1.

Table 4-5. Alternative A CIP – Year 1, Extreme Risk Pipes

Street Name	Size (inch)	Material	Construction Cost	Facility ID(s)	Notes
Between Tramway Dr and Los Pinos Ave	30	RCP	\$200,000	12043-12021	Full CIPP 250 ft
Coming Ave	8	VCP	\$70,000	10395-10396 10012-10394	Full CIPP 500 ft
E Calaveras Blvd	15, 21	VCP	\$400,000	12717-12718 12721-12722 12722-12711 12488-12496 12729-12717 12721-12722	Full CIPP, Point Repair(s), Sectional Liner(s) 1,800 ft
Just East of S Hillview Dr	15	VCP	\$300,000	10176-10177 12716-12719 10185-10184 10185-10184	Full CIPP, Sectional Liner(s) 1,200 ft
N Milpitas Blvd	33, 39	RCP	\$600,000	12232-12251 12218-12522	Full CIPP, Point Repair(s) 600 ft
Nimitz Freeway and California Cir	42	RCP)	\$34,000	12589-12601	Sectional Liner(s) 500 ft
S Abel St	18	VCP	\$42,000	10480-10481	Point Repair(s), Sectional Liner(s). 65 feet, 1 pipe segment

Year 2

The second year consists of various rehabilitation of high risk (grade 4 out of 5) assets.

Table 4-6. Alternative A CIP – Year 2, High Risk Pipes

Street Name	Size (inch)	Material	Construction Cost	Facility ID (s)	Notes
Between Tramway Dr and Los Pinos Ave	24	VCP	\$100,000	12439-12446 12439-12446	Full CIPP 85 ft
Curtis Ave	18	VCP	\$50,000	10333-10347	Sectional Liner(s) 170 ft
E Calaveras Blvd*	21	VCP	\$70,000	10462-10463	Sectional Liner(s) 330 ft
Just East of S Hillview Dr*	15	VCP	\$335,000	12706-12733 10188-10187 10179-10159 10177-10178 10178-10179	Full CIPP, Point Repair(s), Sectional Liner(s) 1,100 ft
Machado Ave	24	RCP	\$280,000	10403-10418 10403-10418	Full CIPP 400 ft
Marylinn Dr	27	VCP	\$500,000	11647-11695 11678-11680	Pipe Replacement, Point Repair(s), Sectional Liner(s) 770 ft
N Hillview Dr	12	VCP	\$40,000	12088-12081	Sectional Liner(s) 220 ft
N Milpitas Blvd*	33, 39	RCP	\$800,000	12218-12219 12522-12526 12251-12219 12248-12233	Full CIPP, Point Repair(s), Sectional Liner(s) 1,060 ft
S Main St	18, 21	VCP	\$250,000	10331-10350 10404-10398 10399-10467 10467-10474	Point Repair(s) and Sectional Liner(s) 1,600 ft
Sinnot Ln	12	VCP	\$180,000	10472-10467 10472-10467	Full CIPP 400 ft

Note:

*: This street also has a GIS segment requiring rehabilitation in Year 1.

Years 3-7

Years 3-7 feature rehabilitation of medium risk assets (grade 3 out of 5) as described in Table 4-7.

Table 4-7. Alternative A CIP – Years 3-7, Medium Risk Pipes	
Street Name	Rehabilitation Action
Ames Ave	Sectional Liner(s)
Between Tramway and Los Pinos Ave*	Full CIPP, Sectional Liner(s)
Coming Ave*	Point Repair(s), Sectional Liner(s)
Connection between N Milpitas Blvd and Summerwind Way****	Full CIPP, Sectional Liner(s)
Connection to Southwest Community Starting from W Calaveras Blvd****	Full CIPP, Point Repair(s), Sectional Liner(s)
Curtis Ave**	Full CIPP, Pipe Replacement, Point Repair(s), Sectional Liner(s)
E Calaveras Blvd*	Point Repair(s), Sectional Liner(s)
Gibraitar Dr	Point Repair(s), Sectional Liner(s)
Great Mall Dr	Full CIPP, Sectional Liner(s)
Just east of S Hillview Dr*	Point Repair(s), Sectional Liner(s)
Kennedy Dr	Full CIPP
Machado Ave**	Sectional Liner(s), Full CIPP
Marylinn Dr**	Full CIPP, Pipe Replacement, Point Repair(s), Sectional Liner(s)
N Abel St	Sectional Liner(s)
N Hillview Dr**	Sectional Liner(s)
N McCarthy Blvd	Sectional Liner(s)
N Milpitas Blvd*	Full CIPP, Sectional Liner(s)
Nimitz Freeway and California Cir*	2 Crossings near - Sectional Liner(s), Full CIPP
River Rock Rd	Full CIPP
S Abbot Ave	Sectional Liner(s)
S Main St**	Point Repair(s), Sectional Liner(s)
S Milpitas Blvd	Point Repair(s), Sectional Liner(s)
Sinclair Freeway Crossing near Fox Hollow Ct	Sectional Liner(s)
Smithwood St	Sectional Liner(s)
Wool Dr	Full CIPP
Yosemite Dr	Full CIPP, Point Repair(s), Sectional Liner(s)

Notes:

*: the street also has repairs in year 1.

** : the street also has repairs in year 2.

****: the street also has repairs in year 8.

Year 8

Year 8 of Alternative A includes rehabilitation of low risk assets (grade 1 or 2) as described in Table 4-8. The 2020 CCTV inspections included several lower risk assets which identified defects requiring rehabilitation.

Table 4-8. Alternative A CIP – Year 8, Low Risk Pipes	
Street Name	Rehabilitation Action
Between Tramway and Los Pinos Dr*	Full CIPP
Coming Ave*	Sectional Liner(s)
Connection to SW Community Starting from W Calaveras Blvd***	Sectional Liner(s)
Great Mall Dr***	Point Repair(s)
Machado Ave**	Full CIPP
N Hillview Dr**	Sectional Liner(s)
Silverlake Dr	Full CIPP and Point Repair
Sinclair Freeway	Full CIPP
Turquoise St	Point Repair
Tramway Dr	Sectional Liner(s)
Meadowland Dr	Pipe Replacement and Point Repair(s)

Notes:

*: the street also has repairs in year 1.

**: the street also has repairs in year 2.

***: the street also has repairs in years 3-7.

4.5.5 Preliminary Sewer Pipeline Capital Improvement Plan – Alternative B

Alternative B presents CIP grouping based on risk while grouping pipes on the same street that have a rehabilitation action associated with it. Table 4-9 provides an overview of Alternative B.

Table 4-9. Preliminary Sewer Pipeline Capital Improvement Plan - Alternative B Summary			
Year	Description	Construction Cost ¹	Construction Cost Per Year
1-4	Rehabilitate Extreme Risk Pipes and Other Pipes Along the Same Street With Rehabilitation Needs	\$7,800,000	\$2,050,000
	CCTV Large Diameter and Medium to Extreme Risk Pipes	\$400,000	
5-6	Rehabilitate High Risk Pipes and Pipes Along the Same Street	\$5,400,000	\$2,700,000
7-8	Rehabilitate Medium Risk Pipes and Pipes Along the Same Street	\$2,800,000	-
8	Rehabilitate Low Risk Streets	\$1,000,000	-
Total Cost		\$17,400,000	\$2,175,000

¹Contingencies amounting to 45% are included in the cost estimate (5% Mobilization/Demobilization, 10% Sewer Bypassing, 30% Construction Cost and Market Contingency). Additionally, traffic control during construction amounting to \$10,000 to \$30,000 depending on roadway traffic rating was also assumed. Administrative, engineering, or other planning costs typical of CIP planning are not included.

Years 1-4

Years 1-4 include rehabilitating extreme risk pipes and pipes with rehabilitation needs (of any risk grading) along the same street and CCTV inspection of the most critical assets as described in Section 4.5.2 involving the long west-side pipeline stretch starting from Barber Lane through N McCarthy Boulevard and throughout City. Table 4-10 provides the list of pipes requiring rehabilitation in more detail.

Table 4-10. Alternative B CIP – Years 1-4, Streets With Extreme Risk Segments

Risk Grade Average	Street Name	Size (inch)	Material	Total Construction Cost of Street	Cost of Rehabilitating Grade 4 or 5 GIS Segments Only	Notes
5.0	S Abel St	18	VCP	\$42,000	-	Point Repair(s), Sectional Liner(s). 65 feet, 1 pipe segment
4.1	Just East of S Hillview Dr	12, 15	VCP	\$720,000	\$615,000	Full CIPP, Point Repair(s), Sectional Liner(s) 2,300/3,450 ft of high/extreme risk pipe
3.9	E Calaveras Blvd	12, 15, 18, 21	VCP	\$727,000	\$450,000	Full CIPP, Point Repair(s), Sectional Liner(s) 2,150/4,650 ft of high/extreme risk pipe
3.7	N Milpitas Blvd	33, 39	RCP	\$2,300,000	\$1,400,000	Full CIPP, Sectional Liner(s) 1,700/3,050 ft of high/extreme risk pipe
3.5	Coming Ave	8	VCP	\$220,000	\$70,000	Full CIPP 500/1,600 ft of extreme risk pipe
3.5	Nimitz Freeway and California Cir	18, 42	VCP, RCP (respectively)	\$615,000	\$34,000	Full CIPP, Sectional Liner(s) 500/2000 ft of extreme risk pipe
2.8	Between Tramway Dr and Los Pinos Ave	24, 30	VCP, RCP	\$3,200,000	\$300,000	Full CIPP, Sectional Liner(s) 350/4,500 ft of high/extreme risk pipe

Years 5-6

The 5th and 6th year consist of various rehabilitation of high risk (grade 4 out of 5) pipes and pipes along the same street which require rehabilitation of any risk rating. Table 4-11 presents the list of pipes

Table 4-11. Alternative B CIP – Years 5-6, Streets with High Risk Segments

Risk Grade Average	Street Name	Size (inch)	Material	Total Construction Cost of Street	Cost of Rehabilitating Grade 4 Pipes Only	Notes
4.0	Sinnot Ln	12	VCP	\$180,000	-	Full CIPP 400 feet, 2 pipes
3.44	S Main St	18, 21	VCP	\$650,000	\$250,000	Point Repair(s) and Sectional Liner(s) 1,600/3,600 ft of high risk pipes
3.17	Marylinn Dr	27, 30	RCP, VCP	\$2,300,000	\$500,000	Full CIPP, Pipe Replacement, Point Repair(s), Sectional Liner(s) 750/3,100 ft of high risk pipes
3.08	Curtis Ave	15, 18	VCP	\$800,000	\$50,000	Full CIPP, Pipe Replacement, Point Repair(s), Sectional Liner(s), 200/1,600 ft of high risk pipes
2.92	Machado Ave	24, 30	RCP, VCP	\$1,300,000	\$280,000	Full CIPP, Sectional Liner(s) 400/2,150 ft of high risk pipes
2.6	N Hillview Dr	12	DIP, CIP	\$170,000	\$40,000	Sectional Liner(s) 200/1,050 ft of high risk pipes

Years 7-8, Medium Risk Pipes

Years 7-8 include rehabilitating medium risk pipes as detailed in Table 4-12

Table 4-12. Alternative B CIP – Years 7-8, Medium Risk Pipes	
Street Name	Rehabilitation Action
Ames Ave	Sectional Liner(s)
Connection to Southwest Community Starting from W Calaveras Blvd	Full CIPP, Point Repair(s), Sectional Liner(s)
Connection Between N Milpitas Blvd and Summerwind Way	Full CIPP, Sectional Liner(s)
Gibraltar Dr	Point Repair(s), Sectional Liner(s)
Great Mall Dr	Full CIPP, Sectional Liner(s)
Kennedy Dr	Full CIPP
N Abel St	Sectional Liner(s)
N McCarthy Blvd	Sectional Liner(s)
River Rock Rd	Full CIPP
S Abbot Ave	Sectional Liner(s)
S Milpitas Blvd	Point Repair(s), Sectional Liner(s)
Sinclair Freeway Crossing near Fox Hollow Ct	Sectional Liner(s)
Smithwood St	Sectional Liner(s)
Wool Dr	Full CIPP
Yosemite Dr	Full CIPP, Point Repair(s), Sectional Liner(s)

Year 8, Low Risk Pipes

Year 8 also includes rehabilitating low risk pipes as detailed in Table 4-13.

Table 4-13. Alternative B CIP – Year 8, Low Risk Pipes	
Street Name	Rehabilitation Action
Silverlake Dr	Full CIPP and Point Repair
Sinclair Freeway	Full CIPP
Turquoise St	Point Repair
Tramway Dr	Sectional Liner(s)
Meadowland Dr	Pipe Replacement and Point Repair(s)

4.5.6 Preliminary Sewer Pipeline Capital Improvement Plan – Alternative C (Recommended)

Alternative C presents a hybrid approach of Alternative A and B. The most pressing defects within the high and extreme risk pipe subset are addressed in the first year to reduce the likelihood of catastrophic failures. Following this, street by street rehabilitation (sorted by risk) similar to Alternative B is recommended for ease of construction.

Table 4-14. Preliminary Sewer Pipeline Capital Improvement Plan - Alternative C Summary

Year	Description	Construction Cost ¹	Construction Cost Per Year
1	Rehabilitate Extreme and High Risk Pipes with Significant Defects	\$1,300,000	\$3,000,000
	CCTV Large Diameter and Medium to Extreme Risk Pipes	\$400,000	
1-3	Rehabilitate Extreme Risk Pipes and Pipes Along the Same Street Requiring Rehabilitation	\$7,400,000	
4	Rehabilitate High Risk Pipes and Pipes Along the Same Street	\$1,900,000	-
5-7	Rehabilitate Medium Risk Pipes and Pipes Along the Same Street	\$5,400,000	\$1,800,000
8	Rehabilitate Low Risk Streets	\$1,000,000	-
Total Cost		\$17,400,000	\$2,175,000

¹Contingencies amounting to 45% are included in the cost estimate (5% Mobilization/Demobilization, 10% Sewer Bypassing, 30% Construction Cost and Market Contingency). Additionally, traffic control during construction amounting to \$10,000 to \$30,000 depending on roadway traffic rating was also assumed. Administrative, engineering, or other planning costs typical of CIP planning are not included.

Year 1

In year 1, extreme and high risk pipes with significant defects are addressed. Table 4-15 provides the list of extreme risk pipes with significant defects. Additionally, CCTV inspection of the most critical assets involving the long west-side pipeline stretch starting from Barber Lane through N McCarthy Boulevard and throughout City as depicted in Figure 4-4 is recommended (Section 4.5.2).

Table 4-15. Alternative C CIP – Year 1, Extreme Risk Pipes With Significant Defects

Street Name	Size	Material	Significant Defects Observed	Rehab Recommendation	Construction Cost	Facility ID
Coming Ave	8	VCP	Broken Soil Visible Surface Corrosion Metal Pipe	Sectional Liner(s), Point Repair(s)	\$40,000	10012-10394
E Calaveras Blvd	15	VCP	Broken	Sectional Liner(s), Point Repair(s)	\$85,000	12717-12718
E Calaveras Blvd	15	VCP	Broken	Full CIPP	\$75,000	12721-12722
E Calaveras Blvd	15	VCP	Hole Soil Visible Broken (3) Broken Soil Visible	Full CIPP	\$40,000	12721-12722
E Calaveras Blvd	15	VCP	Broken (3)	Sectional Liner(s), Point Repair(s)	\$70,000	12722-12711
E Calaveras Blvd	15	VCP	Broken (3)	Sectional Liner(s), Point Repair(s)	\$80,000	12729-12717
Just East of S Hillview Dr	15	VCP	Broken (2)	Sectional Liner(s)	\$35,000	10185-10184
Just East of S Hillview Dr	15	VCP	Broken	Full CIPP	\$30,000	10185-10184
Total Construction Cost					\$500,000	

Table 4-16 provides the list of high risk pipes with significant defects.

Table 4-16. Alternative C CIP – Year 1, High Risk Pipes With Significant Defects

Street Name	Size	Material	Significant Defects Observed	Rehab Recommendation	Construction Cost	Facility ID
Curtis Ave	18	VCP	Broken	Sectional Liner(s)	\$50,000	10333-10347
Marylinn Dr	27	VCP	Broken (3)	Pipe Replacement	\$390,000	11678-11680
Marylinn Dr	27	RCP	Broken (2)	Full CIPP, Point Repair(s)	\$30,000	11657-11678
N Hillview Dr	12	VCP	Obstruction Intruding Through Wall	Sectional Liner(s)	\$40,000	12088-12081
S Main St	18	VCP	Broken (2)	Sectional Liner(s)	\$50,000	10404-10398
S Main St	21	VCP	Broken (2)	Point Repair(s)	\$35,000	10467-10474
Sinnot Ln	12	VCP	Surface Damage Reinforcement Visible	Full CIPP, Point Repair(s)	\$95,000	10472-10467
Sinnot Ln	12	VCP	Surface Damage Reinforcement Projecting	Full CIPP, Point Repair(s)	\$85,000	10472-10467
Total Construction Cost					\$800,000	

Years 1-3

In years 1-3, extreme risk pipes and pipes with rehabilitation needs (of any risk grading) along the same street which were not addressed in year 1 are recommended at this stage. Table 4-17 provides the list of pipes requiring rehabilitation in more detail.

Table 4-17. Alternative C CIP – Years 1-3, Streets with Extreme Risk Segments						
Risk Grade Average	Street Name	Size (inch)	Material	Total Construction Cost of Street	Cost of Rehabilitating Grade 4 or 5 GIS Segments Only	Notes
5.0	S Abel St	18	VCP	\$42,000	-	Point Repair(s), Sectional Liner(s). 65 feet, 1 pipe segment
3.9	Just East of S Hillview Dr*	12, 15	VCP	\$655,000	\$550,000	Full CIPP, Point Repair(s), Sectional Liner(s) 2,300/3,450 ft of high/extreme risk pipe
3.7	N Milpitas Blvd	33, 39	RCP	\$2,300,000	\$1,400,000	Full CIPP, Sectional Liner(s) 1,700/3,050 ft of high/extreme risk pipe
3.5	Nimitz Freeway and California Cir	18, 42	VCP, RCP (respectively)	\$615,000	\$34,000	Full CIPP, Sectional Liner(s) 500/2000 ft of extreme risk pipe
3.3	E Calaveras Blvd*	12, 15, 18, 21	VCP	\$370,000	\$95,000	Full CIPP, Point Repair(s), Sectional Liner(s) 2,150/4,650 ft of high/extreme risk pipe
3.2	Coming Ave*	8	VCP	\$180,000	\$30,000	Full CIPP 500/1,600 ft of extreme risk pipe
2.8	Between Tramway Dr and Los Pinos Ave	24, 30	VCP, RCP	\$3,200,000	\$300,000	Full CIPP, Sectional Liner(s) 350/4,500 ft of high/extreme risk pipe
Total Construction Cost					\$7,400,000	

Note:

*: This street had some rehabilitation done in year 1.

Year 4

The 4th year consist of various rehabilitation of high risk (grade 4 out of 5) pipes and other pipes requiring rehabilitation along the same street. Table 4-18 presents the list of pipes.

Table 4-18. Alternative C CIP – Year 4, Streets with High Risk Segments						
Risk Grade Average	Street Name	Size (inch)	Material	Total Construction Cost of Street	Cost of Rehabilitating Grade 4 Pipes Only	Notes
3.3	S Main St*	18, 21	VCP	\$570,000	\$170,000	Point Repair(s) and Sectional Liner(s) 1,600/3,600 ft of high risk pipes
2.9	Machado Ave	24, 30	RCP, VCP	\$1,300,000	\$280,000	Full CIPP, Sectional Liner(s) 400/2,150 ft of high risk pipes
Total Construction Cost					\$1,900,000	

Note:

*: This street had some rehabilitation done in year 1.

Years 5-7, Medium Risk Pipes

Years 5-7 include rehabilitating medium risk pipes as detailed in Table 4-19.

Table 4-19. Alternative C CIP – Years 5-7, Medium Risk Pipes	
Street Name	Rehabilitation Action
Ames Ave	Sectional Liner(s)
Connection to Southwest Community Starting from W Calaveras Blvd	Full CIPP, Point Repair(s), Sectional Liner(s)
Connection Between N Milpitas Blvd and Summerwind Way	Full CIPP, Sectional Liner(s)
Curtis Ave	Full CIPP, Pipe Replacement, Point Repair(s), Sectional Liner(s)
Gibraltar Dr	Point Repair(s), Sectional Liner(s)
Great Mall Dr	Full CIPP, Sectional Liner(s)
Kennedy Dr	Full CIPP
Marylinn Dr	Full CIPP, Pipe Replacement, Point Repair(s), Sectional Liner(s)
N Abel St	Sectional Liner(s)
N Hillview Dr	Full CIPP, Sectional Liner(s)
N McCarthy Blvd	Sectional Liner(s)
River Rock Rd	Full CIPP
S Abbot Ave	Sectional Liner(s)
S Milpitas Blvd	Point Repair(s), Sectional Liner(s)
Sinclair Freeway Crossing near Fox Hollow Ct	Sectional Liner(s)
Smithwood St	Sectional Liner(s)
Wool Dr	Full CIPP
Yosemite Dr	Full CIPP, Point Repair(s), Sectional Liner(s)

Year 8, Low Risk Pipes

Year 8 also includes rehabilitating low risk pipes as detailed in Table 4-20.

Table 4-20. Alternative C CIP – Year 8, Low Risk Pipes	
Street Name	Rehabilitation Action
Silverlake Dr	Full CIPP and Point Repair
Sinclair Freeway	Full CIPP
Turquoise St	Point Repair
Tramway Dr	Sectional Liner(s)
Meadowland Dr	Pipe Replacement and Point Repair(s)

4.5.7 Sewer Lift Station Rehabilitation

The Main Lift Station and Venus Way Lift Station were inspected, and major deficiencies were catalogued (refer to Table 4-3). The variable frequency drives (VFDs), pump #3, and grinder are the main items requiring rehabilitation. The detailed score for each inventory item is provided in Appendix K, *Main and Venus Way Lift Station Inspections Report*. Per City's 2019-24 CIP, project 6124, an allowance of \$100,000 annual investment from FY 2019-20 through 2022-23 is planned to address these rehabilitation needs.

4.5.8 Estimated Construction Cost

The Association for the Advancement of Cost Engineering (AACE) Class 5 Estimate is a rough order-of-magnitude estimate typically used to evaluate alternatives and is the class of estimate used in this report. Standard unit prices were developed for the primary components in each proposed construction contract. Scope items were parametrically estimated using cost data from similar projects in scope and size and adjusted to suit the specific requirements of this project. The estimated construction costs presented are considered conceptual and include a 45 percent contingency factor. Additionally, the presented costs are budgetary construction costs and do not include engineering, permitting, legal, administrative, or other planning costs typical of budgetary capital improvement planning.

References

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"USGS National Transportation Dataset for California 20170822", *Data Catalog*, 2017, <https://catalog.data.gov/dataset/usgs-national-transportation-dataset-ntd-for-california-20140908-state-or-territory-shapefile>

"Water and Sewer System Information," *City of Milpitas Government*, <http://www.ci.milpitas.ca.gov/milpitas/departments/public-works-department-home-page/watersewer2018/#1546465747578-cb3b6f17-70cd>.

Appendix A: Rehabilitation Table, GIS, and Figures

This Appendix is a file export from Microsoft Excel.

Appendix B: Planned CCTV Inspection Scope

**City of Milpitas
CCTV Inspection Scope
November 14, 2019**

Scope of Work

HydroScience Engineers (HSE) plans to contract with National Plant (Contractor) to inspect portions of the City of Milpitas' large-diameter trunk sewers and other local collector sewers with high-definition CCTV equipment. For large-diameter trunk sewers in the Trunk A grouping below, provide an option to collect 2D laser and sonar data in addition to CCTV. CCTV inspections shall be NASSCO PACP compliant. The actual length to be inspected and inspection methods will be determined later based on pricing, field production, and available budget. During contracting, HSE and Contractor will determine the inspection equipment specifications.

Each "Priority" group below contains groupings of reaches, also listed in order of priority. We expect the Contractor will be able to inspect all the Priority 1 reaches. For Priority 2 reaches, the Contractor should inspect the first grouping and then move onto the second grouping, starting with the largest diameters reaches and working towards the smaller diameters. Within the grouping, the inspection Contractor will be allowed to select the order in which to inspect the reaches based on ease of access, traffic control, and other factors; however, the inspected reaches shall be contiguous as much as possible.

See the attached figures and spreadsheet for the candidate list of reaches planned for inspection. Also provided are shapefiles of the sewer pipes and manholes. The two fields in the sewer pipes attribute table, [CCTV_Plan] and [Diam_CCTV], contain the designated grouping and the expected pipe diameters, respectively. Lengths are based off of the [MEASUREDLE] field. Groupings below have the same names as the inspection maps, with GIS attribute label [CCTV_Plan] in parentheses.

PRIORITY 1

Trunk A_P1 (Trunk1)

Reinforced concrete pipe (RCP), diameters of 33, 36, 39, 42, 54, and 66 inches. 37 reaches, total length 8,830 linear feet (lf). Provide option to perform 2D laser and sonar inspection on a portion of the pipeline.

Trunk B_P1 (Trunk2)

RCP and vitrified clay pipe (VCP), diameters of 27 and 33 inches. 24 reaches, total length 5,760 lf.

Trunk C_P1 (Trunk3)

RCP and VCP, diameters of 24 and 30 inches. 15 reaches, total length 4,850 lf.

SW Area 21-24_P1 (Sub_21-24)

Mostly VCP, diameters of 21 and 24 inches. 19 reaches, total length 4,520 lf.

SW Area 10-18_P1 (Sub_10-18)

Mostly VCP, diameters of 10, 12, 15, and 18 inches. 162 reaches, total length 46,720 lf.

SW Area 8_P1 (Sub_8)

Mostly VCP, 8-inch-diameter, 26 reaches, total length 8,660 lf.

PRIORITY 2***Misc 21-36_P2 (Sub_21-36_P2)***

Mostly VCP, some RCP, diameters of 21, 24, 27, 30, 36 inches. 66 reaches, total length 16,890 lf.

Misc 12-18_P2 (Sub_12-18_P2)

Mostly VCP, diameters of 12, 15, and 18 inches. 141 reaches, total length 31,000 lf.

CITY INSPECTIONS

To be inspected by City of Milpitas forces using City-owned equipment (WinCan). Mostly 6- and 8-inch-diameter VCP pipes. 389 reaches, total length 98,750 lf.

Manholes

There is no plan to perform MACP inspections on manholes; however, during CCTV inspection, the inspection Contractor shall capture video footage in each manhole to allow a basic assessment of manhole conditions.

Cleaning

Cleaning is not anticipated for sewers 15-inch-diameter and larger, and only targeted cleaning is anticipated for 8-inch- to 12-inch-diameter sewers. The Contractor shall attempt to inspect each sewer reach without cleaning. If unable to complete an inspection, mark the record "MSA" per NASSCO PACP, and alert the City immediately. Depending on availability, City forces may be dispatched to clean the pipe at that time, or may clean the pipe later for potential reinspection.

Estimated Pricing (based on communication with National Plant in November 2019)

Diameter	CCTV, per lf	2D Laser + Sonar, per lf
8-inch to 18-inch	\$1.61	n/a
21-inch	\$1.61 - \$2.11	n/a
24-inch to 66-inch	\$2.11 - 2.40	\$6.00

Attachments:

1. Pipe reach summary tables (count and total length by diameter)
2. Inspection plan maps

Count of FID *	Column Labels																		
Row Labels	0	6	8	10	12	15	16	18	21	24	27	30	33	36	39	42	54	66	Grand Total
City	10	220	114	22	13	7				2						1			389
Trunk1													5	4	9	12	2	5	37
Trunk2											21	3							24
Trunk3										6		9							15
Sub_21-24									11	8									19
Sub_10-18				28	23	68	1	42											162
Sub_8			26																26
Sub_21-36_P2									35	5	4	13		9					66
Sub_12-18_P2			1		72	43	1	24											141
Grand Total	10	220	141	50	108	118	2	66	46	21	25	25	5	13	9	13	2	5	879

Sum of MEASUREDLE	Column Labels																		
Row Labels	0	6	8	10	12	15	16	18	21	24	27	30	33	36	39	42	54	66	Grand Total
City	1,198	59,521	28,690	5,158	2,785	1,123				250						11			98,736
Trunk1													1,334	729	2,485	2,995	251	1,035	8,829
Trunk2										4,716	1,045								5,761
Trunk3										1,422		3,427							4,849
Sub_21-24									3,205	1,311									4,516
Sub_10-18				8,321	6,673	19,933	126	11,667											46,720
Sub_8			8,663																8,663
Sub_21-36_P2									7,897	1,368	781	4,242		2,599					16,887
Sub_12-18_P2			134		15,803	9,972	68	5,024											31,001
Grand Total	1,198	59,521	37,487	13,479	25,261	31,028	194	16,691	11,102	4,351	5,497	8,714	1,334	3,328	2,485	3,006	251	1,035	225,962

Legend

SS_Pipe

DIAMETER

- <=6-inch
- 8-inch
- 10-15
- 16-23
- 24-36
- >=39-inch
- Unknown

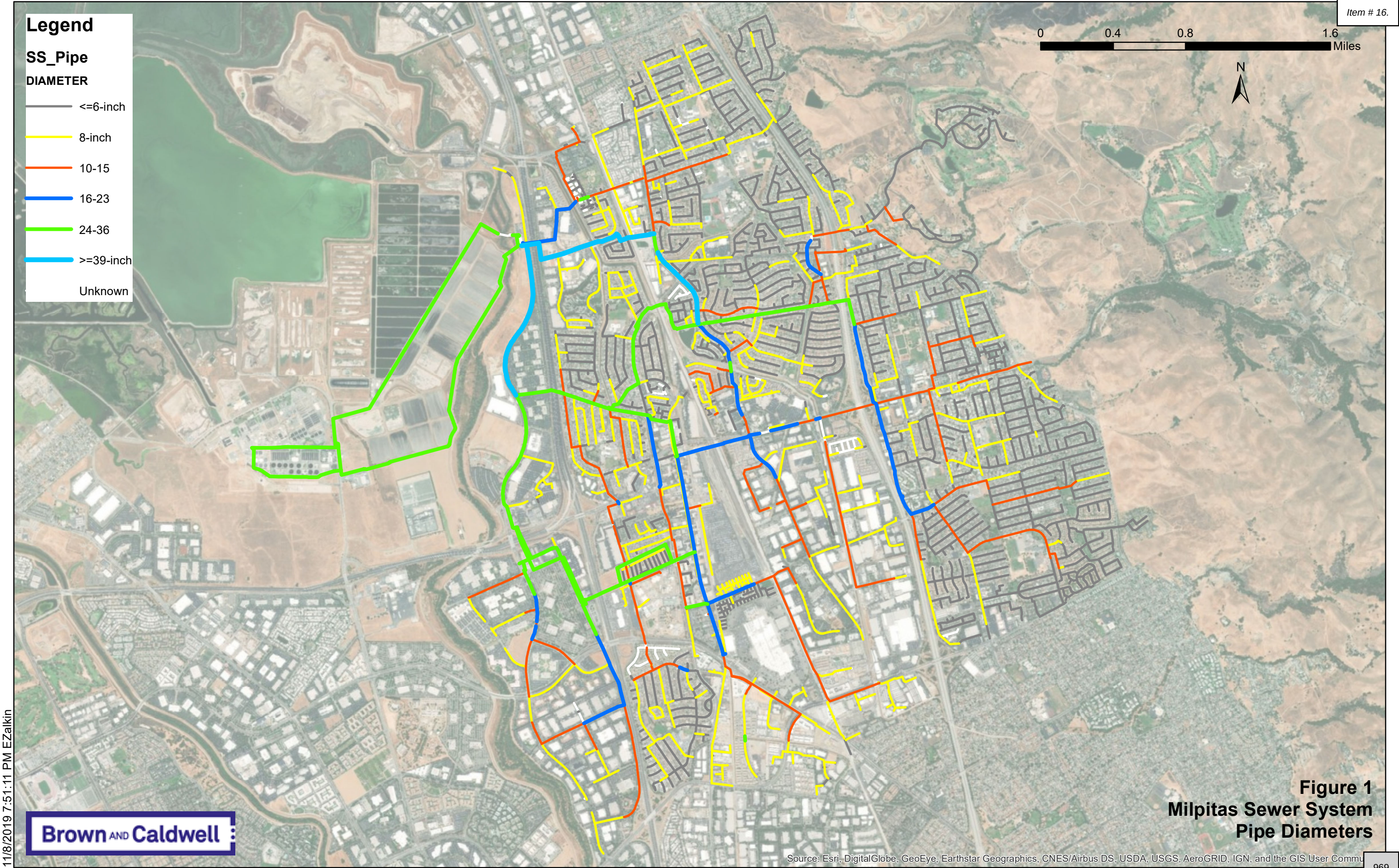
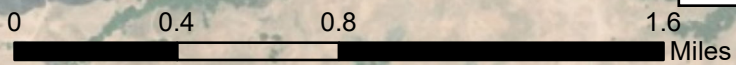
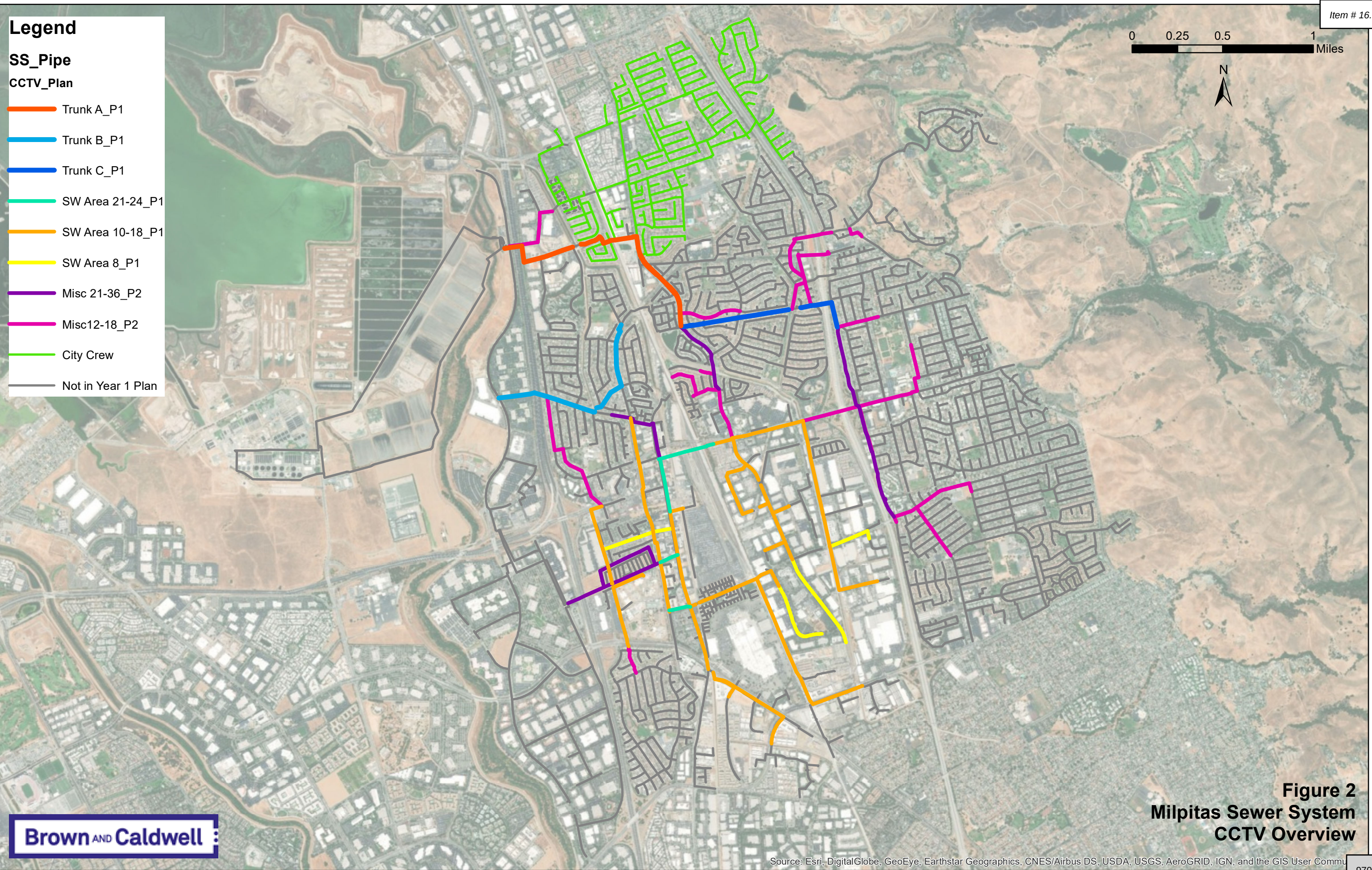


Figure 1
Milpitas Sewer System
Pipe Diameters



Legend

SS_Pipe

CCTV_Plan

Trunk A_P1

Trunk B_P1

Trunk C_P1

SW Area 21-24_P1

SW Area 10-18_P1

SW Area 8_P1

Misc 21-36_P2

Misc12-18_P2

City Crew

Not in Year 1 Plan

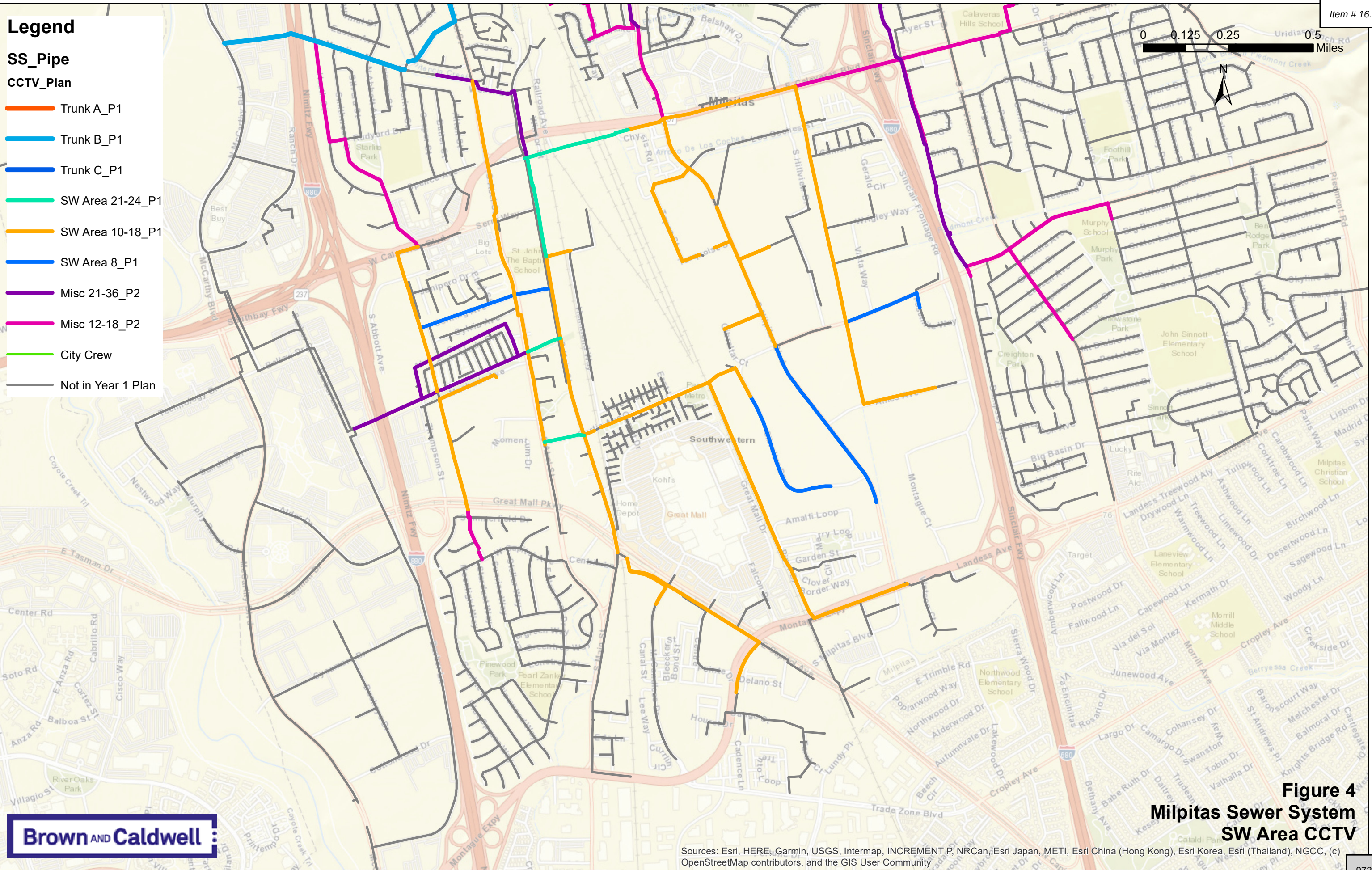


11/14/2019 11:52:11 AM EZalkin



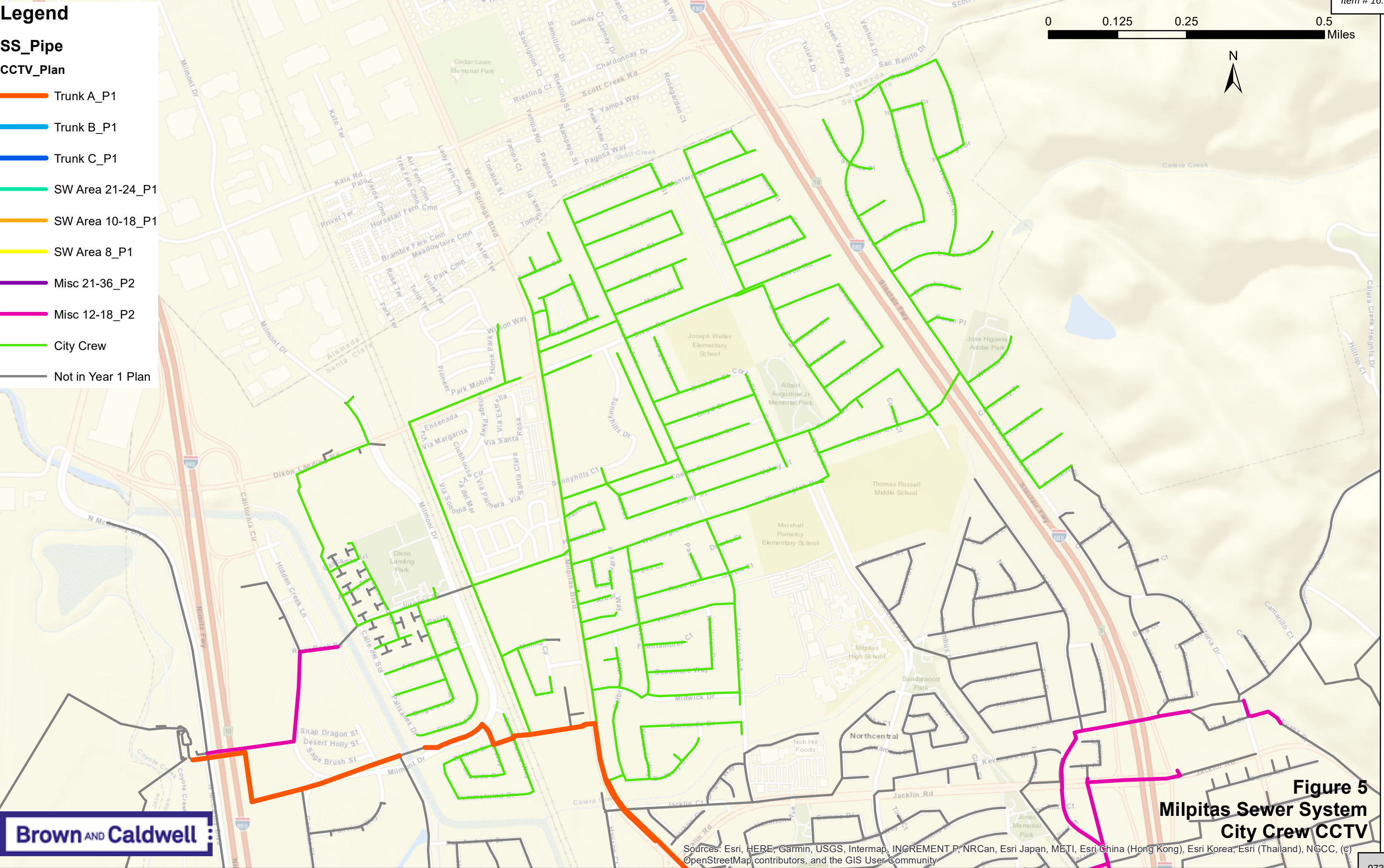
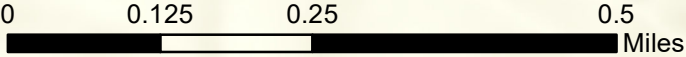
Figure 3
Milpitas Sewer System
Trunk CCTV

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

- Legend
- SS_Pipe
- CCTV_Plan
- Trunk A_P1
- Trunk B_P1
- Trunk C_P1
- SW Area 21-24_P1
- SW Area 10-18_P1
- SW Area 8_P1
- Misc 21-36_P2
- Misc 12-18_P2
- City Crew
- Not in Year 1 Plan



Appendix C: QC Comments Log

City of Milpitas - CCTV Review Summary												
US node ID	DS node ID	Structure quick rating	Reviewed by	QC Header Information (UT26)	QC Coding (UT27)	QC General Comments (UT28)	Inspection ID	Direction of survey	Height (in)	Material	Length surveyed (ft)	Pipe length (ft)
1148	2852	5341	DSkipper	Header information is accurate.		From 276-282 there are multiple cracks. The one that was coded was a continuous crack at 12 o'clock but the camera doesn't look up to clarify where this crack actually ends? And the pipe is broken at 6 o'clock, grade 5, at 276	1148_D_20200501_0315	D	15	VCP	388.3	388
1417	979	4A31	DSkipper	Header information is accurate.		Significant fractures from 30-90ft. Coded correctly,.	1417_D_20200423_0239	D	12	VCP	344.3	343
210	582	5134	DSkipper	Header information is accurate.		Hole Soil Visible at 177, scored correctly as 5. Survey incomplete, crawler unable to proceed after 198 feet due to Siphon	210_D_20200421_2304	D	8	VCP	198.8	233
2229	2222	5141	DSkipper	Header information is accurate.		Broken VCP in two locations, coded correctly.	2229_D_20200422_0512	D	12	VCP	218.7	218
2290	2652	3H2D	DSkipper	Header information is accurate.		Corrected pipe material and shape to 66" RCP per defect log.	2290_U_20200415_0447	U	66	RCP	193.6	200
2321	2317	3N2F	DSkipper	Header information is accurate.		no additional comments	2321_D_20200409_0528	D	39	RCP	236.1	238
2373	2391	3R00	DSkipper	Header information is accurate.		DS MH does not exist. Geoplan indicates it should have been at 415 feet. They continued on until 430 feet and declared it nonexistent.	2373_D_20200413_0537	D	39	RCP	430.1	415
2388	2373	3Y2G	DSkipper	Header information is accurate.		No comments, operator was thorough	2388_D_20200413_0500	D	39	RCP	374.3	370
2584	2321	3M2J	DSkipper	Header information is accurate.		no additional comments	2584_U_20200409_0435	U	39	RCP	367.7	372
2652	2650	3F00	DSkipper	Header information is accurate.		Pipe material is marked as unknown. Pipe appears to be lined	2652_U_20200409_2343	U	62	XXX	148.8	157
2723	2735	3H2H	DSkipper	Header information is accurate.		Changed pipe length to 493 per the geoplan. Inspection only made it part way to 231 ft due to water level	2723_D_20200410_0454	D	40	RCP	231.7	493
2724	2723	3G2F	DSkipper	Header information is accurate.		Corrected pipe size to 40" per comment in the defect log.	2724_D_20200410_0420	D	42	RCP	182.6	187

US node ID	DS node ID	Structure quick rating	Reviewed by	QC Header Information (UT26)	QC Coding (UT27)	QC General Comments (UT28)	Inspection ID	Direction of survey	Height (in)	Material	Length surveyed (ft)	Pipe length (ft)
2725	2724	3Z00	DSkipper	Header information is accurate.		Why is unknown debris a continuous defect for the entire pipe? There is enough flow to obscure the bottom of pipe so not clear what debris is being referenced.	2725_D_20200410_0309	D	42	ZZZ	518.1	507
2726	2725	3W00	DSkipper	Header information is accurate.		Unable to discern pipe material due to liner.	2726_D_20200410_0249	D	42	ZZZ	281.5	292
2840	2842	5B41	DSkipper	Header information is accurate.		Coded correctly, several continuous cracks at 12 oclock, graded as a 5	2840_D_20200501_0439	D	15	VCP	311.9	302
2852	2840	5142	DSkipper	Header information is accurate.		No additional comments, coded correctly	2852_D_20200501_0356	D	15	VCP	500.3	499
340	352	5241	DSkipper	Header information is accurate.		no additional comments	340_D_20200403_0613	D	15	VCP	398.4	422
346	346A	412K	DSkipper	Header information is accurate.		Changed the fractures multiple at 4 feet to broken. the VCP is definitely broken, not merely fractured.	346_D_20200403_0456	D	15	VCP	399.5	239.331
356A	356	4131	DSkipper	Header information is accurate.		In IAM the survey direction was marked incorrectly	356_U_20200406_0016	U	15	VCP	6.6	14.314
374	142	5126	DSkipper	Header information is accurate.		142 is an undocumented manhole. downstream survey was done beginning at 142 and continuing on to 373.	374_D_20200428_0521	D	15	VCP	217.9	
525	539	412D	DSkipper	Header information is accurate.		inspection incomplete due to water level	525_D_20200407_0517	D	18	VCP	152.6	168
558	551	5233	DSkipper	Header information is accurate.		Changed structural grade from 3 to 4 at 154 feet. Broken pipe later on in pipe scored as 5.	558_D_20200429_0306	D	15	VCP	226.5	216
572	570	512F	DSkipper	Header information is accurate.		Broken pipe at 333. Coded correctly as a five. No other comments, looks properly coded.	572_D_20200429_0020	D	15	VCP	385.5	388
659	659A	432F	DSkipper	Header information is accurate.		659A- new uncharted manhole found.	659_D_20200408_0203	D	12	VCP	213.8	244.97
723	743	3P2R	DSkipper	Header information is accurate.		Video header indicates RCP but defect comment log indicates could be Asbestos pipe. Changed in infoasset to Asbestos Cement as pipe material.	723_D_20200417_0019	D	30	AC	433.1	432

US node ID	DS node ID	Structure quick rating	Reviewed by	QC Header Information (UT26)	QC Coding (UT27)	QC General Comments (UT28)	Inspection ID	Direction of survey	Height (in)	Material	Length surveyed (ft)	Pipe length (ft)
727	65	412M	DSkipper	Header information is accurate.		Looks good, he stopped at all the taps.	727_D_20200430_0808	D	15	VCP	384.7	
742A	738	3G2G	DSkipper	742 should be changed to 742A in the video header.		Video file labeled just as 742_738, not 742A	742A_U_20200420_0208	U	30	RCP	220.7	135.744
743	742	3F2F	DSkipper	Header information is accurate.		Pipe material marked as unknown but comment says possibly asbestos. MSA at 185ft - unable to continue with survey. Incomplete Survey	743_D_20200417_0102	D	30	XXX	185.1	224
1019	2195	3A2O	DSkipper	Header information is accurate.		The SRI, SAV, and SSS codes seem to be used concurrently and interchangeably. SSS used for entire pipe but SAV and SRI used for just smaller sections? Not clear what the difference is and why codes were used like that.	1	D	24	VCP	370.5	368
1673	20134	442A	DSkipper	Header information is accurate.		No additional comments	24	D	27	ZZZ	382	392
1805	1826	5232	DSkipper	Header information is accurate.		US survey only 18 feet. Everything looks good.	29	U	27	RCP	18.7	18
1826	1828	5H3J	DSkipper	Header information is accurate.		Video says VCP but recorded as RCP here in infoasset (Correction Noted in Video starting after 0.00 ft)	17	D	27	RCP	271.2	273
1828	1830	5D3D	DSkipper	Header information is accurate.		no additional comments	18	D	27	RCP	146.7	142
1830	1831	5D3C	DSkipper	Header information is accurate.		SRC and SAV at 8.04: Defect Wanders? I don't see what they mean.	19	D	27	RCP	110.3	109
1831	1846	5P3K	DSkipper	Header information is accurate.		at249.9 Is it TBD? Why defective? Correct to another tap code?	20	D	27	RCP	318	319
1846	1847	5I3G	DSkipper	Header information is accurate.		60.60 is this actually TB? Or correct to TF? Same for 99.3 - TBA or TBA?	21	D	27	RCP	222.2	225
2168	2181	3J2I	DSkipper	Header information is accurate.		MH 2391 Not Found. Pipe length was supposed to be 415 ft and they continued to 430 ft before indicating it was NF. Much of the video is sideways or underwater but no fault of the operator, flow was pretty high	3	D	24	RCP	299.2	297

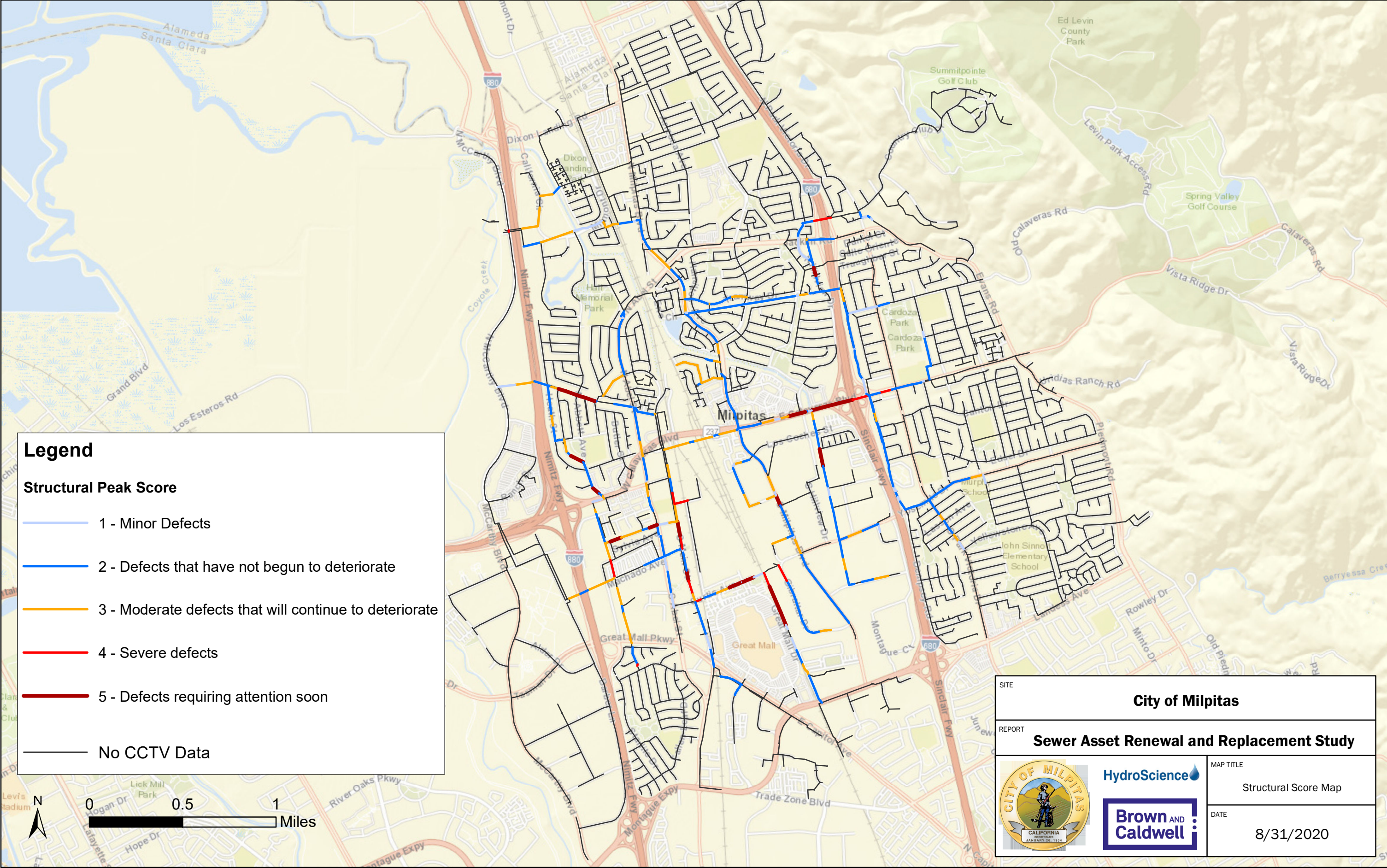
US node ID	DS node ID	Structure quick rating	Reviewed by	QC Header Information (UT26)	QC Coding (UT27)	QC General Comments (UT28)	Inspection ID	Direction of survey	Height (in)	Material	Length surveyed (ft)	Pipe length (ft)
2195	2168	3T2P	DSkipper	Header information is accurate.		No additional comments	2	D	24	RCP	365.4	368
2237	2240	3S2Z	DSkipper	Header information is accurate.		Video is really blurry. SSS and SAV used concurrently/interchangeably for entirety of pipe. Two SAV scores added for continuous sections with significant wall loss	11	D	30	XXX	502.4	500
2240	2241	3R2Z	DSkipper	Header information is accurate.		Video is unfocused	16	D	30	XXX	497.5	497
2241	2592	3S2R	DSkipper	Header information is accurate.		Video is unfocused	13	U	30	XXX	505.7	505
2284	2237	3E2Z	DSkipper	Header information is accurate.		No additional comments	10	D	30	ZZZ	519.2	519
2487	2634	2R11	DSkipper	Header information is accurate.		unclear why there is a comment about not being able to find the upstream MH. It was found near where it was supposed to be, pipe length indicated as 505 feet.	94	U	18	VCP	498.5	505
2589	2577	3R2Y	DSkipper	Header information is accurate.		Video is blurry due to steam. Unfocused but still viewable	14	D	30	XXX	501.4	520
2592	2589	3R2Q	DSkipper	Header information is accurate.		No additional comments	12	U	30	XXX	501	502
2837	2838	3K29	DSkipper	Header information is accurate.		No additional comments.	90	D	18	VCP	368.4	363
2844	2845A	5346	DSkipper	Header information is accurate.		No additional comments	125	D	15	VCP	117.2	76.827
2845	2834	5233	DSkipper	Header information is accurate.		Everything looks accurate	124	D	15	VCP	362.3	361
377	376A	512N	DSkipper	Header information is accurate.		Why did they end at uncharted MH 376A and not continue to 376?	135	D	15	VCP	449.4	342.098
389	390	2911	DSkipper	Header information is accurate.		Pipe lined. nothing much of interest. Deposits throughout and one tap	114	D	10	PE	300.5	302

US node ID	DS node ID	Structure quick rating	Reviewed by	QC Header Information (UT26)	QC Coding (UT27)	QC General Comments (UT28)	Inspection ID	Direction of survey	Height (in)	Material	Length surveyed (ft)	Pipe length (ft)
393	401	5131	DSkipper	Header information is accurate.		no additional comments	104	D	12	VCP	302.3	307
404	378	0	DSkipper	Header information is accurate.		US MH found via CCTV but not found above ground. Paved over.	133	U	15	VCP	258.7	254
523	542	4131	DSkipper	Header information is accurate.		no additional comments	64	D	18	VCP	398.9	423
542	602	5146	DSkipper	Header information is accurate.		no additional comments	65	D	18	VCP	299.4	275
543	592	4131	DSkipper	Header information is accurate.		Looks good - Survey stopped due to crawler unable to get over rock	61	D	18	VCP	277.1	378
543	592	422A	DSkipper	Header information is accurate.		No additional comments	62	U	18	VCP	93.4	378
592	586	544A	DSkipper	Header information is accurate.		no additional comments	63	D	18	VCP	412	410
605	607	2J00	DSkipper	Header information is accurate.		Pipe is lined all the way through.	49	D	12	ZZZ	578.3	578
725	732	5131	DSkipper	Header information is accurate.		No additional comments	131	D	8	VCP	325.2	325
1045	1037	2D00	DHill	Header information is accurate.		No additional comments	1045_D_20200504_0220	D	12	VCP	169.5	157
1060	1145	2I11	DHill	Header information is accurate		No additional comments	1060_D_20200505_0006	D	12	VCP	293.9	292
1113	1149	5531	DHill	Header information is accurate	Changed broken to fractures multiple	No additional comments	1113_D_20200504_0347	D	12	VCP	302.5	303
1149	1151	2500	DHill	Header information is accurate		No additional comments	1149_D_20200504_0410	D	12	VCP	296.3	295

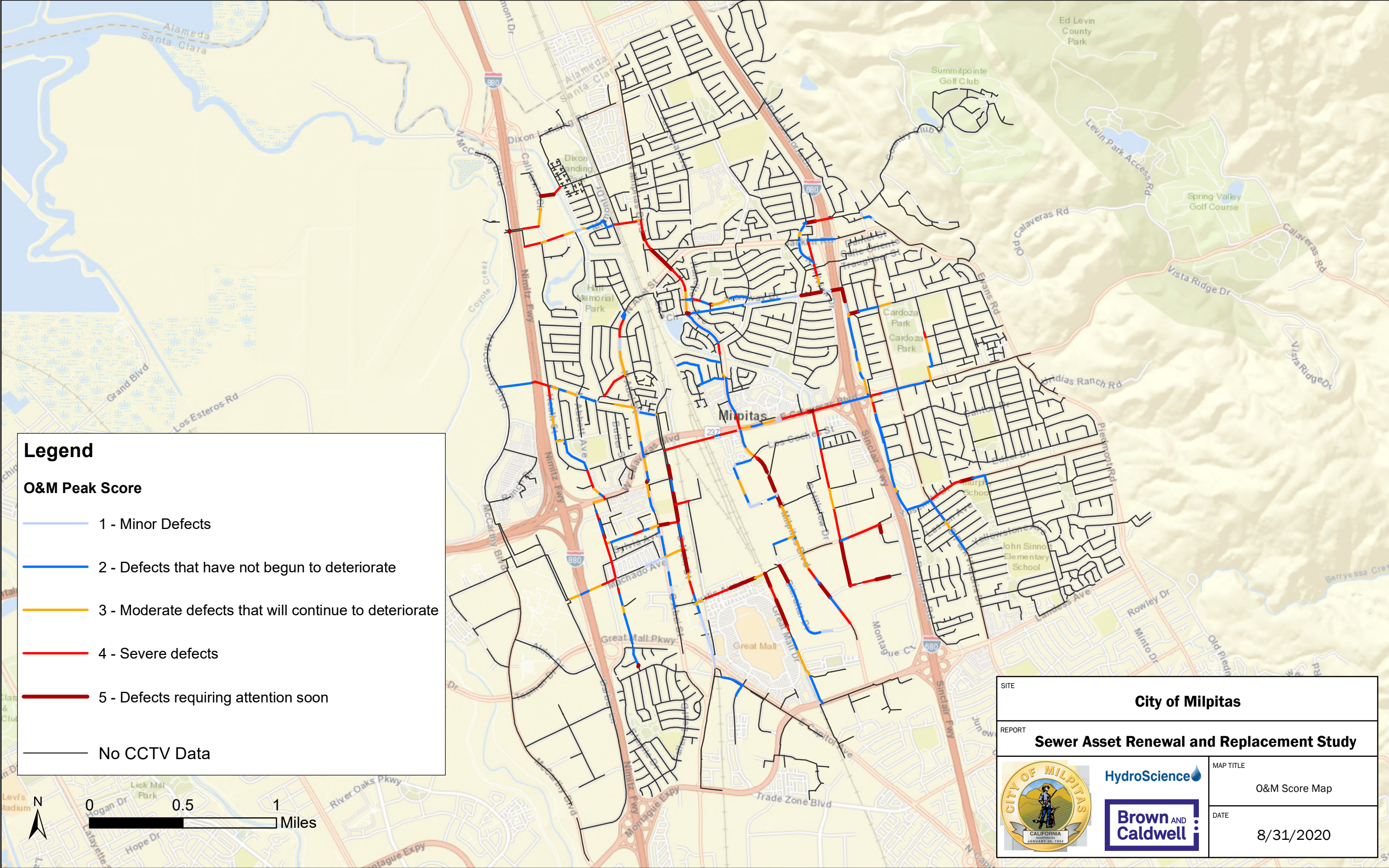
US node ID	DS node ID	Structure quick rating	Reviewed by	QC Header Information (UT26)	QC Coding (UT27)	QC General Comments (UT28)	Inspection ID	Direction of survey	Height (in)	Material	Length surveyed (ft)	Pipe length (ft)
1152	1148	522C	DHill	Header information is accurate	Changed broken to fracture multiple	No additional comments	1152_U_20200504_0501	U	15	VCP	479.2	481
1165	1143	2H00	DHill	Header information is accurate.		No additional comments	1165_D_20200504_2301	D	12	VCP	299.5	294
157	527	5100	DHill	Header information is accurate		Camera blocked by debris	157_D_20200506_0601	D	18	VCP	46.6	
2015	2743	4131	DHill	Header information is accurate		No additional comments	2015_D_20200515_0132	D	18	VCP	44.2	45
2076	2088	2400	DHill	Header information is accurate		No additional comments	2076_U_20200512_0415	U	12	VCP	252.1	288
2078	2076	512G	DHill	Header information is accurate	Changed broken to factures multiple	No additional comments	2078_U_20200512_0444	U	12	VCP	496.7	364
2089	2093	2900	DHill	header information is accurate		No additional comments	2089_D_20200507_0027	D	18	VCP	65.4	64
2094	2205	2G00	DHill	header information is accurate		No additional comments	2094_D_20200507_0053	D	18	VCP	218.6	217
2219	2204	2B00	DHill	Header information is accurate		No additional comments	2219_D_20200507_2352	D	15	VCP	370	397
2358	2658	3G2F	DHill	Header information is accurate		No additional comments	2358_D_20200514_0437	D	33	RCP	199.4	200
2359	2358	3400	DHill	Header information is accurate		No additional comments	2359_D_20200514_0425	D	33	RCP	21.7	24
2391	2359	3722	DHill	Header information is accurate		No additional comments	2391_U_20200514_0326	U	39	RCP	313.2	318
2529	2602	2F00	DHill	Header information is accurate		No additional comments	2529_D_20200512_0020	D	12	PE	240.5	251

US node ID	DS node ID	Structure quick rating	Reviewed by	QC Header Information (UT26)	QC Coding (UT27)	QC General Comments (UT28)	Inspection ID	Direction of survey	Height (in)	Material	Length surveyed (ft)	Pipe length (ft)
2534	2533	2F14	DHill	Header information is accurate		no additional comments	2534_U_20200515_0018	U	15	PE	287.3	292
2602	2593	3D26	DHill	Header information is accurate		No additional comments	2602_D_20200512_0048	D	12	PE	165.5	161
2638	2736	352F	DHill	Header information is accurate		Camera is blocked by debris	2638_D_20200511_0002	D	18	VCP	230.6	446
2658	2661	3H2H	DHill	Header information is accurate		No additional comments	2658_D_20200514_0456	D	33	RCP	231.5	349
2658	2661	3525	DHill	Header information is accurate		Camera is blocked by debris	2658_U_20200514_0549	U	33	RCP	24.8	349
2666	2638	3A2M	DHill	Header information is accurate		No additional comments	2666_D_20200511_0131	D	18	VCP	526.4	524
2714	2718	3321	DHill	Header information is accurate		Camera is blocked by debris	2714_U_20200514_0051	U	42	RCP	21.2	392
2753	2759	3I2I	DHill	Changed pipe material to RCP		No additional comments	2753_U_20200515_0319	U	18	DIP	274.8	272
2760C	2760D	1200	DHill	MH numbers do not match GIS		Need contractor map to match to GIS	2760C_D_20200515_0432	D	18	PVC	148.4	
372	152	0	DHill	Manhole numbers do not match GIS		Need contractor map to match to GIS	372_D_20200506_0507	D	18	VCP	87	
547	681	3C00	DHill	Header information is accurate		No additional comments	547_D_20200507_2242	D	15	VCP	126.9	136
604	605	0	DHill	Header information is accurate		No additional comments	604_D_20200507_2136	D	15	VCP	0	102
160	161	342B	DHill	Manhole numbers do not match GIS		Need info from contractor to associate with GIS	160_D_20200506_0646	D	18	VCP	253.6	

Appendix D: CCTV Structural Scores Map



Appendix E: CCTV O&M Scores Map



Appendix F: Risk Table and GIS

This Appendix is a file export from Microsoft Excel.

Appendix G: Risk Maps

This Appendix is not used.

Appendix H: Defect-Level Rehabilitation Methods

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
ACB	0	CONSTRUCTION	Catch Basin				0	0	0	0	0	0	0	0	
ACOH	0	CONSTRUCTION	Cleanout House				0	0	0	0	0	0	0	0	
ACOM	0	CONSTRUCTION	Cleanout Mainline				0	0	0	0	0	0	0	0	
ACOP	0	CONSTRUCTION	Cleanout Property line				0	0	0	0	0	0	0	0	
ACOS	0	MISCELLANEOUS	Cleanout Saddle				0	0	0	0	0	0	0	0	
ADP	0	CONSTRUCTION	Discharge Point				0	0	0	0	0	0	0	0	
AEP	0	CONSTRUCTION	End of Pipe				0	0	0	0	0	0	0	0	
AJB	0	CONSTRUCTION	Junction Box				0	0	0	0	0	0	0	0	
AM	0	CONSTRUCTION	Meter				0	0	0	0	0	0	0	0	
AMH	0	CONSTRUCTION	Manhole				0	0	0	0	0	0	0	0	
AML	0	MISCELLANEOUS	Mainline				0	0	0	0	0	0	0	0	
AOC	0	CONSTRUCTION	Special Chamber				0	0	0	0	0	0	0	0	
ATC	0	CONSTRUCTION	Tee Connection				0	0	0	0	0	0	0	0	
AW	0	MISCELLANEOUS	Wye				0	0	0	0	0	0	0	0	
AWA	0	CONSTRUCTION	Wastewater Access Device				0	0	0	0	0	0	0	0	
AWD	0	MISCELLANEOUS	Double Wye				0	0	0	0	0	0	0	0	
AWW	0	CONSTRUCTION	Wet Well				0	0	0	0	0	0	0	0	
AZ	0	MISCELLANEOUS	Access Point Other				0	0	0	0	0	0	0	0	
B	4	STRUCTURAL	Broken	LINING	LINING		0	0	1	2	0	0	0	0	
BSV	5	STRUCTURAL	Broken Soil Visible	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
BVV	5	STRUCTURAL	Broken Void Visible	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
CC	1	STRUCTURAL	Crack Circumferential	LINING	LINING		0	0	0	0	0	0	0	0	
CH2	2	STRUCTURAL	Crack Longitudinal Hinge, 2	LINING	LINING		0	0	0	0	0	0	0	0	
CH3	3	STRUCTURAL	Crack Longitudinal Hinge, 3	LINING	LINING		0	0	0	0	0	0	0	0	
CH4	4	STRUCTURAL	Crack Longitudinal Hinge, 4	LINING	LINING		0	0	0	0	0	0	0	0	
CI	0	CONSTRUCTION	Intruding Connection	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	0	0	0	
CL	2	STRUCTURAL	Crack Longitudinal	LINING	LINING		0	0	0	0	0	0	0	0	
CM	3	STRUCTURAL	Crack Multiple	LINING	LINING		0	0	0	0	0	0	0	0	
CN	0	CONSTRUCTION	Connection				0	0	0	0	0	0	0	0	
CS	2	STRUCTURAL	Crack Spiral	LINING	LINING		0	0	0	0	0	0	0	0	
CU	0	MISCELLANEOUS	Camera Underwater				0	0	0	0	0	0	0	0	
CX	0	MISCELLANEOUS	Defective Connection	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
D	0	MISCELLANEOUS	Deformed	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	10	
DAE	0	SERVICE	Deposits Attached Encrustation	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DAGS	0	SERVICE	Deposits Attached Grease	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DAR	0	SERVICE	Deposits Attached Ragging	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DAZ	0	MISCELLANEOUS	Deposits Attached Other	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DB	3	STRUCTURAL	Displaced Brick	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
DBFI	5	MISCELLANEOUS	Deformed Flexible Bulging Inverse Curvature	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
DC	0	MISCELLANEOUS	Change in Sewer Dimension				0	0	0	0	0	0	0	0	
DE	0	MISCELLANEOUS	Debris	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
DFBR	0	MISCELLANEOUS	Deformed Flexible Bulging Round				0	0	5	10	0	0	0	0	
DFC	5	MISCELLANEOUS	Deformed Flexible Bulging Creasing	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
DFE	3	MISCELLANEOUS	Deformed Flexible Elliptical	LINING	LINING		0	0	0	0	0	0	0	0	
DG	0	MISCELLANEOUS	Debris Grease	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
DH	5	MISCELLANEOUS	Deformed Horizontal Brick	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
DI	5	STRUCTURAL	Dropped Invert	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
DNF	0	SERVICE	Deposits Ingressed Fine	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DNGV	0	SERVICE	Deposits Ingressed Gravel	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DNZ	0	SERVICE	Deposits Ingressed Other	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DR	0	MISCELLANEOUS	Deformed Rigid	POINT REPAIR	POINT REPAIR		0	0	0	5	0	0	0	0	
DS	0	MISCELLANEOUS	Debris Silt	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
DSC	0	SERVICE	Deposits Settled Compacted	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DSF	0	SERVICE	Deposits Settled Fine	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DSGV	0	SERVICE	Deposits Settled Gravel	CLEANING	CLEANING		0	0	0	0	0	10	20	30	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
DSZ	0	SERVICE	Deposits Settled Other	CLEANING	CLEANING		0	0	0	0	0	10	20	30	
DTBI	5	MISCELLANEOUS	Deformed Brick Bulging Inverse Curvature	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
DTBR	0	MISCELLANEOUS	Deformed Brick Bulging Round				0	0	0	5	0	0	0	0	
DV	5	STRUCTURAL	Deformed Vertical Brick	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
FBEM	0	MISCELLANEOUS					0	0	0	0	0	0	0	0	
FBEMD	0	STRUCTURAL	Fitting Mitered Bend Down				0	0	0	0	0	0	0	0	
FBEMLD	0	STRUCTURAL	Fitting Mitered Bend Left Down				0	0	0	0	0	0	0	0	
FBEMLU	0	STRUCTURAL	Fitting Mitered Bend Left Up				0	0	0	0	0	0	0	0	
FBEMR	0	STRUCTURAL	Fitting Mitered Bend Right				0	0	0	0	0	0	0	0	
FBEMRD	0	STRUCTURAL	Fitting Mitered Bend Right Down				0	0	0	0	0	0	0	0	
FBEMRU	0	STRUCTURAL	Fitting Mitered Bend Right Up				0	0	0	0	0	0	0	0	
FBEMU	0	STRUCTURAL	Fitting Mitered Bend Up				0	0	0	0	0	0	0	0	
FBES	0	MISCELLANEOUS					0	0	0	0	0	0	0	0	
FBESD	0	STRUCTURAL	Fitting Sweep Bend Down				0	0	0	0	0	0	0	0	
FBESL	0	STRUCTURAL	Fitting Sweep Bend Left				0	0	0	0	0	0	0	0	
FBESLD	0	STRUCTURAL	Fitting Sweep Bend Left Down				0	0	0	0	0	0	0	0	
FBESLU	0	STRUCTURAL	Fitting Sweep Bend Left Up				0	0	0	0	0	0	0	0	
FBESR	0	STRUCTURAL	Fitting Sweep Bend Right				0	0	0	0	0	0	0	0	
FBESRD	0	STRUCTURAL	Fitting Sweep Bend Right Down				0	0	0	0	0	0	0	0	
FBESRU	0	STRUCTURAL	Fitting Sweep Bend Right Up				0	0	0	0	0	0	0	0	
FBESU	0	STRUCTURAL	Fitting Sweep Bend Up				0	0	0	0	0	0	0	0	
FC	2	STRUCTURAL	Fracture Circumferential	LINING	LINING		0	0	0	0	0	0	0	0	
FCA	0	MISCELLANEOUS	Fitting Cap				0	0	0	0	0	0	0	0	
FCAF	0	MISCELLANEOUS	Fitting Cap Fitting				0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
FCAS	0	MISCELLANEOUS	Fitting Cap Seal				0	0	0	0	0	0	0	0	
FH2	3	STRUCTURAL	Fracture Longitudinal Hinge, 2	LINING	LINING		0	0	0	0	0	0	0	0	
FH3	4	STRUCTURAL	Fracture Longitudinal Hinge, 3	LINING	LINING		0	0	0	0	0	0	0	0	
FH4	4	STRUCTURAL	Fracture Longitudinal Hinge, 4	LINING	LINING		0	0	0	0	0	0	0	0	
FL	3	STRUCTURAL	Fracture Longitudinal	LINING	LINING		0	0	0	0	0	0	0	0	
FM	4	STRUCTURAL	Fracture Multiple	LINING	LINING		0	0	0	0	0	0	0	0	
FRV	0	MISCELLANEOUS	Fitting Vertical Riser				0	0	0	0	0	0	0	0	
FS	3	STRUCTURAL	Fracture Spiral	LINING	LINING		0	0	0	0	0	0	0	0	
FTDS	0	MISCELLANEOUS	Fitting Double Sweep Tee				0	0	0	0	0	0	0	0	
FTS	0	MISCELLANEOUS	Fitting Sweep Tee				0	0	0	0	0	0	0	0	
GRT	0	MISCELLANEOUS	Grout at a Location				0	0	0	0	0	0	0	0	
GTFJ	0	MISCELLANEOUS	Grout Test Fail Joint				0	0	0	0	0	0	0	0	
GTFL	0	MISCELLANEOUS	Grout Test Fail Lateral				0	0	0	0	0	0	0	0	
GTPJ	0	MISCELLANEOUS	Grout Test Pass Joint				0	0	0	0	0	0	0	0	
GTPL	0	MISCELLANEOUS	Grout Test Pass Lateral				0	0	0	0	0	0	0	0	
GTUJ	0	MISCELLANEOUS	Grout Test Unable to Test Joint				0	0	0	0	0	0	0	0	
GTUL	0	MISCELLANEOUS	Grout Test Unable to Test Lateral				0	0	0	0	0	0	0	0	
H	0	STRUCTURAL	Hole	POINT REPAIR	POINT REPAIR		0	0	0	2	0	0	0	0	
HSV	5	STRUCTURAL	Hole Soil Visible	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
HVV	5	STRUCTURAL	Hole Void Visible	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
ID	3	MISCELLANEOUS	Infil Dripper	LINING	LINING		0	0	0	0	0	0	0	0	
IDB	3	SERVICE	Infiltration Dripper Barrel	LINING	LINING		0	0	0	0	0	0	0	0	
IDC	3	SERVICE	Infiltration Dripper Connection	LINING	LINING		0	0	0	0	0	0	0	0	
IDJ	3	SERVICE	Infiltration Dripper Joint	LINING	LINING		0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
IDL	3	SERVICE	Infiltration Dripper Lateral	LINING	LINING		0	0	0	0	0	0	0	0	
IG	5	MISCELLANEOUS	Infil Gusher	LINING	LINING		0	0	0	0	0	0	0	0	
IGB	5	SERVICE	Infiltration Gusher Barrel	LINING	LINING		0	0	0	0	0	0	0	0	
IGC	5	SERVICE	Infiltration Gusher Connection	LINING	LINING		0	0	0	0	0	0	0	0	
IGJ	5	SERVICE	Infiltration Gusher Joint	LINING	LINING		0	0	0	0	0	0	0	0	
IGL	5	SERVICE	Infiltration Gusher Lateral	LINING	LINING		0	0	0	0	0	0	0	0	
IR	4	SERVICE	Infil Runner	LINING	LINING		0	0	0	0	0	0	0	0	
IRB	4	SERVICE	Infiltration Runner Barrel	LINING	LINING		0	0	0	0	0	0	0	0	
IRC	4	SERVICE	Infiltration Runner Connection	LINING	LINING		0	0	0	0	0	0	0	0	
IRJ	4	SERVICE	Infiltration Runner Joint	LINING	LINING		0	0	0	0	0	0	0	0	
IRL	4	SERVICE	Infiltration Runner Lateral	LINING	LINING		0	0	0	0	0	0	0	0	
IS	1	SERVICE	Infil Stain				0	0	0	0	0	0	0	0	
ISB	1	SERVICE	Infiltration Stain Barrel				0	0	0	0	0	0	0	0	
ISC	1	SERVICE	Infiltration Stain Connection				0	0	0	0	0	0	0	0	
ISGT	0	CONSTRUCTION	Intruding Sealing Material Grout	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	10	20	30	
ISJ	1	SERVICE	Infiltration Stain Joint				0	0	0	0	0	0	0	0	
ISL	1	SERVICE	Infiltration Stain Lateral				0	0	0	0	0	0	0	0	
ISSR	0	CONSTRUCTION	Intruding Sealing Material Sealing Ring	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	10	20	30	
ISSRB	0	CONSTRUCTION	Intruding Sealing Material Sealing Ring Broken	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	10	20	30	
ISSRH	0	CONSTRUCTION	Intruding Sealing Material Sealing Ring Hanging	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	10	20	30	
ISSRL	0	CONSTRUCTION	Intruding Sealing Material Sealing Ring Loose/Poor	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	10	20	30	
ISZ	0	CONSTRUCTION	Intruding Sealing Material Other	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	10	20	30	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
IW	2	SERVICE	Infil Weeper				0	0	0	0	0	0	0	0	
IWB	2	SERVICE	Infiltration Weeper Barrel				0	0	0	0	0	0	0	0	
IWC	2	SERVICE	Infiltration Weeper Connection				0	0	0	0	0	0	0	0	
IWJ	2	SERVICE	Infiltration Weeper Joint				0	0	0	0	0	0	0	0	
IWL	2	SERVICE	Infiltration Weeper Lateral				0	0	0	0	0	0	0	0	
JAL	4	STRUCTURAL	Joint Angular Large	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
JAM	3	MISCELLANEOUS	Joint Angular Medium	LINING	LINING		0	0	0	0	0	0	0	0	
JAS	0	MISCELLANEOUS	Joint Angular Small				0	0	0	0	0	0	0	0	
JL	0	STRUCTURAL	Displaced Joint Large	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
JM	0	STRUCTURAL	Displaced Joint Medium	LINING	LINING		0	0	0	0	0	0	0	0	
JOL	4	STRUCTURAL	Joint Offset Large	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
JOLD	4	MISCELLANEOUS	Joint Offset Large Defective	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
JOM	3	STRUCTURAL	Joint Offset Medium	LINING	LINING		0	0	0	0	0	0	0	0	
JOMD	3	MISCELLANEOUS	Joint Offset Medium Defective	LINING	LINING		0	0	0	0	0	0	0	0	
JOS	0	MISCELLANEOUS	Joint Offset Small				0	0	0	0	0	0	0	0	
JOSD	0	MISCELLANEOUS	Joint Offset Small Defective				0	0	0	0	0	0	0	0	
JSL	4	STRUCTURAL	Joint Separated Large	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
JSM	3	STRUCTURAL	Joint Separated Medium	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
JSS	0	MISCELLANEOUS	Joint Separated Small				0	0	0	0	0	0	0	0	
KD	0	MISCELLANEOUS	Buckling Dimpling				0	0	0	0	0	0	0	0	
KI	0	MISCELLANEOUS	Inverse Curvature				0	0	0	0	0	0	0	0	
KW	0	MISCELLANEOUS	Buckling Wall				0	0	0	0	0	0	0	0	
LC	0	MISCELLANEOUS	Change in Sewer Lining				0	0	0	0	0	0	0	0	
LD	0	SERVICE	Line Down				0	0	0	0	10	20	0	20	
LFAC	0	STRUCTURAL	Lining Feature Abandoned Connection	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
LFAS	3	STRUCTURAL	Lining Feature Annular Space	LINING	LINING		0	0	0	0	0	0	0	0	
LFB	3	STRUCTURAL	Lining Feature Blistered	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
LFBK	3	STRUCTURAL	Lining Failure Buckled	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
LFBU	3	STRUCTURAL	Lining Failure Bulges	LINING	LINING		0	0	0	0	0	0	0	0	
LFCS	3	STRUCTURAL	Lining Feature Service Cut Shifted	LINING	LINING		0	0	0	0	0	0	0	0	
LFD	3	STRUCTURAL	Lining Feature Detached	LINING	LINING		0	0	0	0	0	0	0	0	
LFDC	3	STRUCTURAL	Lining Feature Discoloration	LINING	LINING		0	0	0	0	0	0	0	0	
LFDE	3	STRUCTURAL	Lining Feature Defective End	LINING	LINING		0	0	0	0	0	0	0	0	
LFDL	3	STRUCTURAL	Lining Feature Delaminating	LINING	LINING		0	0	0	0	0	0	0	0	
LFOC	3	STRUCTURAL	Lining Feature Overcut Service	LINING	LINING		0	0	0	0	0	0	0	0	
LFPH	3	MISCELLANEOUS	Lining Failure Pinhole	LINING	LINING		0	0	0	0	0	0	0	0	
LFRS	3		Lining Failure Resin slug	LINING	LINING		0	0	0	0	0	0	0	0	
LFUC	3	STRUCTURAL	Lining Feature Undercut Service	LINING	LINING		0	0	0	0	0	0	0	0	
LFW	3	STRUCTURAL	Lining Feature Wrinkled	LINING	LINING		0	0	0	0	0	0	0	0	
LFZ	0	STRUCTURAL	Lining Feature Other	LINING	LINING		0	0	0	0	0	0	0	0	
LL	0	CONSTRUCTION	Line Left				0	0	0	0	10	20	20	100	
LLD	0	CONSTRUCTION	Line Left Down				0	0	0	0	10	20	20	100	
LLU	0	CONSTRUCTION	Ling Left Up				0	0	0	0	10	20	20	100	
LN	0	CONSTRUCTION	Lining Defect				0	0	0	0	0	0	0	0	
LR	0	CONSTRUCTION	Line Right				0	0	0	0	10	20	20	100	
LRD	0	CONSTRUCTION	Line Right Down				0	0	0	0	10	20	20	100	
LRU	0	CONSTRUCTION	Line Right Up				0	0	0	0	10	20	20	100	
LU	0	SERVICE	Line Up				0	0	0	0	10	20	20	100	
MB	4	STRUCTURAL	Missing Brick	LINING	LINING		0	0	0	0	0	0	0	0	
MC	0	MISCELLANEOUS	Change in Sewer Material				0	0	0	0	0	0	0	0	
MCU	4	MISCELLANEOUS	Miscellaneous Camera Underwater	LINING	LINING		0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
MGO	0	MISCELLANEOUS	Miscellaneous General Observation				0	0	0	0	0	0	0	0	
MGP	0	MISCELLANEOUS	Miscellaneous General Photograph				0	0	0	0	0	0	0	0	
MH	0	MISCELLANEOUS	Manhole				0	0	0	0	0	0	0	0	
MJL	0	MISCELLANEOUS	Miscellaneous Pipe Joint Length Change				0	0	0	0	0	0	0	0	
MLC	0	MISCELLANEOUS	Miscellaneous Lining Change				0	0	0	0	0	0	0	0	
MMC	0	MISCELLANEOUS	Miscellaneous Material Change				0	0	0	0	0	0	0	0	
MML	3	MISCELLANEOUS	Missing Mortar Large	LINING	LINING		0	0	0	0	0	0	0	0	
MMM	3	MISCELLANEOUS	Missing Mortar Medium	LINING	LINING		0	0	0	0	0	0	0	0	
MMS	2	MISCELLANEOUS	Missing Mortar Small				0	0	0	0	0	0	0	0	
MSA	0	MISCELLANEOUS	Miscellaneous Survey Abandoned				0	0	0	0	0	0	0	0	
MSC	0	MISCELLANEOUS	Miscellaneous Shape/Size Change				0	0	0	0	0	0	0	0	
MU	0	MISCELLANEOUS	Unplotted Manhole				0	0	0	0	0	0	0	0	
MWL	0	MISCELLANEOUS	Miscellaneous Water Level				0	0	0	0	0	0	0	0	
MWLS	0	STRUCTURAL	Miscellaneous Water Level Sag				0	0	0	0	0	30	50	75	
MWM	0	MISCELLANEOUS	Miscellaneous Water Mark				0	0	0	0	49	49	49	75	
MYN	3	MISCELLANEOUS	Miscellaneous Dye Test Not Visible	LINING	LINING		0	0	0	0	0	0	0	0	
MYV	5	MISCELLANEOUS	Miscellaneous Dye Test Visible	LINING	LINING		0	0	0	0	0	0	0	0	
OB	0	SERVICE	Obstruction	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
OBB	0	SERVICE	Obstruction Brick or Masonry	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OBC	0	SERVICE	Obstruction Through Connection	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OBI	5	SERVICE	Obstruction Intruding Through Wall	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
OBJ	0	SERVICE	Obstruction Wedged In The Joint	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OBM	0	SERVICE	Obstruction Pipe Material in Invert	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OBN	0	SERVICE	Obstruction Construction Debris	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OBP	0	SERVICE	Obstruction External Pipe or Cable	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OBR	0	SERVICE	Obstruction Rocks	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OBS	0	SERVICE	Obstruction Built Into Structure	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OBZ	0	SERVICE	Obstruction Other	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
OL	0	STRUCTURAL	Open Joint Large	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
OM	0	STRUCTURAL	Open Joint Medium	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
QH	0	STRUCTURAL	Corrosion Heavy	LINING	LINING		0	0	0	0	0	0	0	0	
QL	0	STRUCTURAL	Corrosion Light	LINING	LINING		0	0	0	0	0	0	0	0	
QM	0	STRUCTURAL	Corrosion Medium	LINING	LINING		0	0	0	0	0	0	0	0	
RBB	5	SERVICE	Roots Ball Barrel	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	0	0	0	
RBC	4	SERVICE	Roots Ball Connection	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	0	0	0	
RBJ	4	SERVICE	Roots Ball Joint	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	0	0	0	
RBL	4	SERVICE	Roots Ball Lateral	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	0	0	0	
RF	0	SERVICE	Roots Fine				0	0	0	0	0	0	0	0	
RFB	2	SERVICE	Roots Fine Barrel	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RFC	1	SERVICE	Roots Fine Connection	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RFJ	1	SERVICE	Roots Fine Joint	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RFL	1	SERVICE	Roots Fine Lateral	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RH	0	SERVICE	Roots Heavy	HEAVY CLEANING	HEAVY CLEANING		0	0	0	0	0	0	0	0	
RMB	4	SERVICE	Roots Medium Barrel	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RMC	3	SERVICE	Roots Medium Connection	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RMJ	3	SERVICE	Roots Medium Joint	CLEANING	CLEANING		0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
RML	3	SERVICE	Roots Medium Lateral	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RPL	0	STRUCTURAL	Point Repair Liner				0	0	0	0	0	0	0	0	
RPLD	4	STRUCTURAL	Point Repaie Liner Defective	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
RPP	0	STRUCTURAL	Point Repair Patch				0	0	0	0	0	0	0	0	
RPPD	4	STRUCTURAL	Point Repair Patch Patch Defective	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
RPR	0	STRUCTURAL	Point Repair Replacement				0	0	0	0	0	0	0	0	
RPRD	4	STRUCTURAL	Point Repair Replacement Defective	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
RPZ	0	STRUCTURAL	Point Repair Other				0	0	0	0	0	0	0	0	
RPZD	0	STRUCTURAL	Point Repair Other Defective	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
RTB	3	SERVICE	Roots Tap Barrel	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RTC	2	SERVICE	Roots Tap Connection	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RTJ	2	SERVICE	Roots Tap Joint	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
RTL	2	SERVICE	Roots Tap Lateral	CLEANING	CLEANING		0	0	0	0	0	0	0	0	
SA	0	MISCELLANEOUS	Survey Abandoned				0	0	0	0	0	0	0	0	
SAM	4	STRUCTURAL	Surface Damage Aggregate Missing	LINING	LINING		0	0	0	0	0	0	0	0	
SAMC	4	STRUCTURAL	Surface Aggregate Missing Chemic	LINING	LINING		0	0	0	0	0	0	0	0	
SAMM	4	STRUCTURAL	Surface Aggregate Missing Mechan	LINING	LINING		0	0	0	0	0	0	0	0	
SAMZ	4	STRUCTURAL	Surface Aggregate Missing Unknow	LINING	LINING		0	0	0	0	0	0	0	0	
SAP	3	STRUCTURAL	Surface Damage Aggregate Projecting	LINING	LINING		0	0	0	0	0	0	0	0	
SAPC	3	STRUCTURAL	Surface Aggregate Projecting Che	LINING	LINING		0	0	0	0	0	0	0	0	
SAPM	3	STRUCTURAL	Surface Aggregate Projecting Mec	LINING	LINING		0	0	0	0	0	0	0	0	
SAPZ	3	STRUCTURAL	Surface Aggregate Projecting Unk	LINING	LINING		0	0	0	0	0	0	0	0	
SAV	2	STRUCTURAL	Surface Damage Aggregate Visible	LINING	LINING		0	0	0	0	0	0	0	0	
SAVC	3	STRUCTURAL	Surface Aggregate Visible Chemic	LINING	LINING		0	0	0	0	0	0	0	0	
SAVM	3	STRUCTURAL	Surface Aggregate Visible Mechan	LINING	LINING		0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
SAVZ	3	STRUCTURAL	Surface Aggregate Visible Unknow	LINING	LINING		0	0	0	0	0	0	0	0	
SCP	3	STRUCTURAL	Surface Corrosion Metal Pipe	LINING	LINING		0	0	0	0	0	0	0	0	
SG	0	SERVICE	Line Sags	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SMW	5	STRUCTURAL	Surface Damage Missing Wall	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SMWC	5	STRUCTURAL	Surface Missing Wall Chemical	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SMWM	5	STRUCTURAL	Surface Missing Wall Mechanical	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SMWZ	5	STRUCTURAL	Surface Missing Wall Unknown	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SRC	5	STRUCTURAL	Surface Damage Reinforcement Cement	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SRCC	5	STRUCTURAL	Surface Reinforcement Corroded C	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SRCM	5	STRUCTURAL	Surface Reinforcement Corroded M	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SRCZ	5	STRUCTURAL	Surface Reinforcement Corroded U	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
SRI	1	MISCELLANEOUS	Surface Roughness Increased				0	0	0	0	0	0	0	0	
SRIC	1	STRUCTURAL	Surface Roughness Increased Chem	LINING	LINING		0	0	0	0	0	0	0	0	
SRIM	1	STRUCTURAL	Surface Roughness Increased Mech	LINING	LINING		0	0	0	0	0	0	0	0	
SRIZ	1	STRUCTURAL	Surface Roughness Increased Unkn	LINING	LINING		0	0	0	0	0	0	0	0	
SRP	5	STRUCTURAL	Surface Reinforcement Projecting	LINING	LINING		0	0	0	0	0	0	0	0	
SRPC	3	STRUCTURAL	Surface Reinforcement Projecting	LINING	LINING		0	0	0	0	0	0	0	0	
SRPM	3	MISCELLANEOUS	Surface Reinforcement Projecting	LINING	LINING		0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
SRPZ	3	STRUCTURAL	Surface Reinforcement Projecting	LINING	LINING		0	0	0	0	0	0	0	0	
SRV	4	STRUCTURAL	Surface Damage Reinforcement Visible	LINING	LINING		0	0	0	0	0	0	0	0	
SRVC	5	MISCELLANEOUS	Surface Reinforcement Visible Ch	LINING	LINING		0	0	0	0	0	0	0	0	
SRVM	5	STRUCTURAL	Surface Reinforcement Visible Me	LINING	LINING		0	0	0	0	0	0	0	0	
SRVZ	5	STRUCTURAL	Surface Reinforcement Visible Un	LINING	LINING		0	0	0	0	0	0	0	0	
SSC	1	MISCELLANEOUS	Surface Spilling of Damage Coating				0	0	0	0	0	0	0	0	
SSS	2	STRUCTURAL	Surface Damage Surface Spalling	LINING	LINING		0	0	0	0	0	0	0	0	
SSSC	2	STRUCTURAL	Surface Spalling Chemical	LINING	LINING		0	0	0	0	0	0	0	0	
SSSM	2	STRUCTURAL	Surface Spalling Mechanical	LINING	LINING		0	0	0	0	0	0	0	0	
SSSZ	2	MISCELLANEOUS	Surface Spalling Other	LINING	LINING		0	0	0	0	0	0	0	0	
SZ	0	STRUCTURAL	Surface Damage Other	LINING	LINING		0	0	0	0	0	0	0	0	
SZC	0	STRUCTURAL	Surface Other Chemical	LINING	LINING		0	0	0	0	0	0	0	0	
SZM	0	STRUCTURAL	Surface Other Mechanical	LINING	LINING		0	0	0	0	0	0	0	0	
SZZ	0	STRUCTURAL	Surface Other Unknown	LINING	LINING		0	0	0	0	0	0	0	0	
TB	0	CONSTRUCTION	Tap Break-in				0	0	0	0	0	0	0	0	
TBA	0	CONSTRUCTION	Tap Break-in Active				0	0	0	0	0	0	0	0	
TBB	0	CONSTRUCTION	Tap Break-in Abandoned				0	0	0	0	0	0	0	0	
TBC	2	CONSTRUCTION	Tap Break-in Capped				0	0	0	0	0	0	0	0	
TBD	3	CONSTRUCTION	Tap Break-in Defective	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
TBI	0	CONSTRUCTION	Tap Break-in Intruding	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
TF	0	CONSTRUCTION	Tap Factory				0	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
TFA	0	CONSTRUCTION	Tap Factory Activity				0	0	0	0	0	0	0	0	
TFB	0	CONSTRUCTION	Tap Factory Abandoned				0	0	0	0	0	0	0	0	
TFC	0	CONSTRUCTION	Tap Factory Capped				0	0	0	0	0	0	0	0	
TFD	2	CONSTRUCTION	Tap Factory Defective				0	0	0	0	0	0	0	0	
TFI	0	CONSTRUCTION	Tap Factory Intruding				0	0	0	0	0	10	20	30	
TR	0	CONSTRUCTION	Tap Rehabilitated				0	0	0	0	0	0	0	0	
TRA	0	MISCELLANEOUS	Tap Rehabilitated Activity				0	0	0	0	0	0	0	0	
TRB	0	MISCELLANEOUS	Tap Rehabilitated Abandoned				0	0	0	0	0	0	0	0	
TRC	0	MISCELLANEOUS	Tap Rehabilitated Capped				0	0	0	0	0	0	0	0	
TRD	2	CONSTRUCTION	Tap Rehabilitated Defective				0	0	0	0	0	0	0	0	
TRI	0	CONSTRUCTION	Tap Rehabilitated Intruding				0	0	0	0	0	10	20	30	
TS	0	CONSTRUCTION	Tap Saddle				0	0	0	0	0	0	0	0	
TSA	0	CONSTRUCTION	Tap Saddle Activity				0	0	0	0	0	0	0	0	
TSB	0	CONSTRUCTION	Tap Saddle Abandoned				0	0	0	0	0	0	0	0	
TSC	0	CONSTRUCTION	Tap Saddle Capped				0	0	0	0	0	0	0	0	
TSD	2	CONSTRUCTION	Tap Saddle Defective				0	0	0	0	0	0	0	0	
TSI	0	CONSTRUCTION	Tap Saddle Intruding	POINT REPAIR	POINT REPAIR		0	0	0	0	0	10	20	30	
VC	1	SERVICE	Vermin Cockroach				0	0	0	0	0	0	0	0	
VR	2	SERVICE	Vermin Rat				0	0	0	0	0	0	0	0	
VZ	1	SERVICE	Vermin Other				0	0	0	0	0	0	0	0	
WFC	2	STRUCTURAL	Weld Feature Circumferential	LINING	LINING		0	0	0	0	0	0	0	0	
WFL	2	STRUCTURAL	Weld Feature Longitudinal	LINING	LINING		0	0	0	0	0	0	0	0	
WFM	3	STRUCTURAL	Weld Feature Multiple	LINING	LINING		0	0	0	0	0	0	0	0	
WFS	2	STRUCTURAL	Weld Feature Spiral	LINING	LINING		0	0	0	0	0	0	0	0	
WFZ	0	STRUCTURAL	Weld Feature Other	LINING	LINING		0	0	0	0	0	0	0	0	
WL	0	MISCELLANEOUS	Water Level				0	0	0	0	0	0	0	0	
X	0	STRUCTURAL	Collapse	POINT REPAIR	POINT REPAIR		5	0	0	0	0	0	0	0	

Defect Code	Default Score	Type	Description	Rehab. Method	Alternative Method	Comments	Clock Pos. Grade1	Clock Pos. Grade2	Clock Pos. Grade3	Clock Pos. Grade4	Value % Grade1	Value % Grade2	Value % Grade3	Value % Grade4	Alter. Rehab. Cutoff
XB	5	STRUCTURAL	Collapse Brick Sewer	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	
XP	5	STRUCTURAL	Collapse Pipe Sewer	POINT REPAIR	POINT REPAIR		0	0	0	0	0	0	0	0	

Appendix I: GIS Updates

See section below and see 2 GIS shapefiles attached related to the Appendix I sub-section “GIS fixes”

- Appx I_duplicate_pipes.zip
- Appx I_before_rehab_adjustments.zip.

Appendix I

GIS Updates

GIS Data Received

A copy of the City GIS was provided in the Fall of 2019. There are 17,880 assets where 3240 are sewer pipes and 14,640 are laterals. On June 17, 2020, HSE provided GIS updates with revisions to drawing number, shape length, elevations, material, year, abandoned tag, diameter, private ownership tag, and added GIS segments.

GIS Updates

In the process of the desktop condition assessment task and renewal and replacement plan, two updated GIS shapefiles were created – risk GIS (Appendix F) and rehabilitation GIS (Appendix A). To both updates GIS shapefiles, the City GIS was updated based upon results of the CCTV and modeling efforts. It was then joined with CCTV inspection score data, rough pavement presence was determined, and depth was calculated by subtracting pipe inverts from known manhole rim elevations. Then, this was joined with risk updates (first shapefile) or rehabilitation updates (second shapefile).

Risk GIS

The first GIS shapefile involves the risk updates (desktop condition assessment). The attribute table provides the risk scores (normalized from 1-5, normalized from 1-100, and total mathematical score) as well as LOF COF scores and their constituents. Each LOF and COF factor has their own column where the number shown is the rating multiplied by the weighting described earlier in this report.

Rehabilitation GIS

The second GIS shapefile involves renewal and replacement fields. Important fields added to the City GIS in this version includes rehabilitation recommendation for each asset, number of rehabilitations (point repair(s), section liner(s), full lining), and flow chart branch (the decision tree path that led to the recommendation). The “total cost” column was the default name by InfoAsset and factors in traffic control and a 45% markup for sewer bypassing, mobilization/demobilization, and construction cost and market contingency. However, the cost does not include planning costs such as engineering, permitting, legal, administrative, or other items as stated in summary tables throughout the report.

GIS Fixes

Some minor post rehabilitation analysis fixes had to be made. These edited pipes were exported as shapefiles and provided as attachments in this appendix - (duplicate pipes.zip and before rehabilitation adjustments.zip). The first issue involved duplicate GIS pipes. These were reviewed and removed. Facility IDs with more than 1 pipe were exported into the “Appx I_duplicate pipes.zip”. The second issue involved the choice of “Facility ID” as the unique identifier for CCTV surveys. Upon further review, this identifier is not unique for around 50 of the 3240 pipes with Facility ID. For around 50 pipes, 2 to 4 pipes had identical facility ID but spatially different GIS segments along the same path. As a result, a rehabilitation cost was attributed to the first of many pipes with the same facility ID and the other pipes of different lengths was then assigned the exact same rehabilitation, rehabilitation length, and associated cost. For example, the 2 pipe GIS segments with Facility ID “10160-10164” were each assigned a “Full CIPP” rehabilitation recommendation with a cost of \$36,000 of each with the rehab length assumption of 393 feet. However, one of the GIS segments had a pipe length of 10 feet. This resulted in a vastly greater cost than it should have. In addition, the number of

rehabilitation items was attributed to each GIS segment. Other identifiers were searched in the attribute table, but ultimately because this identifier was used for the CCTV surveys, this is the identifier we had to stick with. Resolution: for these 50 pipes, BC edited this GIS version to fix the planning cost and properly assign the number of rehab and rehab length. These 50 pipes were exported into “Appx I_before_rehab_adjustments.zip”. In future GIS updates, City staff should consider generating a new and unique facility ID field.

Appendix J: Basis of Cost Estimate Details

Appendix J: Basis of Cost Assumptions

J.1 Basis of cost assumptions

This section describes the cost basis for rehabilitation items. Items related to quotes from manufacturers only include material and installation costs. These do not include labor or agency costs used for master planning such as administrative, permitting, or other costs. For pipes with unknown diameters, the average pipe diameter of nine inches was used for costing. For pipes with unknown depths, the average pipe depth of 11 feet was assumed.

J.1.1 CCTV Costs

Table J-1 presents CCTV costs used in the analysis.

Table J-1. CCTV Cost By Pipe Diameter	
Pipe Diameter (inch) ^{1, 2}	Cost (\$/LF)
Up to 18	4
19 to 24	5
25 to 36	6
37 to 66 ²	8

¹CCTV bids are from City of Bloomington FY 2017 CCTV Inspections PROJECT NO. # 50-18-53007-17-00. CITY BID NO. 2017-16. The costs shown here are an average of the bids from Michels Pipe Services, National Power Rodding Corp., and Bloomington City engineer estimate. G.A. Rich & Sons, Inc. was excluded due to low bids.

²CCTV cost for pipe diameters between 37-inch and 66-inch was extrapolated.

J.1.2 Pipe Replacement

Table J-2 and J-3 presents pipe replacement costs for pipes located under pavement and not under pavement, respectively. The cost shown on the tables below reflect pipe material, installation, backfill, and excavation costs. Since GIS data did not provide pavement information, the presence of pavement was determined by the “select by location” and intersecting pipes with the USGS transportation and road segments layer. Of 3254 pipes, 90% of the pipes (2937 pipes) were under pavement.

Table J-2. Pipe Replacement, Pavement Present				
Pipe Diameter (inch) ¹	Cost (\$/LF)			
	0-8 Feet Below Grade	8-12 Feet Below Grade	12-16 Feet Below Grade	Over 16 Feet Below Grade
6	\$195	\$210	\$225	\$260
8	\$265	\$280	\$295	\$330
10	\$335	\$350	\$365	\$400
12	\$405	\$420	\$435	\$475
15	\$505	\$525	\$545	\$585
18	\$610	\$630	\$650	\$695
21	\$715	\$735	\$755	\$805
24	\$815	\$840	\$865	\$915
27	\$920	\$945	\$970	\$1,025
30	\$1,025	\$1,050	\$1,075	\$1,130
33	\$1,125	\$1,155	\$1,185	\$1,245
36	\$1,230	\$1,260	\$1,290	\$1,350
39	\$1,330	\$1,365	\$1,400	\$1,465
42	\$1,435	\$1,470	\$1,505	\$1,575
48	\$1,645	\$1,680	\$1,715	\$1,790
54	\$1,850	\$1,890	\$1,930	\$2,010
66	\$2,265	\$2,310	\$2,355	\$2,450

¹Pipe material costs are provided by 2020 quotes from Northern Pipe (RCP Pipe) and Mission Clay Products (VCP Pipe)

²Backfill, Excavation, and pavement are provided by RSMeans construction cost database

Table J-3. Pipe Replacement, No Pavement				
Pipe Diameter (inch) ⁽¹⁾	Cost (\$/LF)			
	0-8 Feet Below Grade	8-12 Feet Below Grade	12-16 Feet Below Grade	Over 16 Feet Below Grade
6	\$165	\$180	\$195	\$230
8	\$225	\$240	\$255	\$290
10	\$285	\$300	\$315	\$350
12	\$345	\$360	\$375	\$415
15	\$430	\$450	\$470	\$510
18	\$520	\$540	\$560	\$605
21	\$610	\$630	\$650	\$700
24	\$695	\$720	\$745	\$795
27	\$785	\$810	\$835	\$890
30	\$875	\$900	\$925	\$980
33	\$960	\$990	\$1,020	\$1,080
36	\$1,050	\$1,080	\$1,110	\$1,170
39	\$1,135	\$1,170	\$1,205	\$1,270
42	\$1,225	\$1,260	\$1,295	\$1,365
48	\$1,405	\$1,440	\$1,475	\$1,550
54	\$1,580	\$1,620	\$1,660	\$1,740
66	\$1,935	\$1,980	\$2,025	\$2,120

¹Pipe material costs are provided by 2020 quotes from Northern Pipe (RCP Pipe) and Mission Clay Products (VCP Pipe)

²Backfill, Excavation, and pavement are provided by RSMeans construction cost database

J.1.3 Point Repair(s) by Excavation

Table X-X and X-X presents point repair(s) by excavation costs used in the analysis. The costs presented are per point repair. A pipe assigned the rehabilitation recommendation “point repair(s)” or a combination of lining and “point repair(s)” may have more than one point repair. The excavation cost assumes 10 feet sections. The unit costs (\$/LF) are taken from pipe replacement section and multiplied by 10. No additional multiplier was applied at the moment. This may result in a lower end of cost estimation. Typically, a point repair compared to a full pipe replacement will have a much greater unit cost due to similar equipment, machine rental, and labor costs.

Table J-4. Point Repair by Excavation, Pavement Present				
Pipe Diameter (inch) ⁽¹⁾	Cost (\$/LF)			
	0-8 Feet Below Grade	8-12 Feet Below Grade	12-16 Feet Below Grade	Over 16 Feet Below Grade
6	\$600	\$800	\$1,000	\$1,300
8	\$700	\$900	\$1,000	\$1,400
10	\$800	\$1,000	\$1,200	\$1,500
12	\$900	\$1,100	\$1,300	\$1,600
15	\$1,100	\$1,400	\$1,600	\$2,000
18	\$1,400	\$1,600	\$1,800	\$2,200
21	\$1,700	\$1,900	\$2,200	\$2,600
24	\$2,000	\$2,300	\$2,500	\$3,000
27	\$2,400	\$2,700	\$2,900	\$3,500
30	\$2,700	\$3,000	\$3,300	\$3,800
33	\$3,500	\$3,800	\$4,100	\$4,700
36	\$3,700	\$4,000	\$4,300	\$5,000
39	\$3,400	\$3,800	\$4,100	\$4,700
42	\$3,900	\$4,200	\$4,600	\$5,300
48	\$5,000	\$5,400	\$5,700	\$6,500
54	\$6,200	\$6,600	\$7,000	\$7,800
66	\$8,600	\$9,100	\$9,600	\$10,500

¹Pipe material costs are provided by 2020 quotes from Northern Pipe (RCP Pipe) and Mission Clay Products (VCP Pipe)

²Backfill, Excavation, and pavement are provided by RSMeans construction cost database

Table J-5. Point Repair by Excavation, No Pavement				
Pipe Diameter (inch) ⁽¹⁾	Cost (\$/LF)			
	0-8 Feet Below Grade	8-12 Feet Below Grade	12-16 Feet Below Grade	Over 16 Feet Below Grade
6	\$400	\$600	\$800	\$1,100
8	\$400	\$600	\$800	\$1,100
10	\$500	\$700	\$900	\$1,200
12	\$600	\$800	\$900	\$1,300
15	\$800	\$1,000	\$1,200	\$1,600
18	\$900	\$1,100	\$1,300	\$1,700
21	\$1,100	\$1,400	\$1,600	\$2,100
24	\$1,300	\$1,600	\$1,800	\$2,300
27	\$1,600	\$1,900	\$2,100	\$2,700
30	\$1,800	\$2,000	\$2,300	\$2,900
33	\$2,400	\$2,700	\$3,000	\$3,600
36	\$2,400	\$2,700	\$3,000	\$3,600
39	\$1,900	\$2,200	\$2,500	\$3,200
42	\$2,100	\$2,400	\$2,800	\$3,400
48	\$2,800	\$3,100	\$3,500	\$4,300
54	\$3,400	\$3,800	\$4,200	\$5,000
66	\$4,800	\$5,200	\$5,700	\$6,600

¹Pipe material costs are provided by 2020 quotes from Northern Pipe (RCP Pipe) and Mission Clay Products (VCP Pipe)

²Backfill, Excavation, and pavement are provided by RSMeans construction cost database

J.1.4 Sectional Liner(s)

Table J-6 presents sectional liner(s) costs used in the analysis.

Table J-6. Sectional Lining Costs	
Pipe Diameter (inch) ⁽¹⁾	Cost (\$/LF)
6 ²	3,000
8	3,000
10 ²	4,500
12 ²	6,000
15 ²	7,500
18 ²	7,500
21 ²	9,000
24 ²	9,000
27 ²	10,500
30 ²	10,500
33 ²	12,000
36 ²	12,000
39 ²	13,500
42 ²	13,500
48 ²	13,500
54 ²	13,500
66 ²	15,000

¹Prices from Virginia Beach Annual Services Construction Contract #17 bid tab

²Medium to large diameter sectional lining based on extrapolation.

J.1.5 Full Pipe Length Cured in Place Pipe (Full CIPP)

Table J-7 presents full CIPP costs used in the analysis.

Table J-7. Full CIPP Costs	
Pipe Diameter (inch) ⁽¹⁾	Cost (\$/LF)
6	96
8	128
10	160
12	192
15	240
18	288
21	336
24	384
27	432
30	480
33	528
36	576
39	624
42	672
48	768
54	864
66	1056

¹Based on evaluations of North Davis Sewer District Bid Tabs, Project 3 through Project 7, escalated to 2020 dollars

Costs do not include bypass pumping or traffic control. Unit Diameter Costs are based on 200 ft lateral spacing and 2000 ft project length

²Larger diameter (36-inch to 66-inch) full CIPP based on Salt Lake City BODR

Appendix K: Main and Venus Way Lift Station Inspections Draft Report, May 2020

DRAFT

Main and Venus Way Lift Station Inspections Report

Prepared for
City of Milpitas – Sewer Master Plan
Milpitas, CA
May 14, 2020

DRAFT

Main and Venus Way Lift Station Inspections Report

Prepared for
City of Milpitas – Sewer Master Plan
Milpitas, California
May 14, 2020

This is a draft and is not intended to be a final representation
of the work done or recommendations made by Brown and Caldwell.
It should not be relied upon; consult the final report.



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Walnut Creek, CA 94596

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List of Abbreviations

A	ampere (amp)
AIC	ampere interrupting capacity
ARV	air release valve
ATS	automatic transfer switch
BFV	butterfly valve
CAV	combination air valve
FM	force main
kV	kilovolt
kVA	kilovolt-ampere
HP	horsepower
LCP	local control panel
MAS	multi-agent system
MCC	motor control center
NEMA	National Electrical Manufacturers Association
PG&E	Pacific Gas & Electric
ph	phase
PLC	programmable logic controller
PV	plug valve
PVC	polyvinyl chloride
SME	subject matter expert
SS	stainless steel
SSMH	sanitary sewer manhole
V	volt
VFD	variable frequency drive
W	watt

Section 1

Introduction

City of Milpitas (City) and HydroScience Engineers, Inc. (HydroScience) entered into an agreement dated October 18, 2019 for professional services for the following project: City of Milpitas – Sewer Master Plan (Project). Brown and Caldwell is performing work on the Project as a subconsultant to HydroScience. The purpose of this report is to document the visual investigations performed by Brown and Caldwell at two sewer facilities, Main Lift Station and Venus Way Lift Station, as part of the Project scope of work, Task 2. Data Collection/Preliminary Research/System Review/Field Inspection. The facility locations are shown on Figure 1.

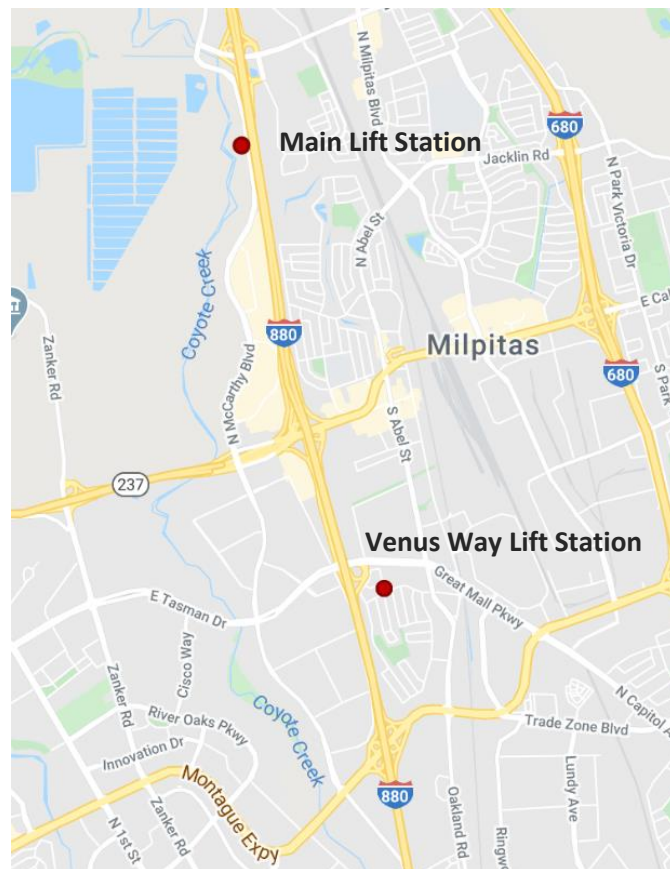


Figure 1. Facility Locations Map

The inspection information in this report is organized in the following sections:

Section 2 - System Information and Data

Section 3 – Main Lift Station Inspections

Section 4 – Venus Way Lift Station Inspections

Appendix A through Appendix F – Main Lift Station Inspection Records

Appendix G through Appendix K – Venus Way Lift Station Inspections

Section 2

System Information and Data

Review of the available system information and data, and the selection of the asset inventory to be used to perform field inspections are summarized in this section.

2.1 Existing Reports and Information

Existing reports and information provided by the City and reviewed for the Main Lift Station and Venus Way Lift Station are included in Table 2-1.

Table 2-1. Lift Station Existing Reports and Information

Document Title	Type	Project Number	Drawing Reference	Pages	Description/Notes	Date(s)
Main and Venus Lift Stations						
Sewer Inventory Master	Spreadsheet					–
Main Lift Station						
Main Sewage Pump Station Improvements Project Project No. 6103	Record Drawing	6103	2-1066	95	Prepared by Winzler & Kelly Consulting Engineers	Nov 2008
Letter Anthony Petroccitto, Winzler & Kelly to Tom Yousch, City of Milpitas Subject: Milpitas Main Sewage Pump Station Capacity – Existing Station and New Station Under Construction	Letter	6103		3	New pump station capacity including system head curves	Undated, 2008
Project No. 6078 Plans for the Construction of Parallel Force Main Project 2000	Record Drawing	6078	2-1031	32	Prepared by Kennedy/Jenks Consultants Sheets 18-19 revised May 2020 Sheet 30 revised June 2004	Oct 2002 Jun 2004 May 2020
Main Sewage Pump Station Improvements Project November 1997 Project No. 6071 Volume 4 - Contract Drawings	Record Drawing	6071	2-986	32	Prepared by Carollo Engineers Final revision per owner comments	Apr 2001
Venus Way Lift Station						
Venus Pump Station Improvement Project No. 6101 Project Drawings June 2008	As-Built Drawing	6101	2-1107	21	Prepared by Dodson Psomas	Feb 2009
Approved Submittal 01a from Anderson Pacific Engineering Construction, Inc. Project No. 6101 Section 11130, Submersible Pumps	Submittal	6101		25	Flygt pumps, motors, accessories	Sep 2008

2.2 Asset Inventory for Inspections

The existing reports and information for the lift stations were reviewed by a team of subject matter experts (SMEs) covering the following disciplines:

- Mechanical
- Electrical
- Instrumentation
- Civil
- Structural

The SMEs identified the assets to be inspected, and the assets were entered into Fulcrum for field inspection data collection and condition assessment by asset. The asset types used for the inspections are included in Table 2-2. Specific assets are discussed in Section 3 for the Main Lift Station and Section 4 for the Venus Way Lift Station.

Table 2-2. Asset Types for Inspections

Mechanical Asset Type		Electrical Asset Type	Instrumentation Asset Type	Structure Asset Type
Actuator		Battery	Flow Transmitter	Basin
Air Compressor		Battery Bank	Level Switch	Building
Controller		Building	Panel	Clarifier
Crane		Buss Duct	Remote Telemetry Unit	Crane
Discharge Pipes		Circuit Breaker	Radio (Transceiver)	Tank
Fan		Generator		Tank Cover
Fish Screen Rake		Motor		Roof
Flow Meter		Motor Control Center		Slab
Gate	Bulkhead	Motor Starter		Vault
	Slide	Panel		
	Sluice	PLC		
	N/A	Protective Relay		
Grinder		Rectifier		
Pig Launcher		Switch		
Piping		Switchgear		
Pump		Transformer		
Screens		Uninterruptable Power Supply		
Stoplog		Variable Freq Drive		
Tank				
Valve	ARV/CAV			
	Butterfly			
	Check			
	Diaphragm			
	Gate			
	Pinch			
	Plug			

Assets that were reviewed but not included in the final asset inventory for inspections, and the reasons, are included in Table 2-3. All of these assets were identified from information found in the Sewer Inventory Master spreadsheet.

Table 2-3. Assets Not Included in the Inventory for Inspections

Asset Names/Types	Reason Not Included	Asset Types	Project/ Drawing Reference	Year of Construction
Main Lift Station				
Pump #1 and Pump #6 pumps, piping, valves	Future per Sewer Inventory Master. Base assembly, piping, and rail system installed under Project 6103/2-1066 Drawing Number M-101	Pump Piping Valves		
Grinders #5, #6, #7, #8	Future per Sewer Inventory Master	Grinder		
Venus Way Lift Station				
8" Bypass Line	Unknown ¹	Piping	6101/2-1107	2008
Seal holes in slab, valve vault	Assess with valve vault		6101/2-1107	2008
Vertical Pipe Supports	Assess under Miscellaneous		6101/2-1107	2008
Pumps, electrical, valves, vaults, piping, vents	Replaced in/updated with Project 6101	Various	6064/2-849	1994
Cathodic protection, bubbler piping, electrical service	Replaced in/updated with Project 6101	Various	6040/2-660	1984
Piping, valves, covers, manholes, electroliers, luminaires, electrical, fire hydrants and valves	Replaced in/updated with Project 6101	Various	2-161	1965
Existing SSMH 1-2 and 15" Gravity Sewer	Different asset class On Sheet C-1 of Project 6101 (2-1107)	Gravity Sewer		1965
Dry Well	Replaced in/updated with Project 6101	Tank		1964
Other				
Force Main A, venturi meter and vault	Force main, not lift station asset	Force main, flow meter and vault	2-343	1975
Butterfly Valve	Force main, not lift station asset	Valve and vault	2-986	1997

¹ Piping in Venus Way station was all in good condition

Section 3

Main Lift Station Inspections

3.1 Assets

The assets for Main Lift Station inspections are included in Table 3-1 (Mechanical), Table 3-2 (Electrical), Table 3-3 (Instrumentation), Table 3-4 (Civil), and Table 3-5 (Structural).

Table 3-1. Mechanical Assets				
Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
Pig Launcher A	36" Pig Launcher	PIG-A	Pig Launcher	2002
Pig Launcher B	36" Pig Launcher	PIG-B	Pig Launcher	2002
Pinch Valve 1	36" Pinch Valve (1 of 3)		Valve	2002
Pinch Valve 2	36" Pinch Valve (2 of 3)		Valve	2002
Pinch Valve 3	36" Pinch Valve (3 of 3)		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	36-inch flanged coupling adapter. 36-inch ductile iron 45' MJ x MJ bend. 20-inch or 36-inch FLxPE spool through sleeve with link seal. 36" x 20" x 36" ductile iron tee (force main A)		Piping	2008
Manifold Piping Butterfly Valve	36-inch diameter BFV, middle of manifold		Valve	2008
Manifold Piping Plug Valve #1	36-inch diameter PV, pumps 1, 2, 3		Valve	2008
Manifold PV #1 Actuator	plug valve #1 electric actuator		Actuator	2008
Manifold Piping Plug Valve #2	36-inch diameter PV, pumps 4, 5, 6		Valve	2008
Manifold PV #2 Actuator	plug valve #2 electric actuator		Actuator	2008
Pump #2	FLYGT CP3531-775, 170HP Submersible Pump		Pump	2008
Pump #2 Piping	20-Inch Ductile Iron Vertical Discharge Pipe, 20-Inch Ductile Iron 90 Elbow, 20-Inch Flanged Coupling Adapter		Piping	2008
Pump #2 Check Valve	20-Inch Diameter Spring Loaded Check Valve		Valve	2008
Pump #2 Plug Valve	20-Inch Diameter Plug Valve		Valve	2008
Pump #3	FLYGT CP3531-775, 170HP Submersible Pump		Pump	2008
Pump #3 Piping	20-Inch Ductile Iron Vertical Discharge Pipe, 20-Inch Ductile Iron 90 Elbow, 20-Inch Flanged Coupling Adapter		Piping	2008
Pump #3 Check Valve	20-Inch Diameter Spring Loaded Check Valve		Valve	2008

Table 3-1. Mechanical Assets

Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
Pump #3 Plug Valve	20-Inch Diameter Plug Valve		Valve	2008
Pump #4	FLYGT CP3531-775, 170HP Submersible Pump		Pump	2008
Pump #4 Piping	20-Inch Ductile Iron Vertical Discharge Pipe, 20-Inch Ductile Iron 90 Elbow, 20-Inch Flanged Coupling Adapter		Piping	2008
Pump #4 Check Valve	20-Inch Diameter Spring Loaded Check Valve		Valve	2008
Pump #4 Plug Valve	20-Inch Diameter Plug Valve		Valve	2008
Pump #5 (not installed yet)	FLYGT CP3531-775, 170HP Submersible Pump		Pump	
Pump #5 Piping	20-Inch Ductile Iron Vertical Discharge Pipe, 20-Inch Ductile Iron 90 Elbow, 20-Inch Flanged Coupling Adapter		Piping	2008
Pump #5 Check Valve	20-Inch Diameter Spring Loaded Check Valve		Valve	2008
Pump #5 Plug Valve	20-Inch Diameter Plug Valve		Valve	2008
Main Head Gate	54-inch sluice gate with manual actuator		Gate	2008
Head Gate #1	48-inch sluice gate with electric actuator		Gate	2008
Head Gate #2	48-inch sluice gate with electric actuator		Gate	2008
Head Gate #3	48-inch sluice gate with electric actuator		Gate	2008
Head Gate #4	48-inch sluice gate with electric actuator		Gate	2008
Grinder #1	5-hp electric driven		Grinder	2008
Grinder #2	10-hp electric driven		Grinder	2008
Grinder #3	10-hp electric driven		Grinder	2008
Grinder #4	5-hp electric driven		Grinder	2008
Air Supply Fan	PS ventilation system		Fan	2008
Exhaust Fan & Stack	PS ventilation system		Fan	2008
Miscellaneous	Pipe support, 5' x 7' aluminum hatch, galv grating, 3'' SS guide rail, 4-inch diameter PVC drain, pipe wall anchor bracket			
2" combo air/vac valve				
Force Main A B Flow Recorder				
Eye wash				
Flow Meter B	This is for force main B			
Air vac 1 to 15	All across the pump station.			

Table 3-2. Electrical Assets

Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
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
Variable Frequency Drive P2	VFD for Pump 2 (170 HP)		Variable Freq Drive	2008
Variable Frequency Drive P3	VFD for Pump 3 (170 HP)		Variable Freq Drive	2008
Variable Frequency Drive P4	VFD for Pump 4 (170 HP)		Variable Freq Drive	2008
Variable Frequency Drive P5	VFD for Pump 5 (170 HP)		Variable Freq Drive	2008
Local Disconnect for Engine Jacket Water Heater	30A/3P		Switch	2000
Motor Control Center 2	600 A, 480 V, 3-ph, 3W, 65000 AIC	MCC-2	Motor Control Center	2000
Motor Control Center 2A	600 A, 480 V, 3-ph, 3W, 65000 AIC	MCC-2A	Motor Control Center	2000
Dry Type Transformer	30 kVA, 480-208/120 V, Dry Type		Transformer	2008
Lighting panel (LP-1)		LA	Panel	2008
Dry Type Transformer	30 kVA, 480-208/120 V, Dry Type		Transformer	2000
Lighting panel (LA)	100 A, 1-Ph, 3 Wire	LP-1	Panel	2000
Electrical/Generator Building-Electrical			Building	2000
Motor Control Center A	400 A, 480 V, 3-ph, 3W, 65000 AIC	MCC-A	Motor Control Center	2008
Motor Control Center B	400 A, 480 V, 3-ph, 3W, 65000 AIC	MCC-B	Motor Control Center	2008
Dry Type Transformer	10 kVA, 480-240/120 V, Dry Type		Transformer	2008
Distribution panel(DP-1)	125 A, NEMA Type 1	DP-1	Panel	2008
Dry Type Transformer	75 kVA, 480-208/120 V, Dry Type		Transformer	2008
Distribution Panel (DP-2)	125 A, NEMA Type 1	DP-2	Panel	2008
Local Control Panel for Grinder#1	LCP grinder1		Panel	2008
Local Control Panel for Grinder#2	LCP grinder2		Panel	2008
Local Control Panel for Grinder#3	LCP grinder3		Panel	2008
Local Control Panel for Grinder#4	LCP grinder4		Panel	2008
Local Disconnect for CU-1 (for FC-1)	30A/3P		Switch	2008
Local Disconnect for EF-1 (for Control Room)	30A/3P		Switch	2008
Local Disconnect for EF-5 (for wetwell)	60A/3P		Switch	2008
Local Disconnect for SF-1 (for Wet Well)	60A/3P		Switch	2008
Local Disconnect for HP-1 (for FC-2)	30A/3P		Switch	2008
Local Disconnect for FC-1 (for Control Room)	30A/3P		Switch	2008
Generator	1000 kVA, 480 V Diesel Driven Engine Generator		Generator	2000
Automatic Transfer Switch	ATS, 1600 A		Switch	2000

Table 3-3. Instrumentation Assets

Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
MAS Enclosure and Pump Motor Monitor Panel	MAS	MAS 711	Panel	2008
Level Switch	Level High High	LSHH-201	Level Switch	2008
Level Switch	Ultrasonic level	LE-202	Level Switch	2008
Level Switch	Ultrasonic level	LE-203	Level Switch	2008
Generator and Fuel System Control Panel	Local Control Panel		Panel	2000

Table 3-4. Civil Assets

Asset Name	Asset Description	Asset Type	Year Installed
Electrical building		Building	
Control building		Building	
Site civil		Asphalt Pavement	

Table 3-5. Structural Assets

Asset Name	Asset Description	Asset Type	Year Installed
Pinch Valve Vault 1	Pinch Valve Vault (1 of 3)	Vault	2002
Pinch Valve Vault 2	Pinch Valve Vault (2 of 3)	Vault	2002
Pinch Valve Vault 3	Pinch Valve Vault (3 of 3)	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
Electrical/Generator Building-Structural		Building	2000
Fuel Tank (bulk)	2,000-gal UL-2085 above ground vault tank	Tank	2008
Fuel Tank (day)		Tank	2000
Control Building		Building	2008
Grit Chamber/Inflow Structure		Tank	2008
Wet Well		Tank	2008
Garage		Building	2008

3.2 Condition Data

Field inspections were completed on February 11, 2020 and March 11, 2020. The condition data and scores for Main Lift Station inspections are included in Table 3-6 (Mechanical), Table 3-7 (Electrical), Table 3-8 (Instrumentation), Table 3-9 (Civil), and Table 3-10 (Structural). Condition and performance scores for instrumentation, civil, and structure were 1 (no defects and asset functioning as intended) or 2 (minor defects, higher than expected O&M). Mechanical and electrical components received scores of 4 (major defects, function highly impaired) and mechanical components received scores of 5 (failing/failed, not functioning as intended), see Tables 3-6 and 3-7.

Table 3-6. Mechanical Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Pig Launcher A	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pig Launcher B	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pinch Valve 1			NA - Not enough information available.	NA - Not enough information available.
Pinch Valve 2			NA - Not enough information available.	NA - Not enough information available.
Pinch Valve 3			NA - Not enough information available.	NA - Not enough information available.
Mag Meter (flow meter A)	Not in Operation		4 - Poor – Major defects observed. Asset integrity may be compromised.	4 - Poor – In service, but function is highly impaired.
Venturi Meter- Removed in 2008			NA - Not enough information available.	NA - Not enough information available.
Butterfly Valve			NA - Not enough information available.	NA - Not enough information available.
Manifold Piping	None		2 - Fair – Only minor defects observed.	2 - Fair – In service, but higher than expected O&M.
Manifold Piping Butterfly Valve	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Manifold Piping Plug Valve #1			1 - Good – No defects observed.	NA - Not enough information available.
Manifold PV #1 Actuator	None		1 - Good – No defects observed.	NA - Not enough information available.
Manifold Piping Plug Valve #2	None		2 - Fair – Only minor defects observed.	2 - Fair – In service, but higher than expected O&M.
Manifold PV #2 Actuator		Does not work.	5 - Failing or Failed – Asset integrity is compromised. Asset may be out of service.	5 - Failing or Failed – Asset is not functioning as intended or is out of service.
Pump #2	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pump #2 Piping	None		2 - Fair – Only minor defects observed.	2 - Fair – In service, but higher than expected O&M.
Pump #2 Check Valve	None		2 - Fair – Only minor defects observed.	1 - Good – Asset functioning as intended.
Pump #2 Plug Valve			1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pump #3		passed life limit	4 - Poor – Major defects observed. Asset integrity may be compromised.	4 - Poor – In service, but function is highly impaired.
Pump #3 Piping	None		2 - Fair – Only minor defects observed.	2 - Fair – In service, but higher than expected O&M.
Pump #3 Check Valve	None		2 - Fair – Only minor defects observed.	1 - Good – Asset functioning as intended.
Pump #3 Plug Valve			2 - Fair – Only minor defects observed.	1 - Good – Asset functioning as intended.
Pump #4	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pump #4 Piping	None		2 - Fair – Only minor defects observed.	2 - Fair – In service, but higher than expected O&M.

Table 3-6. Mechanical Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Pump #4 Check Valve	None		2 - Fair – Only minor defects observed.	1 - Good – Asset functioning as intended.
Pump #4 Plug Valve			2 - Fair – Only minor defects observed.	1 - Good – Asset functioning as intended.
Pump #5 (not installed yet)			N/A	N/A
Pump #5 Piping	None		1 - Good – No defects observed.	NA - Not enough information available.
Pump #5 Check Valve			1 - Good – No defects observed.	NA - Not enough information available.
Pump #5 Plug Valve			1 - Good – No defects observed.	NA - Not enough information available.
Main Head Gate	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Head Gate #1	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Head Gate #2	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Head Gate #3	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Head Gate #4	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Grinder #1	Excessive Vibration, Inadequate Supports		5 - Failing or Failed – Asset integrity is compromised. Asset may be out of service.	5 - Failing or Failed – Asset is not functioning as intended or is out of service.
Grinder #2	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Grinder #3	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Grinder #4	None		1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Air Supply Fan			1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Exhaust Fan & Stack			1 - Good – No defects observed.	2 - Fair – In service, but higher than expected O&M.
Miscellaneous				
2" combo air/vac valve			4 - Poor – Major defects observed. Asset integrity may be compromised.	4 - Poor – In service, but function is highly impaired.
Force Main A B Flow Recorder			1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Eye wash			1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Flow Meter B		It works but the operation is not accurate.	4 - Poor – Major defects observed. Asset integrity may be compromised.	4 - Poor – In service, but function is highly impaired.
Air vac 1 to 15	Cavitation, Coating Failure, Inadequate Supports		5 - Failing or Failed – Asset integrity is compromised. Asset may be out of service.	5 - Failing or Failed – Asset is not functioning as intended or is out of service.

Table 3-7. Electrical Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Main Transformer	No defects noted		1 - Excellent	1 - Component Functioning as Intended
Outdoor Utility Disconnect and Metering Panel	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Main Switchgear	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Variable Frequency Drive P2	No Corrosion Noted	ArcFlash labels missing	4 - Integrity of Component Moderately Compromised	2 - In-Service, but Higher than Expected O&M
Variable Frequency Drive P3	No Corrosion Noted. Understood from City that IGBT was replaced a year ago.	ArcFlash labels missing	4 - Integrity of Component Moderately Compromised	2 - In-Service, but Higher than Expected O&M
Variable Frequency Drive P4	No Corrosion Noted	ArcFlash labels missing	4 - Integrity of Component Moderately Compromised	2 - In-Service, but Higher than Expected O&M
Variable Frequency Drive P5	No Corrosion Noted. Understood from City that Cooling Fans were replaced year ago	ArcFlash labels missing	4 - Integrity of Component Moderately Compromised	2 - In-Service, but Higher than Expected O&M
Local Disconnect for Engine Jacket Water Heater	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Motor Control Center 2	No Corrosion Noted.	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Motor Control Center 2A	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Dry Type Transformer	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Lighting panel (LP-1)	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Dry Type Transformer	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Lighting panel (LA)	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Electrical/Generator Building-Electrical		Lighting – Outdated technology	1 - Excellent	1 - Component Functioning as Intended
Motor Control Center A	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Motor Control Center B	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Dry Type Transformer	No corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Distribution panel(DP-1)	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended

Table 3-7. Electrical Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Dry Type Transformer	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Distribution Panel (DP-2)	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Local Control Panel for Grinder#1	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Local Control Panel for Grinder#2	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Local Control Panel for Grinder#3	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Local Control Panel for Grinder#4	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended
Local Disconnect for CU-1 (for FC-1)			1 - Excellent	1 - Component Functioning as Intended
Local Disconnect for EF-1 (for Control Room)	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Local Disconnect for EF-5 (for wetwell)	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Local Disconnect for SF-1 (for Wet Well)	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Local Disconnect for HP-1 (for FC-2)	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Local Disconnect for FC-1 (for Control Room)	No Corrosion Noted		1 - Excellent	1 - Component Functioning as Intended
Generator	Good condition		1 - Excellent	1 - Component Functioning as Intended
Automatic Transfer Switch	No Corrosion Noted	ArcFlash labels missing	1 - Excellent	1 - Component Functioning as Intended

Table 3-8. Instrumentation Condition Data

Asset Name	Asset ID	Field Assessment	Condition Score	Performance Score
MAS Enclosure and Pump Motor Monitor Panel	MAS 711	No Corrosion Noted	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Level Switch	LSHH-201	In Good Condition	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Level Switch	LE-202	In Good Condition	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Level Switch	LE-203	Not accessible	N/A	N/A
Generator and Fuel System Control Panel		No Corrosion Noted	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.

Table 3-9. Civil Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Electrical building			1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Control building			1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Site civil			1 - Good – No defects observed.	1 - Good – Asset functioning as intended.

Table 3-10. Structural Condition Data

Asset Name	Material	Field Assessment	Comments	Condition Score	Performance Score
Pinch Valve Vault 1	Concrete	Corrosion of metal walls	None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pinch Valve Vault 2	Concrete		Exposed aggregates	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pinch Valve Vault 3	Concrete		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Mag Meter Vault	Concrete	Corrosion of metal walls	Corroded metal at hatch opening	2 - Fair – Only minor defects observed.	1 - Good – Asset functioning as intended.
Venturi Meter Vault	Concrete	Cracks in walls	No cracking inside, surface cracks on outside, coating still present on inside	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Butterfly Valve Vault	Concrete		No visible cracks besides on curb outside	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Electrical/Generator Building-Structural	Masonry	Cracks in walls,Moisture issues	Some cracks inside and outside, cosmetic cracks	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Fuel Tank (bulk)	Metal		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Fuel Tank (day)	Metal		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Control Building	Masonry	Cracks in walls	None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Grit Chamber/Inflow Structure	Concrete		Poor lighting	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Wet Well	Concrete	Paint issues	Coating appears to be deteriorating towards bottom, tanks were in operation, no inspection of walls and slab below liquid line	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Garage	Concrete	Corrosion of metal walls	Water accumulation inside when it's raining, water seeps thru slab	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.

Section 4

Venus Way Lift Station Inspections

4.1 Assets

The assets for Venus Way Lift Station inspections are included in Table 4-1 (Mechanical), Table 4-2 (Electrical), Table 4-3 (Instrumentation), Table 4-4 (Civil), and Table 4-5 (Structural).

Table 4-1. Mechanical Assets

Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
Pump #1	FLYGT CP3102-441, 5HP 3ph 230V Submersible Pump		Pump	2008
Pump #2	FLYGT CP3102-441, 5HP 3ph 230V Submersible Pump		Pump	2008
Pump Guide Rails	Reinstalled in 2008			2008
8" Gate Valve, Pump 1 and 2	8" Gate Valve, Pump 1 and 2		Valve	2008
8" Gate Valve, Pump 2	8" Gate Valve, Pump 2		Valve	2008
8" Gate Valve, Pump 1 and 2	8" Gate Valve, Pump 1 and 2		Valve	2008
8" Check Valve, Pump 1	8" Check Valve, Pump 1		Valve	2008
8" Check Valve, Pump 2	8" Check Valve, Pump 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

Table 4-2. Electrical Assets

Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
Utility Transformer	240/120 V, 3-Ph, 3 W	XFMR T-1	Transformer	2000
Service Pedestal	Service Disconnect and Metering			2008
Pump Control Panel	Starter panel for Pumps #1 and 2 (Each 5 HP)		Panel	2008

Table 4-3. Instrumentation Assets

Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
Level Instrument	Wet Well Level Sensor	LSHH-01	Level Switch	2008

Table 4-4. Civil Assets

Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
Site civil				

Table 4-5. Structural Assets

Asset Name	Asset Description	Asset ID	Asset Type	Year Installed
Wet Well	72" Diameter Reinforced Concrete Pipe		Tank	1964
Valve Vault			Vault	1994
Aluminum Hatch-Vault	Aluminum Hatch, slide-in		Vault	2008
Aluminum Hatch-Wet Well	Aluminum Hatch w/ safety grate		Vault	2008

4.2 Condition Data

Field inspections were completed on February 11, 2020 and March 11, 2020. The condition data and scores for Venus Way Lift Station inspections are included in Table 4-6 (Mechanical), Table 4-7 (Electrical), Table 4-8 (Instrumentation), Table 4-9 (Civil), and Table 4-10 (Structural). Condition and performance scores were all 1 (no defects and asset functioning as intended).

Table 4-6. Mechanical Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Pump #1		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pump #2		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Pump Guide Rails		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
8" Gate Valve, Pump 1 and 2		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
8" Gate Valve, Pump 2		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
8" Gate Valve, Pump 1 and 2		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
8" Check Valve, Pump 1		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
8" Check Valve, Pump 2		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
4" Flap Gate	Could not find	None	NA - Not enough information available.	NA - Not enough information available.
2" Combo Air/vacuum valve		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.

Table 4-7. Electrical Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Utility Transformer		No Corrosion Noted	1 - Excellent	1 - Component Functioning as Intended
Service Pedestal			1 - Excellent	1 - Component Functioning as Intended
Pump Control Panel		No Corrosion Noted	1 - Excellent	1 - Component Functioning as Intended

Table 4-8. Instrumentation Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Level Instrument		See wet well photos	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.

Table 4-9. Civil Condition Data

Asset Name	Field Assessment	Comments	Condition Score	Performance Score
Site civil			1 - Good – No defects observed.	1 - Good – Asset functioning as intended.

Table 4-10. Structural Condition Data

Asset Name	Material	Field Assessment	Comments	Condition Score	Performance Score
Wet Well	Concrete	Oxidation	None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Valve Vault	Concrete		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Aluminum Hatch-Vault			None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.
Aluminum Hatch-Wet Well	Metal		None	1 - Good – No defects observed.	1 - Good – Asset functioning as intended.

Section 5

Limitations

This document was prepared solely for City of Milpitas in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Milpitas and HydroScience Engineers, Inc., dated October 18, 2019. This document is governed by the specific scope of work authorized by City of Milpitas; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by City of Milpitas and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Further, Brown and Caldwell makes no warranties, express or implied, with respect to this document, except for those, if any, contained in the agreement pursuant to which the document was prepared.

All data, drawings, documents, or information contained this report have been prepared exclusively for the person or entity to whom it was addressed and may not be relied upon by any other person or entity without the prior written consent of Brown and Caldwell unless otherwise provided by the Agreement pursuant to which these services were provided.

Appendix A: Main Lift Station – Mechanical

Main Pump Station-Mech

Created	2020-02-07 16:28:52 PST by Erik Zalkin
Updated	2020-02-20 17:14:36 PST by Hamed Hakimelahi
Location	37.4476, -121.922806
Asset Location	Main Pump Station-Mech

Pig Launcher A, PIG-A

Equipment Data

Mechanical Asset Name	Pig Launcher A
Mechanical Asset Description	36" Pig Launcher
Asset ID	PIG-A
Asset Type	Pig Launcher
Year Installed	2002
Size/Diameter	36
Coated?	Yes
Mechanical Field Assessment	None
Coating Condition	In tact

Mechanical Equipment Photos





Mechanical Observation Comments

Has never been used

Condition

Mechanical Condition Score

1 - Good – No defects observed.

Performance

Mechanical Performance Score

1 - Good – Asset functioning as intended.

Pig Launcher B, PIG-B

Equipment Data

Mechanical Asset Name	Pig Launcher B
Mechanical Asset Description	36" Pig Launcher
Asset ID	PIG-B
Asset Type	Pig Launcher
Year Installed	2002
Size/Diameter	36
Coated?	Yes
Mechanical Field Assessment	None
Coating Condition	In tact

Mechanical Equipment Photos





Mechanical Observation Comments

Never been used

Condition

Mechanical Condition Score

1 - Good - No defects observed.

Performance

Mechanical Performance Score

1 - Good - Asset functioning as intended.

Pinch Valve 1

Equipment Data

Mechanical Asset Name	Pinch Valve 1
Mechanical Asset Description	36" Pinch Valve (1 of 3)
Asset Type	Valve
Year Installed	2002
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	NA - Not enough information available.
----------------------------	--

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

Pinch Valve 2**Equipment Data**

Mechanical Asset Name	Pinch Valve 2
Mechanical Asset Description	36" Pinch Valve (2 of 3)
Asset Type	Valve
Year Installed	2002
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	NA - Not enough information available.
----------------------------	--

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

Pinch Valve 3**Equipment Data**

Mechanical Asset Name	Pinch Valve 3
Mechanical Asset Description	36" Pinch Valve (3 of 3)
Asset Type	Valve
Year Installed	2002
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	NA - Not enough information available.
----------------------------	--

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

Mag Meter (flow meter A)**Equipment Data**

Mechanical Asset Name	Mag Meter (flow meter A)
Mechanical Asset Description	24" Magnetic Meter

Asset Type	Flow Meter
Year Installed	2002
Flow Meter Type	Magnetic
Size/Diameter	24"
Coated?	No
Mechanical Field Assessment	Not in Operation
Mechanical Equipment Photos	



Mechanical Observation Comments

None

Condition

Mechanical Condition Score

4 - Poor – Major defects observed. Asset integrity may be compromised.

Performance

Mechanical Performance Score

4 - Poor – In service, but function is highly impaired.

Venturi Meter- Removed in 2008**Equipment Data**

Mechanical Asset Name	Venturi Meter- Removed in 2008
Mechanical Asset Description	36" Venturi Meter (taken out)
Asset Type	Flow Meter
Year Installed	1975
Flow Meter Type	Venturi
Size/Diameter	36
Mechanical Observation Comments	None

Condition

Mechanical Condition Score

NA - Not enough information available.

Performance

Mechanical Performance Score

NA - Not enough information available.

Butterfly Valve**Equipment Data**

Mechanical Asset Name	Butterfly Valve
Mechanical Asset Description	36" Butterfly Valve, FM interconnect
Asset Type	Valve
Year Installed	1970
Mechanical Field Assessment	
Mechanical Observation Comments	Could not find it in the field

Condition

Mechanical Condition Score

NA - Not enough information available.

Performance

Mechanical Performance Score

NA - Not enough information available.

Manifold Piping**Equipment Data**

Mechanical Asset Name	Manifold Piping
Mechanical Asset Description	36-inch flanged coupling adapter. 36-inch ductile iron 45' MJ x MJ bend. 20-inch or 36-inch FLxPE spool through sleeve with link seal. 36" x 20" x 36" ductile iron tee (force main A)
Asset Type	Piping
Year Installed	2008
Size/Diameter	36
Coated?	Yes

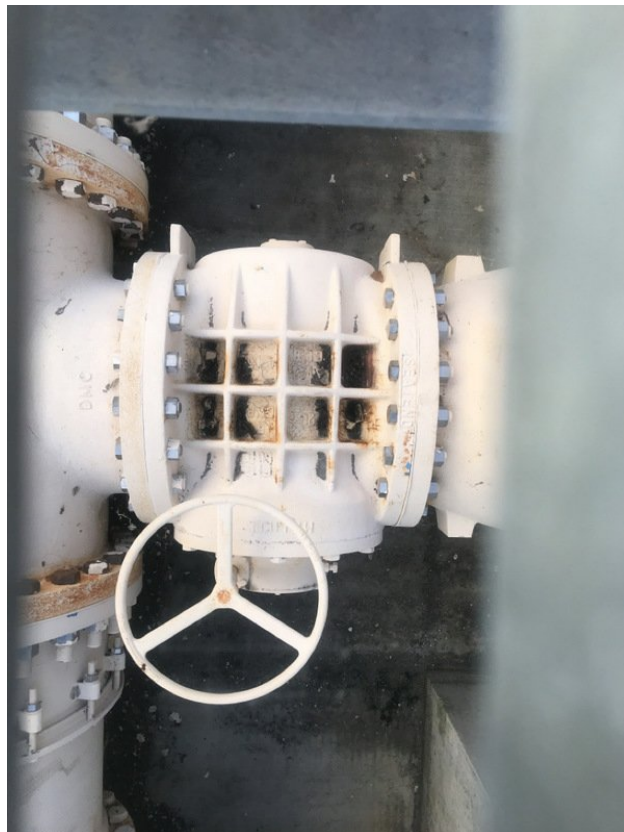
Mechanical Field Assessment

None

Coating Condition

Blistered

Mechanical Equipment Photos







Mechanical Observation Comments	According to staff, the pipes operate well.
---------------------------------	---

Condition

Mechanical Condition Score	2 - Fair – Only minor defects observed.
----------------------------	---

Performance

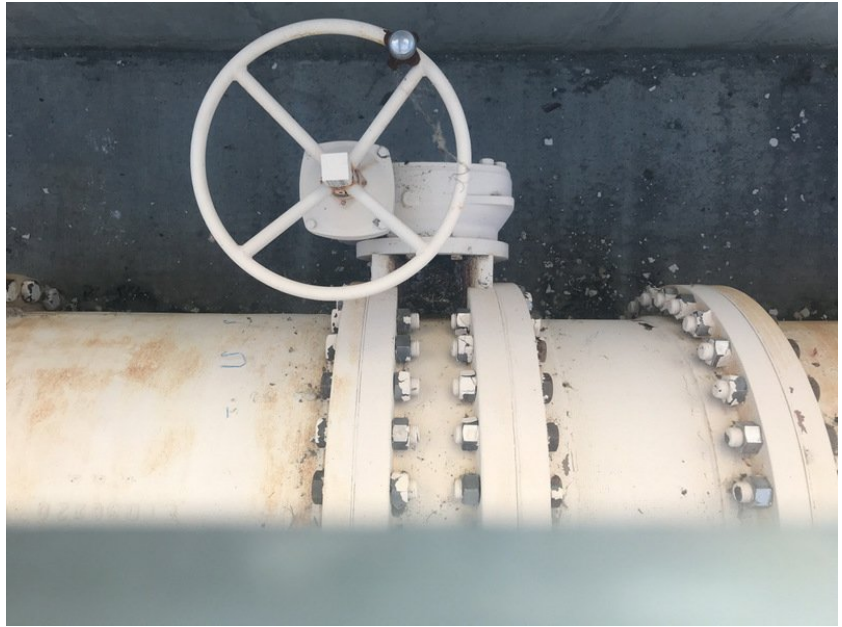
Mechanical Performance Score	2 - Fair – In service, but higher than expected O&M.
------------------------------	--

Manifold Piping Butterfly Valve

Equipment Data

Mechanical Asset Name	Manifold Piping Butterfly Valve
Mechanical Asset Description	36-inch diameter BFV, middle of manifold
Asset Type	Valve
Year Installed	2008
Control Type	Local
Drive Type	Manual
Valve Type	Butterfly
Size/Diameter	36
Mechanical Field Assessment	None
Mechanical Equipment Photos	





Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Manifold Piping Plug Valve #1

Equipment Data

Mechanical Asset Name	Manifold Piping Plug Valve #1
Mechanical Asset Description	36-inch diameter PV, pumps 1, 2, 3
Asset Type	Valve
Year Installed	2008
Drive Type	Manual
Valve Type	Plug
Size/Diameter	36
Mechanical Field Assessment	

Mechanical Equipment Photos



Mechanical Observation Comments	Pump 1 has not been installed yet
---------------------------------	-----------------------------------

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

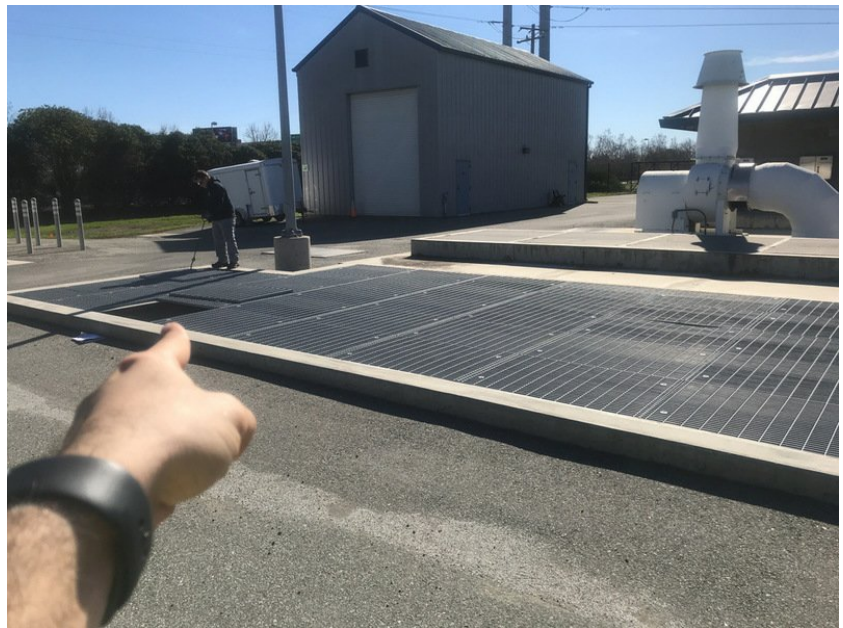
Manifold PV #1 Actuator**Equipment Data**

Mechanical Asset Name	Manifold PV #1 Actuator
Mechanical Asset Description	plug valve #1 electric actuator
Asset Type	Actuator
Year Installed	2008
Control Type	Local
Drive Type	Electric
Mechanical Field Assessment	None
Mechanical Equipment Photos	









Mechanical Observation Comments	operator has never used this. The operator dont know if the actuator works.
---------------------------------	---

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

Manifold Piping Plug Valve #2

Equipment Data

Mechanical Asset Name	Manifold Piping Plug Valve #2
Mechanical Asset Description	36-inch diameter PV, pumps 4, 5, 6
Asset Type	Valve

Year Installed	2008
Valve Type	Plug
Size/Diameter	36
Mechanical Field Assessment	None
Mechanical Equipment Photos	



Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	2 - Fair – Only minor defects observed.
----------------------------	---

Performance

Mechanical Performance Score	2 - Fair – In service, but higher than expected O&M.
------------------------------	--

Manifold PV #2 Actuator

Equipment Data

Mechanical Asset Name	Manifold PV #2 Actuator
Mechanical Asset Description	plug valve #2 electric actuator
Asset Type	Actuator
Year Installed	2008
Control Type	Local
Drive Type	Electric
Mechanical Field Assessment	Does not work.
Mechanical Equipment Photos	







Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	5 - Failing or Failed – Asset integrity is compromised. Asset may be out of service.
----------------------------	--

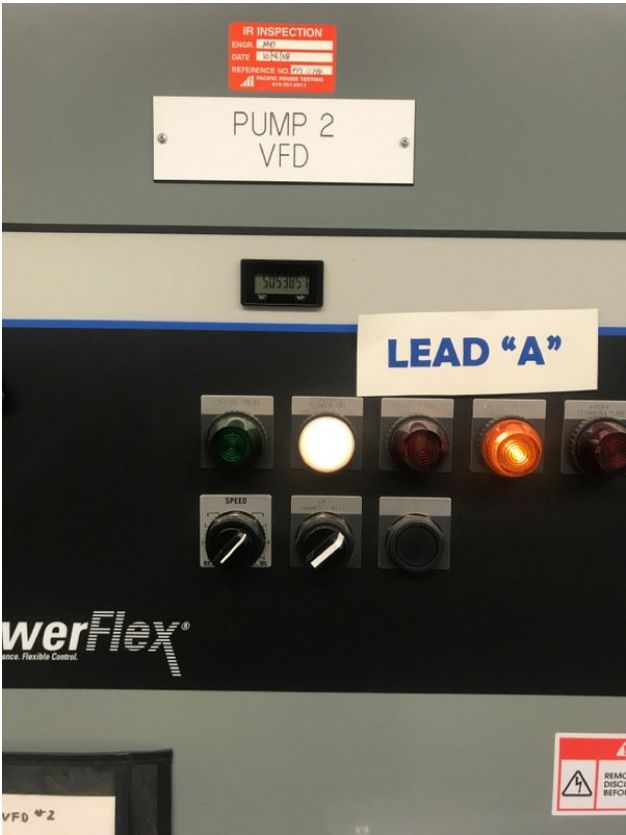
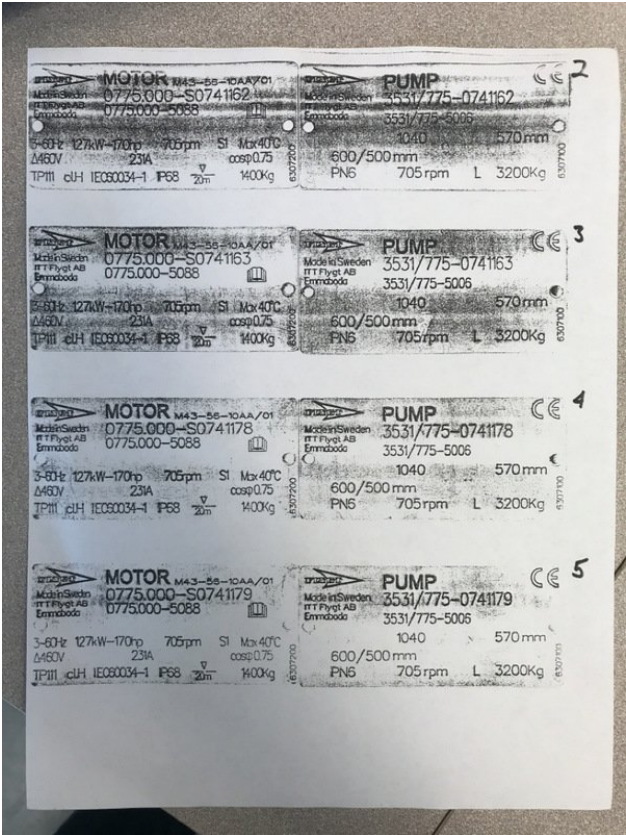
Performance

Mechanical Performance Score	5 - Failing or Failed – Asset is not functioning as intended or is out of service.
------------------------------	--

Pump #2

Equipment Data

Mechanical Asset Name	Pump #2
Mechanical Asset Description	FLYGT CP3531-775, 170HP Submersible Pump
Asset Type	Pump
Year Installed	2008
Pump Type	Submersible
Mechanical Field Assessment	None
Mechanical Equipment Photos	











Mechanical Observation Comments	Rebuilt 1.5 years ago
---------------------------------	-----------------------

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Pump #2 Piping

Equipment Data

Mechanical Asset Name	Pump #2 Piping
Mechanical Asset Description	20-Inch Ductile Iron Vertical Discharge Pipe, 20-Inch Ductile Iron 90 Elbow, 20-Inch Flanged Coupling Adapter
Asset Type	Piping
Year Installed	2008
Size/Diameter	20"
Coated?	Yes
Mechanical Field Assessment	None
Coating Condition	In tact
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	2 - Fair – Only minor defects observed.
----------------------------	---

Performance

Mechanical Performance Score	2 - Fair – In service, but higher than expected O&M.
------------------------------	--

Pump #2 Check Valve

Equipment Data

Mechanical Asset Name	Pump #2 Check Valve
-----------------------	---------------------

Mechanical Asset Description	20-Inch Diameter Spring Loaded Check Valve
Asset Type	Valve
Year Installed	2008
Valve Type	Check
Size/Diameter	20
Mechanical Field Assessment	None

Mechanical Equipment Photos







Mechanical Observation Comments

None

Condition

Mechanical Condition Score

2 - Fair – Only minor defects observed.

Performance

Mechanical Performance Score

1 - Good – Asset functioning as intended.

Pump #2 Plug Valve

Equipment Data

Mechanical Asset Name	Pump #2 Plug Valve
Mechanical Asset Description	20-Inch Diameter Plug Valve
Asset Type	Valve
Year Installed	2008
Control Type	Local
Valve Type	Plug
Size/Diameter	20

Mechanical Equipment Photos



Mechanical Observation Comments

None

Condition

Mechanical Condition Score 1 - Good – No defects observed.

Performance

Mechanical Performance Score 1 - Good – Asset functioning as intended.

Pump #3

Equipment Data

Mechanical Asset Name	Pump #3
Mechanical Asset Description	FLYGT CP3531-775, 170HP Submersible Pump
Asset Type	Pump
Year Installed	2008
Pump Type	Submersible
Mechanical Field Assessment	passed life limit
Mechanical Equipment Photos	





Mechanical Observation Comments	It has 50,000 hours on it. Should be replaced.
---------------------------------	--

Condition

Mechanical Condition Score	4 - Poor – Major defects observed. Asset integrity may be compromised.
----------------------------	--

Performance

Mechanical Performance Score	4 - Poor – In service, but function is highly impaired.
------------------------------	---

Pump #3 Piping

Equipment Data

Mechanical Asset Name	Pump #3 Piping
Mechanical Asset Description	20-Inch Ductile Iron Vertical Discharge Pipe, 20-Inch Ductile Iron 90 Elbow, 20-Inch Flanged Coupling Adapter
Asset Type	Piping
Year Installed	2008
Size/Diameter	20"
Coated?	Yes
Mechanical Field Assessment	None
Coating Condition	In tact

Mechanical Equipment Photos



Mechanical Observation Comments

None

Condition

Mechanical Condition Score

2 - Fair – Only minor defects observed.

Performance

Mechanical Performance Score

2 - Fair – In service, but higher than expected O&M.

Pump #3 Check Valve**Equipment Data**

Mechanical Asset Name

Pump #3 Check Valve

Mechanical Asset Description

20-Inch Diameter Spring Loaded Check Valve

Asset Type

Valve

Year Installed

2008

Size/Diameter

20"

Mechanical Field Assessment

None

Mechanical Equipment Photos





Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	2 - Fair – Only minor defects observed.
----------------------------	---

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Pump #3 Plug Valve

Equipment Data

Mechanical Asset Name	Pump #3 Plug Valve
Mechanical Asset Description	20-Inch Diameter Plug Valve
Asset Type	Valve
Year Installed	2008
Valve Type	Plug
Size/Diameter	20"

Mechanical Equipment Photos



Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	2 - Fair – Only minor defects observed.
----------------------------	---

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Pump #4**Equipment Data**

Mechanical Asset Name	Pump #4
Mechanical Asset Description	FLYGT CP3531-775, 170HP Submersible Pump
Asset Type	Pump
Year Installed	2008
Pump Type	Submersible
Mechanical Field Assessment	None

Mechanical Equipment Photos



Mechanical Observation Comments	None
Condition	
Mechanical Condition Score	1 - Good – No defects observed.
Performance	
Mechanical Performance Score	1 - Good – Asset functioning as intended.
Pump #4 Piping	

Equipment Data

Mechanical Asset Name	Pump #4 Piping
Mechanical Asset Description	20-Inch Ductile Iron Vertical Discharge Pipe, 20-Inch Ductile Iron 90 Elbow, 20-Inch Flanged Coupling Adapter
Asset Type	Piping
Year Installed	2008
Size/Diameter	20"
Coated?	Yes
Mechanical Field Assessment	None
Coating Condition	In tact
Mechanical Equipment Photos	

Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	2 - Fair – Only minor defects observed.
----------------------------	---

Performance

Mechanical Performance Score	2 - Fair – In service, but higher than expected O&M.
------------------------------	--

Pump #4 Check Valve

Equipment Data

Mechanical Asset Name	Pump #4 Check Valve
Mechanical Asset Description	20-Inch Diameter Spring Loaded Check Valve
Asset Type	Valve
Year Installed	2008
Valve Type	Check
Size/Diameter	20"
Mechanical Field Assessment	None
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	2 - Fair – Only minor defects observed.
----------------------------	---

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Pump #4 Plug Valve**Equipment Data**

Mechanical Asset Name	Pump #4 Plug Valve
Mechanical Asset Description	20-Inch Diameter Plug Valve
Asset Type	Valve
Year Installed	2008
Valve Type	Plug
Size/Diameter	20
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	2 - Fair – Only minor defects observed.
----------------------------	---

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Pump #5 (not installed yet)**Equipment Data**

Mechanical Asset Name	Pump #5 (not installed yet)
Mechanical Asset Description	FLYGT CP3531-775, 170HP Submersible Pump
Asset Type	Pump
Mechanical Equipment Photos	



Mechanical Observation Comments

None

Pump #5 Piping

Equipment Data

Mechanical Asset Name

Pump #5 Piping

Mechanical Asset Description

20-Inch Ductile Iron Vertical Discharge Pipe, 20-Inch Ductile Iron 90 Elbow, 20-Inch Flanged Coupling Adapter

Asset Type

Piping

Year Installed	2008
Mechanical Field Assessment	None
Mechanical Observation Comments	The piping is not being used,

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

Pump #5 Check Valve

Equipment Data

Mechanical Asset Name	Pump #5 Check Valve
Mechanical Asset Description	20-Inch Diameter Spring Loaded Check Valve
Asset Type	Valve
Year Installed	2008
Mechanical Observation Comments	Not being used,

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

Pump #5 Plug Valve

Equipment Data

Mechanical Asset Name	Pump #5 Plug Valve
Mechanical Asset Description	20-Inch Diameter Plug Valve
Asset Type	Valve
Year Installed	2008
Mechanical Observation Comments	Not being used

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

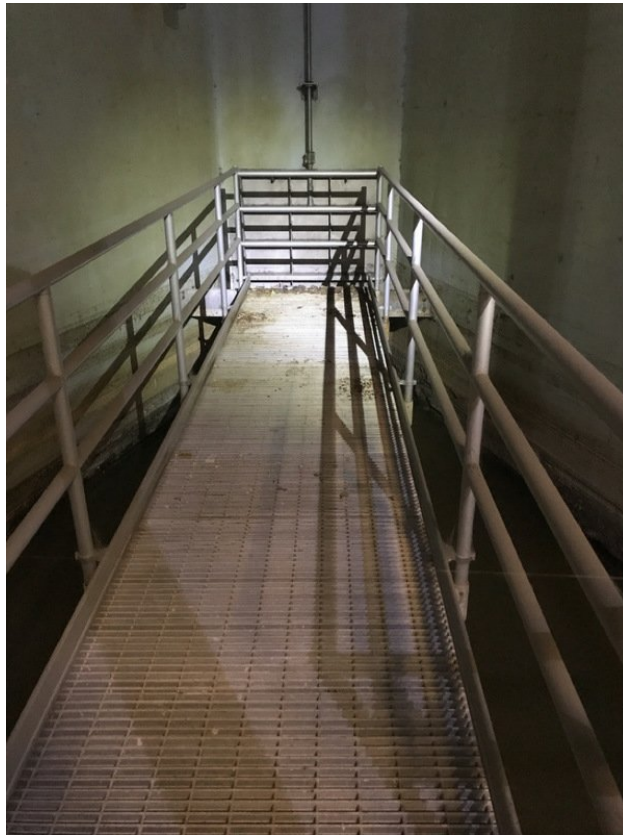
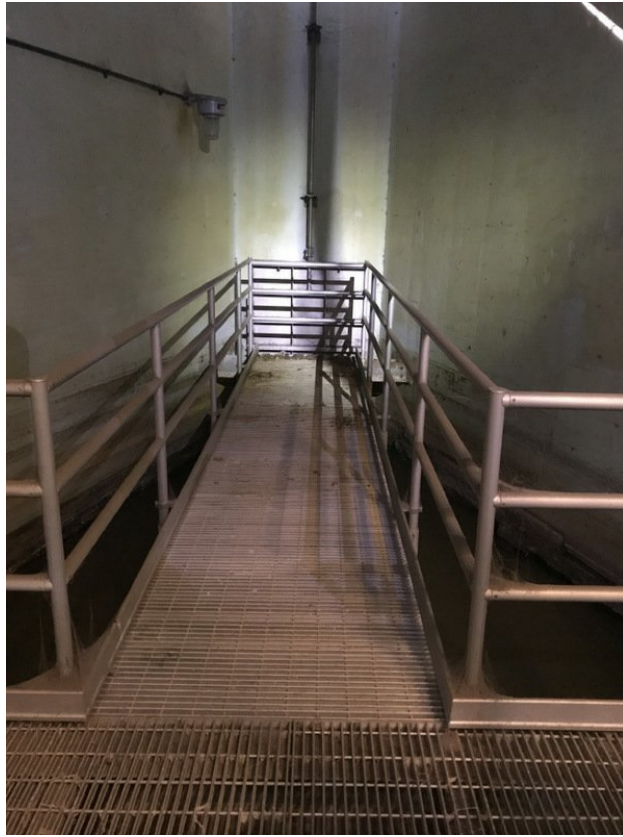
Main Head Gate

Equipment Data

Mechanical Asset Name	Main Head Gate
Mechanical Asset Description	54-inch sluice gate with manual actuator
Asset Type	Gate
Year Installed	2008
Control Type	Local
Drive Type	Manual

Gate Type	Sluice
Size/Diameter	54"
Mechanical Field Assessment	None
Mechanical Equipment Photos	







Mechanical Observation Comments

None

Condition

Mechanical Condition Score

1 - Good – No defects observed.

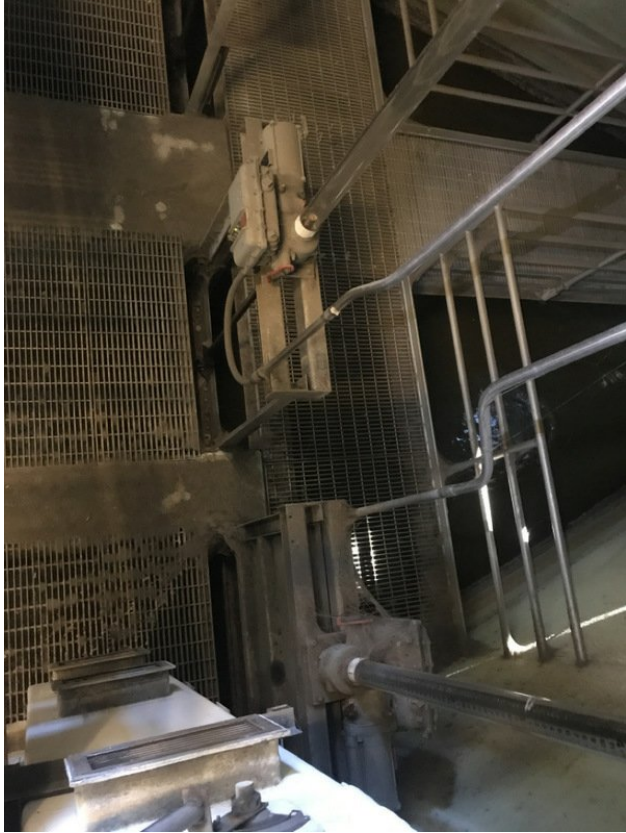
Performance

Mechanical Performance Score

1 - Good – Asset functioning as intended.

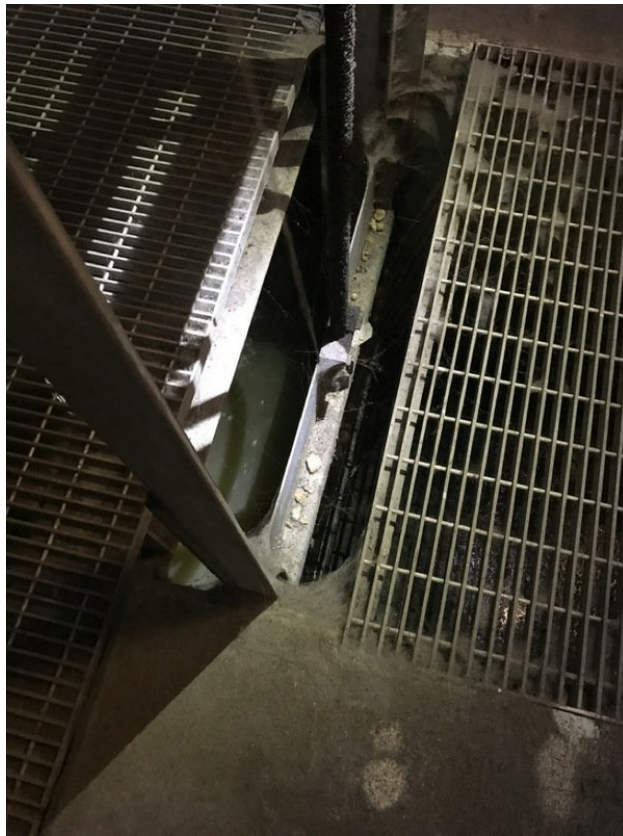
Head Gate #1

Equipment Data

Mechanical Asset Name	Head Gate #1
Mechanical Asset Description	48-inch sluice gate with electric actuator
Asset Type	Gate
Year Installed	2008
Control Type	Local
Drive Type	Electric
Gate Type	Sluice
Size/Diameter	48"
Mechanical Field Assessment	None
Mechanical Equipment Photos	









Mechanical Observation Comments

None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Head Gate #2

Equipment Data

Mechanical Asset Name	Head Gate #2
Mechanical Asset Description	48-inch sluice gate with electric actuator
Asset Type	Gate
Year Installed	2008
Control Type	Local
Drive Type	Electric
Gate Type	Sluice
Size/Diameter	48
Mechanical Field Assessment	None
Mechanical Equipment Photos	



Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Head Gate #3

Equipment Data

Mechanical Asset Name	Head Gate #3
Mechanical Asset Description	48-inch sluice gate with electric actuator
Asset Type	Gate
Year Installed	2008
Control Type	Local
Drive Type	Electric
Gate Type	Sluice
Size/Diameter	48
Mechanical Field Assessment	None
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Head Gate #4

Equipment Data

Mechanical Asset Name	Head Gate #4
Mechanical Asset Description	48-inch sluice gate with electric actuator
Asset Type	Gate
Year Installed	2008
Control Type	Local
Drive Type	Electric
Gate Type	Sluice
Size/Diameter	48
Mechanical Field Assessment	None

Mechanical Equipment Photos



Mechanical Observation Comments	None
Condition	
Mechanical Condition Score	1 - Good – No defects observed.
Performance	
Mechanical Performance Score	1 - Good – Asset functioning as intended.
Grinder #1	

Equipment Data

Mechanical Asset Name	Grinder #1
Mechanical Asset Description	5-hp electric driven
Asset Type	Grinder
Year Installed	2008
Control Type	Local
Drive Type	Electric
Mechanical Field Assessment	Excessive Vibration, Inadequate Supports
Mechanical Equipment Photos	





Mechanical Observation Comments

None

Condition

Mechanical Condition Score

5 - Failing or Failed – Asset integrity is compromised. Asset may be out of service.

Performance

Mechanical Performance Score

5 - Failing or Failed – Asset is not functioning as intended or is out of service.

Grinder #2

Equipment Data

Mechanical Asset Name

Grinder #2

Mechanical Asset Description

10-hp electric driven

Asset Type

Grinder

Year Installed	2008
Control Type	Local
Drive Type	Electric
Mechanical Field Assessment	None

Mechanical Equipment Photos



Mechanical Observation Comments

None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Grinder #3

Equipment Data

Mechanical Asset Name	Grinder #3
Mechanical Asset Description	10-hp electric driven
Asset Type	Grinder
Year Installed	2008
Control Type	Local
Drive Type	Electric
Mechanical Field Assessment	None
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Grinder #4

Equipment Data

Mechanical Asset Name	Grinder #4
Mechanical Asset Description	5-hp electric driven
Asset Type	Grinder
Year Installed	2008
Control Type	Local
Drive Type	Electric
Mechanical Field Assessment	None
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Air Supply Fan

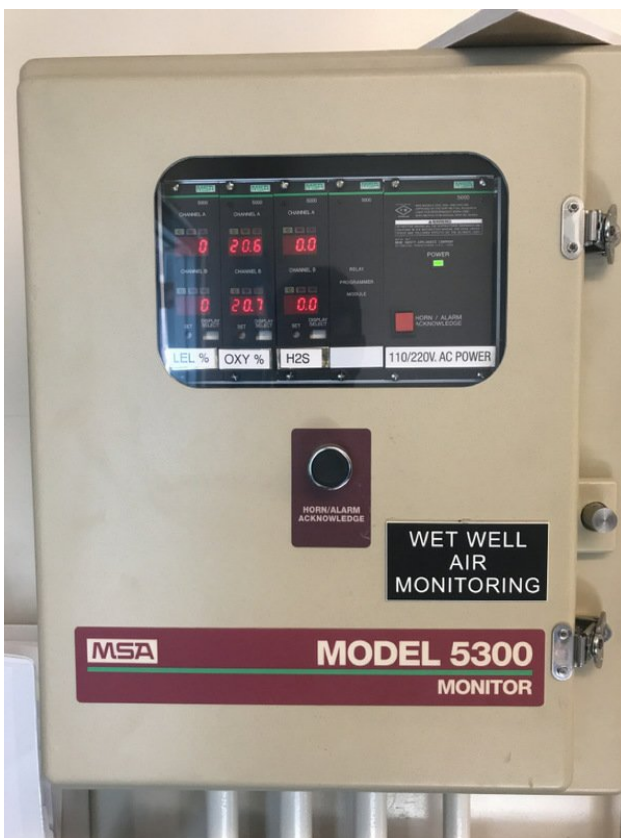
Equipment Data

Mechanical Asset Name	Air Supply Fan
Mechanical Asset Description	PS ventilation system
Asset Type	Fan
Year Installed	2008

Mechanical Equipment Photos







[illegible]

Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Exhaust Fan & Stack

Equipment Data

Mechanical Asset Name	Exhaust Fan & Stack
-----------------------	---------------------

Mechanical Asset Description	PS ventilation system
------------------------------	-----------------------

Asset Type	Fan
------------	-----

Year Installed	2008
----------------	------

Mechanical Equipment Photos







Mechanical Observation Comments

None

Condition

Mechanical Condition Score 1 - Good – No defects observed.

Performance

Mechanical Performance Score 2 - Fair – In service, but higher than expected O&M.

Miscellaneous

Equipment Data

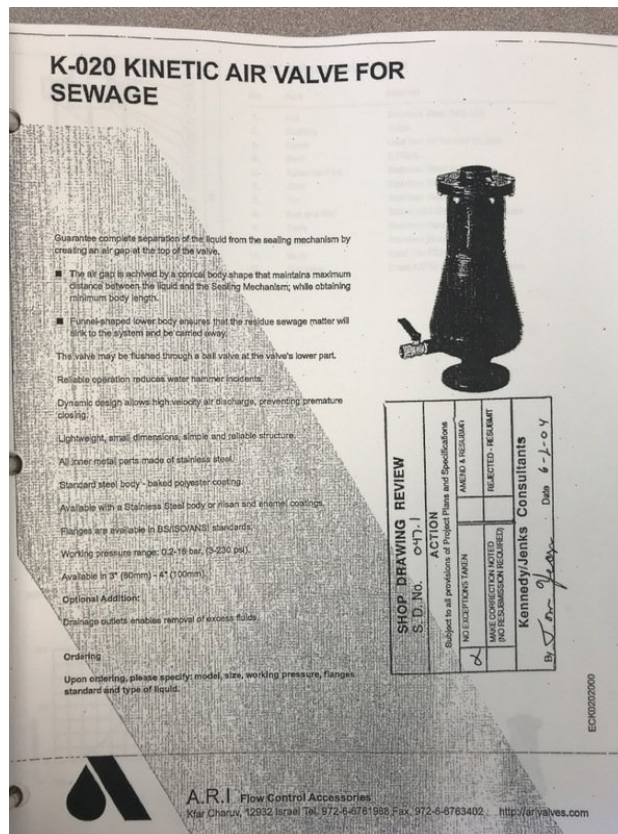
Mechanical Asset Name	Miscellaneous
Mechanical Asset Description	Pipe support, 5' x 7' aluminum hatch, galv grating, 3" SS guide rail, 4-inch diameter PVC drain, pipe wall anchor bracket
Mechanical Observation Comments	None

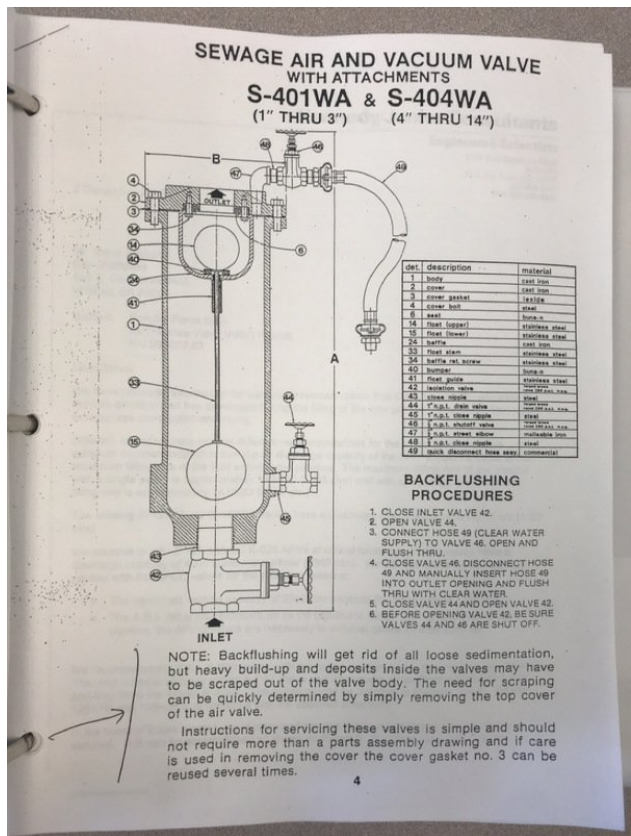
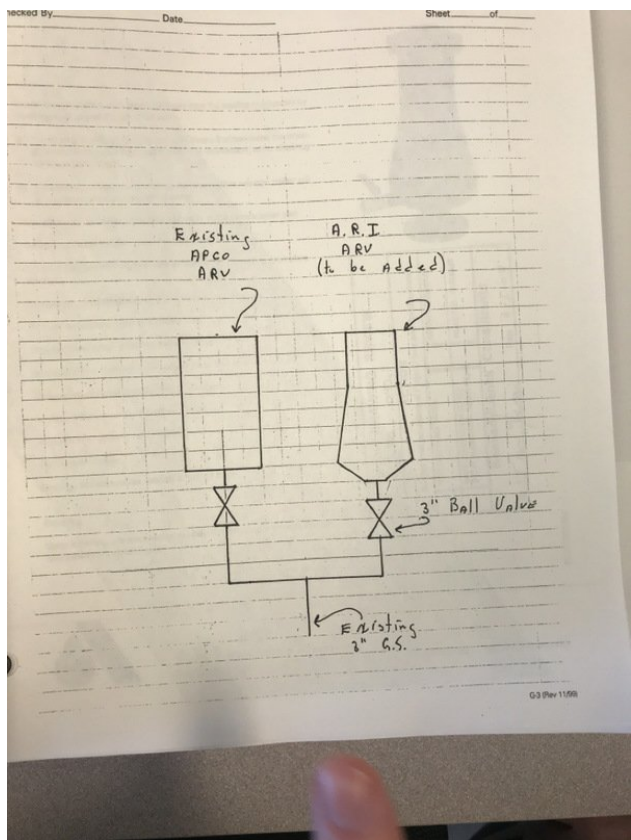
2" combo air/vac valve

Equipment Data

Mechanical Asset Name 2" combo air/vac valve

Mechanical Equipment Photos





Mechanical Condition Score

4 - Poor – Major defects observed. Asset integrity may be compromised.

Performance

Mechanical Performance Score

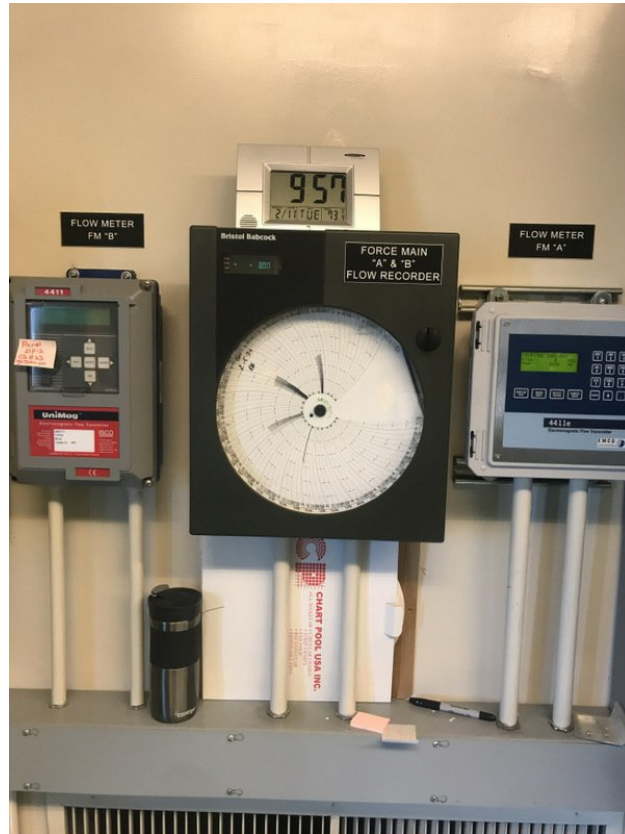
4 - Poor – In service, but function is highly impaired.

Force Main A B Flow Recorder**Equipment Data**

Mechanical Asset Name

Force Main A B Flow Recorder

Mechanical Equipment Photos



Mechanical Observation Comments

None

Condition

Mechanical Condition Score

1 - Good – No defects observed.

Performance

Mechanical Performance Score

1 - Good – Asset functioning as intended.

Eye wash**Equipment Data**

Mechanical Asset Name

Eye wash

Mechanical Equipment Photos



Mechanical Observation Comments

None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Flow Meter B

Equipment Data

Mechanical Asset Name	Flow Meter B
Mechanical Asset Description	This is for force main B
Mechanical Field Assessment	It works but the operation is not accurate.
Mechanical Equipment Photos	





Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	4 - Poor – Major defects observed. Asset integrity may be compromised.
----------------------------	--

Performance

Mechanical Performance Score	4 - Poor – In service, but function is highly impaired.
------------------------------	---

Air vac 1 to 15

Equipment Data

Mechanical Asset Name	Air vac 1 to 15
Mechanical Asset Description	All across the pump station.
Mechanical Field Assessment	Cavitation, Coating Failure, Inadequate Supports
Mechanical Equipment Photos	





Mechanical Observation Comments

None

Condition

Mechanical Condition Score	5 - Failing or Failed – Asset integrity is compromised. Asset may be out of service.
----------------------------	--

Performance

Mechanical Performance Score	5 - Failing or Failed – Asset is not functioning as intended or is out of service.
------------------------------	--

Appendix B: Main Lift Station – Electrical

Main Pump Station-Elec

Created	2020-02-07 23:14:55 UTC by Erik Zalkin
Updated	2020-02-22 00:03:47 UTC by Sundara Palani
Location	37.44755, -121.922864
Asset Location	Main Pump Station-Elec

Main Transformer

Electrical Asset Name	Main Transformer
Electrical Asset Description	1000 kVA, 12 kV-480 V, 3-ph (PG&E)
Electrical Asset Type	Transformer
Year Installed	2000

Electrical Equipment

Electrical Equipment Observations

Age	20
Manufacturer	PG&E
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	N/A

Electrical Equipment Photos







Electrical Equipment Observations	No defects noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Outdoor Utility Disconnect and Metering Panel

Electrical Asset Name	Outdoor Utility Disconnect and Metering Panel
Electrical Asset Description	Outdoor NEMA 3R Enclosure
Electrical Asset Type	Panel
Year Installed	2000

Electrical Equipment

Electrical Equipment Observations

Age	20 Years
Manufacturer	Eaton
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Electrical Equipment Photos	







Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Main Switchgear

Electrical Asset Name	Main Switchgear
Electrical Asset Description	Located in Existing Generator Building
Electrical Asset Type	Switchgear
Year Installed	2000

Electrical Equipment

Electrical Equipment Observations

Age	20 Years
Manufacturer	RSE- SIERRA
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	Two Space available
Electrical Equipment Photos	



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Variable Frequency Drive P2

Electrical Asset Name	Variable Frequency Drive P2
Electrical Asset Description	VFD for Pump 2 (170 HP)
Electrical Asset Type	Variable Freq Drive
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 years
Manufacturer	Allen Bradley
Model	Power Flex 700 Series
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Electrical Equipment Photos	







Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	4 - Integrity of Component Moderately Compromised
Electrical Equipment Performance Score	2 - In-Service, but Higher than Expected O&M

Variable Frequency Drive P3

Electrical Asset Name	Variable Frequency Drive P3
Electrical Asset Description	VFD for Pump 3 (170 HP)
Electrical Asset Type	Variable Freq Drive
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Allen Bradley
Model	Power Flex 700 Series
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	Not Applicable
Electrical Equipment Observations	No Corrosion Noted. Understood from City that IGBT was replaced a year ago.
Electrical Equipment Condition Score	4 - Integrity of Component Moderately Compromised
Electrical Equipment Performance Score	2 - In-Service, but Higher than Expected O&M

Variable Frequency Drive P4

Electrical Asset Name	Variable Frequency Drive P4
Electrical Asset Description	VFD for Pump 4 (170 HP)
Electrical Asset Type	Variable Freq Drive
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Allen Bradley
Model	Power Flex 700 Series
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	NA
Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	4 - Integrity of Component Moderately Compromised
Electrical Equipment Performance Score	2 - In-Service, but Higher than Expected O&M

Variable Frequency Drive P5

Electrical Asset Name	Variable Frequency Drive P5
Electrical Asset Description	VFD for Pump 5 (170 HP)
Electrical Asset Type	Variable Freq Drive
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Allen Bradley
Model	Power Flex 700 Series
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	NA
Electrical Equipment Observations	No Corrosion Noted. Understood from City that Cooling Fans were replaced year ago
Electrical Equipment Condition Score	4 - Integrity of Component Moderately Compromised
Electrical Equipment Performance Score	2 - In-Service, but Higher than Expected O&M

Local Disconnect for Engine Jacket Water Heater

Electrical Asset Name	Local Disconnect for Engine Jacket Water Heater
Electrical Asset Description	30A/3P
Electrical Asset Type	Switch
Year Installed	2000

Electrical Equipment

Electrical Equipment Observations

Age	20 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Motor Control Center 2

Electrical Asset Name	Motor Control Center 2
Electrical Asset Description	600 A, 480 V, 3-ph, 3W, 65000 AIC
Asset ID	MCC-2
Electrical Asset Type	Motor Control Center
Year Installed	2000

Electrical Equipment**Electrical Equipment Observations**

Age	20 Years
Manufacturer	Eaton
Model	Freedom Series 2100
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	Spaces available

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted.
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Motor Control Center 2A

Electrical Asset Name	Motor Control Center 2A
Electrical Asset Description	600 A, 480 V, 3-ph, 3W, 65000 AIC
Asset ID	MCC-2A
Electrical Asset Type	Motor Control Center
Year Installed	2000

Electrical Equipment**Electrical Equipment Observations**

Age	20 Years
Manufacturer	Eaton
Model	Freedom 2100 Series
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	Spaces Available
Electrical Equipment Photos	



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Dry Type Transformer

Electrical Asset Name	Dry Type Transformer
Electrical Asset Description	30 kVA, 480-208/120 V, Dry Type
Electrical Asset Type	Transformer
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Eaton
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA
Electrical Equipment Photos	

Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Lighting panel (LP-1)

Electrical Asset Name	Lighting panel (LP-1)
Asset ID	LA
Electrical Asset Type	Panel
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Eaton
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	10 Spares available
Electrical Equipment Photos	



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Dry Type Transformer

Electrical Asset Name	Dry Type Transformer
Electrical Asset Description	30 kVA, 480-208/120 V, Dry Type
Electrical Asset Type	Transformer
Year Installed	2000

Electrical Equipment

Electrical Equipment Observations

Age	20 Years
Manufacturer	GE

Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA
Electrical Equipment Photos	



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Lighting panel (LA)

Electrical Asset Name	Lighting panel (LA)
Electrical Asset Description	100 A, 1-Ph, 3 Wire
Asset ID	LP-1
Electrical Asset Type	Panel
Year Installed	2000

Electrical Equipment

Electrical Equipment Observations

Age	20 Years
Manufacturer	GE
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	10 Spares available

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent

Electrical Equipment Performance Score

1 - Component Functioning as Intended

Electrical/Generator Building-Electrical

Electrical Asset Name	Electrical/Generator Building-Electrical
Electrical Asset Type	Building
Year Installed	2000

Electrical Building**Electrical Building Observations**

Electrical Conduits	Good Condition
Electrical Pull and Junction Boxes	Good Condition
Electrical Lighting	Outdated Technology
Electrical Building Photos	





Electrical Building Observations	No Corrosion Noted on Conduits and Pull Boxes
Electrical Building Condition Score	1 - Excellent
Electrical Building Performance Score	1 - Component Functioning as Intended

Motor Control Center A

Electrical Asset Name	Motor Control Center A
Electrical Asset Description	400 A, 480 V, 3-ph, 3W, 65000 AIC
Asset ID	MCC-A
Electrical Asset Type	Motor Control Center
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Eaton
Model	Freedom 2000 Series
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	2 Space available
Electrical Equipment Photos	



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Motor Control Center B

Electrical Asset Name	Motor Control Center B
Electrical Asset Description	400 A, 480 V, 3-ph, 3W, 65000 AIC
Asset ID	MCC-B
Electrical Asset Type	Motor Control Center
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Eaton
Model	Freedom 2000 Series
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	3 Spaces available

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Dry Type Transformer

Electrical Asset Name	Dry Type Transformer
Electrical Asset Description	10 kVA, 480-240/120 V, Dry Type

Electrical Asset Type	Transformer
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Eaton
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA

Electrical Equipment Photos





Electrical Equipment Observations	No corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Distribution panel(DP-1)

Electrical Asset Name	Distribution panel(DP-1)
Electrical Asset Description	125 A, NEMA Type 1
Asset ID	DP-1
Electrical Asset Type	Panel
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Eaton
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	15 Spare Breakers available
Electrical Equipment Photos	



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

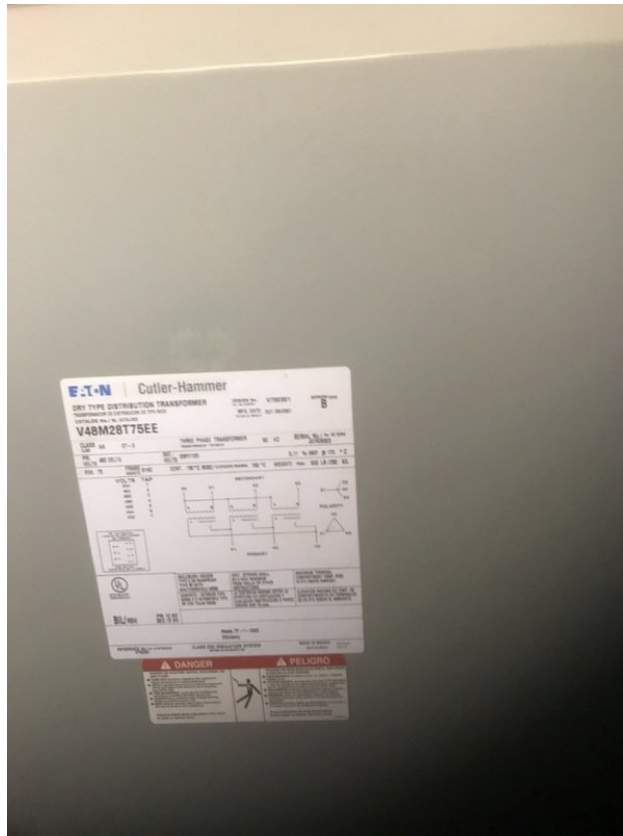
Dry Type Transformer

Electrical Asset Name	Dry Type Transformer
Electrical Asset Description	75 kVA, 480-208/120 V, Dry Type
Electrical Asset Type	Transformer
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Eaton
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA
Electrical Equipment Photos	



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Distribution Panel (DP-2)

Electrical Asset Name	Distribution Panel (DP-2)
Electrical Asset Description	125 A, NEMA Type 1
Asset ID	DP-2
Electrical Asset Type	Panel
Year Installed	2008

Electrical Equipment

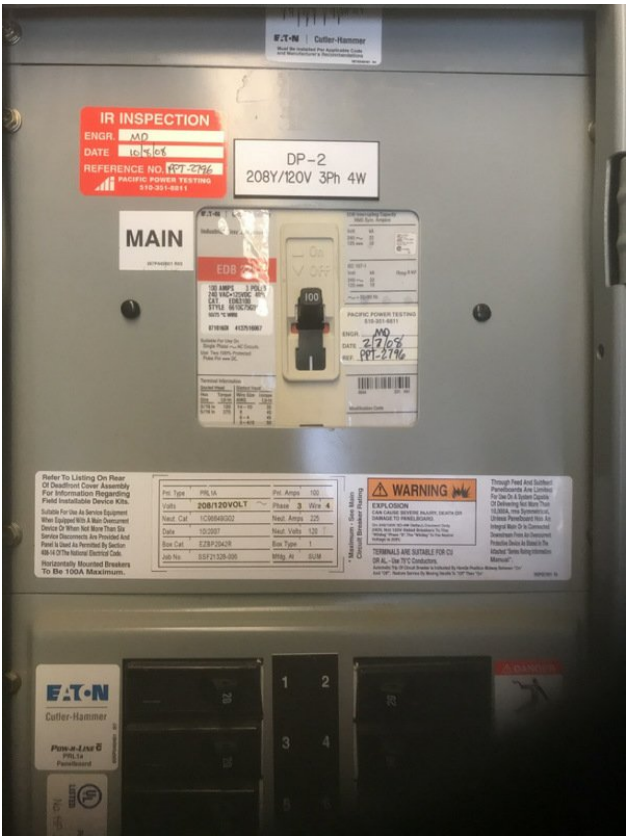
Electrical Equipment Observations

Age	12 Years
Manufacturer	Eaton
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	6 Spares available

Electrical Equipment Photos







Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Control Panel for Grinder#1

Electrical Asset Name	Local Control Panel for Grinder#1
Electrical Asset Description	LCP grinder1
Electrical Asset Type	Panel
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	NA

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Control Panel for Grinder#2

Electrical Asset Name	Local Control Panel for Grinder#2
Electrical Asset Description	LCP grinder2
Electrical Asset Type	Panel
Year Installed	2008

Electrical Equipment**Electrical Equipment Observations**

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	NA

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Control Panel for Grinder#3

Electrical Asset Name	Local Control Panel for Grinder#3
Electrical Asset Description	LCP grinder3
Electrical Asset Type	Panel
Year Installed	2008

Electrical Equipment**Electrical Equipment Observations**

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	NA

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Control Panel for Grinder#4

Electrical Asset Name	Local Control Panel for Grinder#4
Electrical Asset Description	LCP grinder4
Electrical Asset Type	Panel
Year Installed	2008

Electrical Equipment**Electrical Equipment Observations**

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	NA
Electrical Equipment Photos	





Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Disconnect for CU-1 (for FC-1)

Electrical Asset Name	Local Disconnect for CU-1 (for FC-1)
Electrical Asset Description	30A/3P
Electrical Asset Type	Switch
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Electrical Equipment Photos

**Local Disconnect for EF-1 (for Control Room)**

Electrical Asset Name	Local Disconnect for EF-1 (for Control Room)
Electrical Asset Description	30A/3P
Electrical Asset Type	Switch
Year Installed	2008

Electrical Equipment**Electrical Equipment Observations**

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA
Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Disconnect for EF-5 (for wetwell)

Electrical Asset Name	Local Disconnect for EF-5 (for wetwell)
Electrical Asset Description	60A/3P
Electrical Asset Type	Switch
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA
Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Disconnect for SF-1 (for Wet Well)

Electrical Asset Name	Local Disconnect for SF-1 (for Wet Well)
Electrical Asset Description	60A/3P
Electrical Asset Type	Switch
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA
Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Disconnect for HP-1 (for FC-2)

Electrical Asset Name	Local Disconnect for HP-1 (for FC-2)
Electrical Asset Description	30A/3P
Electrical Asset Type	Switch
Year Installed	2008

Electrical Equipment

Electrical Equipment Observations

Age	12 Years
Manufacturer	Square D
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Local Disconnect for FC-1 (for Control Room)

Electrical Asset Name	Local Disconnect for FC-1 (for Control Room)
Electrical Asset Description	30A/3P
Electrical Asset Type	Switch
Year Installed	2008

Electrical Equipment**Electrical Equipment Observations**

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA
Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Generator

Electrical Asset Name	Generator
Electrical Asset Description	1000 kVA, 480 V Diesel Driven Engine Generator

Electrical Asset Type	Generator
Year Installed	2000

Electrical Motor or Generator

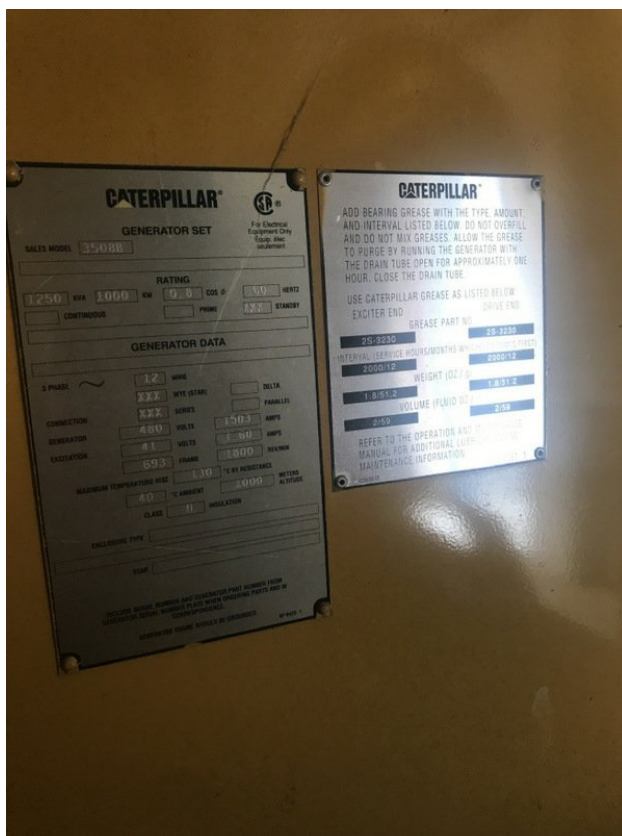
Electrical Motor or Generator Observations

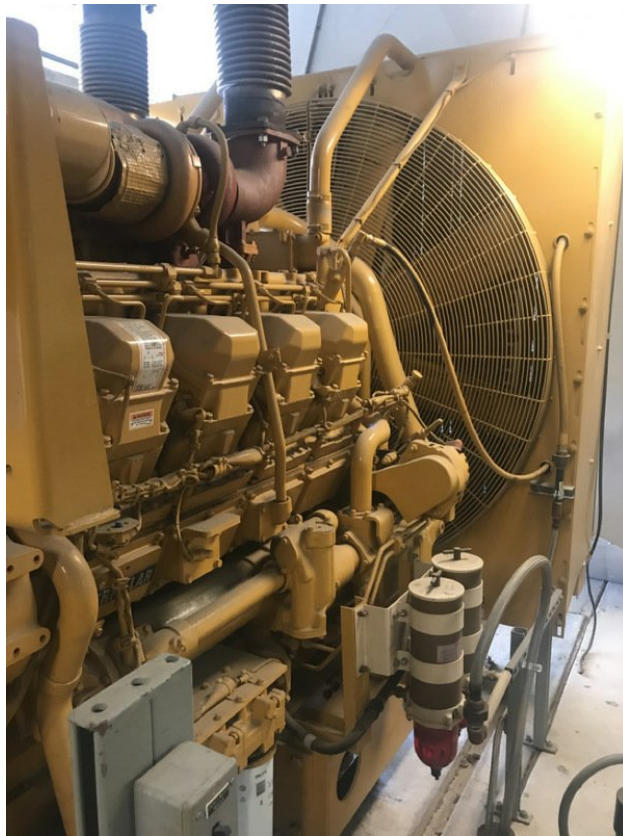
Age	20 Years
Manufacturer	Caterpillar
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Visible Motor Monitoring Equipment	Good Condition
Electrical Motor Photos	

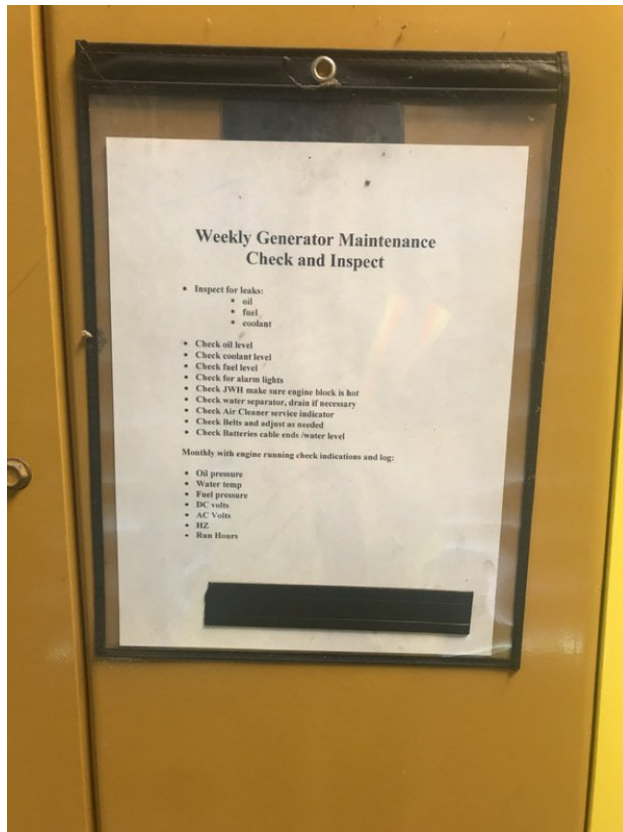


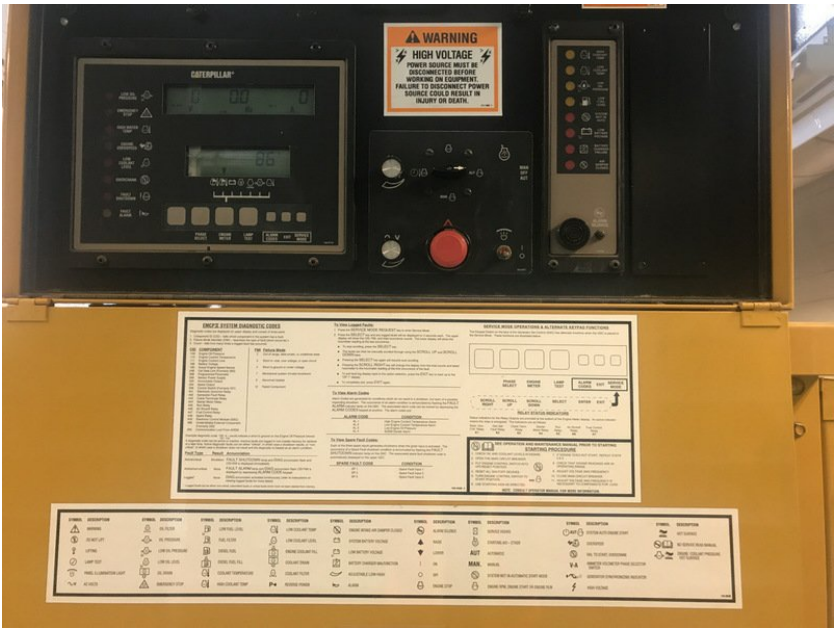




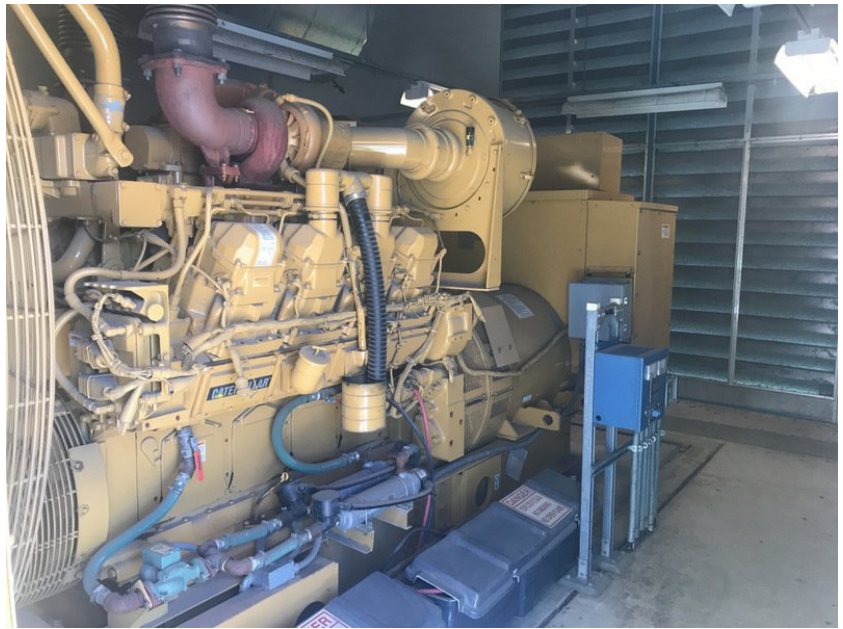














Electrical Motor Observations	No Corrosion Noted
Electrical Motor Condition Score	1 - Excellent
Electrical Motor Performance Score	1 - Component Functioning as Intended

Automatic Transfer Switch

Electrical Asset Name	Automatic Transfer Switch
Electrical Asset Description	ATS, 1600 A
Electrical Asset Type	Switch
Year Installed	2000

Electrical Equipment

Electrical Equipment Observations

Age	20 Years
Manufacturer	ASCO
Model	ASCO 7 Series
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	NA
Electrical Equipment Photos	



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Appendix C: Main Lift Station – Instrumentation

Main Pump Station-Instr

Created	2020-02-08 00:28:37 UTC by Erik Zalkin
Updated	2020-02-19 17:40:26 UTC by Sundara Palani
Location	37.447504, -121.922779
Asset Location	Main Pump Station-Instr

MAS Enclosure and Pump Motor Monitor Panel, MAS 711

Asset Name	MAS Enclosure and Pump Motor Monitor Panel
Asset Description	MAS
Asset ID	MAS 711
Asset Type	Panel
Year Installed	2008

Instrumentation Photos





Instrumentation Observation Comments	No Corrosion Noted
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Condition

Instrumentation Condition Score	1 - Good – No defects observed.
---------------------------------	---------------------------------

Performance

Instrumentation Performance Score	1 - Good – Asset functioning as intended.
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Level Switch, LSHH-201

Asset Name	Level Switch
Asset Description	Level High High
Asset ID	LSHH-201
Asset Type	Level Switch
Year Installed	2008
Instrumentation Observation Comments	In Good Condition

Condition

Instrumentation Condition Score	1 - Good – No defects observed.
---------------------------------	---------------------------------

Performance

Instrumentation Performance Score	1 - Good – Asset functioning as intended.
-----------------------------------	---

Level Switch, LE-202

Asset Name	Level Switch
Asset Description	Ultrasonic level
Asset ID	LE-202

Asset Type	Level Switch
Year Installed	2008
Instrumentation Observation Comments	In Good Condition

Condition

Instrumentation Condition Score	1 - Good – No defects observed.
---------------------------------	---------------------------------

Performance

Instrumentation Performance Score	1 - Good – Asset functioning as intended.
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Level Switch, LE-203

Asset Name	Level Switch
Asset Description	Ultrasonic level
Asset ID	LE-203
Asset Type	Level Switch
Year Installed	2008

Generator and Fuel System Control Panel

Asset Name	Generator and Fuel System Control Panel
Asset Description	Local Control Panel
Asset Type	Panel
Year Installed	2000

Instrumentation Photos





Instrumentation Observation Comments	No Corrosion Noted
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Condition

Instrumentation Condition Score	1 - Good – No defects observed.
---------------------------------	---------------------------------

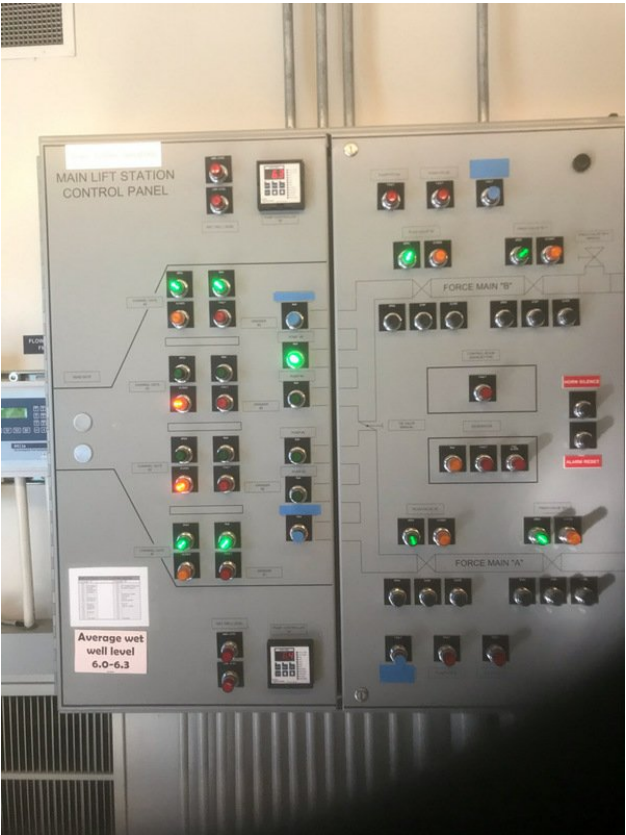
Performance

Instrumentation Performance Score	1 - Good – Asset functioning as intended.
-----------------------------------	---

Main Lift Station Control Panel

Asset Name	Main Lift Station Control Panel
Asset Description	Local Control Panel
Asset Type	Panel
Year Installed	2008

Instrumentation Photos



Condition

Instrumentation Condition Score	1 - Good – No defects observed.
---------------------------------	---------------------------------

Performance

Instrumentation Performance Score	1 - Good – Asset functioning as intended.
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Appendix D: Main Lift Station – Civil

Main Pump Station-Civil

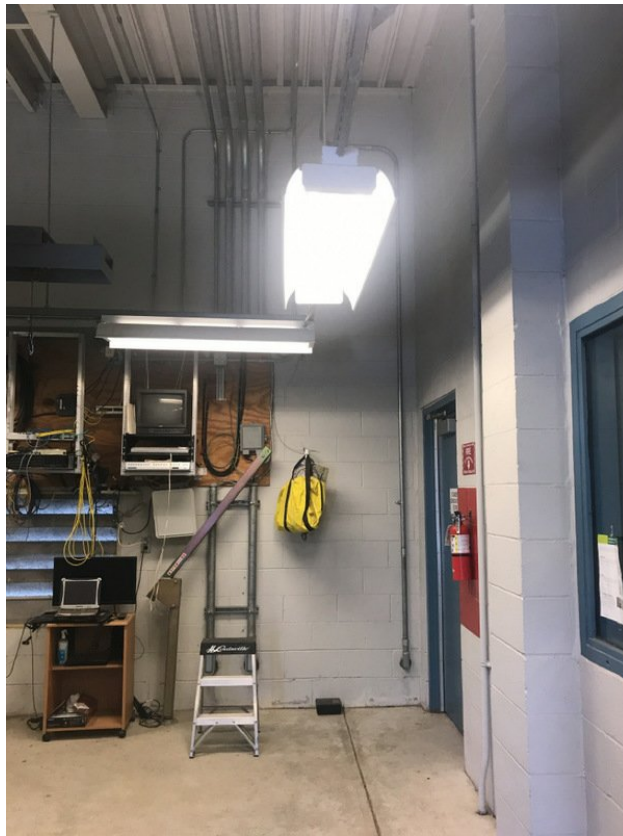
Created	2020-02-07 16:28:25 PST by Erik Zalkin
Updated	2020-02-11 11:12:14 PST by Hamed Hakimelahi
Location	37.447588, -121.922757
Asset Location	Main Pump Station-Civil

Electrical building

Grounds/Site Improvements

Asset Name	Electrical building
Civil Photos	













Control building

Grounds/Site Improvements

Asset Name

Control building

Civil Photos





Condition

Civil Condition Score 1 - Good - No defects observed.

Performance

Civil Performance Score 1 - Good - Asset functioning as intended.

Site civil

Grounds/Site Improvements

Asset Name Site civil

Civil Field Assessment

Road/Driveway

Road/Driveway Type	Asphalt Pavement
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Road/Driveway Observations	Fine
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Grading

Erosion	No
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Landscaping	Yes
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Drainage

Drainage Type	Storm Drains
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Drainage Observations	All fine
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Civil Photos





















Condition

Civil Condition Score	1 - Good – No defects observed.
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Performance

Civil Performance Score	1 - Good – Asset functioning as intended.
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Appendix E: Main Lift Station – Structural

Main Pump Station-Struct

Created	2020-02-08 00:29:05 UTC by Erik Zalkin
Updated	2020-03-12 16:27:27 UTC by Dwight Evans
Location	37.447546, -121.9228
Asset Location	Main Pump Station-Struct

Pinch Valve Vault 1

Structural Equipment

Asset Name	Pinch Valve Vault 1
Asset Description	Pinch Valve Vault (1 of 3)
Type of Structure	Vault
Year Installed	2002
Material	Concrete
Structural Field Assessment	Corrosion of metal walls

Structural Photos





Cold joint



Exposed rebar



Corroded lid

Structural Observation Comments

None

Condition

Structural Condition Score	1 - Good – No defects observed.
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Performance

Structural Performance Score	1 - Good – Asset functioning as intended.
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Pinch Valve Vault 2

Structural Equipment

Asset Name	Pinch Valve Vault 2
Asset Description	Pinch Valve Vault (2 of 3)
Type of Structure	Vault
Year Installed	2002
Material	Concrete

Structural Photos





Exposed aggregates

Condition

Structural Condition Score	1 - Good – No defects observed.
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Performance

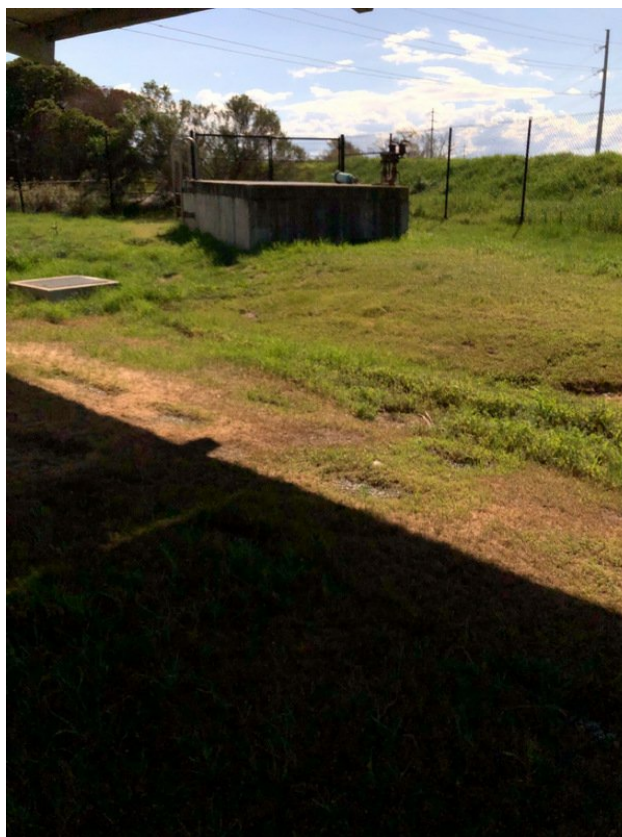
Structural Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Pinch Valve Vault 3

Structural Equipment

Asset Name	Pinch Valve Vault 3
Asset Description	Pinch Valve Vault (3 of 3)
Type of Structure	Vault
Year Installed	2002
Material	Concrete

Structural Photos





Exposed aggregates, sim to 2



Corroded metal attachment



Spalling concrete



Structural Observation Comments

None

Condition

Structural Condition Score	1 - Good – No defects observed.
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Performance

Structural Performance Score	1 - Good – Asset functioning as intended.
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Mag Meter Vault

Structural Equipment

Asset Name	Mag Meter Vault
Asset Description	24" Magnetic Meter Vault
Type of Structure	Vault
Year Installed	2002
Material	Concrete
Structural Field Assessment	Corrosion of metal walls
Structural Photos	





Corroded metal



Corroded metal



Does not close All the way due to expansion from corrosion

Structural Observation Comments

Corroded metal at hatch opening

Condition

Structural Condition Score

2 - Fair – Only minor defects observed.

Performance

Structural Performance Score

1 - Good – Asset functioning as intended.

Venturi Meter Vault

Structural Equipment

Asset Name	Venturi Meter Vault
Asset Description	36" Venturi Meter Vault
Type of Structure	Vault
Year Installed	1975
Material	Concrete
Structural Field Assessment	Cracks in walls
Structural Photos	





Structural Observation Comments

No cracking inside, surface cracks on outside, coating still present on inside

Condition

Structural Condition Score

1 - Good – No defects observed.

Performance

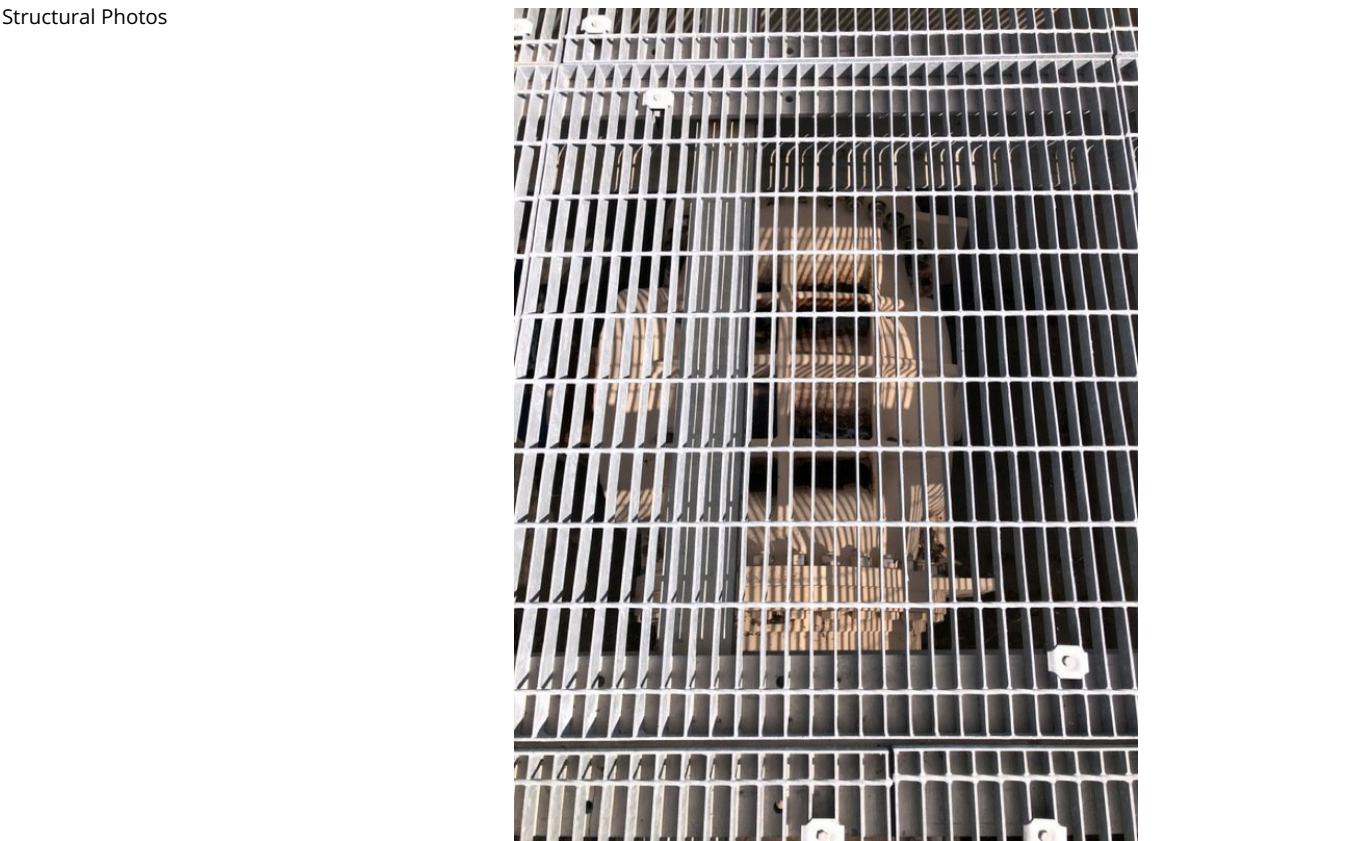
Structural Performance Score

1 - Good – Asset functioning as intended.

Butterfly Valve Vault

Structural Equipment

Asset Name	Butterfly Valve Vault
Asset Description	36" Butterfly Valve Vault
Type of Structure	Vault
Year Installed	1997
Material	Concrete





No visible cracks on inside



Structural Observation Comments

No visible cracks besides on curb outside

Condition

Structural Condition Score 1 - Good – No defects observed.

Performance

Structural Performance Score 1 - Good – Asset functioning as intended.

Electrical/Generator Building-Structural

Structural Equipment

Asset Name Electrical/Generator Building-Structural

Type of Structure Building

Year Installed 2000

Material Masonry

Structural Field Assessment Cracks in walls, Moisture issues

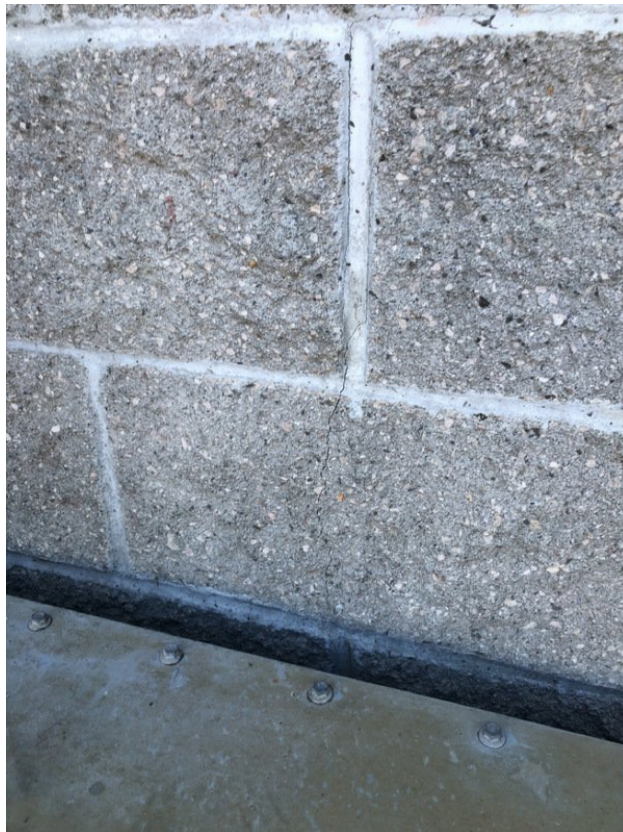
Structural Photos



Outside, front entrance



Outside, left of entrance



Cracks on left side of building, next to equipment cabinet



Back side



Cracks, back side



Right side of building



Cracks inside, right side of building



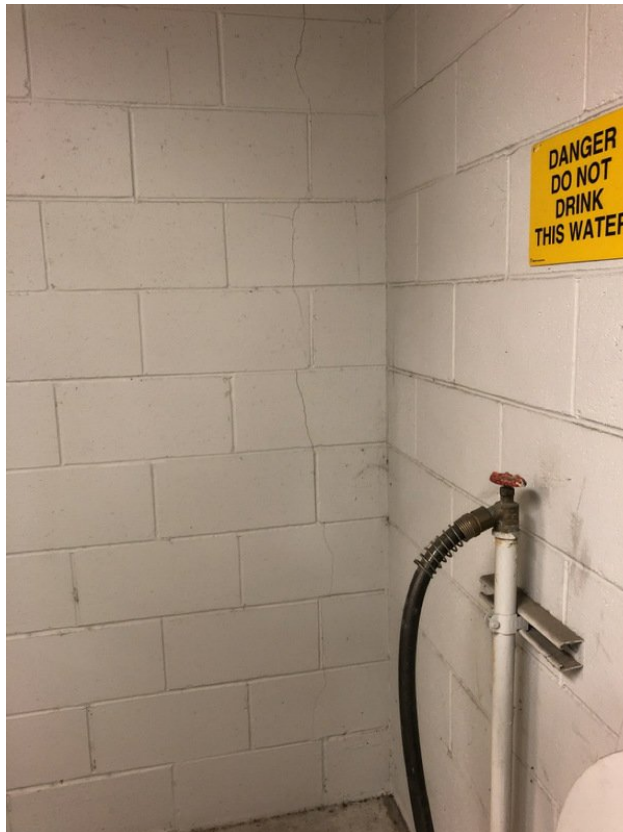
Moisture inside, right side of building



TYP wall to roof connection



TYP wall to roof connection



Vertical crack in corner, crack starts from bottom and goes to the top



Electrical equipment supposedly anchored, though not visible outside





Roof beams

Structural Observation Comments

Some cracks inside and outside, cosmetic cracks

Condition

Structural Condition Score

1 - Good – No defects observed.

Performance

Structural Performance Score

1 - Good – Asset functioning as intended.

Fuel Tank (bulk)

Structural Equipment

Asset Name

Fuel Tank (bulk)

Asset Description

2,000-gal UL-2085 above ground vault tank

Type of Structure

Tank

Year Installed

2008

Material

Metal

Structural Photos



Stainless steel anchors



Not flexible



Pipe continues inside building, underneath Grating/cover plate



Connects to day tank, flexible coupling here

Condition

Structural Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Structural Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Fuel Tank (day)

Structural Equipment

Asset Name	Fuel Tank (day)
Type of Structure	Tank
Year Installed	2000
Material	Metal



4 anchors



Piping on one side, piping attached to wall, flexible connection for 2 lines only (2 gray pipes coming out of slab), 4 red shutoff valves



No flexible coupling here

Structural Observation Comments

None

Condition

Structural Condition Score

1 - Good – No defects observed.

Performance

Structural Performance Score

1 - Good – Asset functioning as intended.

Control Building**Structural Equipment**

Asset Name

Control Building

Type of Structure

Building

Year Installed

2008

Material

Masonry

Structural Field Assessment

Cracks in walls

Structural Photos



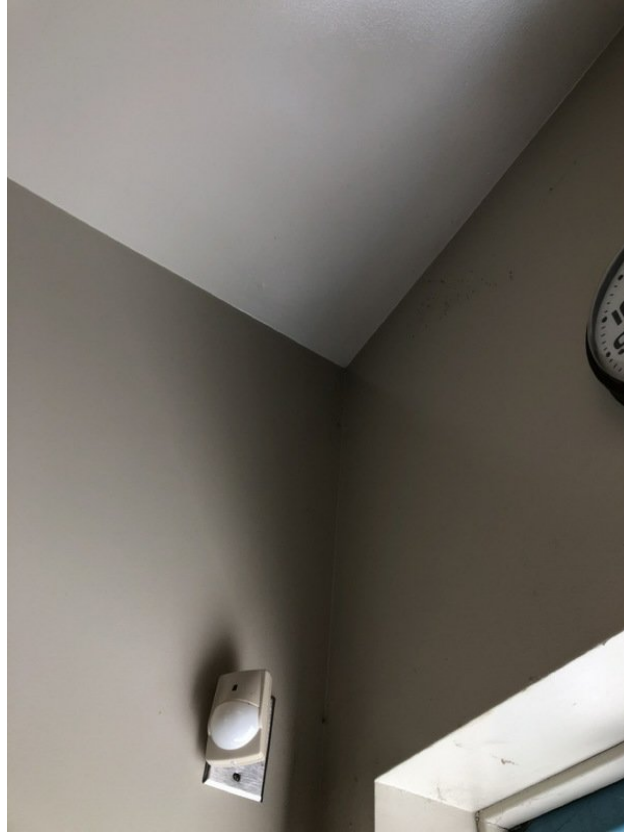
Front



Connection to roof, from outside, vertical blocking different than what is shown on drawing



Flexible coupling



Concealed finished ceiling, have to peep thru hatch to see roof to wall connection from inside

Structural Observation Comments

None

Condition

Structural Condition Score

1 - Good – No defects observed.

Performance

Structural Performance Score

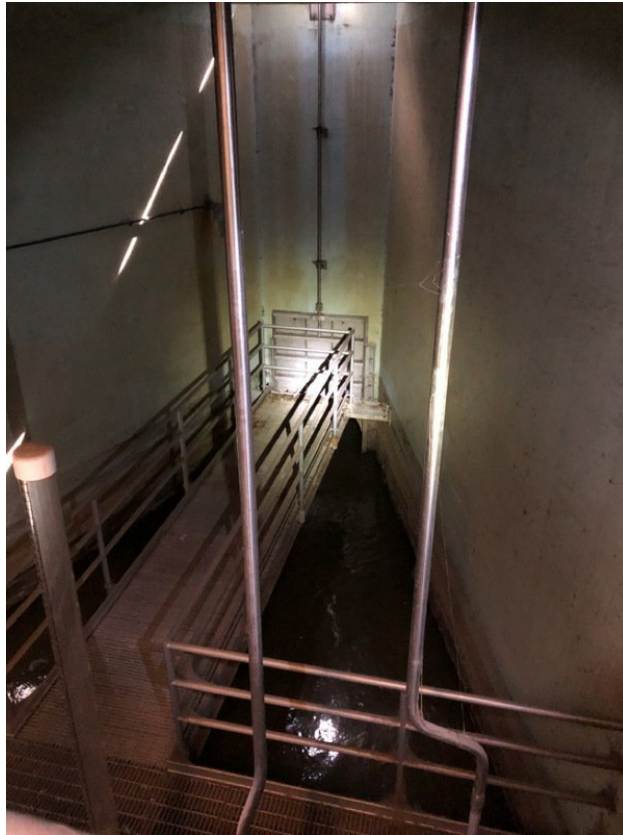
1 - Good – Asset functioning as intended.

Grit Chamber/Inflow Structure

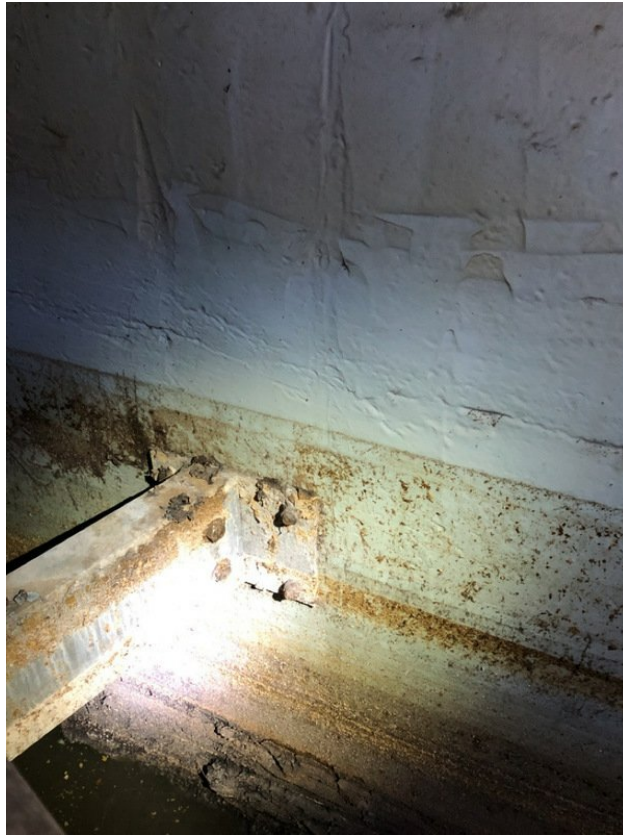
Structural Equipment

Asset Name	Grit Chamber/Inflow Structure
Type of Structure	Tank
Year Installed	2008
Material	Concrete

Structural Photos



Eroding of coating and concrete, color change at bottom



Dirt on steel not corrosion



Condition

Structural Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Structural Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Wet Well

Structural Equipment

Asset Name	Wet Well
Type of Structure	Tank
Year Installed	2008
Material	Concrete
Structural Field Assessment	Paint issues
Structural Photos	



Building on top of wet well, entrance to wet well



Stair knee brace connection









Penetration on opposite side of grit chamber



Compromised coating

Structural Observation Comments

Coating appears to be deteriorating towards bottom, tanks were in operation, no inspection of walls and slab below liquid line

Condition

Structural Condition Score

1 - Good – No defects observed.

Performance

Structural Performance Score

1 - Good – Asset functioning as intended.

Garage

Structural Equipment

Asset Name

Garage

Type of Structure

Building

Year Installed

2008

Structural Photos



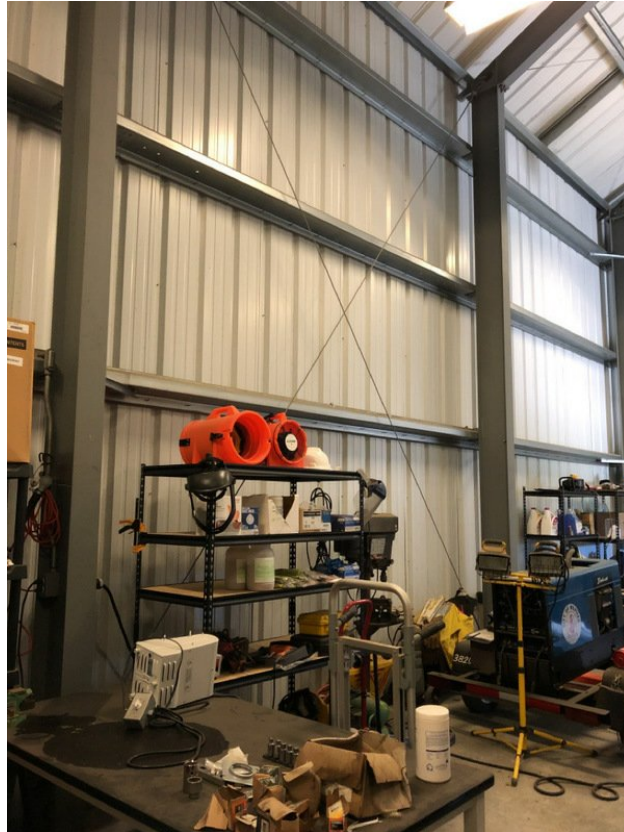
Outside, PEMB



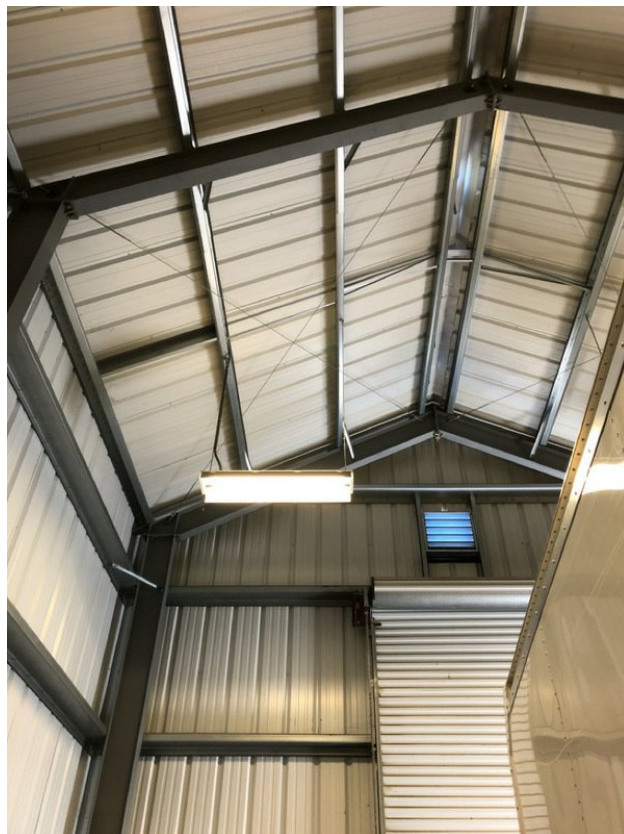
Cracks in slab, inside view, when it rains, water propagation follows cracks (water may have come up through cracks)



TYP wind girts



Tension brace, middle bay only



Tension brace in roof, end bay only, 3 bays total



Structural Observation Comments

Water accumulation inside when it's raining, water seeps thru slab

Condition

Structural Condition Score

1 - Good – No defects observed.

Performance

Structural Performance Score

1 - Good – Asset functioning as intended.

Appendix F: Venus Way Lift Station – Mechanical

Venus Way-Mech

Created	2020-02-07 16:27:36 PST by Erik Zalkin
Updated	2020-02-11 12:30:18 PST by Hamed Hakimelahi
Location	37.413692, -121.909061
Asset Location	Venus Way-Mech

Pump #1**Equipment Data**

Mechanical Asset Name	Pump #1
Mechanical Asset Description	FLYGT CP3102-441, 5HP 3ph 230V Submersible Pump
Asset Type	Pump
Year Installed	2008
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Pump #2**Equipment Data**

Mechanical Asset Name	Pump #2
Mechanical Asset Description	FLYGT CP3102-441, 5HP 3ph 230V Submersible Pump
Asset Type	Pump
Year Installed	2008
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Pump Guide Rails**Equipment Data**

Mechanical Asset Name	Pump Guide Rails
Mechanical Asset Description	Reinstalled in 2008
Year Installed	2008
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

8" Gate Valve, Pump 1 and 2

Equipment Data

Mechanical Asset Name	8" Gate Valve, Pump 1 and 2
Mechanical Asset Description	8" Gate Valve, Pump 1 and 2
Asset Type	Valve
Year Installed	2008
Mechanical Equipment Photos	



Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

8" Gate Valve, Pump 2

Equipment Data

Mechanical Asset Name	8" Gate Valve, Pump 2
Mechanical Asset Description	8" Gate Valve, Pump 2
Asset Type	Valve
Year Installed	2008

Mechanical Equipment Photos



Mechanical Observation Comments

None

Condition

Mechanical Condition Score

1 - Good – No defects observed.

Performance

Mechanical Performance Score

1 - Good – Asset functioning as intended.

8" Gate Valve, Pump 1 and 2**Equipment Data**

Mechanical Asset Name

8" Gate Valve, Pump 1 and 2

Mechanical Asset Description

8" Gate Valve, Pump 1 and 2

Asset Type

Valve

Year Installed

2008

Mechanical Equipment Photos



Mechanical Observation Comments

None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

8" Check Valve, Pump 1

Equipment Data

Mechanical Asset Name	8" Check Valve, Pump 1
Mechanical Asset Description	8" Check Valve, Pump 1
Asset Type	Valve
Year Installed	2008

Mechanical Equipment Photos



Mechanical Observation Comments

None

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

8" Check Valve, Pump 2

Equipment Data

Mechanical Asset Name	8" Check Valve, Pump 2
-----------------------	------------------------

Mechanical Asset Description	8" Check Valve, Pump 2
------------------------------	------------------------

Asset Type	Valve
------------	-------

Year Installed	2008
----------------	------

Mechanical Equipment Photos	
-----------------------------	--



Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

4" Flap Gate

Equipment Data

Mechanical Asset Name	4" Flap Gate
-----------------------	--------------

Mechanical Asset Description	4" Flap Gate in wet well
------------------------------	--------------------------

Asset Type	Valve
------------	-------

Year Installed	2008
Mechanical Field Assessment	Could bot find
Mechanical Observation Comments	None

Condition

Mechanical Condition Score	NA - Not enough information available.
----------------------------	--

Performance

Mechanical Performance Score	NA - Not enough information available.
------------------------------	--

2" Combo Air/vacuum valve

Equipment Data

Mechanical Asset Name	2" Combo Air/vacuum valve
Mechanical Asset Description	2" Combo Air/vacuum valve
Asset Type	Valve
Year Installed	2008
Mechanical Equipment Photos	





Mechanical Observation Comments	None
---------------------------------	------

Condition

Mechanical Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Mechanical Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

Appendix G: Venus Way Lift Station – Electrical

Venus Way-Elec

Created	2020-02-08 00:26:11 UTC by Erik Zalkin
Updated	2020-02-22 00:00:26 UTC by Sundara Palani
Location	37.413686, -121.909069
Asset Location	Venus Way-Elec

Utility Transformer

Electrical Asset Name	Utility Transformer
Electrical Asset Description	240/120 V, 3-Ph, 3 W
Asset ID	XFMR T-1
Electrical Asset Type	Transformer
Year Installed	2000

Electrical Equipment

Electrical Equipment Observations

Age	20 Years
Manufacturer	PG&E Owned
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	NA
Number of Available Spares and Spaces	NA

Electrical Equipment Photos



Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent

Electrical Equipment Performance Score

1 - Component Functioning as Intended

Service Pedestal

Electrical Asset Name	Service Pedestal
Electrical Asset Description	Service Disconnect and Metering
Year Installed	2008

Pump Control Panel

Electrical Asset Name	Pump Control Panel
Electrical Asset Description	Starter panel for Pumps #1 and 2 (Each 5 HP)
Electrical Asset Type	Panel
Year Installed	2008

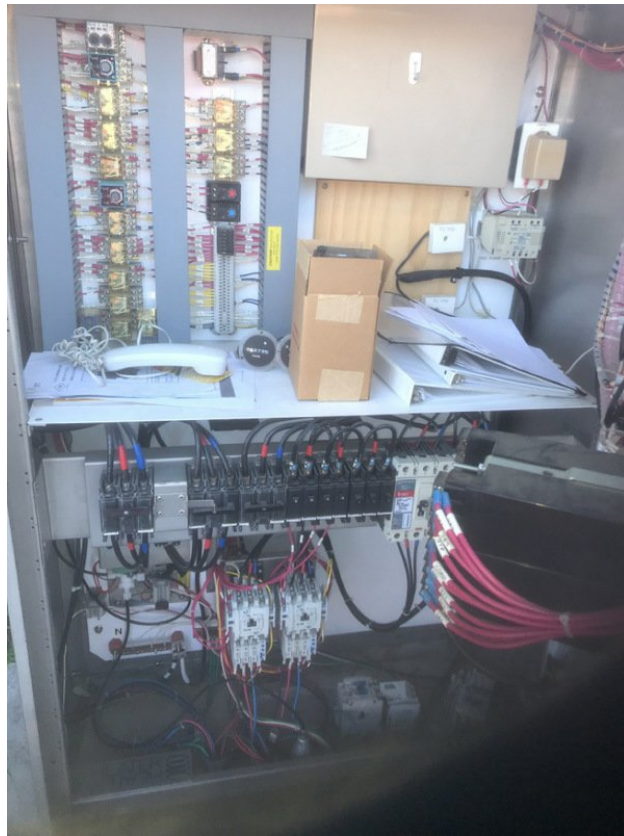
Electrical Equipment**Electrical Equipment Observations**

Age	12 Years
Electrical Enclosure Condition	Good Condition
Electrical Heat Release	Normal
Electrical Arcflash Labels	Missing
Number of Available Spares and Spaces	NA
Electrical Equipment Photos	









Electrical Equipment Observations	No Corrosion Noted
Electrical Equipment Condition Score	1 - Excellent
Electrical Equipment Performance Score	1 - Component Functioning as Intended

Appendix H: Venus Way Lift Station – Instrumentation

Venus Way-Instr

Created	2020-02-07 16:27:21 PST by Erik Zalkin
Updated	2020-02-14 15:32:15 PST by Erik Zalkin
Location	37.413684, -121.909056
Asset Location	Venus Way-Instr

Level Instrument, LSHH-01

Asset Name	Level Instrument
Asset Description	Wet Well Level Sensor
Asset ID	LSHH-01
Asset Type	Level Switch
Year Installed	2008
Instrumentation Observation Comments	Did not obtain photo; see wet well photos (mechanical)

Condition

Instrumentation Condition Score	1 - Good – No defects observed.
---------------------------------	---------------------------------

Performance

Instrumentation Performance Score	1 - Good – Asset functioning as intended.
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Appendix I: Venus Way Lift Station – Civil

Venus Way-Civil

Created	2020-02-07 16:26:57 PST by Erik Zalkin
Updated	2020-02-11 12:30:21 PST by Hamed Hakimelahi
Location	37.413677, -121.909062
Asset Location	Venus Way-Civil

Site civil

Grounds/Site Improvements

Asset Name	Site civil
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Civil Photos









Condition

Civil Condition Score

1 - Good - No defects observed.

Performance

Civil Performance Score	1 - Good – Asset functioning as intended.
-------------------------	---

Appendix J: Venus Way Lift Station – Structural

Venus Way-Struct

Created	2020-02-07 16:27:46 PST by Erik Zalkin
Updated	2020-03-12 14:47:14 PDT by Erik Zalkin
Location	37.413696, -121.909065
Asset Location	Venus Way-Struct

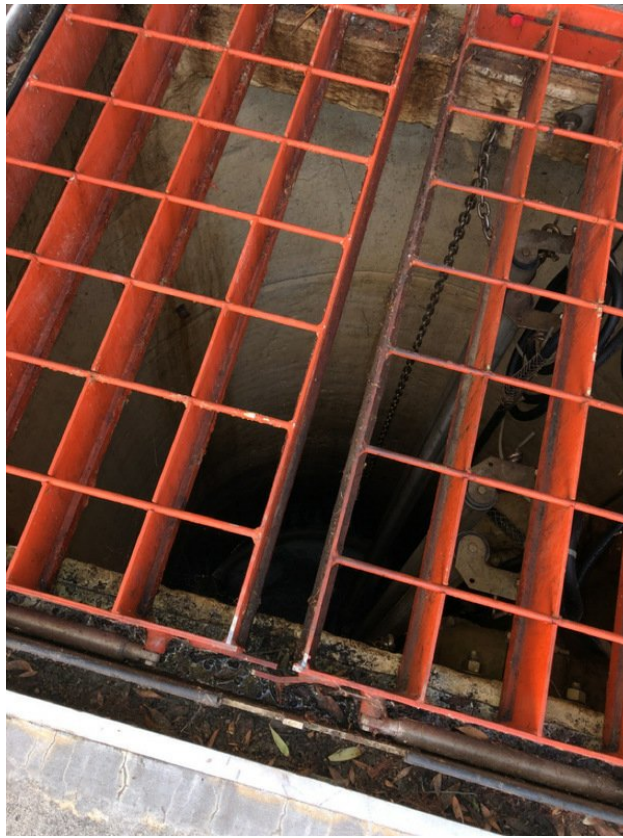
Wet Well

Structural Equipment

Asset Name	Wet Well
Asset Description	72" Diameter Reinforced Concrete Pipe
Type of Structure	Tank
Year Installed	1964
Material	Concrete

Structural Photos





Oxidation

Structural Observation Comments

None

Condition

Structural Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Structural Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

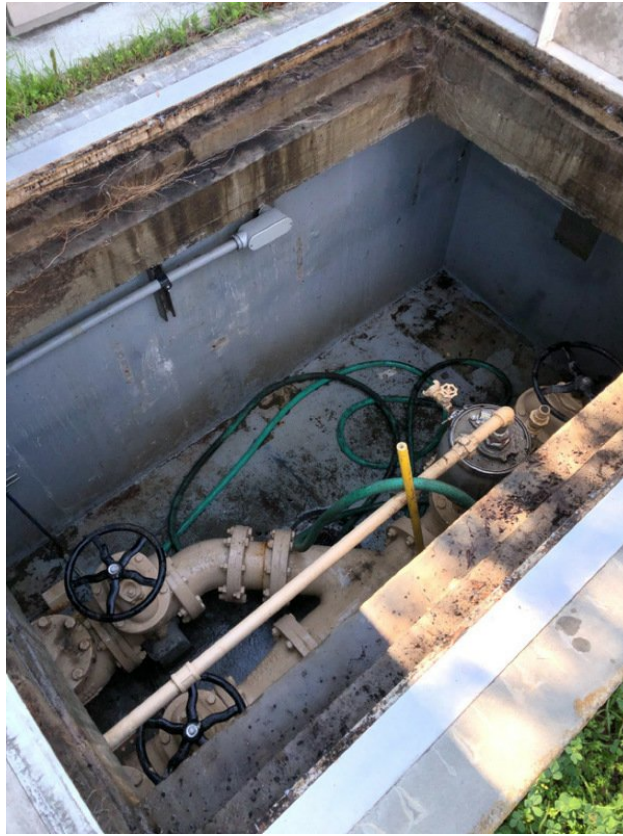
Valve Vault

Structural Equipment

Asset Name	Valve Vault
Type of Structure	Vault
Year Installed	1994
Material	Concrete

Structural Photos





Structural Observation Comments

None

Condition

Structural Condition Score

1 - Good – No defects observed.

Performance

Structural Performance Score

1 - Good – Asset functioning as intended.

Aluminum Hatch-Vault

Structural Equipment

Asset Name	Aluminum Hatch-Vault
Asset Description	Aluminum Hatch, slide-in
Type of Structure	Vault
Year Installed	2008

Structural Photos



Structural Observation Comments

None

Condition

Structural Condition Score

1 - Good – No defects observed.

Performance

Structural Performance Score

1 - Good – Asset functioning as intended.

Aluminum Hatch-Wet Well**Structural Equipment**

Asset Name	Aluminum Hatch-Wet Well
Asset Description	Aluminum Hatch w/ safety grate
Type of Structure	Vault
Year Installed	2008
Material	Metal

Structural Photos



Structural Observation Comments	None
---------------------------------	------

Condition

Structural Condition Score	1 - Good – No defects observed.
----------------------------	---------------------------------

Performance

Structural Performance Score	1 - Good – Asset functioning as intended.
------------------------------	---

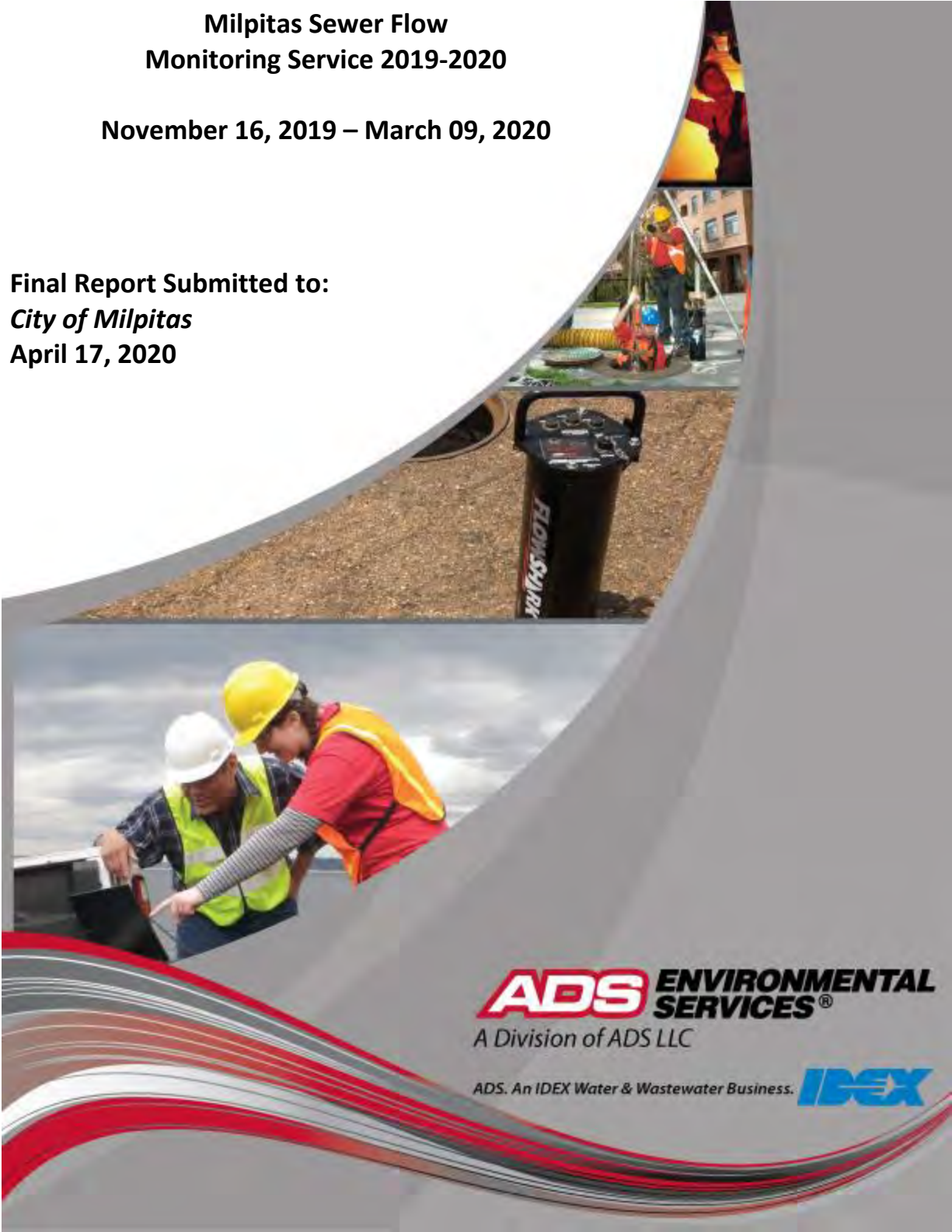
APPENDIX B
City of Milpitas
Sewer Master Plan Study
Milpitas Sewer Flow Monitoring Report 2019-2020

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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**



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 gauge 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

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_0041

Site Address /Location: S Abel St and Curtis Ave, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.418531°

Longitude:

-121.904896°

Pipe Size (H x W)

23.00"x23.50"

Pipe Shape

Circular

Manhole #

#0041

System Characteristics

Residential/Commercial

Access

Traffic

Drive

Medium



Installation Information

Installation Date:

Thursday, November 14, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

5:37:00 AM

Pipe Size (HxW)

23.00"x23.50"

Depth of Flow (Wet DOF) (in)

5.50"

Range (Air DOF) (in)

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.40'

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

7'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

1304



ADS Project Name: Milpitas.WWTFM.CA2019-2020

ADS Project Number: 22431.11.325

SCATTERGRAPH REPORT

MIL_0041

Flow Monitor

MIL_0041

Pipe Height
23.00 in

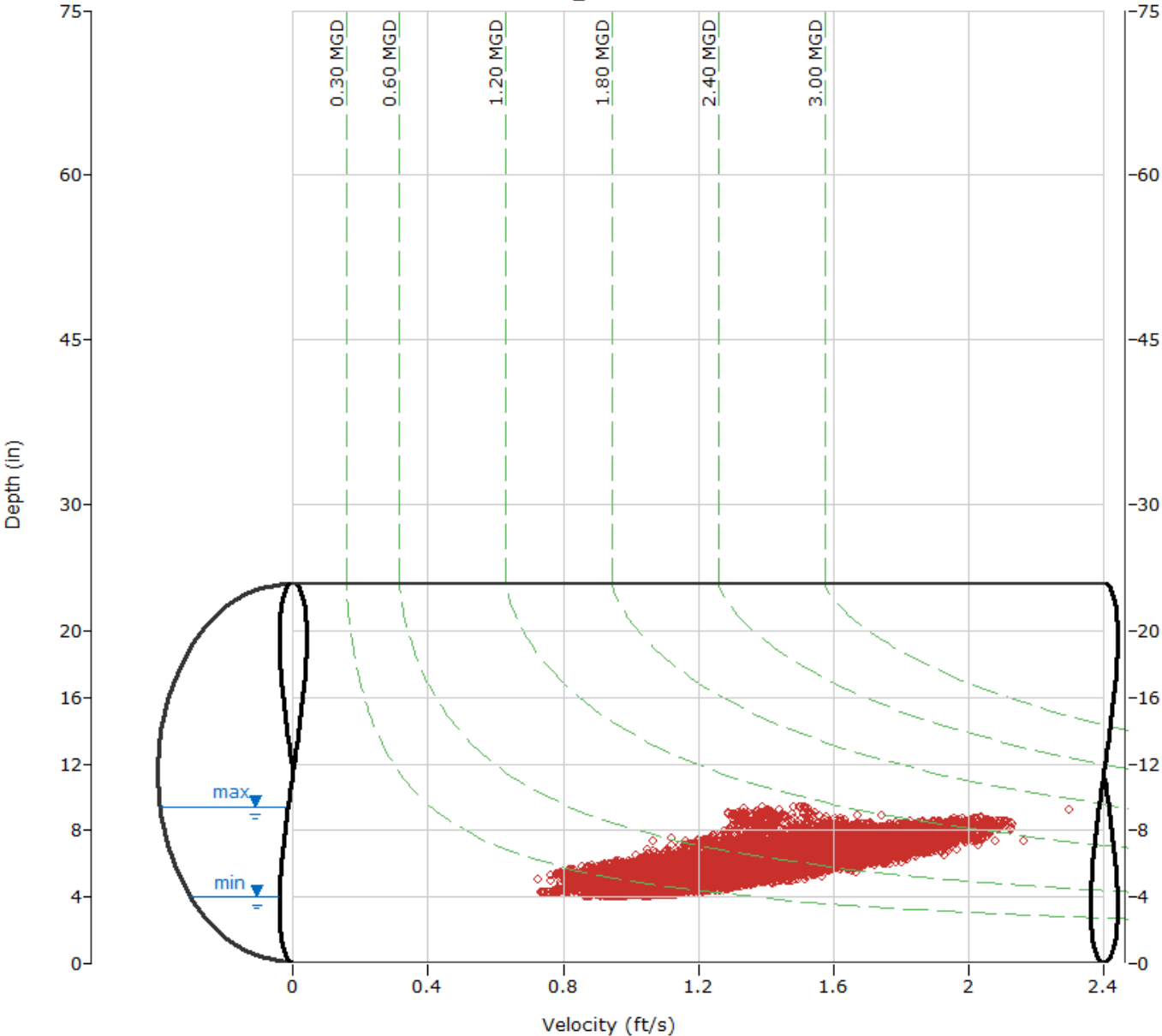
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

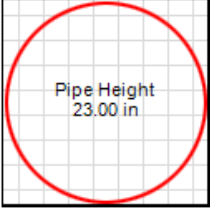


HYDROGRAPH REPORT

MIL_0041

Flow Monitor

MIL_0041



Pipe Height
23.00 in

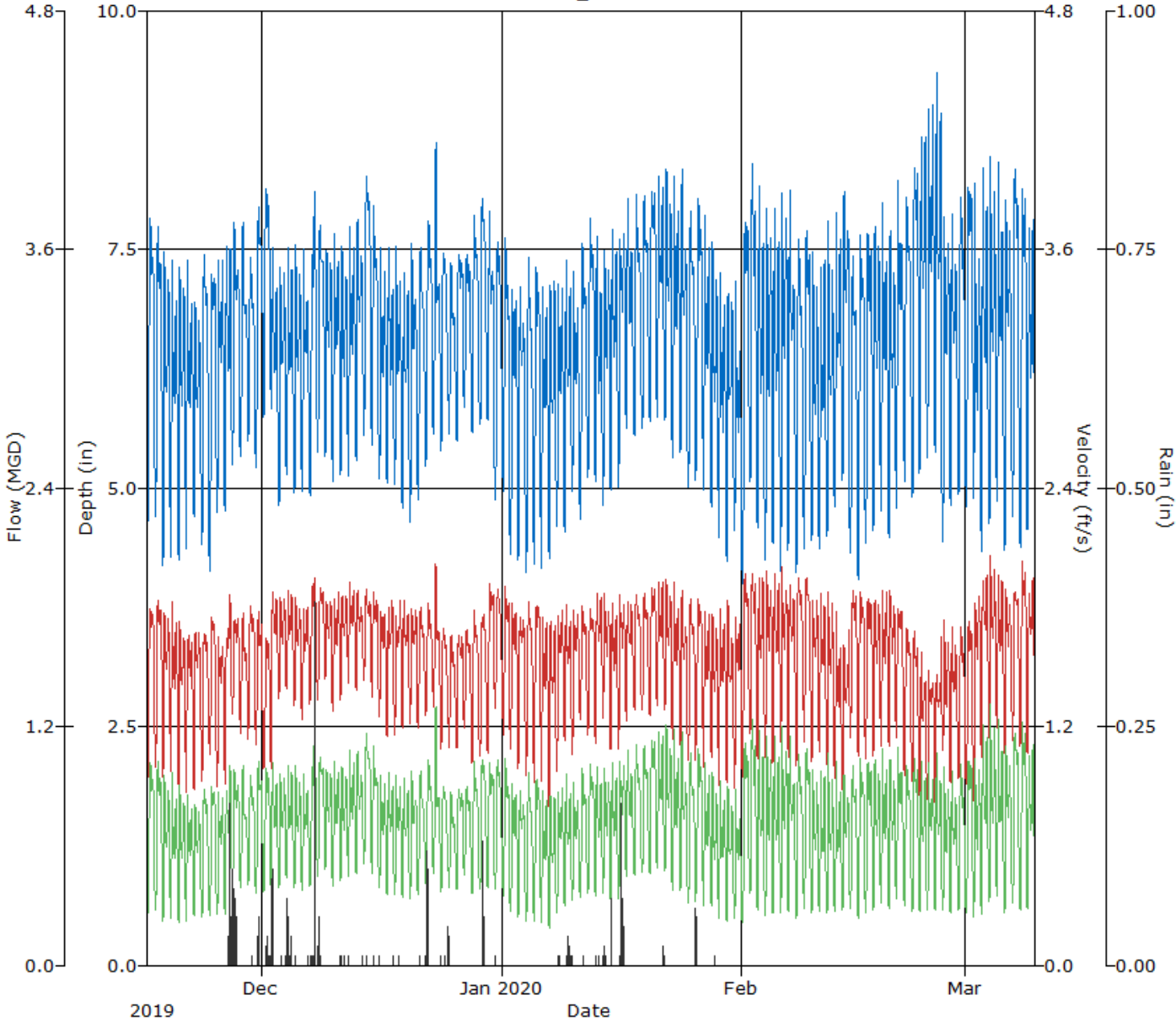
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain

ADS ENVIRONMENTAL SERVICES



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			

1307

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Item # 16.	
	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	

Item # 16.

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	

Item # 16.

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 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. Surge 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



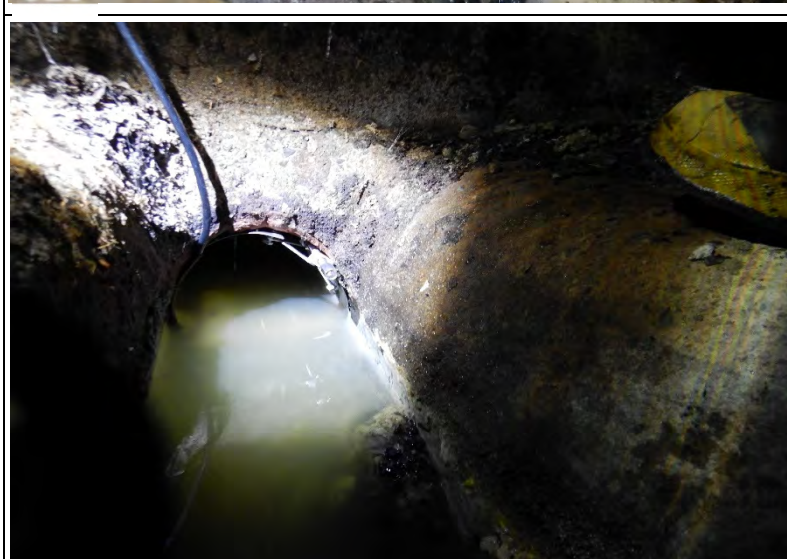
Site Name

Item # 16.

Flow Monitoring Site Report

MIL_0186

Site Address /Location:	N Milpitas Blvd and Sunnyhills Ct			Monitor Series	Location Type
Site Access Details:	Drive	Latitude:	37.454452°	TRITON+	Temporary
		Longitude:	-121.910707°	Pipe Size (H x W)	Pipe Shape
				8.0" x 8.0"	Circular



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:

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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

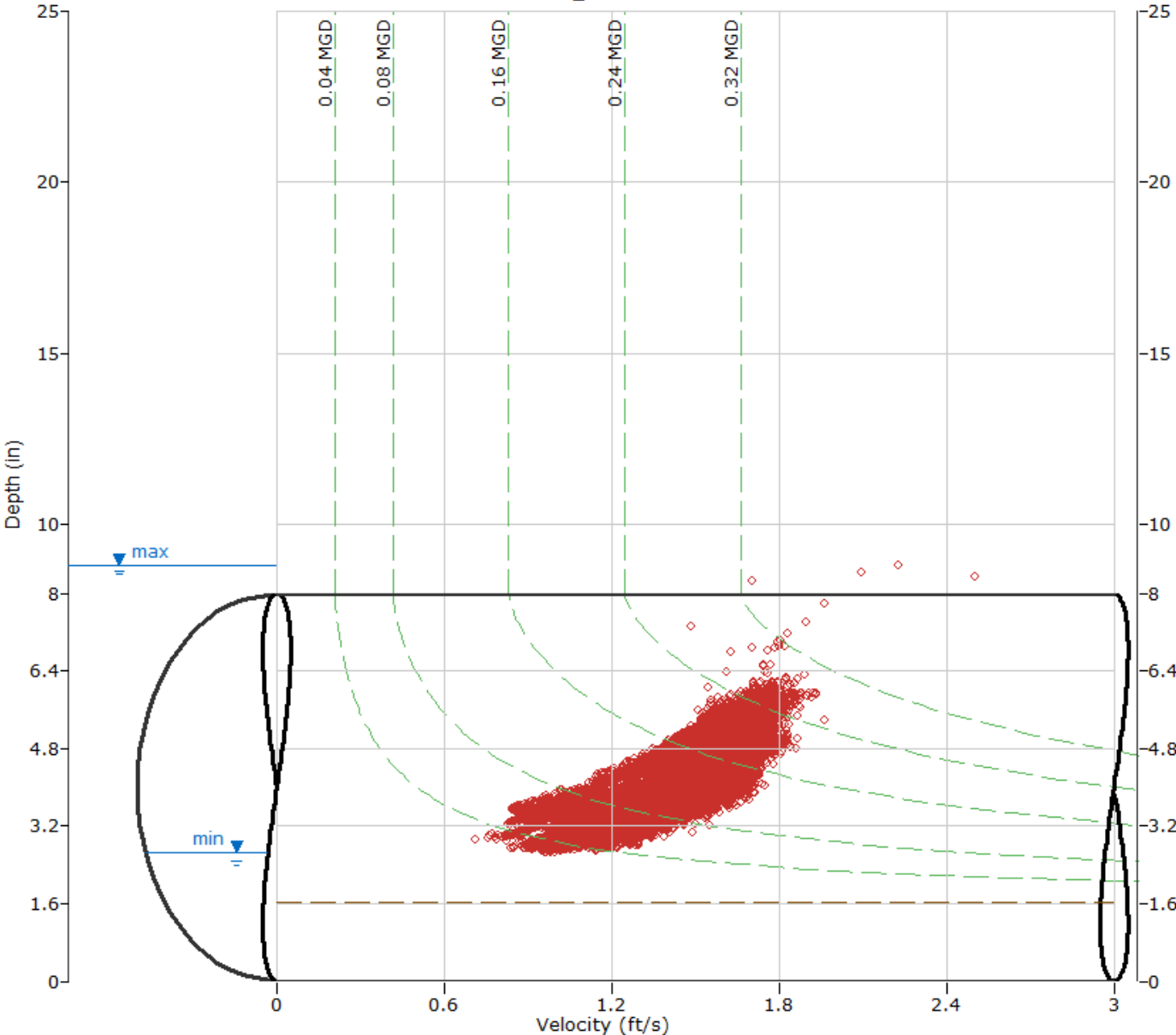
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

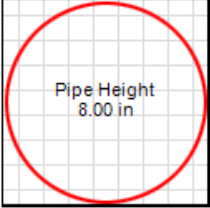


HYDROGRAPH REPORT

MIL_0186

Flow Monitor

MIL_0186



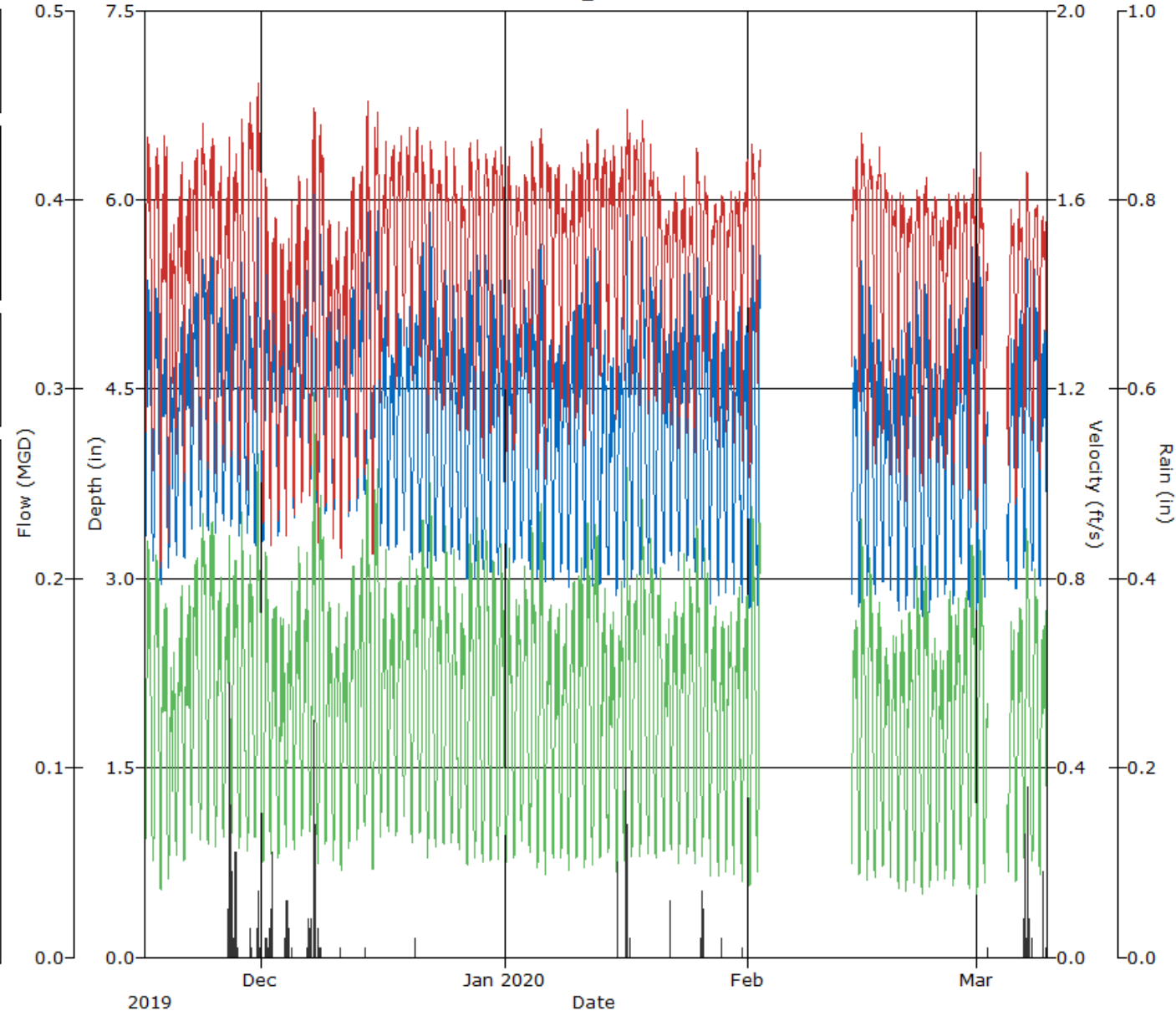
Pipe Height
8.00 in

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	0.05
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	
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	
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	0.44
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	
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	0.01
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	
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	
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	0.02
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	
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	
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	1.00
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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain	
	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	Item # 16.	
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		
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		
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		
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		
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		
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		
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		
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		

Item # 16.

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_0190

Site Address /Location:	N Abel St and Weller Ln			Monitor Series	Location Type
Site Access Details:	middle of N bound lanes	Latitude:	37.432482°	TRITON+	Temporary
		Longitude:	-121.909452°	Pipe Size (H x W)	Pipe Shape
				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:

1318

ADS Project Name:	Milpitas.WWTFM.CA19-20
ADS Project Number:	22431

SCATTERGRAPH REPORT

MIL_0190

Flow Monitor

MIL_0190

Pipe Height
18.00 in

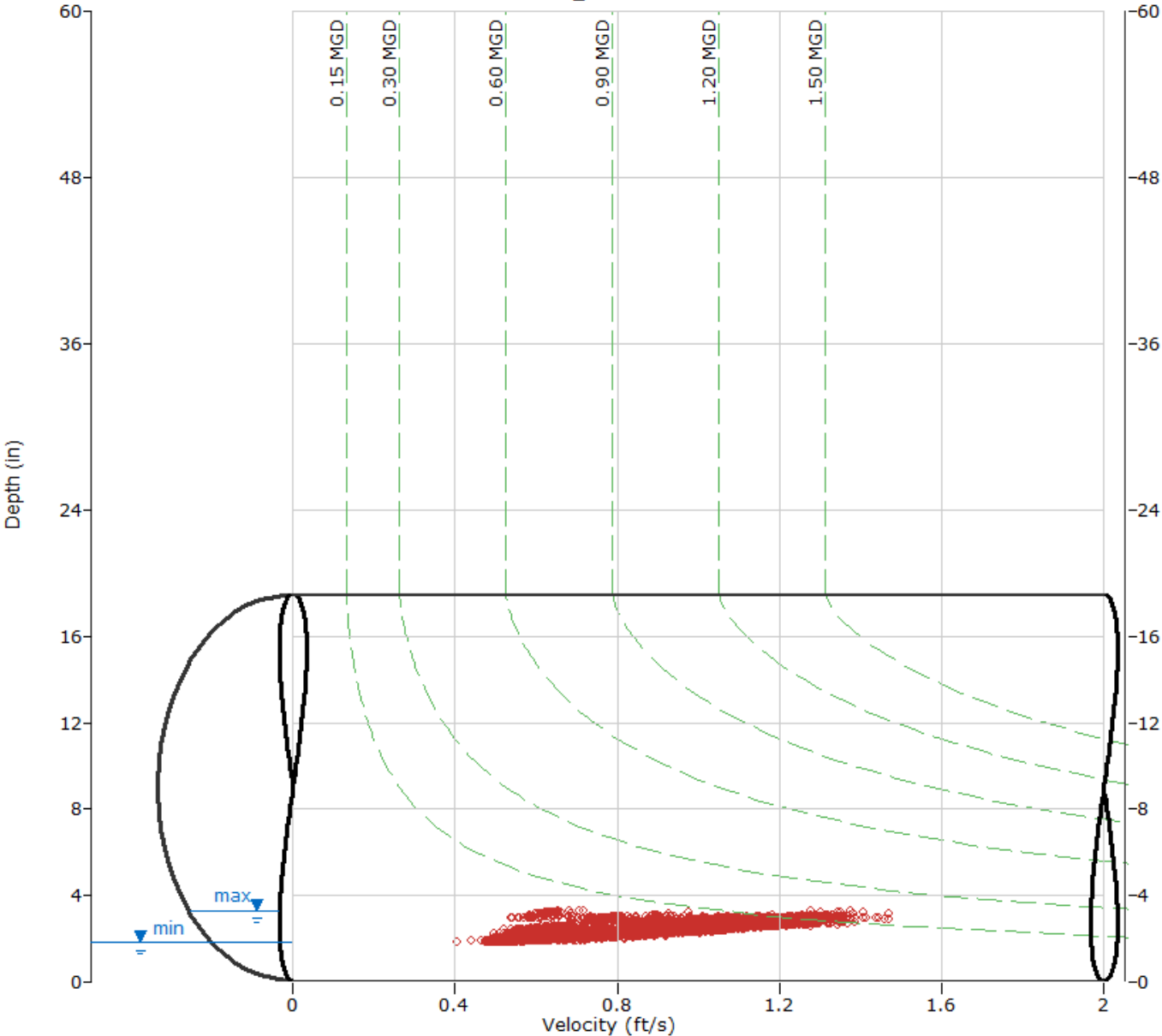
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

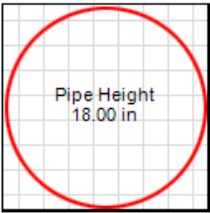


HYDROGRAPH REPORT

MIL_0190

Flow Monitor

MIL_0190



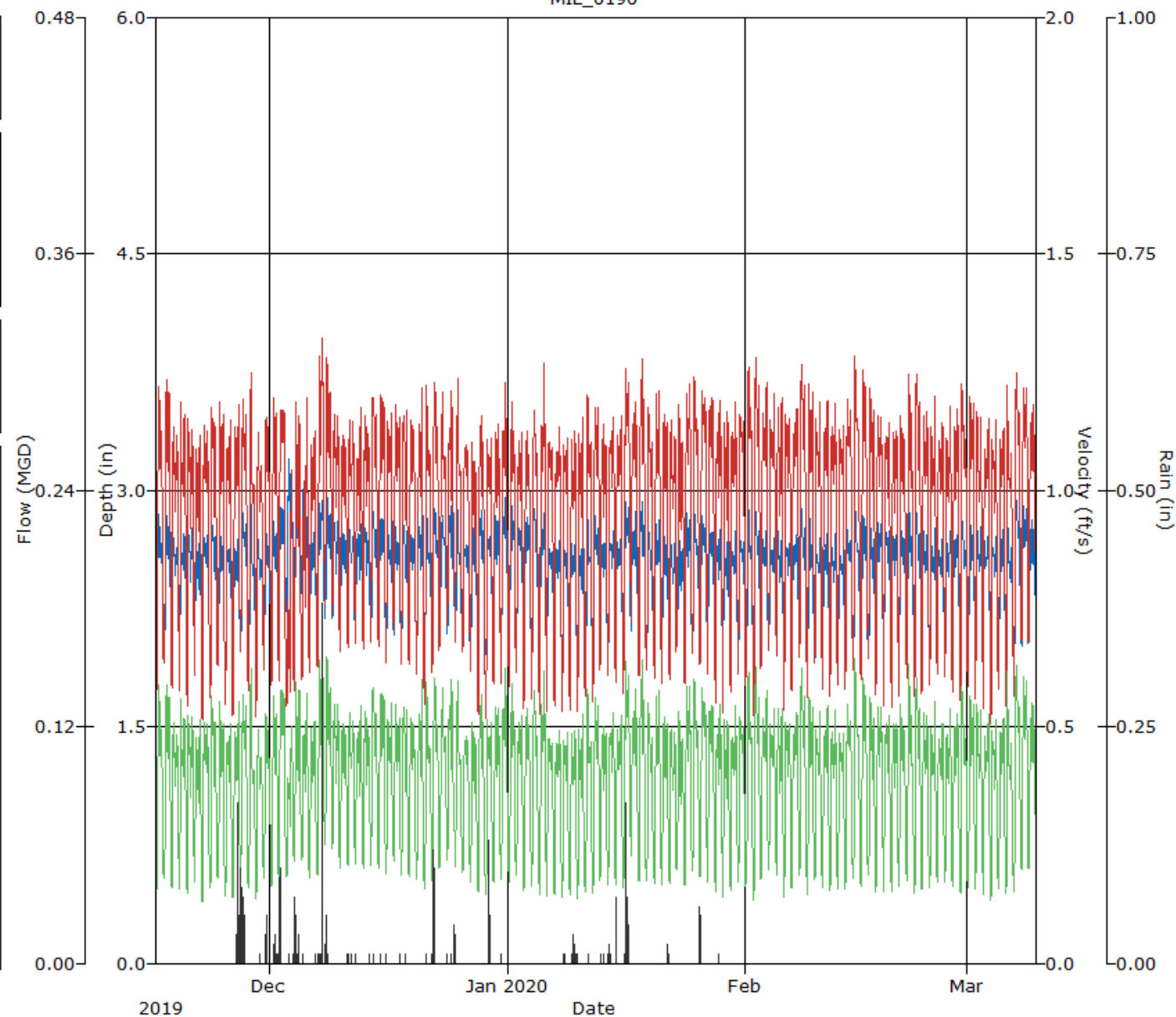
Pipe Height
18.00 in.

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	
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	
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	
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	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain	
	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		

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_0229

Site Address /Location: Bellew Dr and McCarthy Blvd

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: In right lane of road

Latitude:

37.420574°

Longitude:

-121.921605°

Pipe Size (H x W)

21.0" x 21.0"

Pipe Shape

Circular

Manhole #

229

System Characteristics

Residential/Commercial

Access

Traffic

Drive

Medium



Installation Information

Installation Date:

Tuesday, November 12, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

4:21:29 AM

Pipe Size (HxW)

21.0" x 21.0"

Depth of Flow (Wet DOF) (in)

2.25

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

0.25

Velocity Sensor Offset (in)

0"

Silt (in)

0.25"

Silt Type

Soft / Loose

Hydraulic Comments:

Shallow depth with slow velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

15'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1325

ADS Project Name: Milpitas.WWTFM.CA19-20

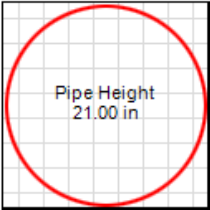
ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_0229

Flow Monitor

MIL_0229



Pipe Height
21.00 in

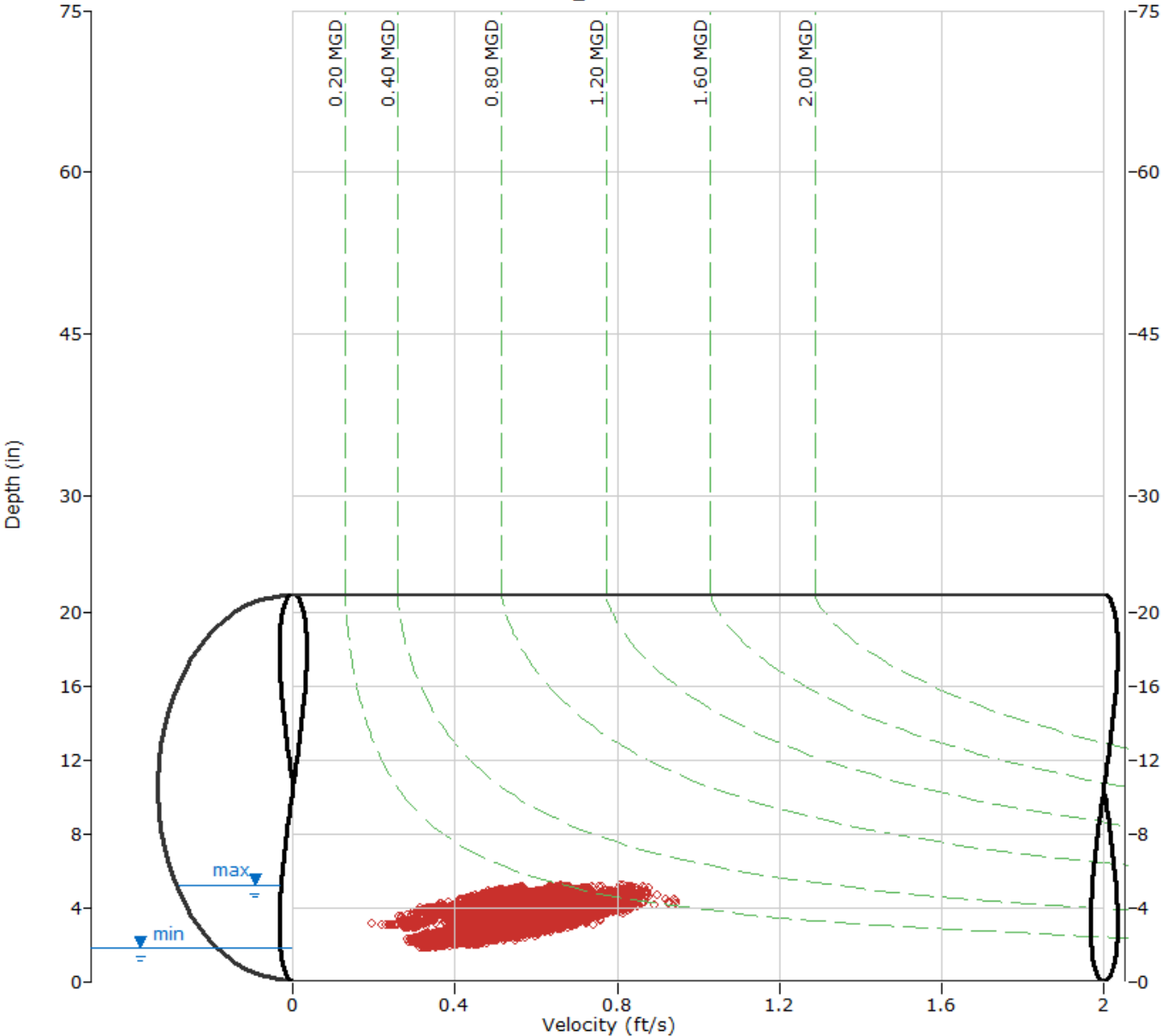
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

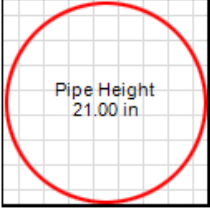
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_0229

Flow Monitor

MIL_0229



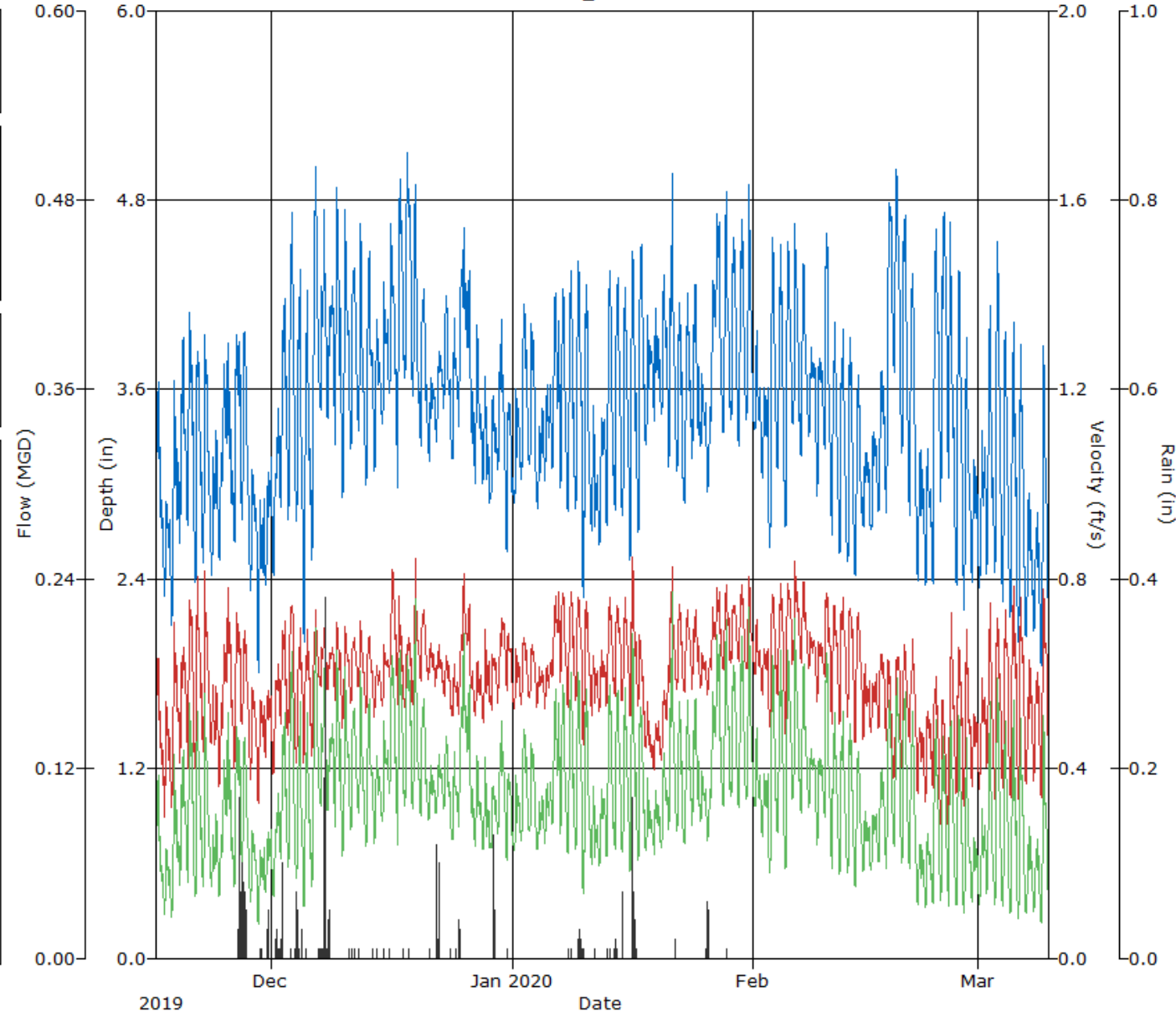
Pipe Height
21.00 in

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	
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	
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	
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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

MIL_0386

Site Address /Location: Milpitas Blvd and Los Coches St, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.430913°

Longitude:

-121.898992°

Pipe Size (H x W)

18.00"x18.00"

Pipe Shape

Circular

Manhole #

#0386

System Characteristics

Residential/Commercial

Access

Drive

Traffic

Medium



Installation Information

Installation Date:

Friday, November 15, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

8:54:00 AM

Pipe Size (HxW)

18.00"x18.00"

Depth of Flow (Wet DOF) (in)

7.25"

Range (Air DOF) (in)

7.25"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.76'

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

14'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

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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

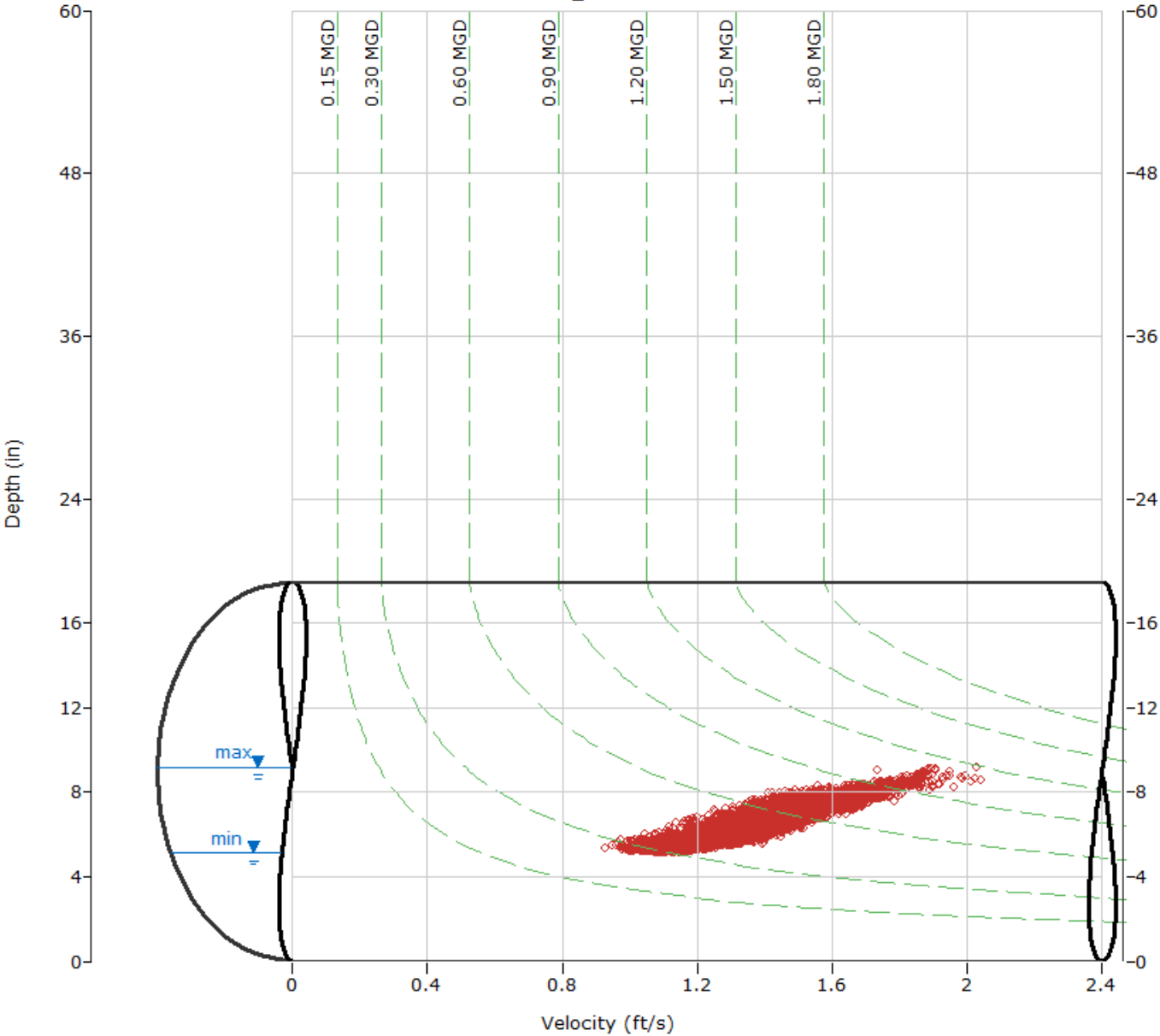
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

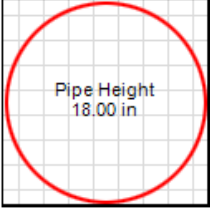


HYDROGRAPH REPORT

MIL_0386

Flow Monitor

MIL_0386



Pipe Height
18.00 in.

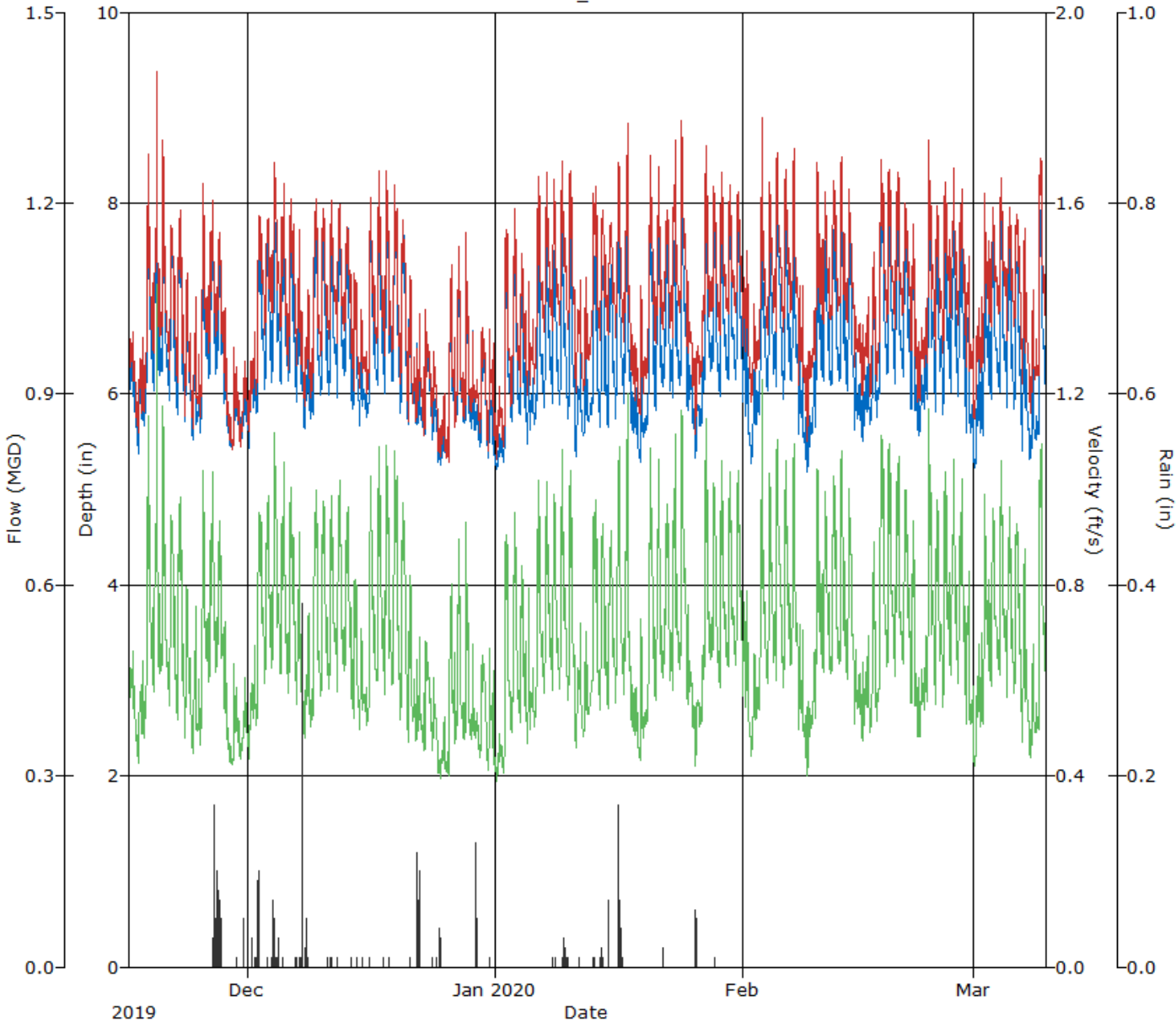
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain

ADS 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	11	
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		

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Item # 16.	
	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	

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_0602

Site Address /Location: Main St and Curtis Ave

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details:

Parking lane

Latitude:

37.424137°

Longitude:

-121.905174°

Pipe Size (H x W)

18.0" x 18.0"

Pipe Shape

Circular

Manhole #

602

System Characteristics

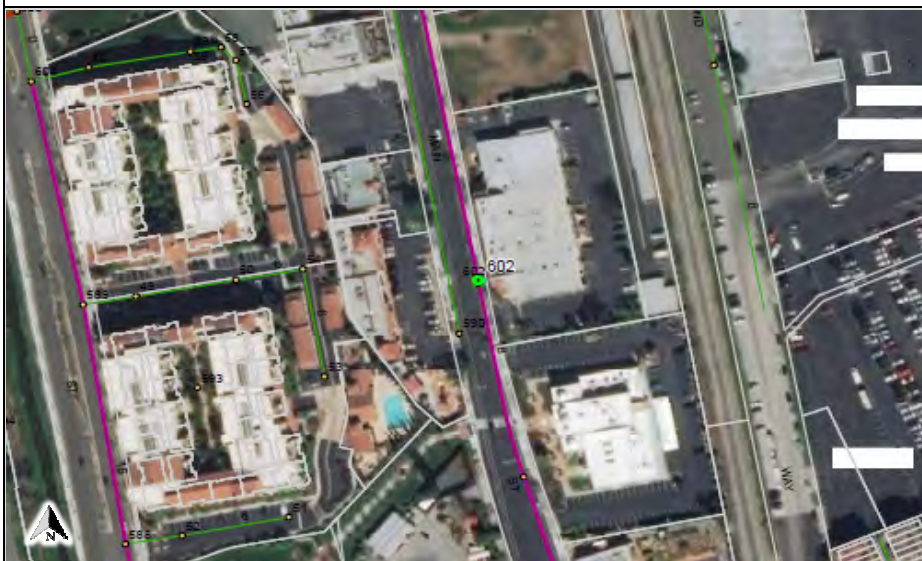
Residential/Commercial

Access

Drive

Traffic

Light



Installation Information

Installation Date:

Tuesday, November 12, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

9:11:40 AM

Pipe Size (HxW)

18.0" x 18.0"

Depth of Flow (Wet DOF) (in)

6.25

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.52

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

7'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1339

ADS Project Name: Milpitas.WWTFM.CA19-20

ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_0602

Flow Monitor

MIL_0602

Pipe Height
18.00 in

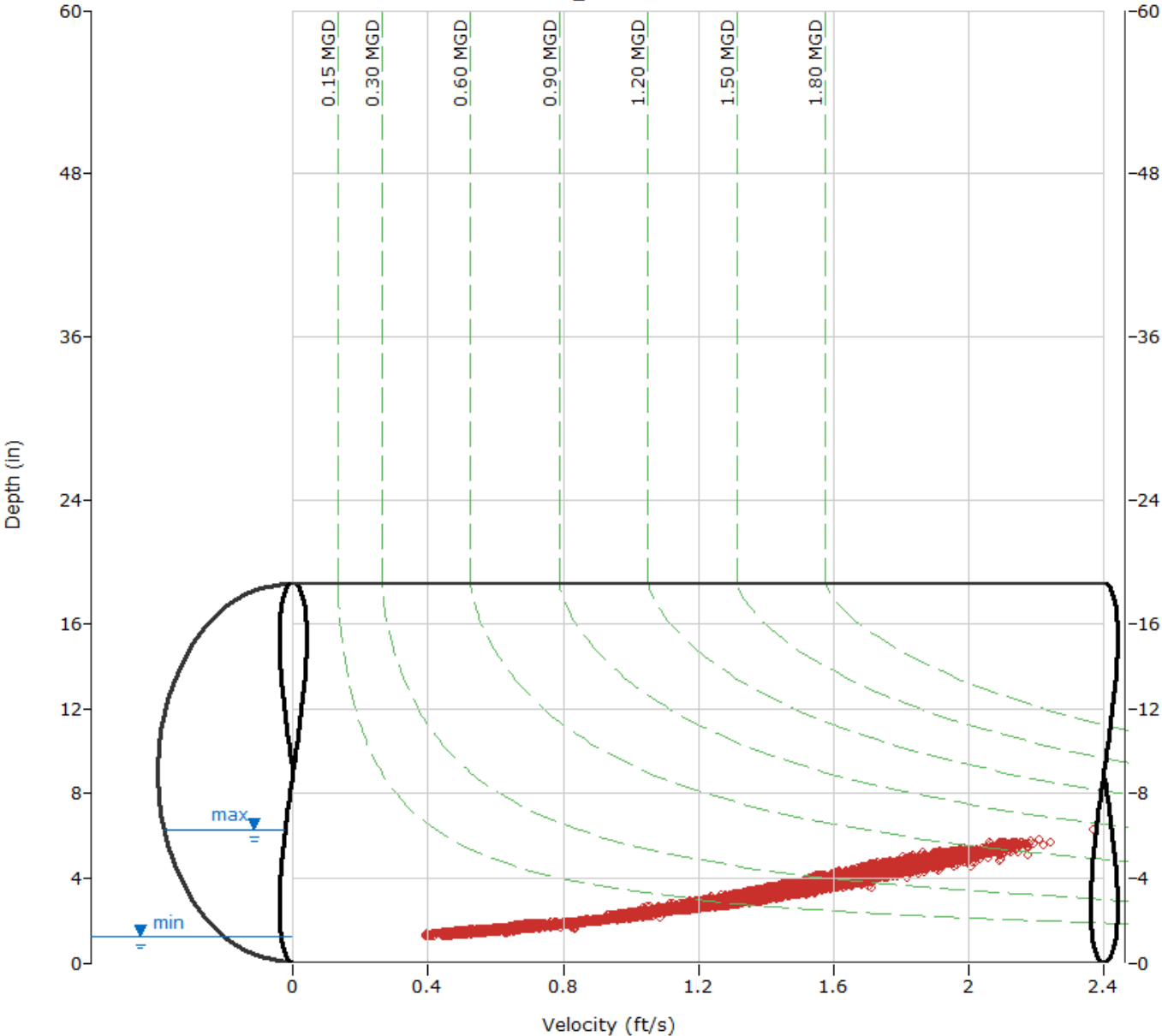
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

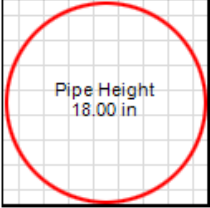
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_0602

Flow Monitor

MIL_0602



Pipe Height
18.00 in.

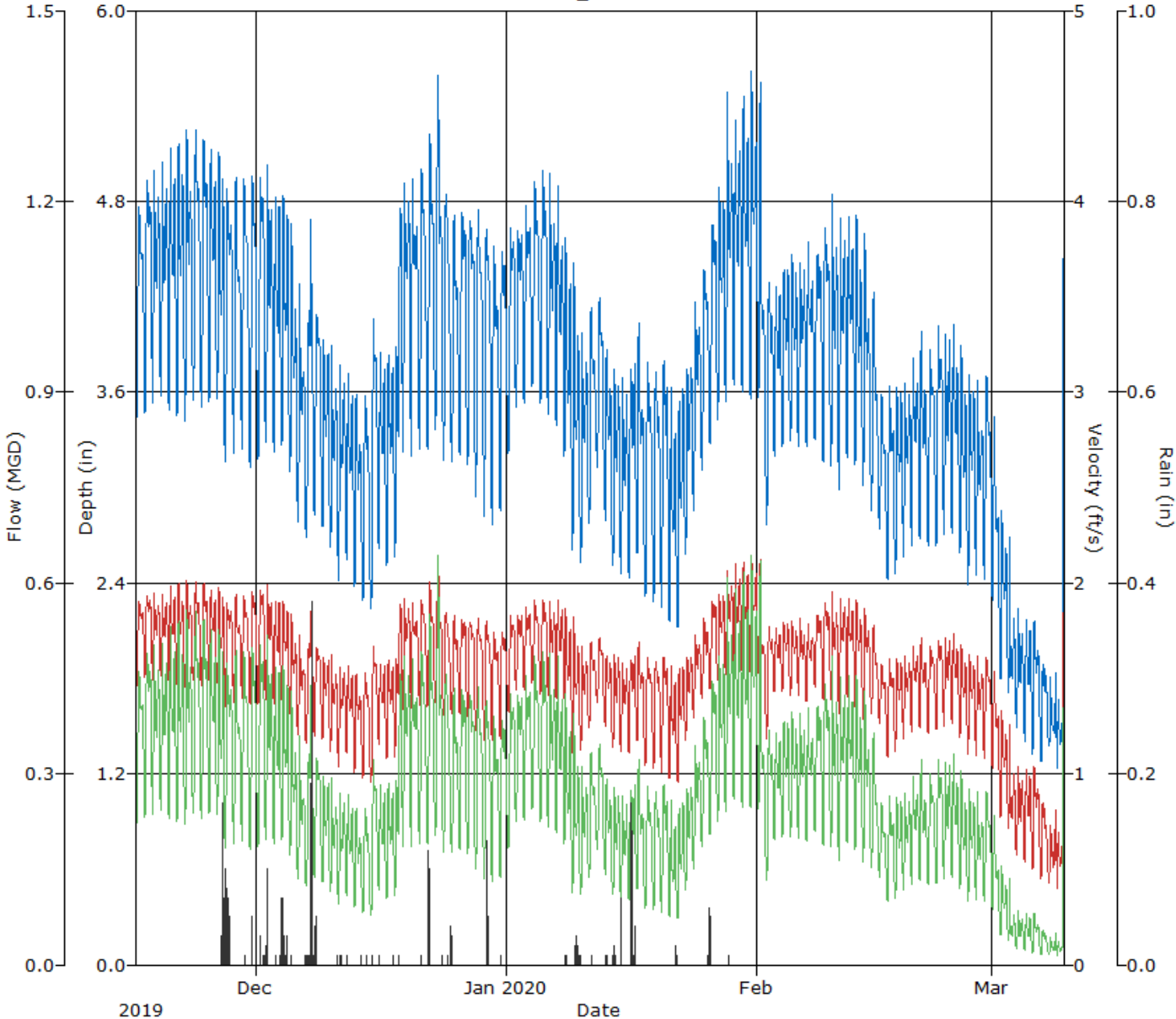
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain

ADS 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	
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	
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	
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	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain	
	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		

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_0649

Site Address /Location: 79 Railroad Avenue

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details:

Drive

Latitude:

37.430840°

Longitude:

-121.905657

Pipe Size (H x W)

21.50" x 21.50"

Pipe Shape

Circular

Manhole #

649

System Characteristics

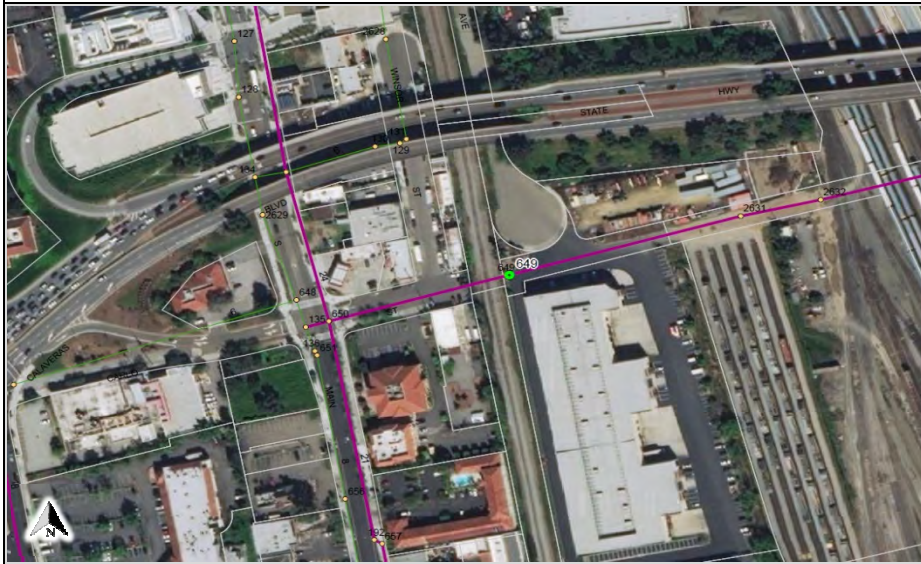
Residential/Commercial

Access

Traffic

Drive

Light



Installation Information

Installation Date:

Tuesday, November 12, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

10:22:26 AM

Pipe Size (HxW)

21.50" x 21.50"

Depth of Flow (Wet DOF) (in)

10.50

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.61

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

Smooth deep flow with moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

10'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

PVC

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1346



ADS Project Name: Milpitas.WWTFM.CA19-20

49

ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_0649

Flow Monitor

MIL_0649

Pipe Height
21.50 in

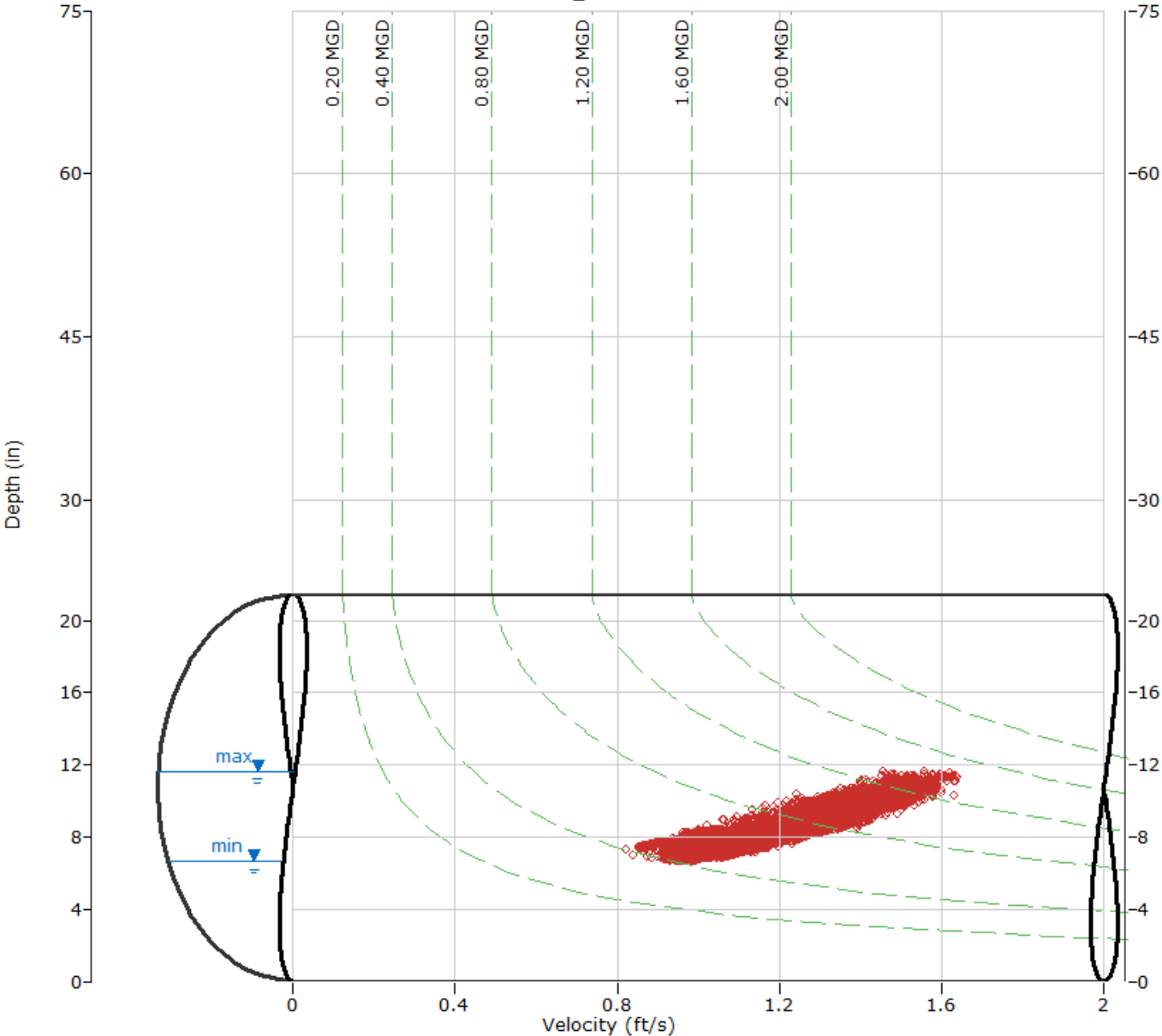
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

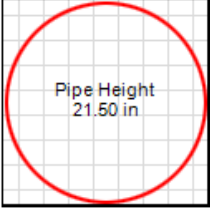


HYDROGRAPH REPORT

MIL_0649

Flow Monitor

MIL_0649



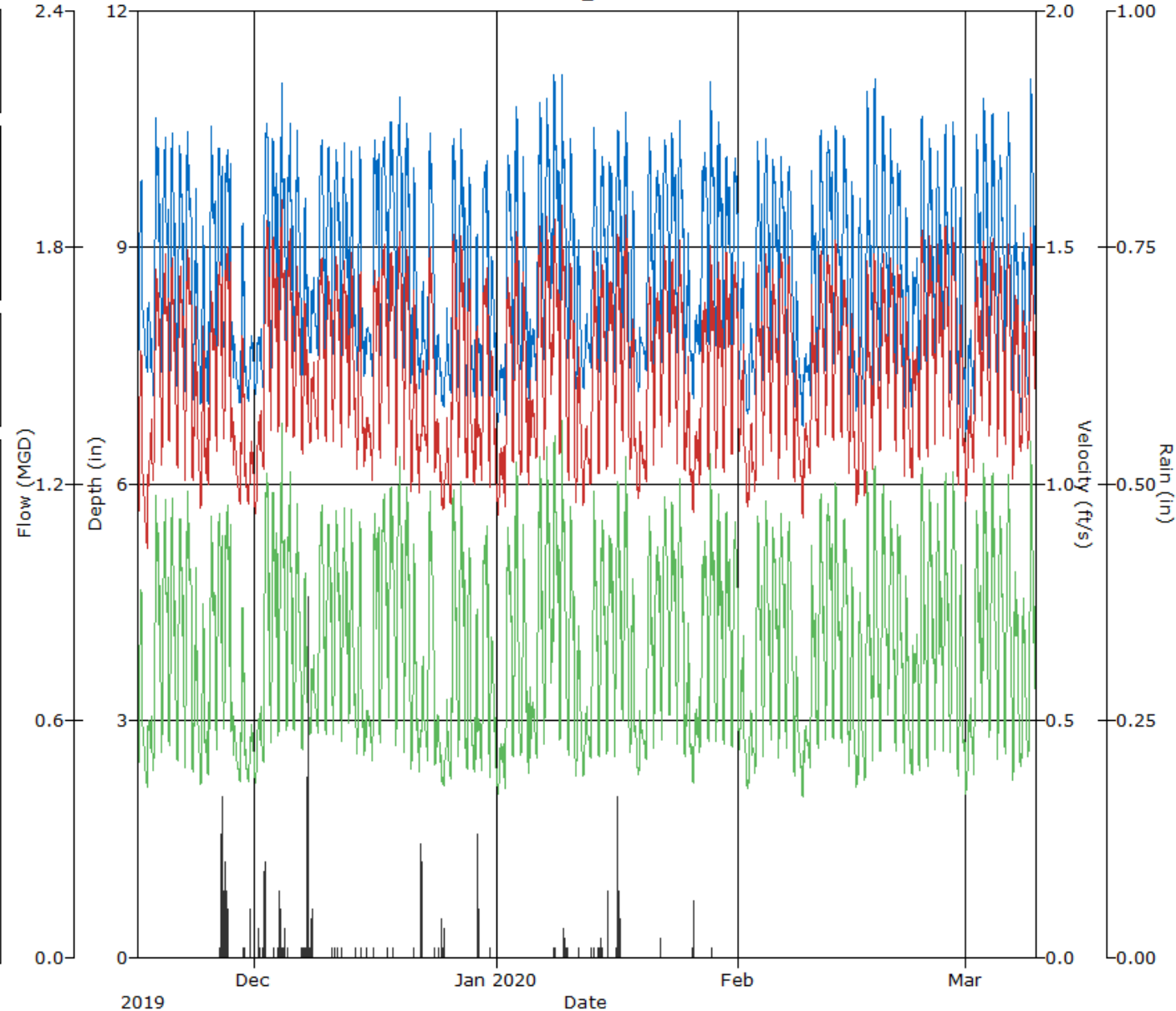
Pipe Height
21.50 in

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	

Item # 16.

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 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 occurred 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_0715

Site Address /Location: Barber Ln and Bellew Dr

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: In Parking Lot

Latitude:

37.421203°

Longitude:

-121.917399

Pipe Size (H x W)

30.5" x 30.0"

Pipe Shape

Circular

Manhole #

715

System Characteristics

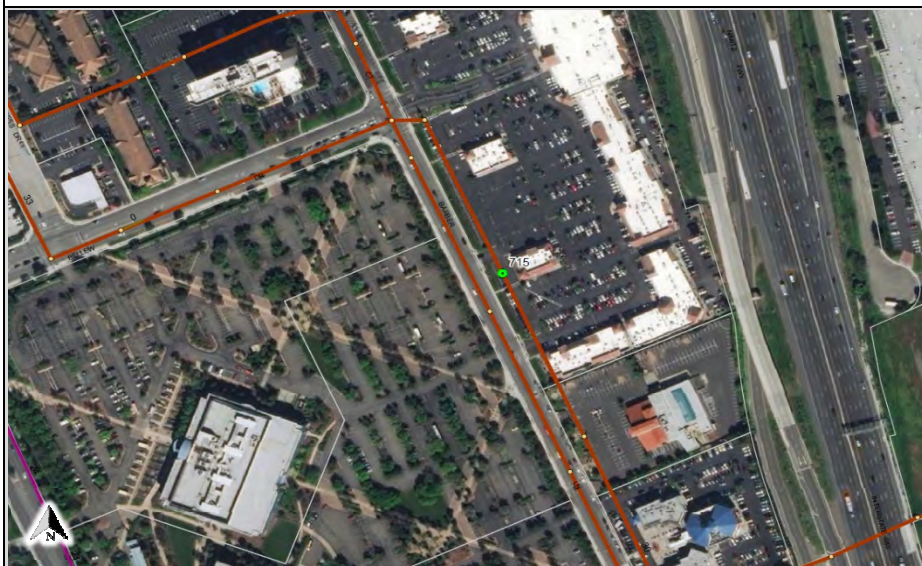
Residential/Commercial

Access

Traffic

Drive

Light



Installation Information

Installation Date:

Tuesday, November 12, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

5:47:56 AM

Pipe Size (HxW)

30.5" x 30.0"

Depth of Flow (Wet DOF) (in)

5.63

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.03

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

5'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1353



ADS Project Name: Milpitas.WWTFM.CA19-20

ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_0715

Flow Monitor

MIL_0715

Pipe Height
30.50 in

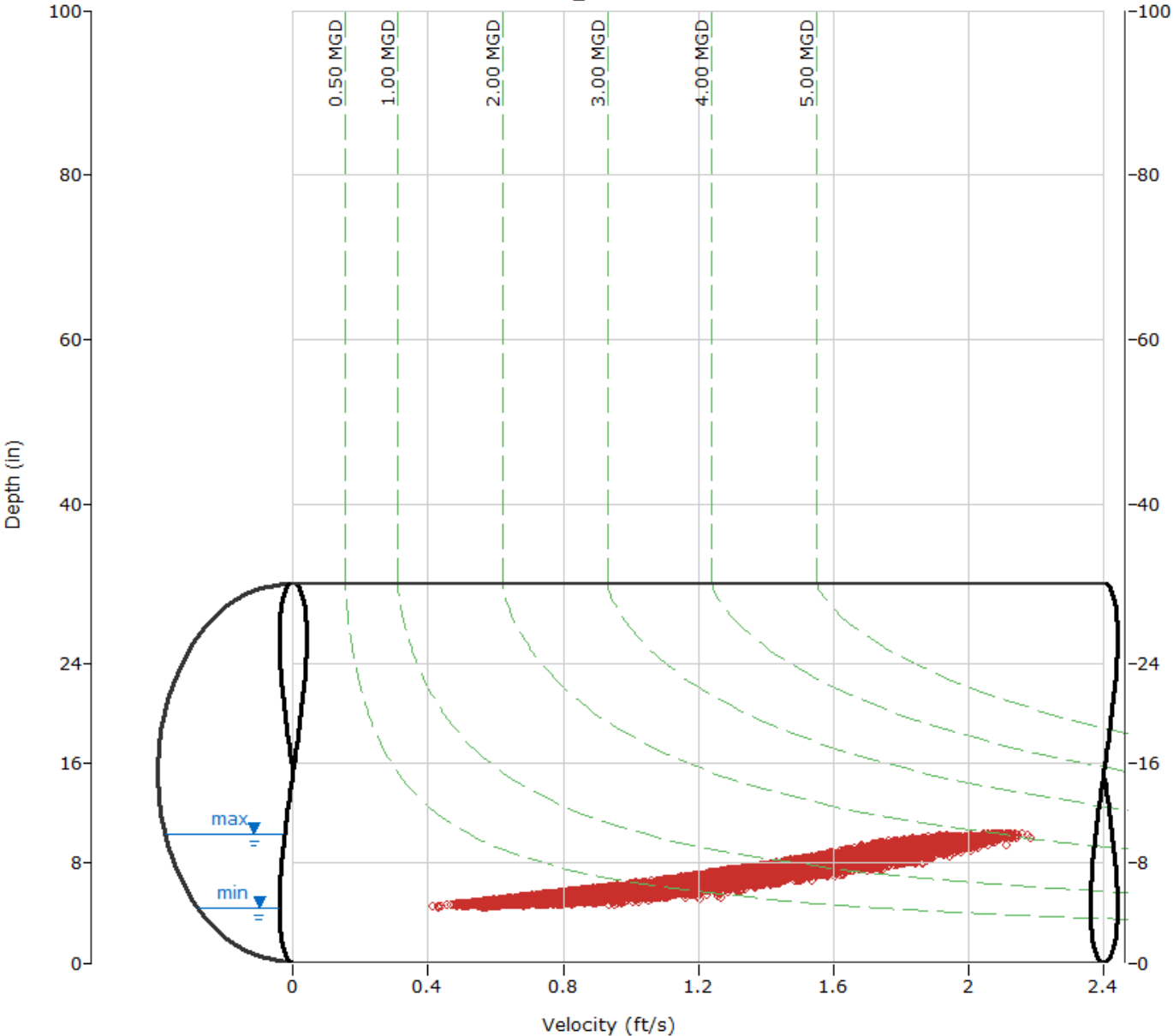
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

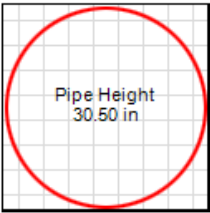


HYDROGRAPH REPORT

MIL_0715

Flow Monitor

MIL_0715



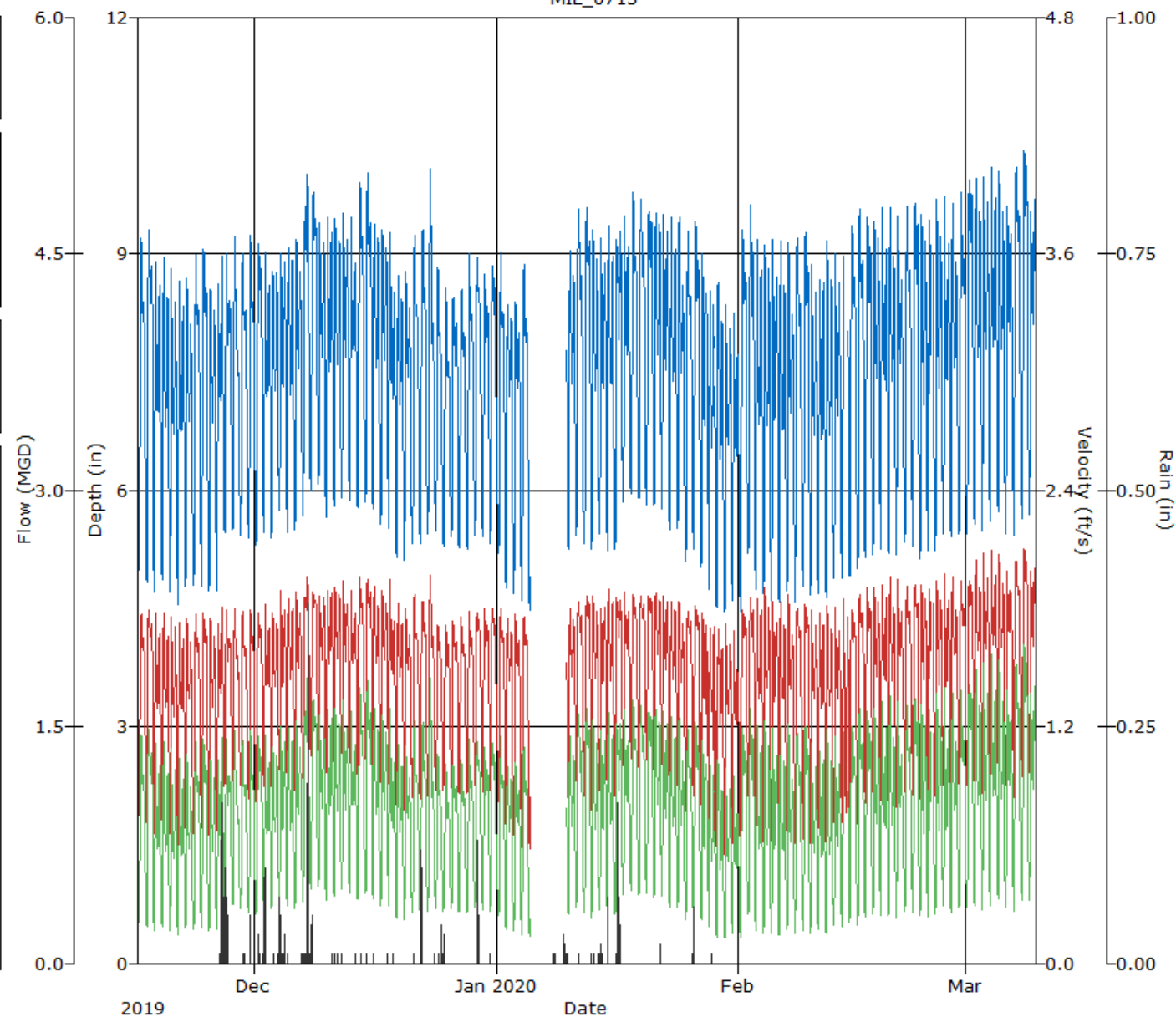
Pipe Height
30.50 in

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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			

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_0744

Site Address /Location:

Thompson Court and Machado Avenue

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details:

Drive

Latitude:

37.419309°

Longitude:

-121.911002°

Pipe Size (H x W)

15.0" x 15.0"

Pipe Shape

Circular

Manhole #

744

System Characteristics

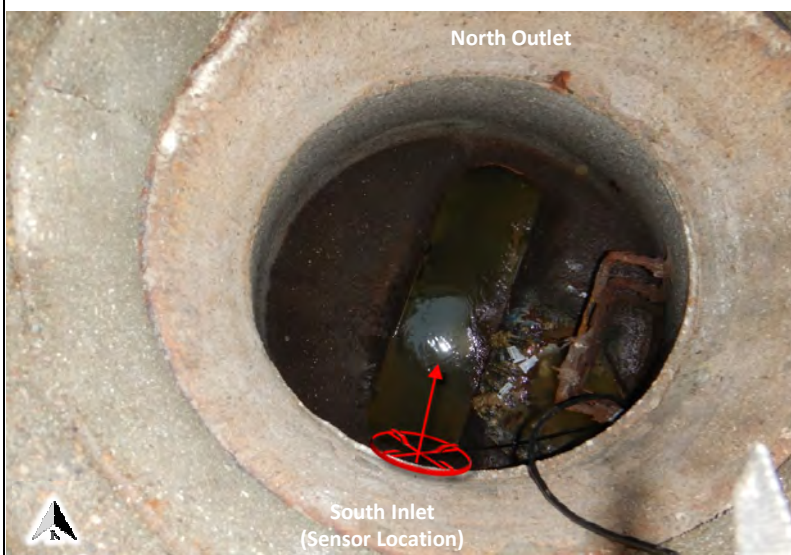
Residential

Access

Traffic

Drive

Light



Installation Information

Installation Date:

Tuesday, November 12, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

6:52:52 AM

Pipe Size (HxW)

15.0" x 15.0"

Depth of Flow (Wet DOF) (in)

5.50

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.05

Velocity Sensor Offset (in)

0"

Silt

0"

Silt Type

Hydraulic Comments:

Smooth flow with medium depth and velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

5'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

PVC

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1360



ADS Project Name:

Milpitas.WWTFM.CA19-20

ADS Project Number:

22431

SCATTERGRAPH REPORT

MIL_0744

Flow Monitor

MIL_0744

Pipe Height
15.00 in

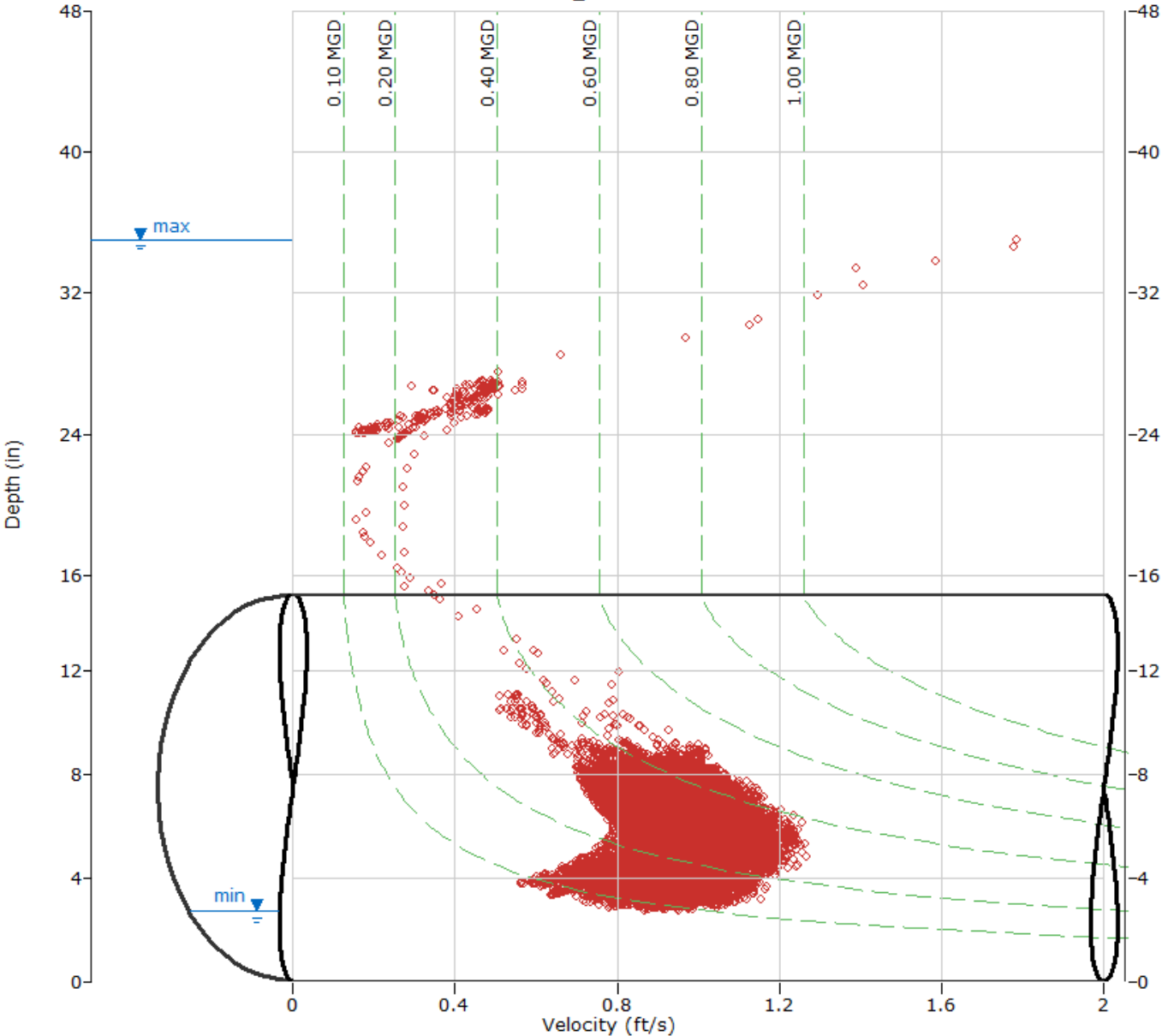
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

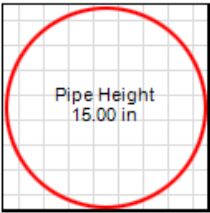


HYDROGRAPH REPORT

MIL_0744

Flow Monitor

MIL_0744



Pipe Height
15.00 in.

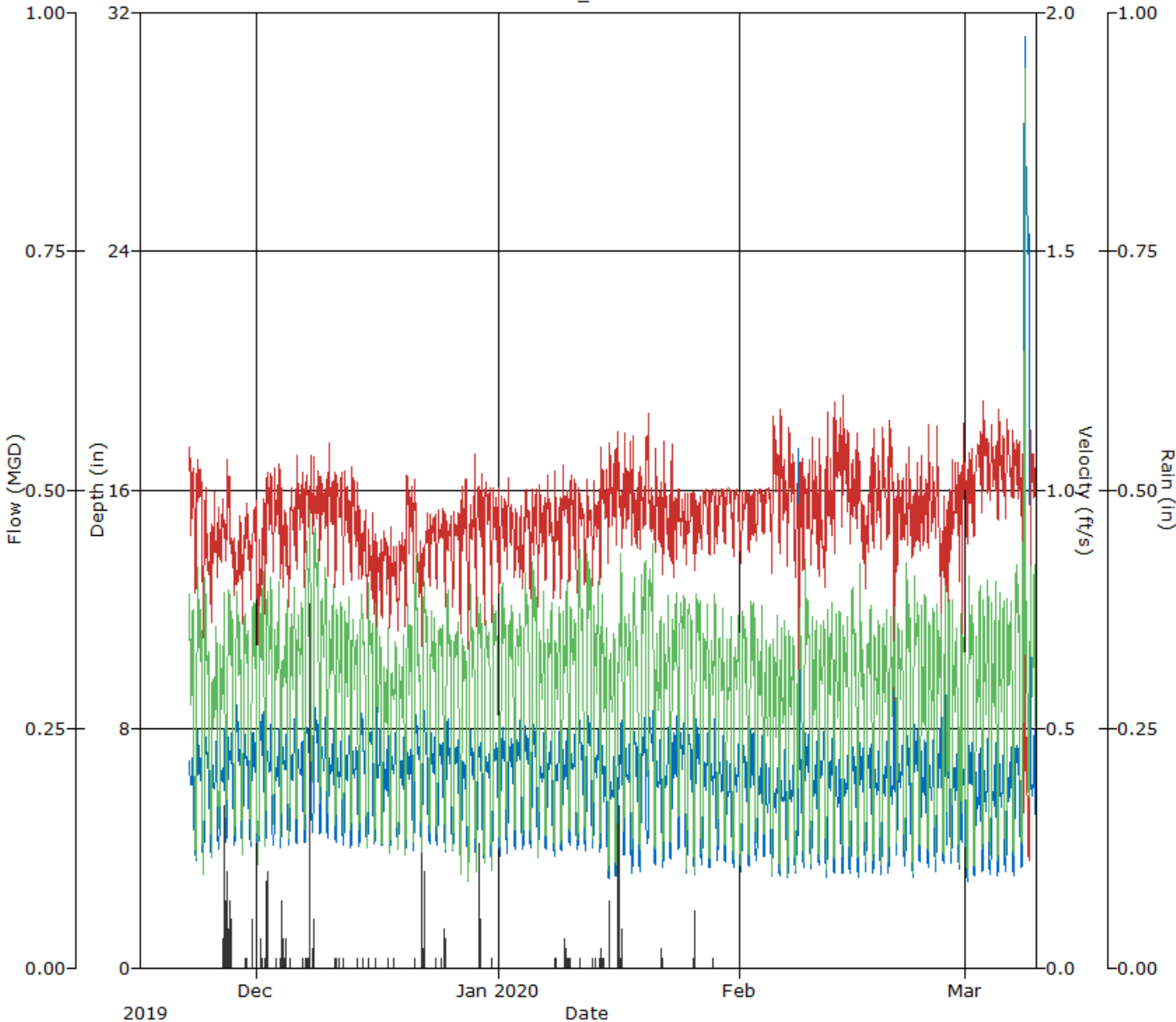
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain

ADS ENVIRONMENTAL SERVICES



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	
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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

MIL_1043

Site Address /Location: Ayer St and Park Hill Dr, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.436384°

Longitude:

-121.887700°

Pipe Size (H x W)

20.75"x20.75"

Pipe Shape

Circular

Manhole #

1043

System Characteristics

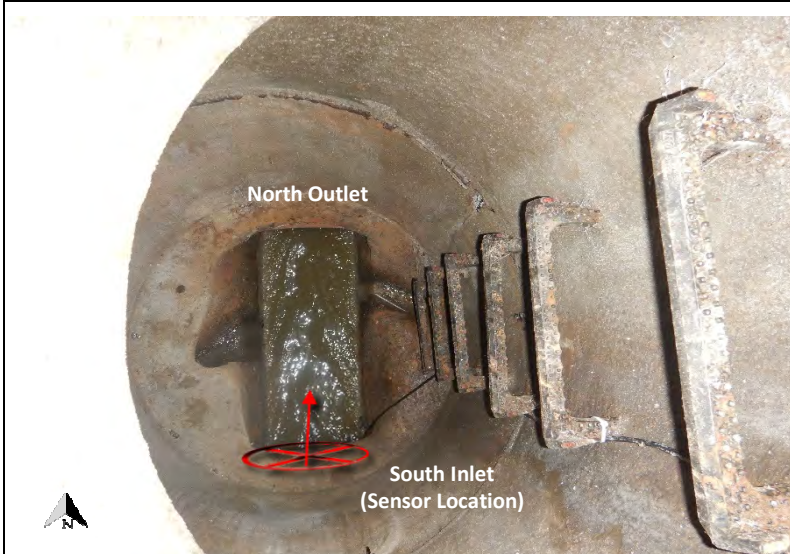
Residential/Commercial

Access

Drive

Traffic

Medium



Installation Information

Installation Date:

Thursday, November 14, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

6:52:00 AM

Pipe Size (HxW)

20.75"x20.75"

Depth of Flow (Wet DOF) (in)

6.38"

Range (Air DOF) (in)

NA

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

4.50'

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Medium depth with fast velocity and small waves

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

10'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

1367



ADS Project Name: Milpitas.WWTFM.CA2019-2020

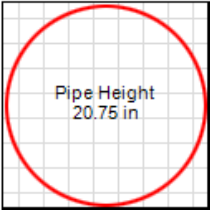
ADS Project Number: 22431.11.325

SCATTERGRAPH REPORT

MIL_1043

Flow Monitor

MIL_1043



Pipe Height
20.75 in

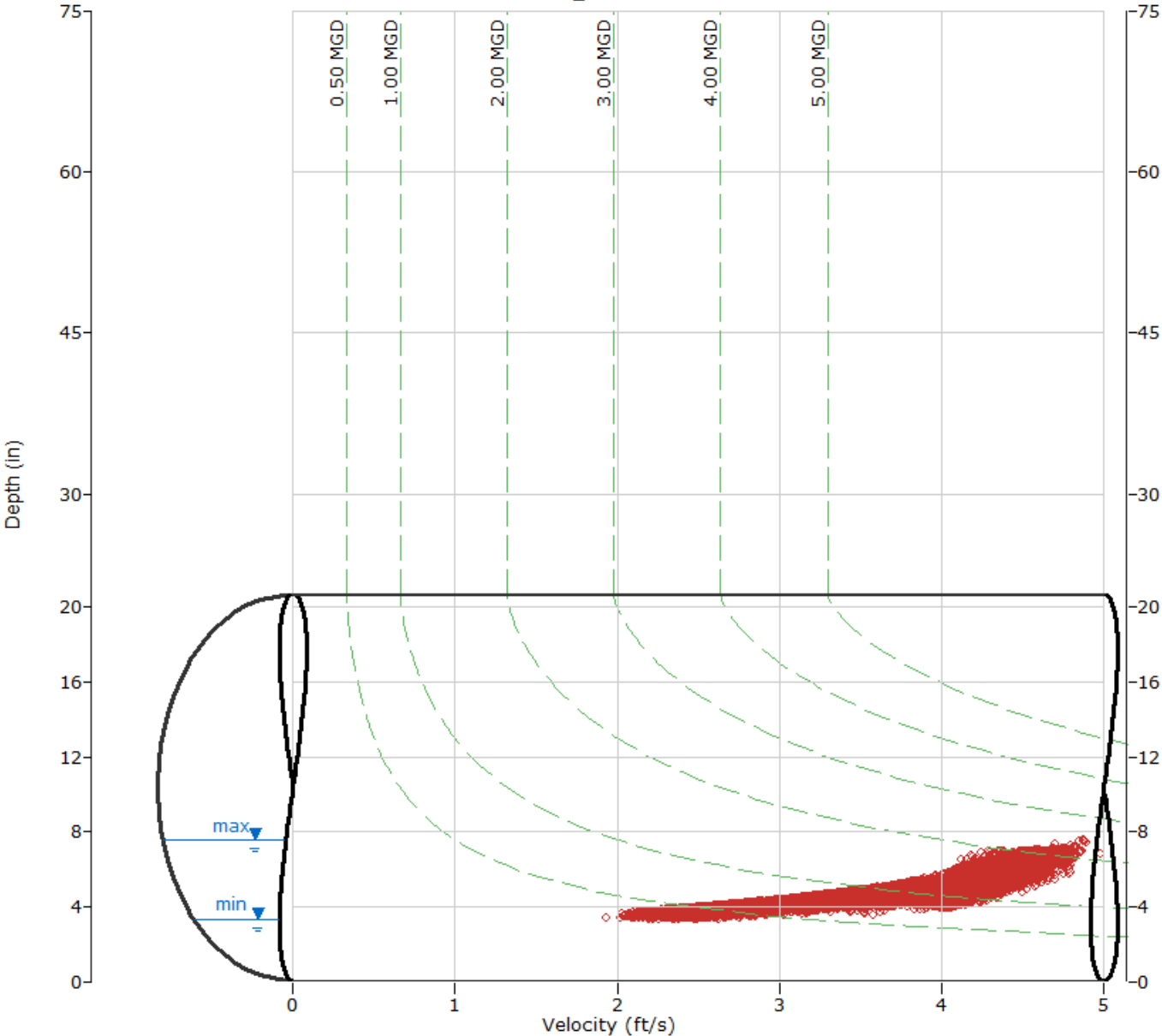
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

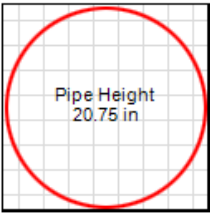


HYDROGRAPH REPORT

MIL_1043

Flow Monitor

MIL_1043



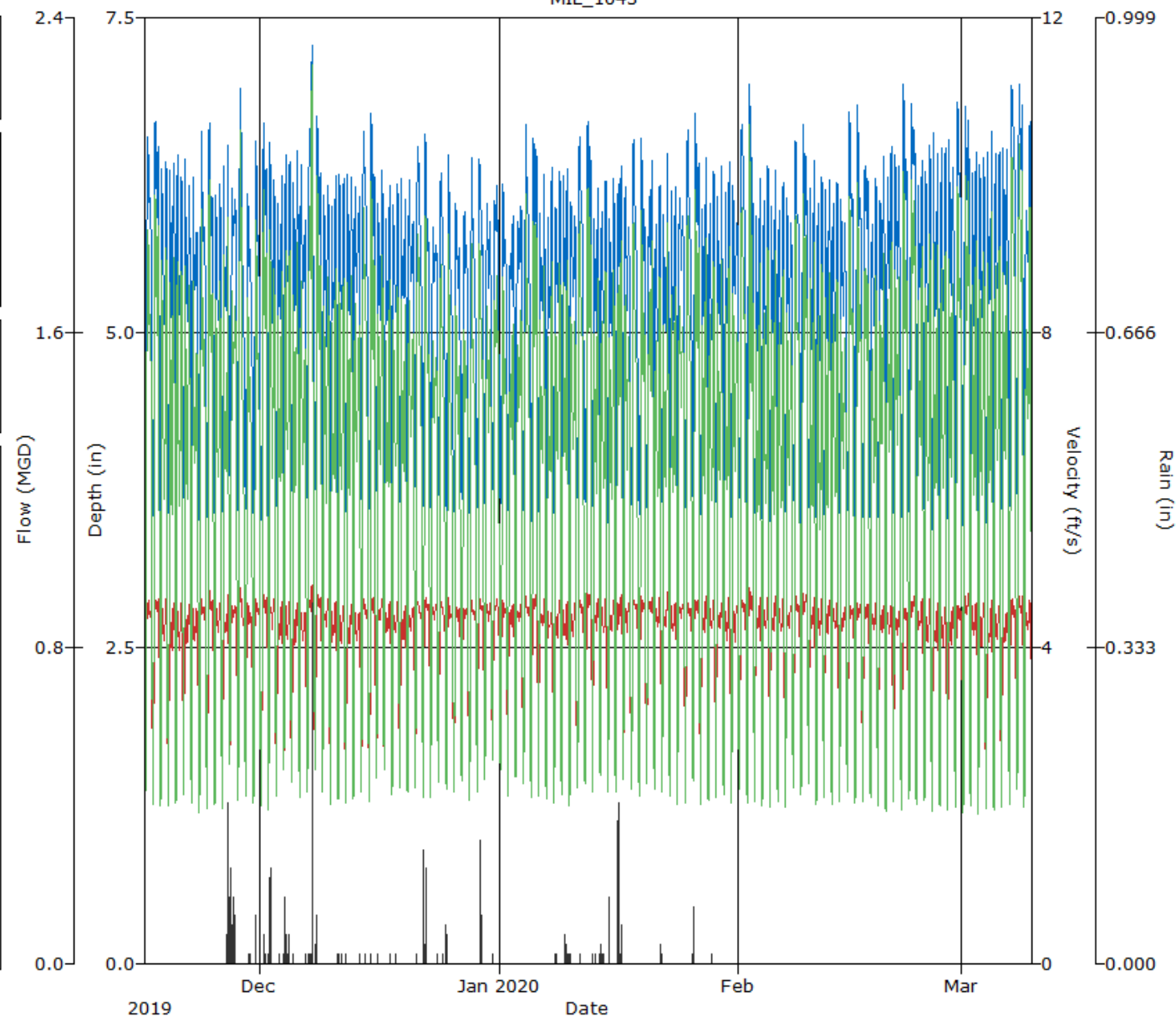
Pipe Height
20.75 in

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	
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	
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	
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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Item # 16.	
	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		

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_1193

Site Address /Location: Yosemite Dr and Dempsey Rd, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.426666°

Longitude:

-121.883676°

Pipe Size (H x W)

21.00"x21.00"

Pipe Shape

Circular

Manhole #

1193

System Characteristics

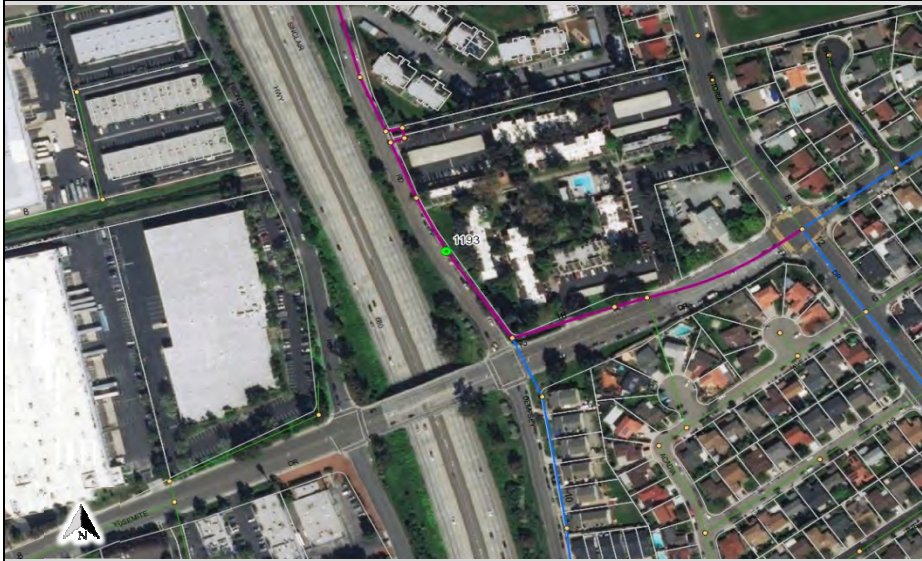
Residential/Commercial

Access

Drive

Traffic

Light



Installation Information

Installation Date:

Thursday, November 14, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

8:09:00 AM

Pipe Size (HxW)

21.00"x21.00"

Depth of Flow (Wet DOF) (in)

5.13"

Range (Air DOF) (in)

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

3.50'

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Smooth flow with medium depth and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

15'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

1374

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

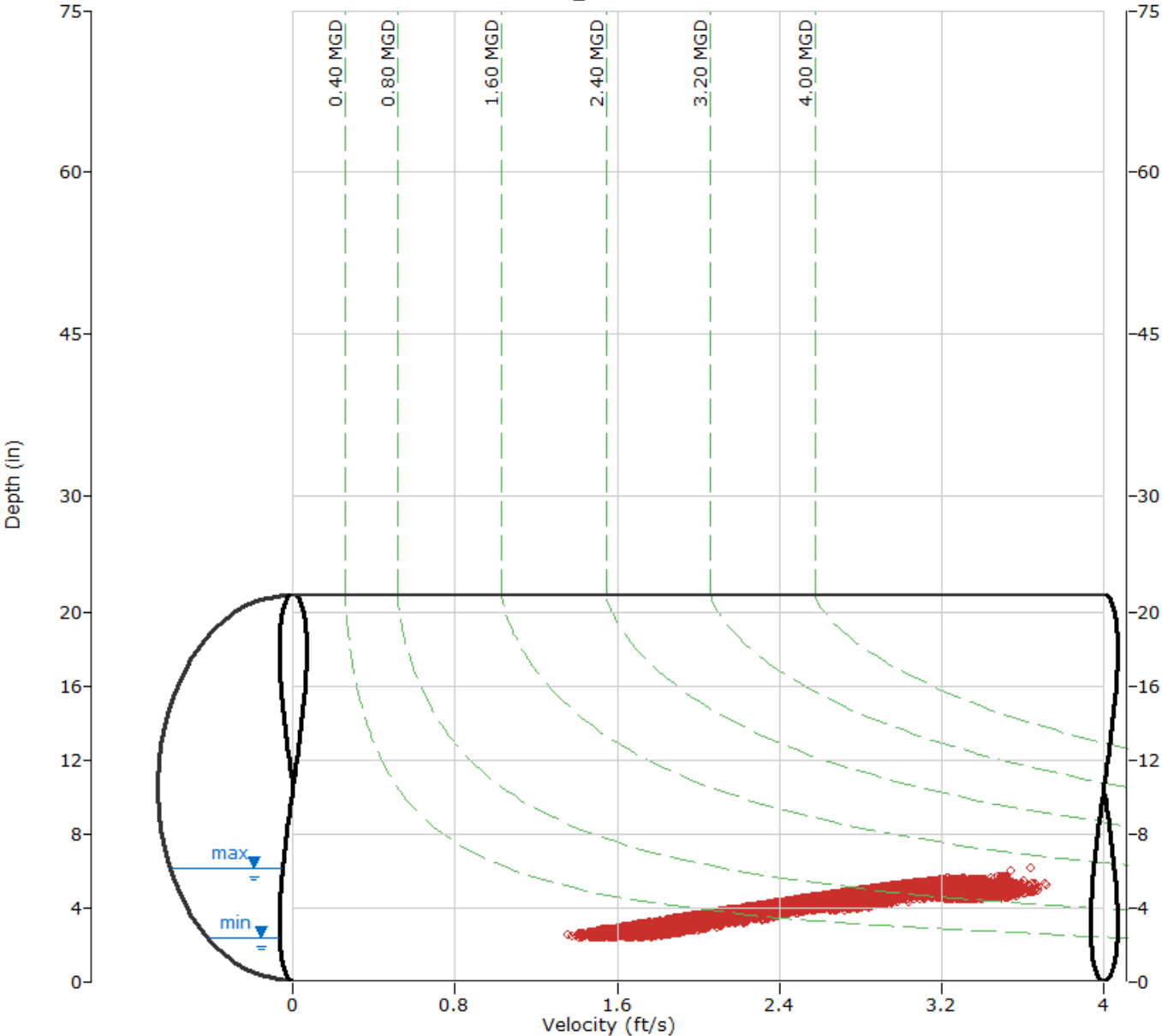
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

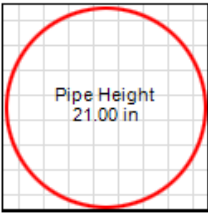


HYDROGRAPH REPORT

MIL_1193

Flow Monitor

MIL_1193



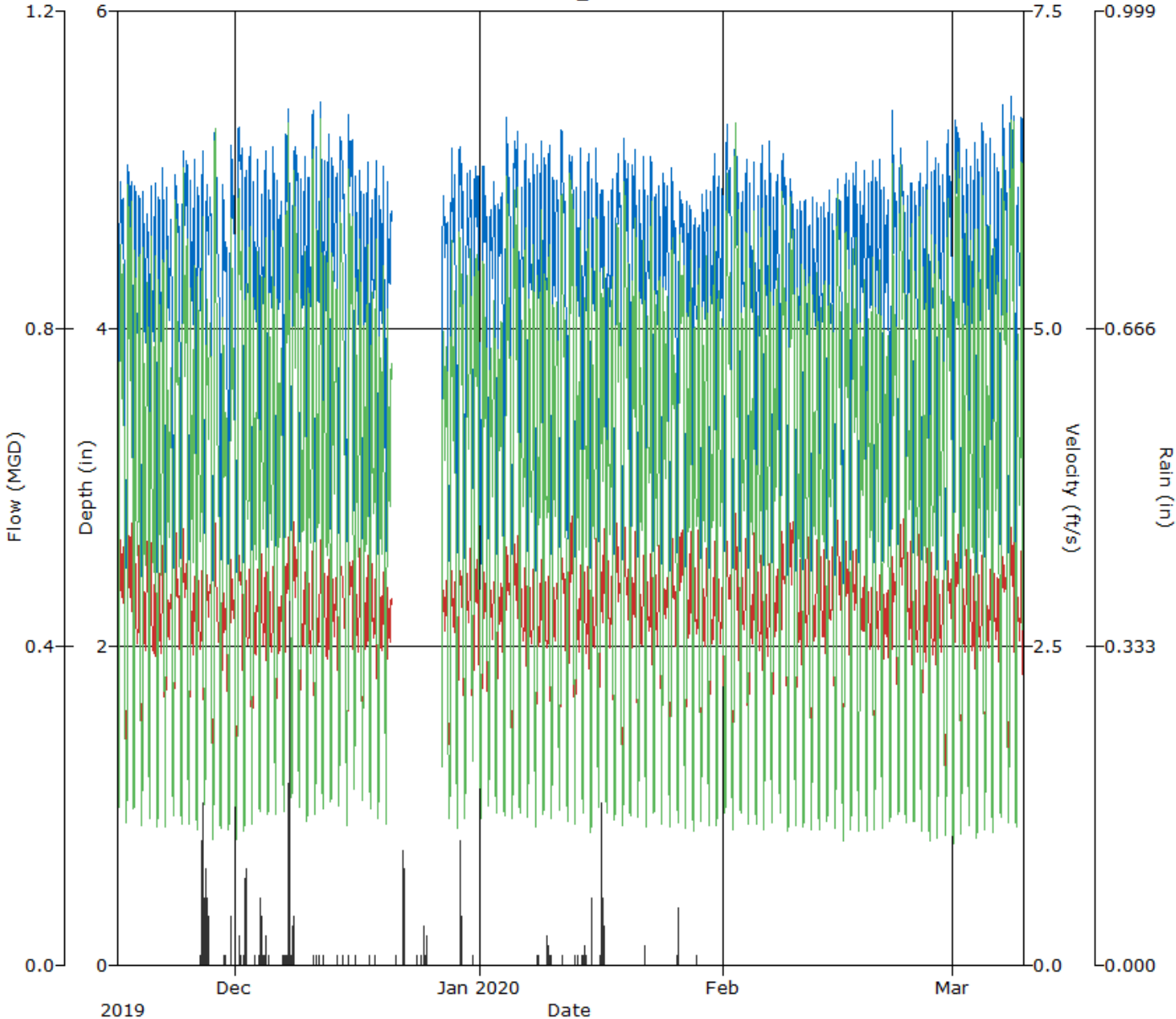
Pipe Height
21.00 in

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain	
	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		

Item # 16.

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	

Item # 16.

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 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. Surge 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_1564

Site Address /Location: Country Club Dr and Park Victoria Dr, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.449480°

Pipe Size (H x W)

8.00"x8.00"

Pipe Shape

Circular

Longitude:

-121.887946°

Manhole #

1564

System Characteristics

Residential/Commercial

Access

Drive

Traffic

Medium



Installation Information

Installation Date:

Thursday, November 14, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

4:25:00 AM

Pipe Size (HxW)

8.00"x8.00"

Depth of Flow (Wet DOF) (in)

0.63"

Range (Air DOF) (in)

0.63"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.69

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Shallow depth with moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

4'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

1381



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

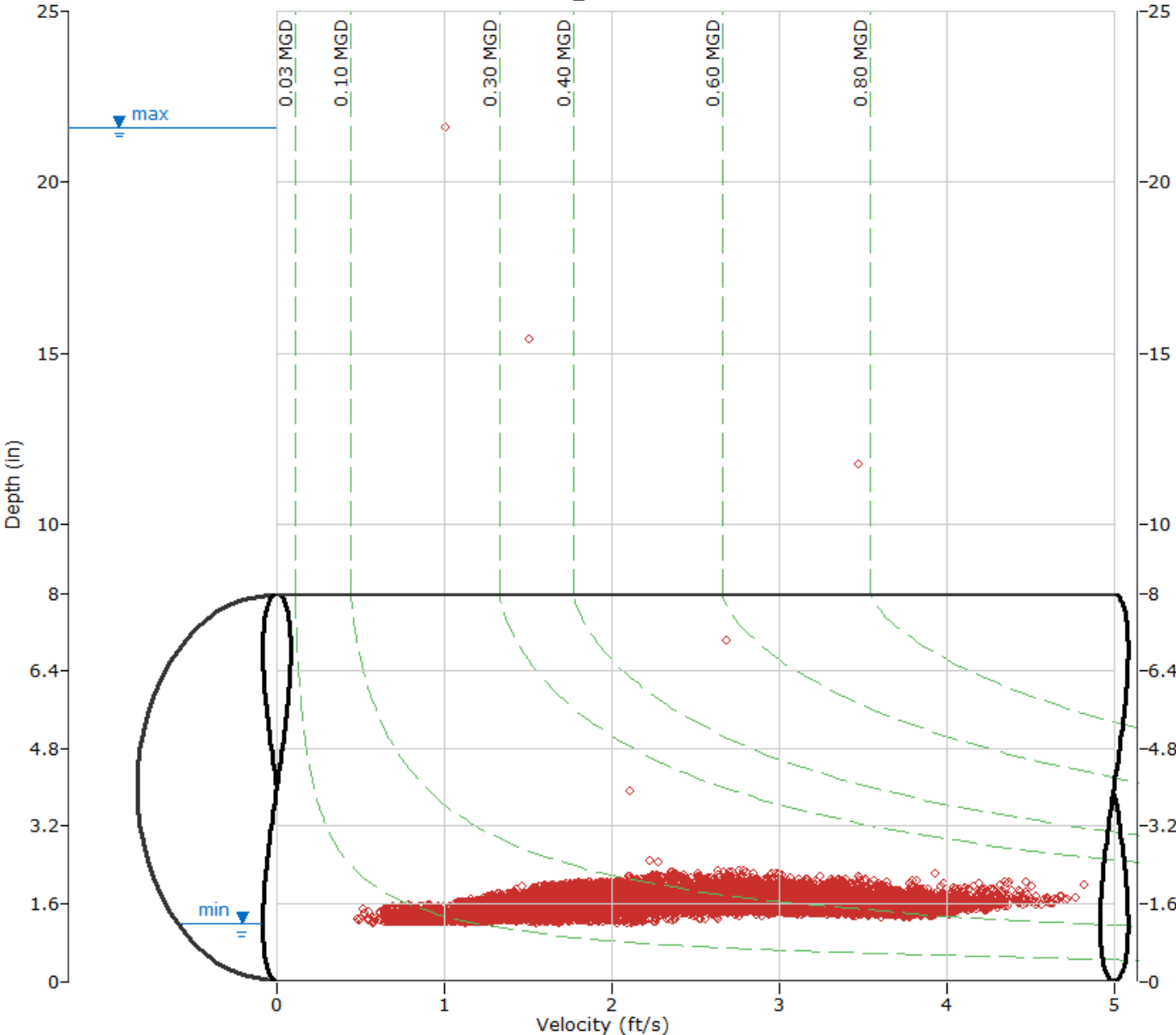
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

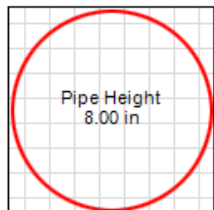
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT

MIL_1564

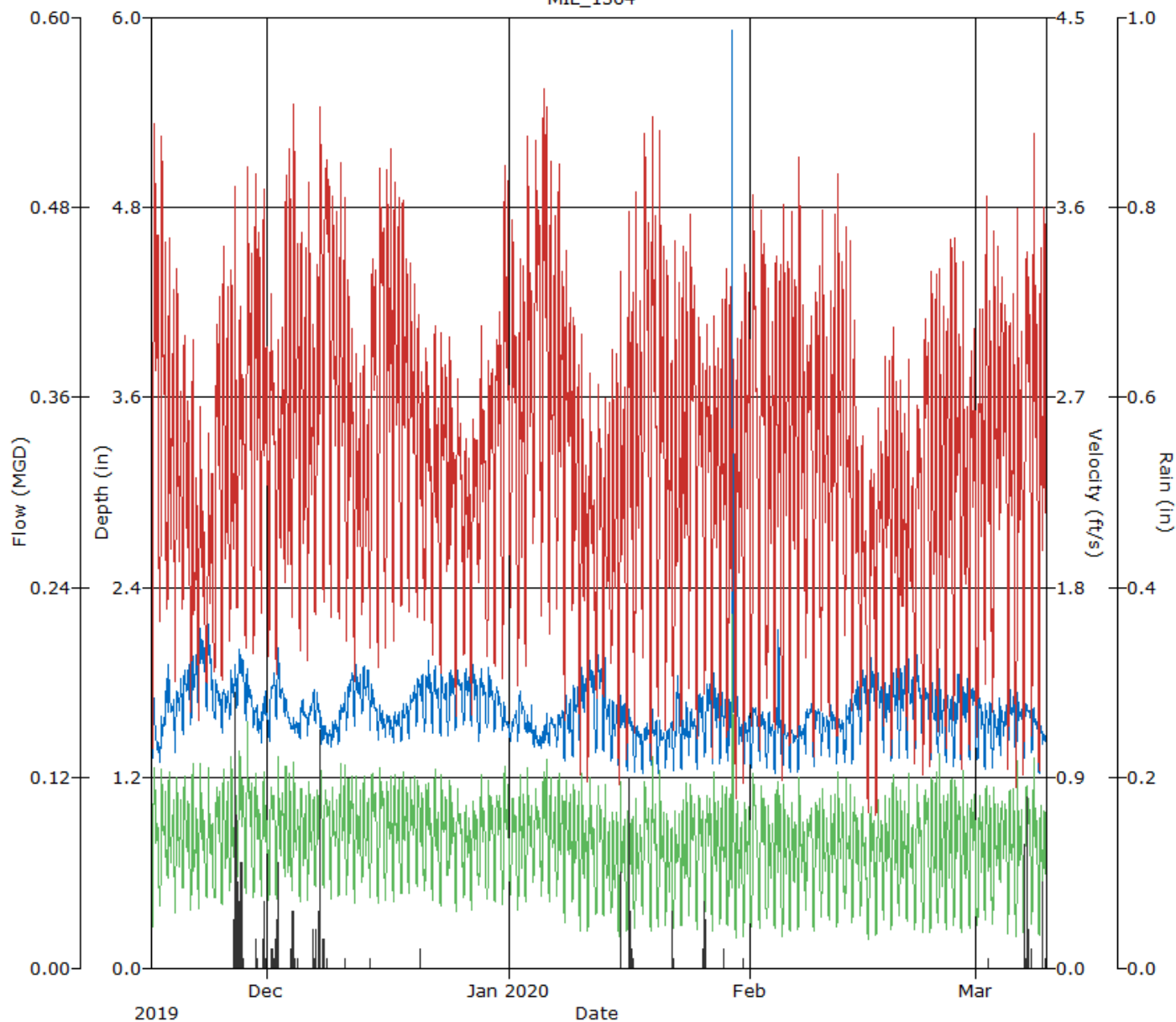
Flow Monitor
MIL_1564



Report Period
11/16/2019
To
3/9/2020

- Legend
- Depth
 - Velocity
 - Quantity
 - Rain

ADS ENVIRONMENTAL SERVICES



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		1.00

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Item # 16.	
	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		
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		
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		

Item # 16.

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	0.01
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	
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

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_1790

Site Address /Location: 490 N McCarthy Blvd, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.435578°

Longitude:

-121.919933°

Pipe Size (H x W)

28.00"x28.00"

Pipe Shape

Circular

Manhole #

1790

System Characteristics

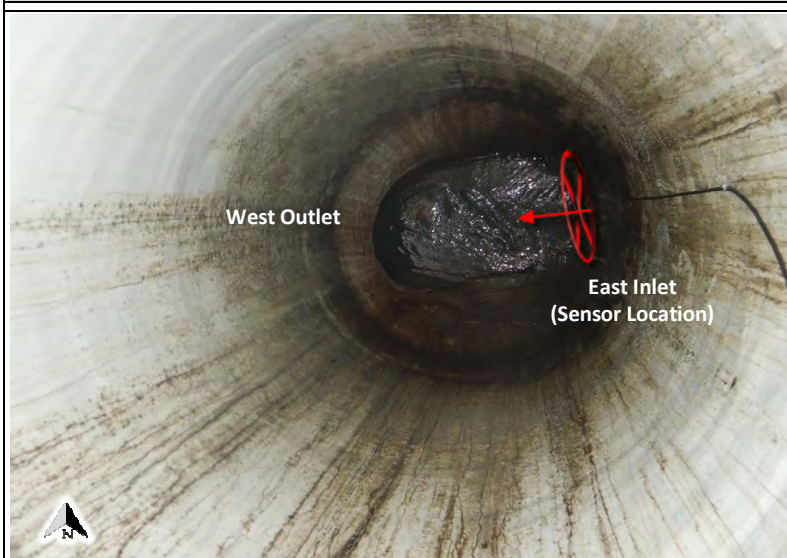
Residential/Commercial

Access

Traffic

Drive

Light



Installation Information

Installation Date:

Friday, November 15, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

4:26:00 AM

Pipe Size (HxW)

28.00"x28.00"

Depth of Flow (Wet DOF) (in)

9.00"

Range (Air DOF) (in)

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.82'

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Smooth flow with deep depth and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

12'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

1388



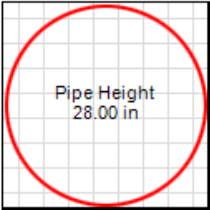
ADS Project Name: Milpitas.WWTFM.CA2019-2020

ADS Project Number: 22431.11.325

SCATTERGRAPH REPORT

MIL_1790

Flow Monitor
MIL_1790

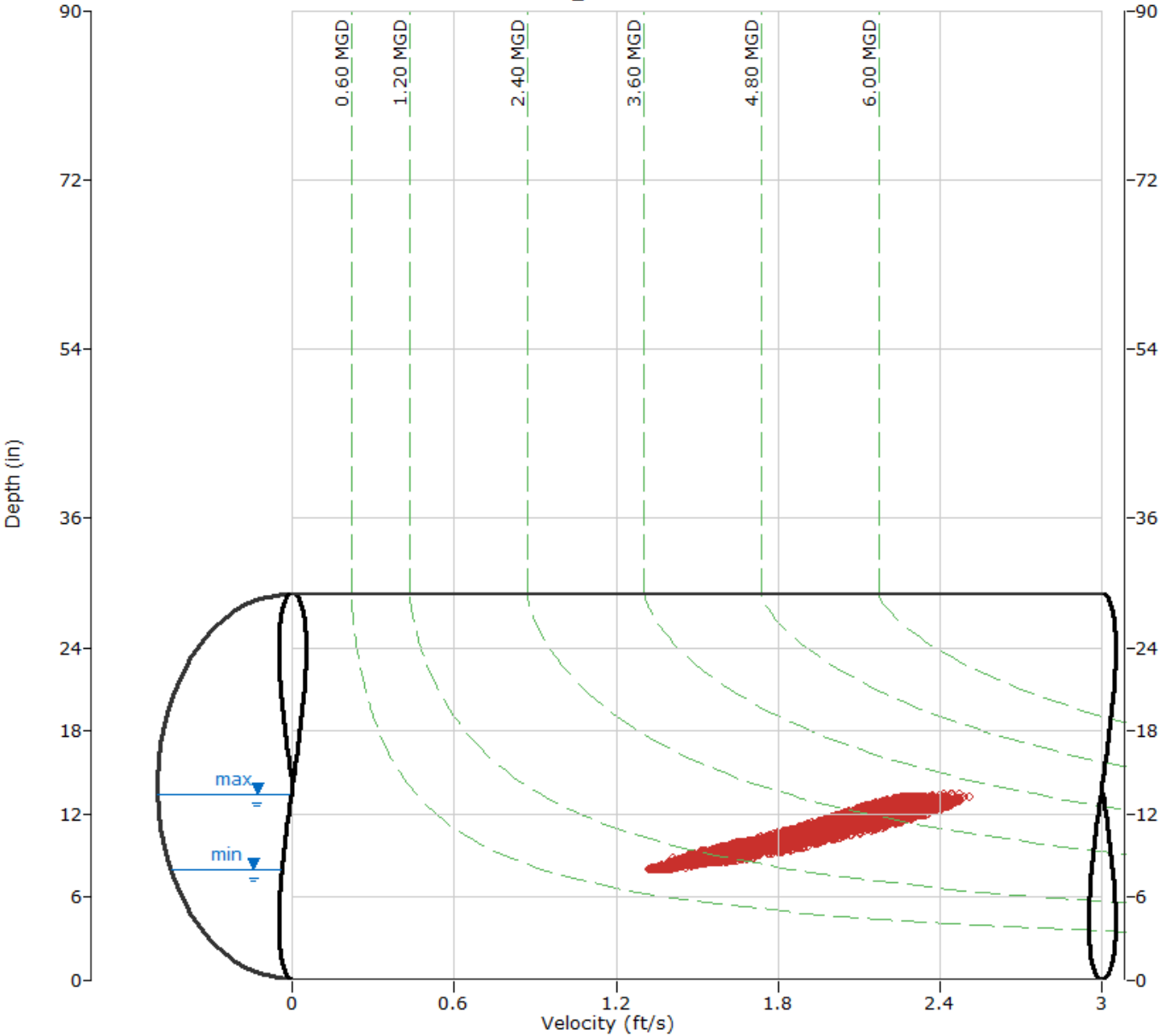


Report Period
11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

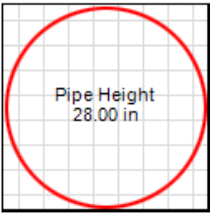


HYDROGRAPH REPORT

MIL_1790

Flow Monitor

MIL_1790



Pipe Height
28.00 in

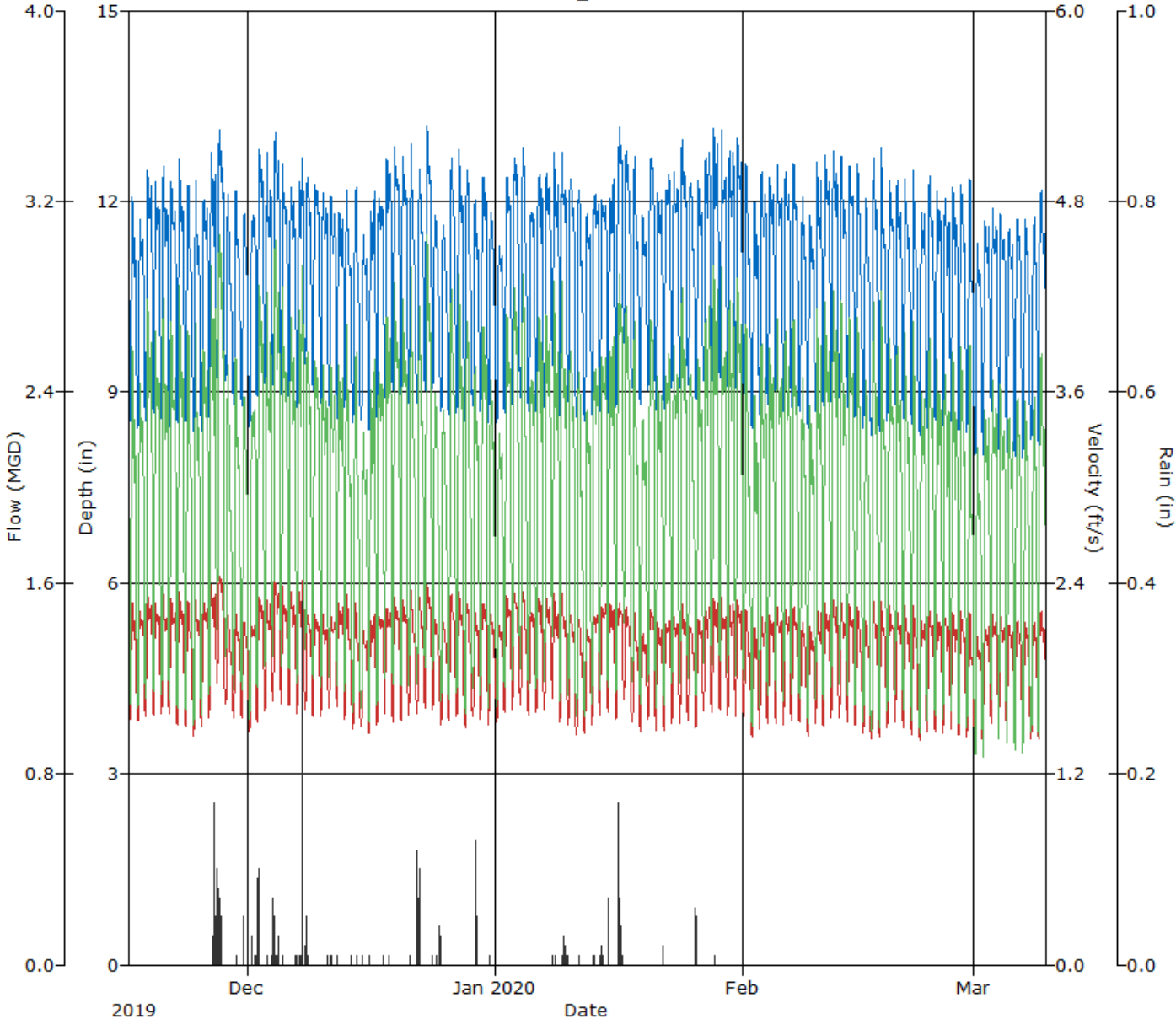
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain

ADS ENVIRONMENTAL SERVICES



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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	1.00
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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_1795

Site Address /Location: Marylinn Dr and Penitencia St, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.435797°

Longitude:

-121.911864°

Pipe Size (H x W)

27.00"x27.00"

Pipe Shape

Circular

Manhole #

1795

System Characteristics

Residential/Commercial

Access

Drive

Traffic

Medium



Installation Information

Installation Date:

Friday, November 15, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

6:23:00 AM

Pipe Size (HxW)

27.00"x27.00"

Depth of Flow (Wet DOF) (in)

9.75"

Range (Air DOF) (in)

NA

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

0.34'

Velocity Sensor Offset (in)

0"

Silt (in)

3.0"

Silt Type

Soft / Loose

Hydraulic Comments:

Smooth flow with deep depth and slow velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

8'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

1395



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

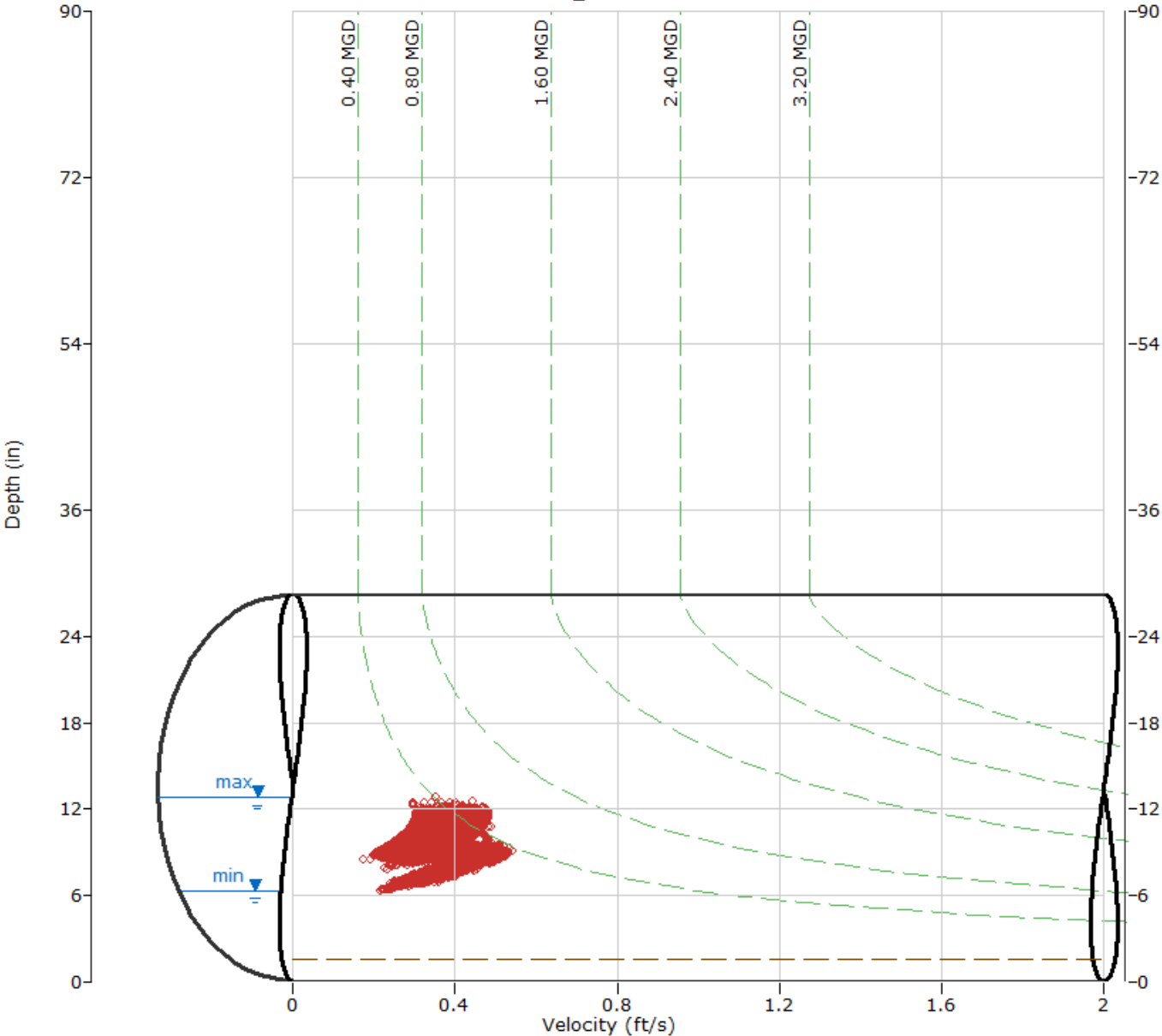
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

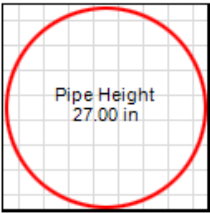
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_1795

Flow Monitor

MIL_1795



Pipe Height
27.00 in

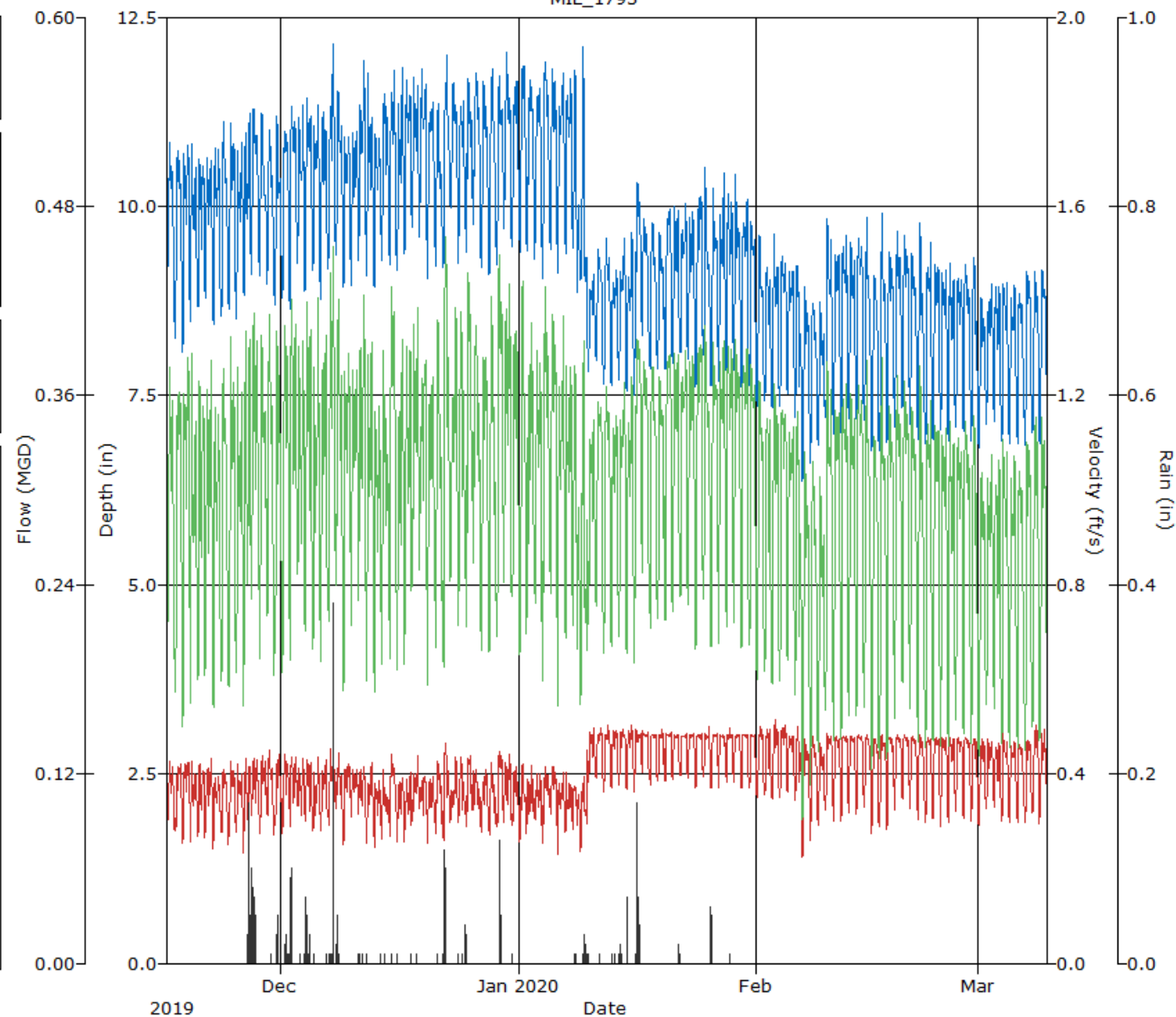
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain

ADS ENVIRONMENTAL SERVICES



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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	1.00
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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Item # 16.	
	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	

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_2300

Site Address /Location:	Washington Dr and Fontainebleu Avenue, Milpitas, CA			Monitor Series	Location Type
Site Access Details:	In between lanes w/buses	Latitude:	37.452734	TRITON+	Temporary
		Longitude:	-121.909412	Pipe Size (H x W)	Pipe Shape
				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:	1402
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ADS Project Name:	Milpitas.WWTFM.CA19-20	105
ADS Project Number:	22431	

SCATTERGRAPH REPORT

MIL_2300

Flow Monitor

MIL_2300

Pipe Height
10.25 in

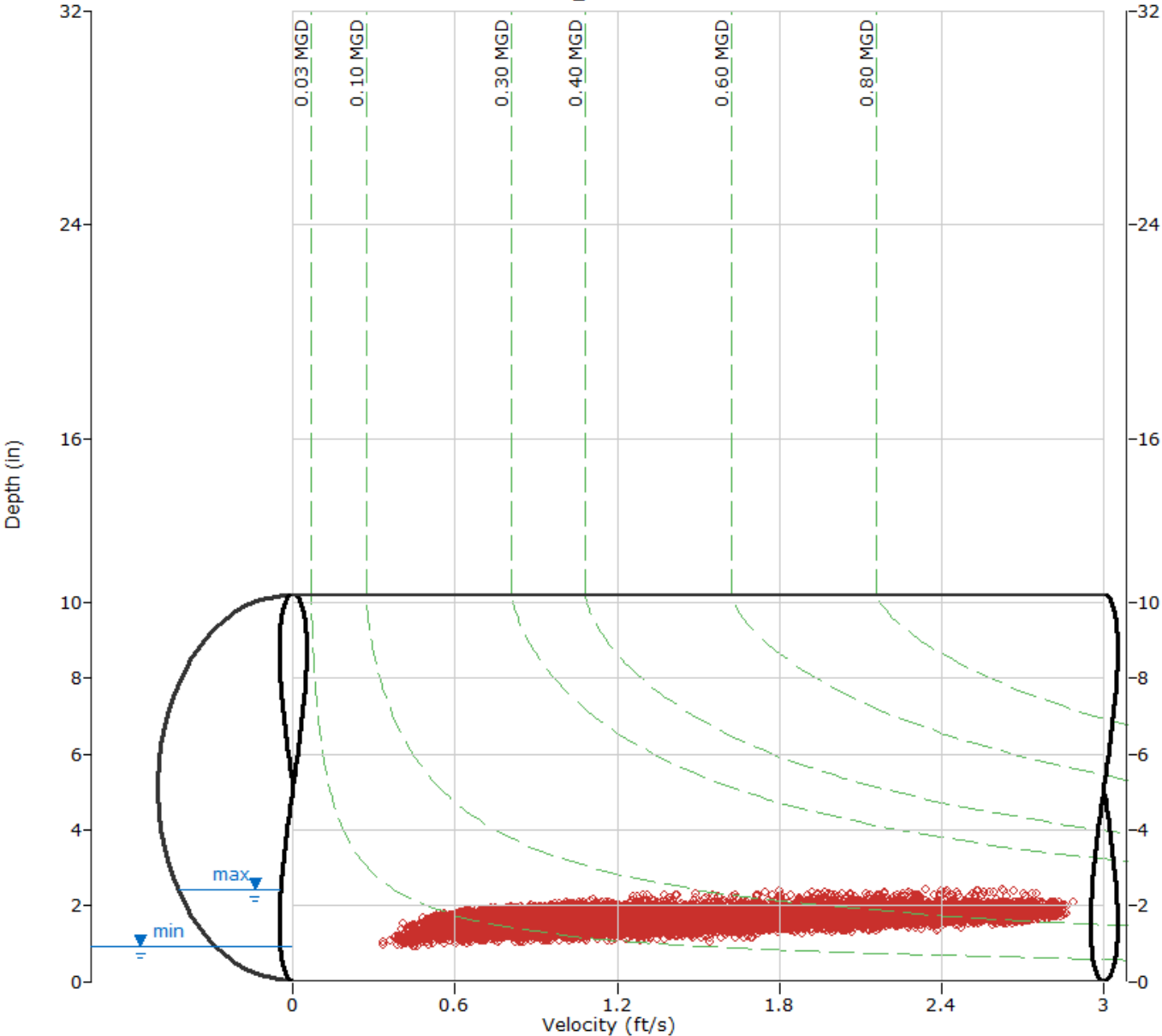
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

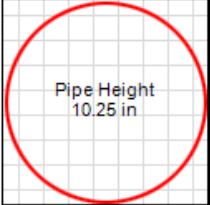
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_2300

Flow Monitor

MIL_2300



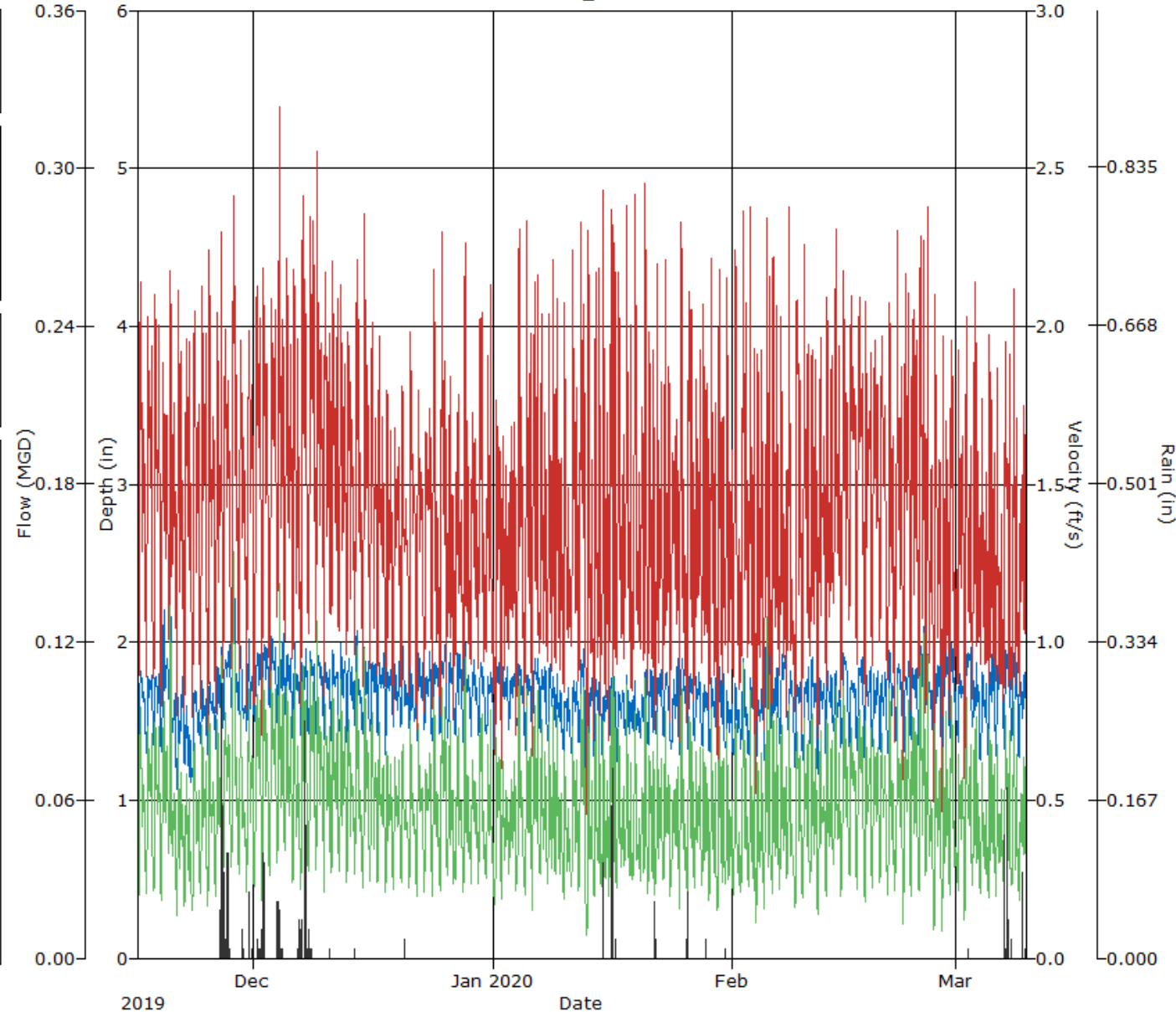
Pipe Height
10.25 in.

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	
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	
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	
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	
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	
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	1405

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Item # 16.	
	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	0.10
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	
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	
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	
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	
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	
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	
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	
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

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_2334

Site Address /Location: Tramway Dr and Strickroth Dr

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details:

Drive

Latitude:

37.44209

Longitude:

-121.903338

Pipe Size (H x W)

12.5" x 12.5"

Pipe Shape

Circular

Manhole #

2334

System Characteristics

Residential

Access

Traffic

Drive

Light



Installation Information

Installation Date:

Friday, November 15, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

7:47:00 AM

Pipe Size (HxW)

12.5" x 12.5"

Depth of Flow (Wet DOF) (in)

2.25"

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

3.52

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

good flow, shallow and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

12'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Vitrified Clay Pipe

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1409

ADS Project Name: Milpitas.WWTFM.CA19-20

1.2

ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_2334

Flow Monitor

MIL_2334

Pipe Height
12.50 in

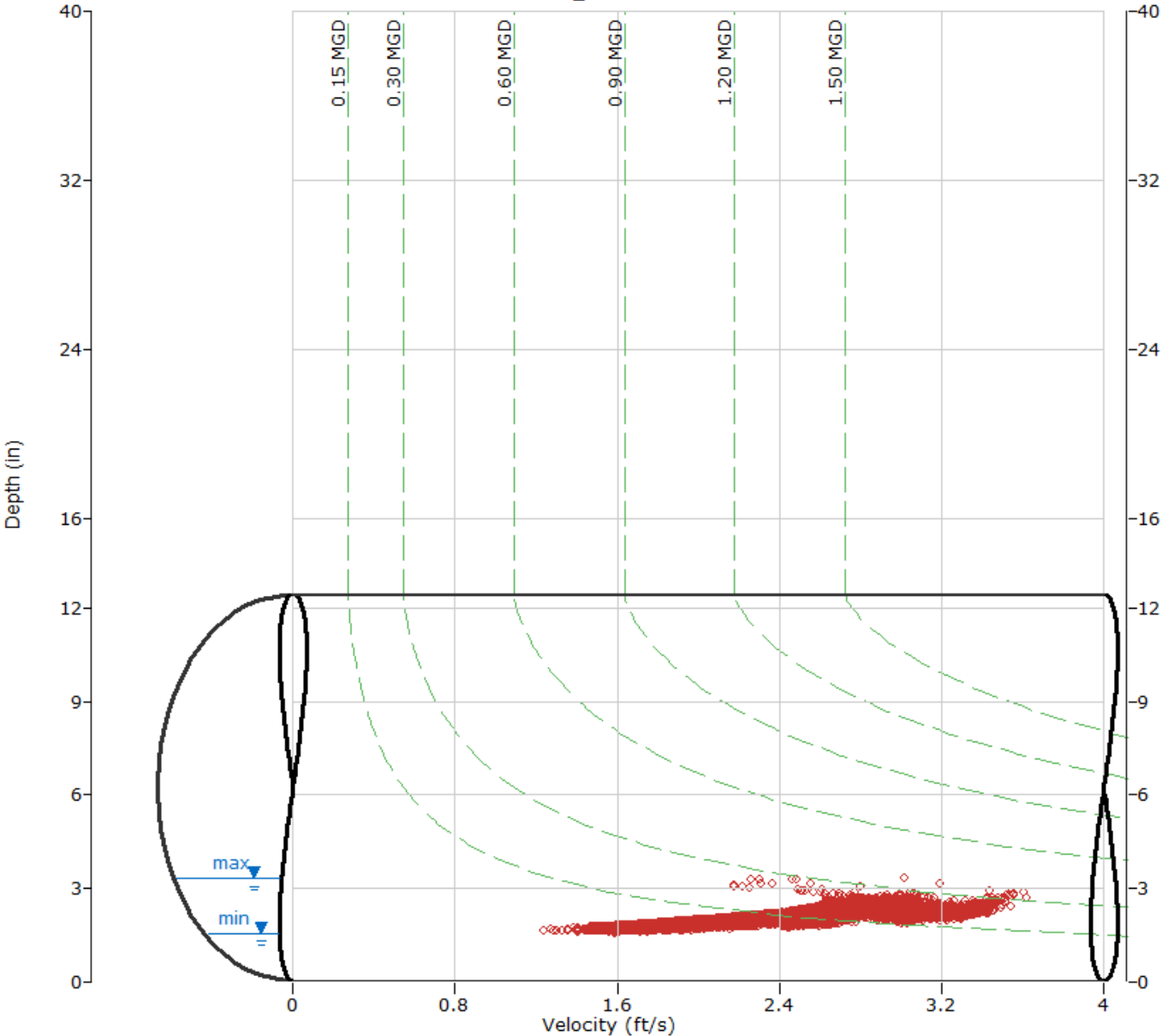
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_2334

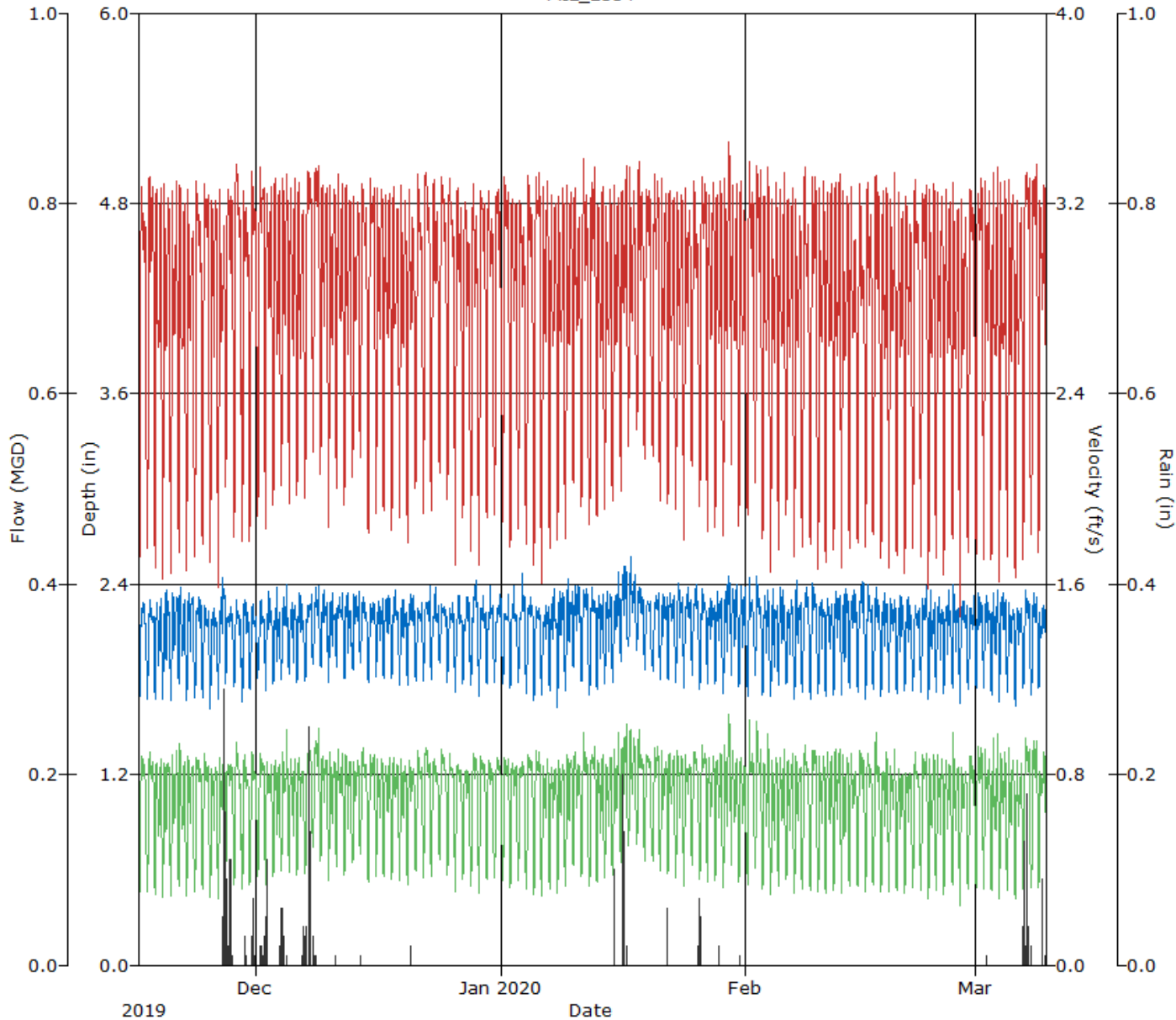
Flow Monitor
MIL_2334

Pipe Height
12.50 in

Report Period
11/16/2019
To
3/9/2020

Legend
— Depth
— Velocity
— Quantity
— Rain

ADS ENVIRONMENTAL
SERVICES



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	
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	
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	
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	
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	
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	1

1412

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	
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	
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	

Item # 16.

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

Item # 16.

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 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



Site Name

Item # 16.

MIL_2491

Site Address /Location: N Milpitas Blvd and E Calaveras Blvd, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: Drive

Latitude:

37.433991

Longitude:

-121.900388

Pipe Size (H x W)

15.0" x 15.0"

Pipe Shape

Circular

Manhole #

2491

System Characteristics

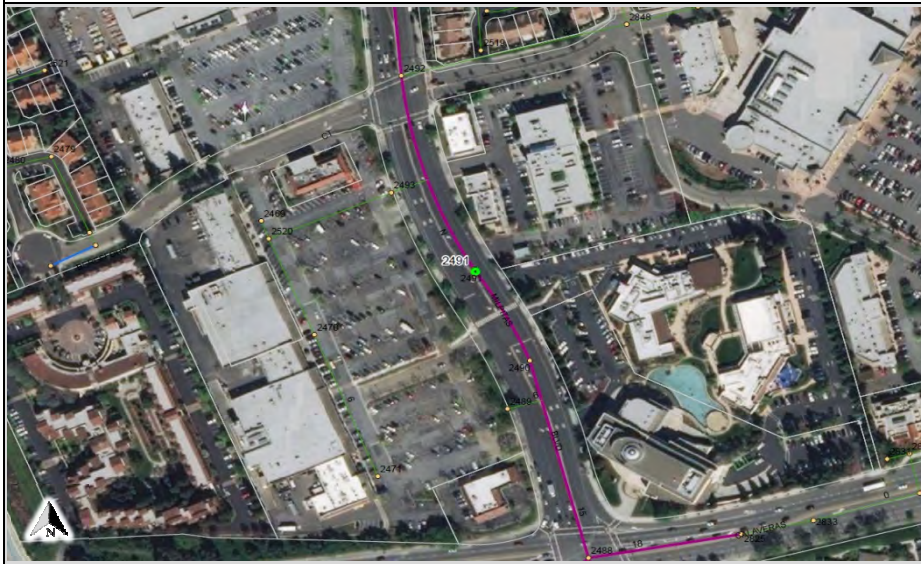
Residential/Commercial

Access

Drive

Traffic

Heavy



Installation Information

Installation Date:

Wednesday, November 13, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

9:04:37 AM

Pipe Size (HxW)

15.0" x 15.0"

Depth of Flow (Wet DOF) (in)

3.25"

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

3.74

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

Good flow, Moderate depth and velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

10'

Manhole Configuration

Single

Manhole Material:

Vitrified Clay Pipe

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

PVC

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1416



ADS Project Name: Milpitas.WWTFM.CA19-20

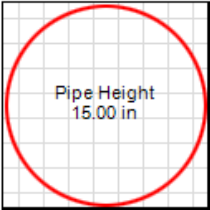
ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_2491

Flow Monitor

MIL_2491



Pipe Height
15.00 in.

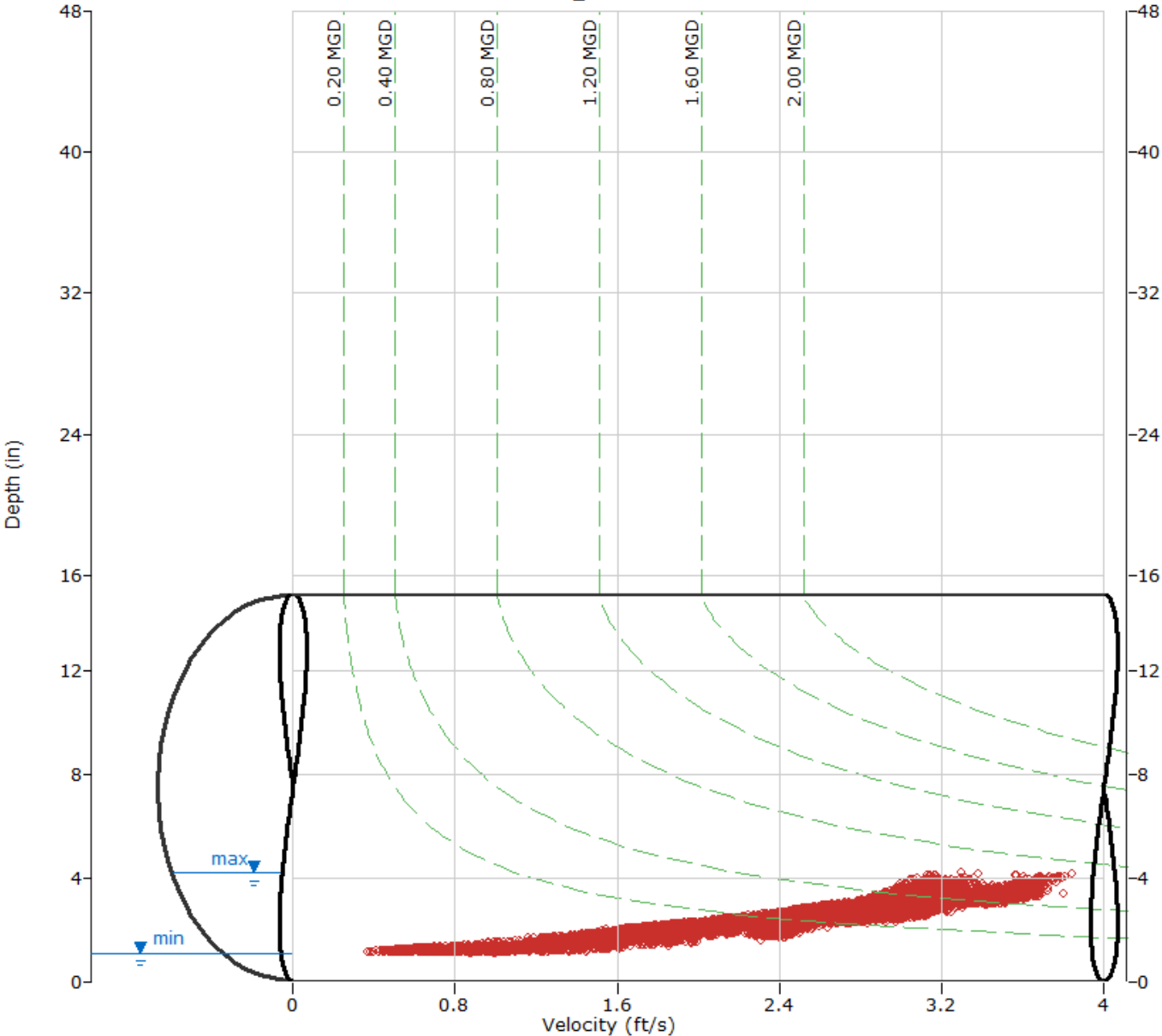
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

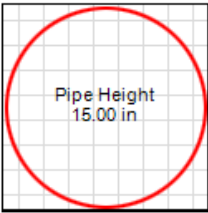
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_2491

Flow Monitor

MIL_2491



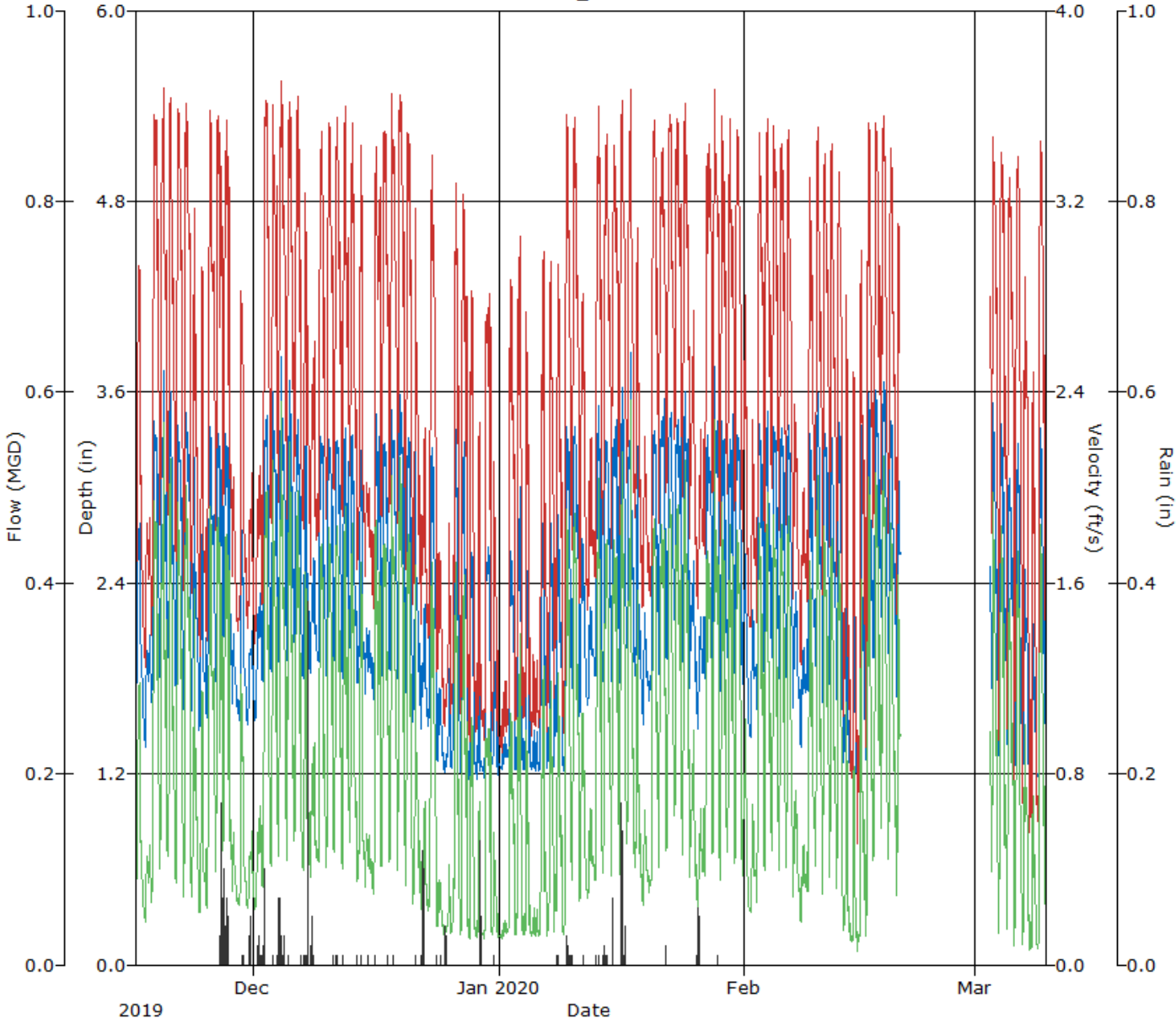
Pipe Height
15.00 in.

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	
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	
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	
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	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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																	

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_2569

Site Address /Location: Milpitas Blvd and Tramway Dr

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details:

Drive

Latitude:

37.440801

Longitude:

-121.9044

Pipe Size (H x W)

21.0" x 21.0"

Pipe Shape

Circular

Manhole #

2569

System Characteristics

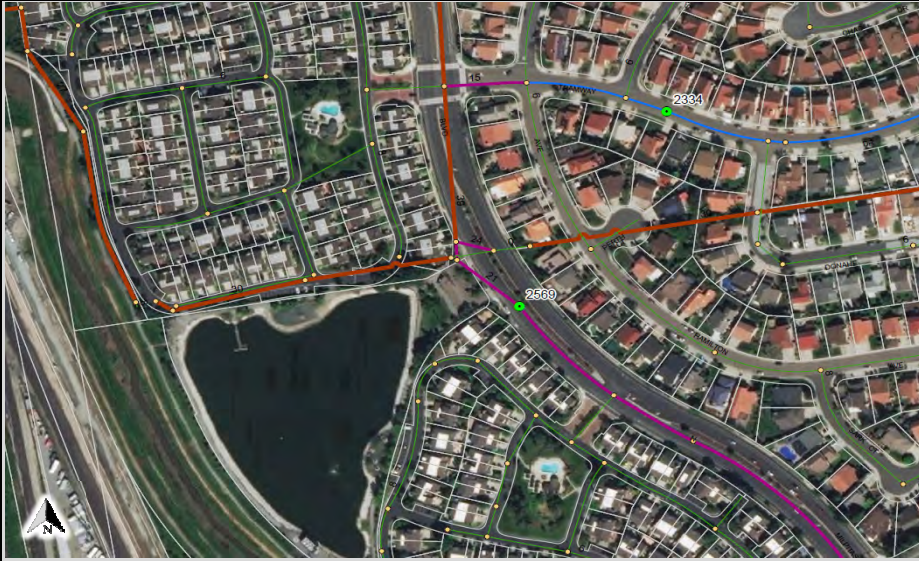
Residential/Commercial

Access

Traffic

Drive

Medium



Installation Information

Installation Date:

Wednesday, November 13, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

8:15:00 AM

Pipe Size (HxW)

21.0" x 21.0"

Depth of Flow (Wet DOF) (in)

7.5"

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.26

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

Smooth good flow, Medium depth and velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

10'

Manhole Configuration

Single

Manhole Material:

Vitrified Clay Pipe

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

PVC

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1423



ADS Project Name: Milpitas.WWTFM.CA19-20

ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_2569

Flow Monitor

MIL_2569

Pipe Height
21.00 in

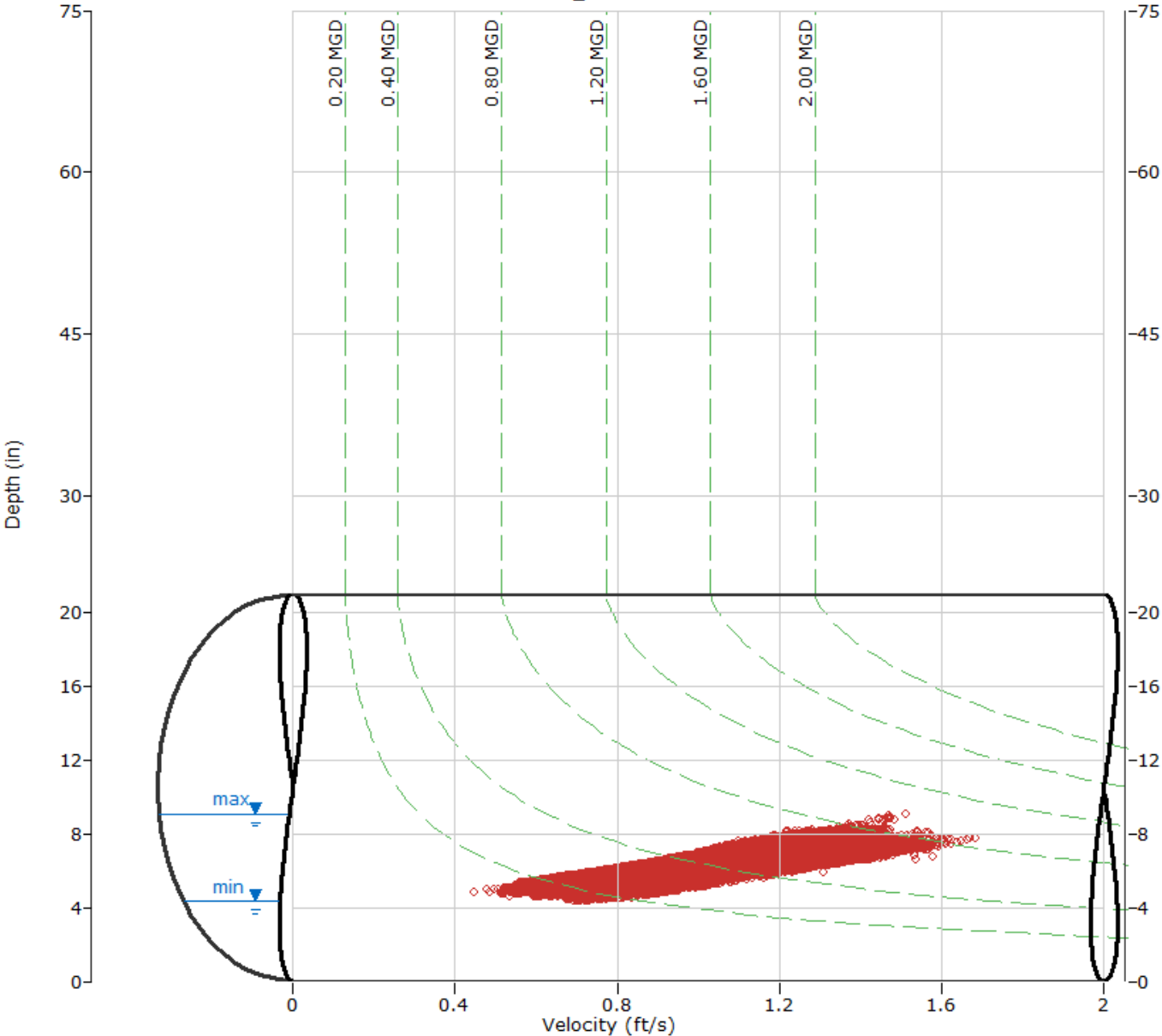
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

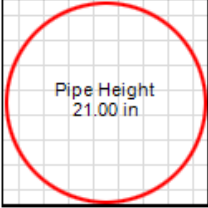
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_2569

Flow Monitor

MIL_2569



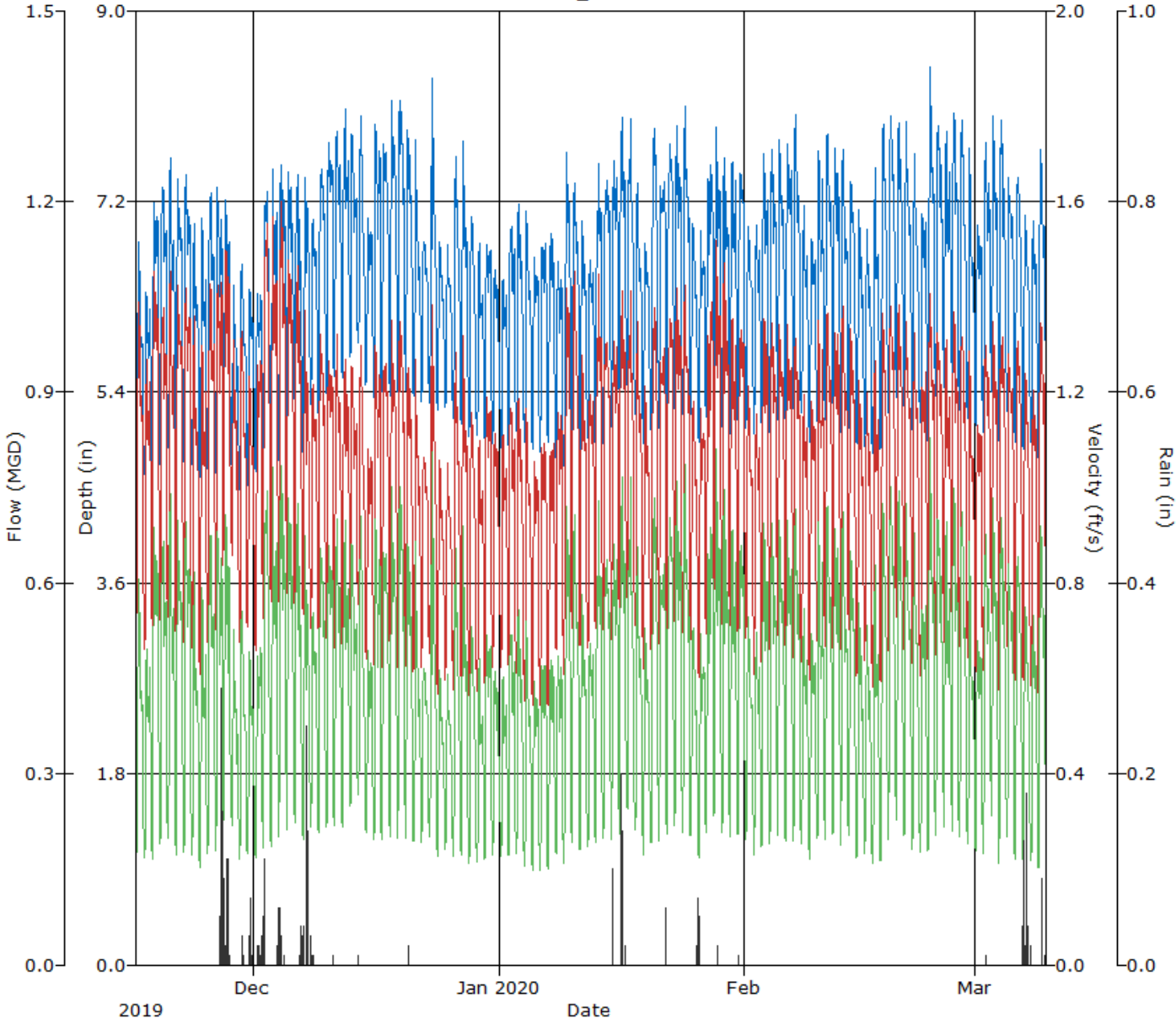
Pipe Height
21.00 in

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	
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	
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	
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	
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	
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	
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	1426

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Item # 16.	
	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	
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	
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	

Item # 16.

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	0.01
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	
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	0.58
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	
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

Item # 16.

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 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. Surge 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_2666

Site Address /Location: California Cir and Cadillac Court, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: Drive

Latitude:

37.449182°

Longitude:

-121.919254°

Pipe Size (H x W)

17.88" x 17.88"

Pipe Shape

Circular

Manhole #

2666

System Characteristics

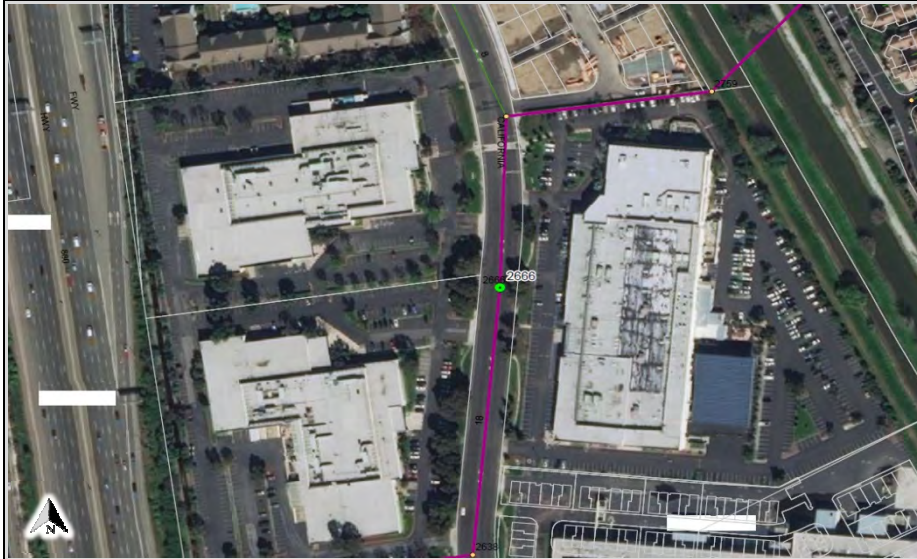
Residential/Commercial

Access

Drive

Traffic

Medium



Installation Information

Installation Date:

Tuesday, November 12, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

4:33:04 AM

Pipe Size (HxW)

17.88" x 17.88"

Depth of Flow (Wet DOF) (in)

6.25"

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.58

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

good flow, medium depth and velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

9'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

PVC

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1430

ADS Project Name: Milpitas.WWTFM.CA19-20

133

ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_2666

Flow Monitor

MIL_2666

Pipe Height
17.88 in

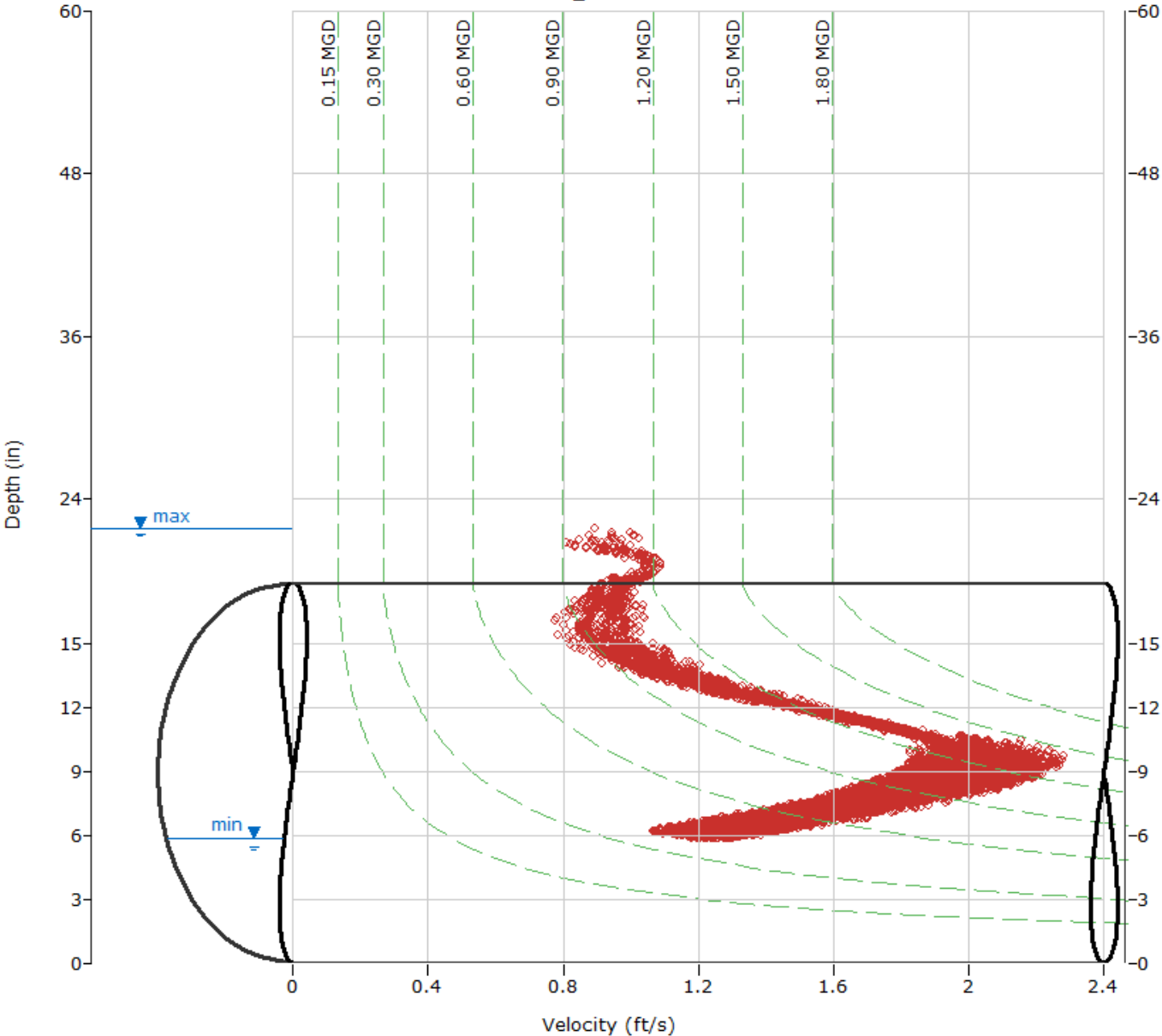
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

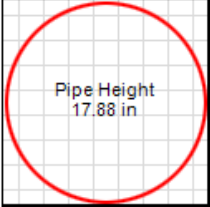
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_2666

Flow Monitor

MIL_2666

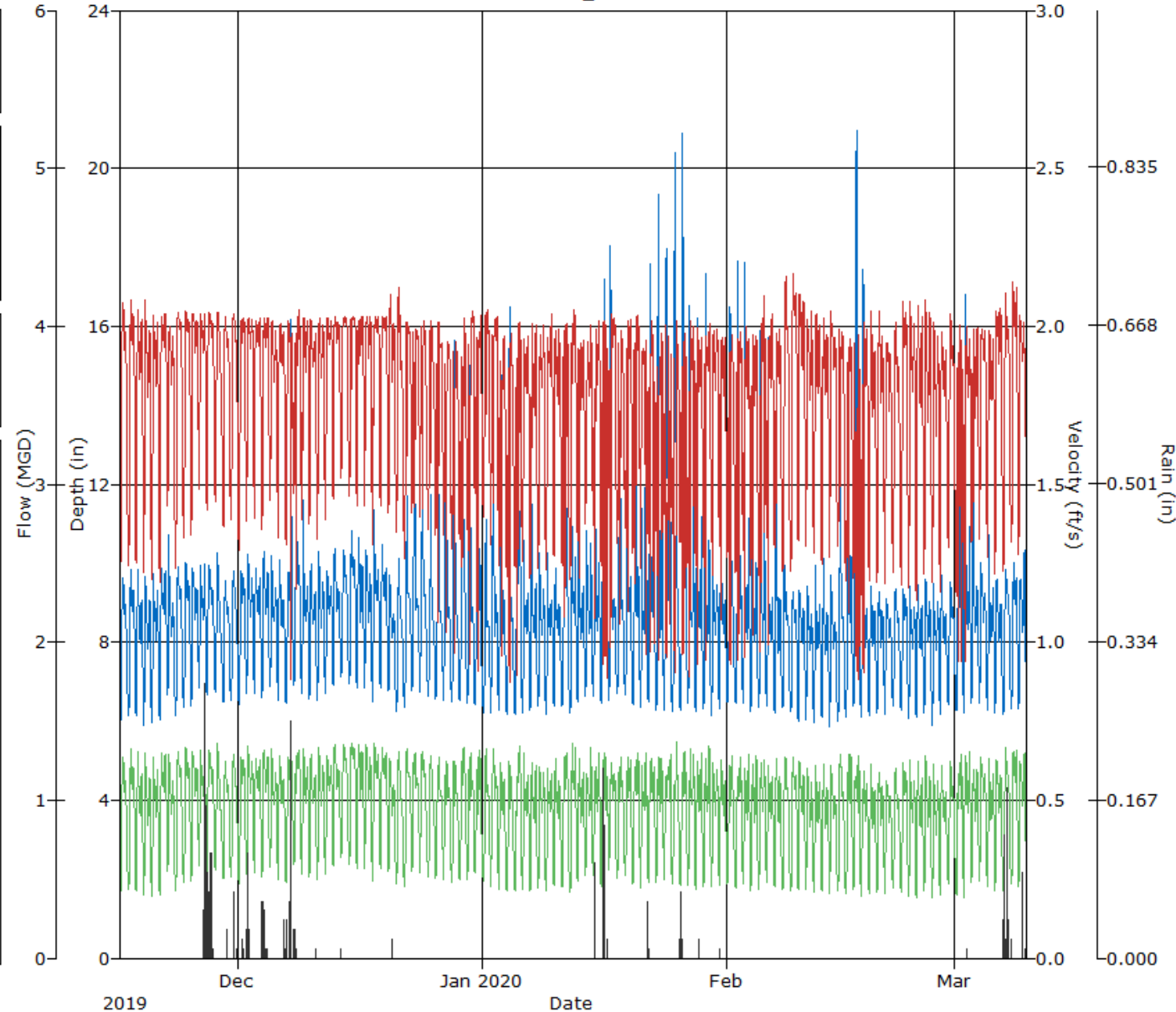


Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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								1	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	0.01
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	
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	0.58
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	
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

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_2721

Site Address /Location: 1545 N Milpitas Blvd

Monitor Series

TRITON+

Location Type

Temporary

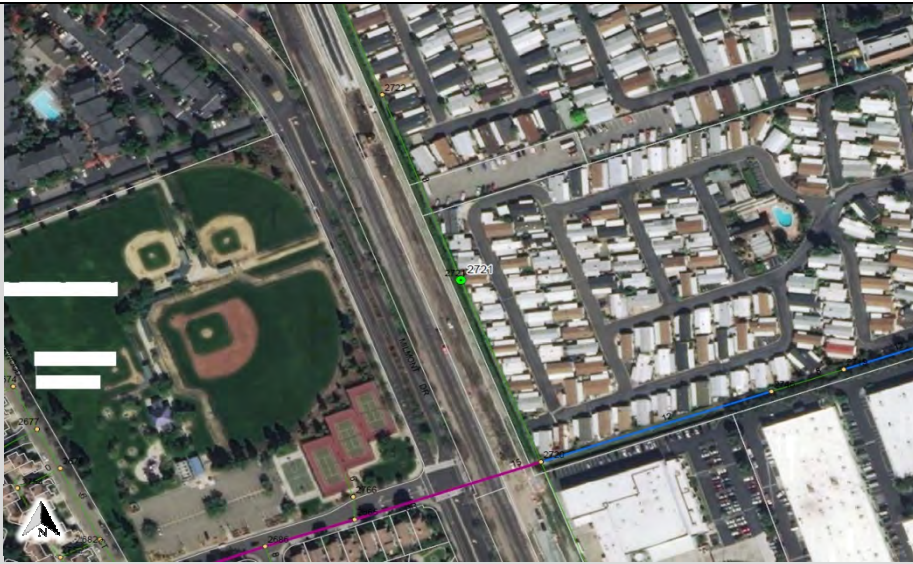
Site Access Details: Gate access. Need hip waders to cross stream.

Latitude:
Longitude:

37.452946°
-121.914112°

Pipe Size (H x W)
8.0" x 8.0"

Pipe Shape
Circular



Manhole #

2721

System Characteristics

Residential

Access

Traffic

Drive

Light



Installation Information

Installation Date:

Friday, November 15, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

9:56:00 AM

Pipe Size (HxW)

8.0" x 8.0"

Depth of Flow (Wet DOF) (in)

5.50"

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.7

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

Good flow medium depth and velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

6'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

PVC

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1437

ADS Project Name: Milpitas.WWTFM.CA19-20

ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_2721

Flow Monitor

MIL_2721

Pipe Height
8.00 in

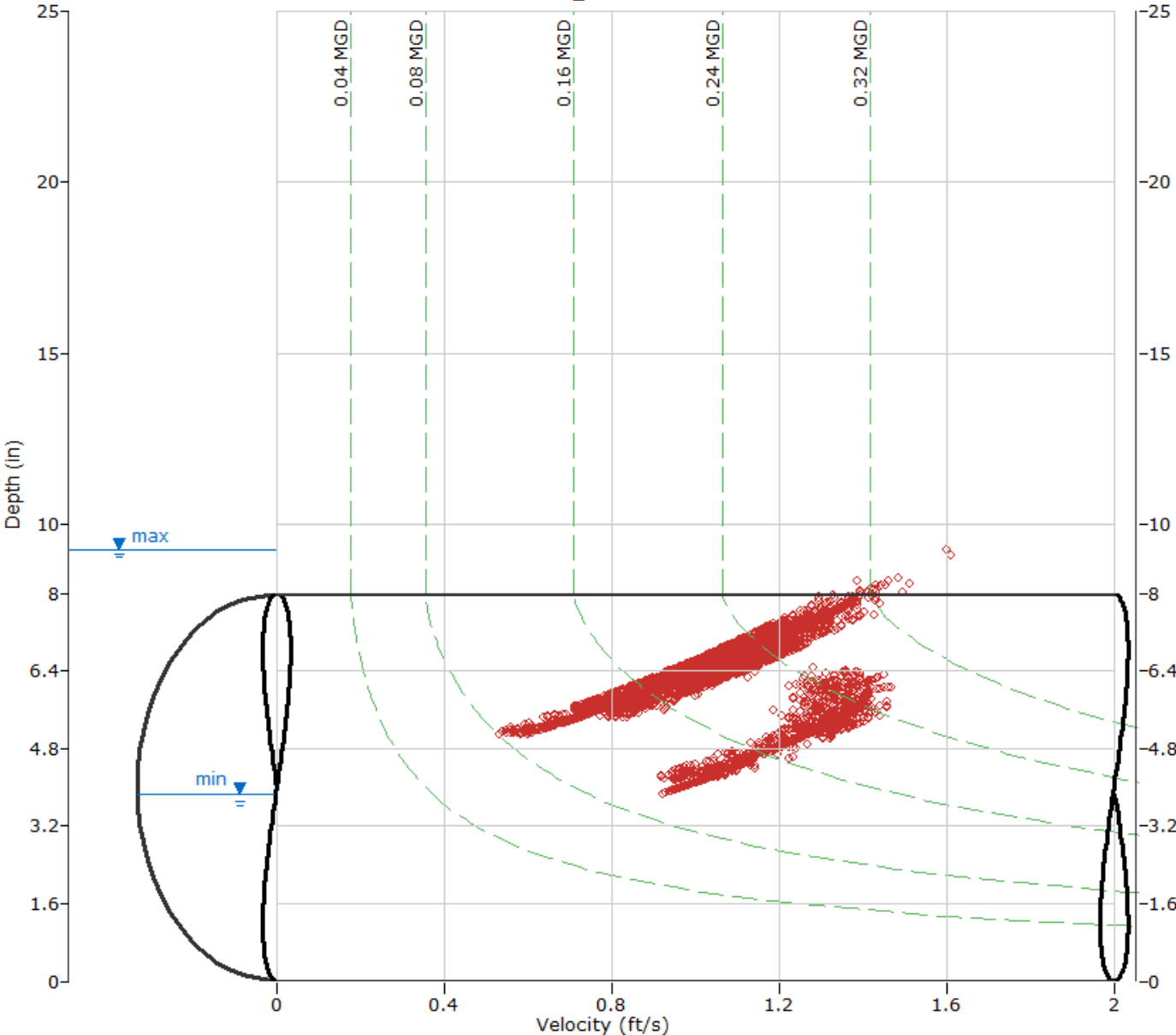
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

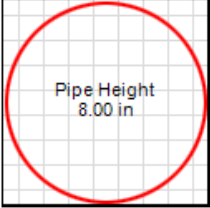
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_2721

Flow Monitor

MIL_2721



Pipe Height
8.00 in

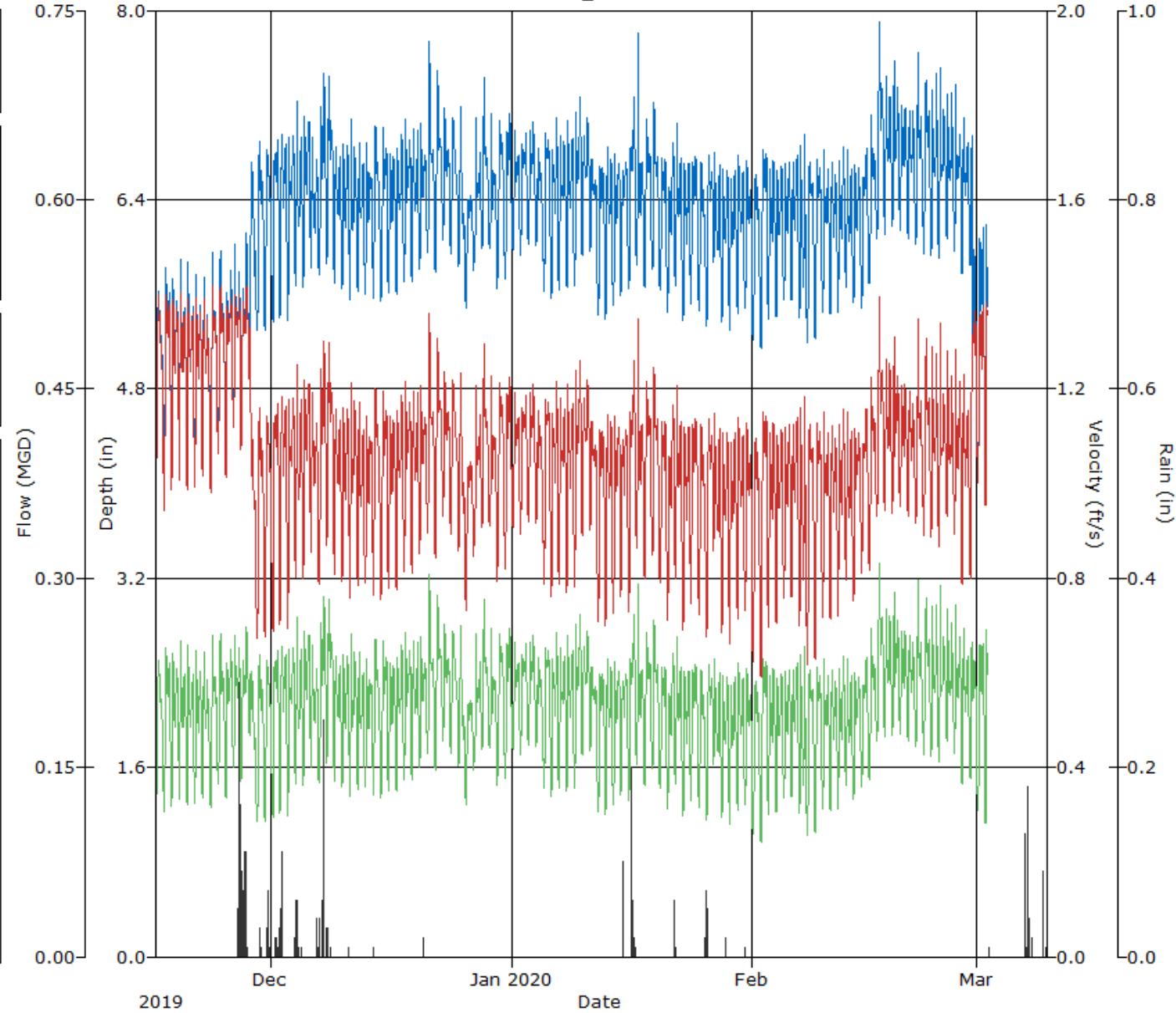
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain

ADS ENVIRONMENTAL SERVICES



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	0.05
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	
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	0.44
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	
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	0.06
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	
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	0.01
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	
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	0.01
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	0.02
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	0.02
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	0.02
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	0.02
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	0.02
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	0.02
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	0.02
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	0.02
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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Item # 16.	
	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	0.10 0.66
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	
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	
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	
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	
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	
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	
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	
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		

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

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_2724

Site Address /Location: California Cir and Cadillac Court, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details:

Drive

Latitude:

37.446644°

Longitude:

-121.918485°

Pipe Size (H x W)

39.88" x 40.50"

Pipe Shape

Circular

Manhole #

2724

System Characteristics

Residential/Commercial

Access

Drive

Traffic

Light



Installation Information

Installation Date:

Tuesday, November 12, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

5:37:34 AM

Pipe Size (HxW)

39.88" x 40.50"

Depth of Flow (Wet DOF) (in)

14.00"

Range (Air DOF) (in)

0.00"

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

0.89

Velocity Sensor Offset (in)

0"

Silt (in)

0"

Silt Type

Hydraulic Comments:

Ok flow, Deep and slow

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

20'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

PVC

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Manhole Pick / Vent Hole

Additional Site Info. / Comments:

1444



ADS Project Name: Milpitas.WWTFM.CA19-20

147

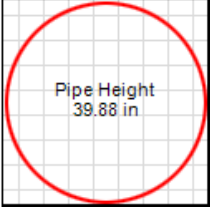
ADS Project Number: 22431

SCATTERGRAPH REPORT

MIL_2724

Flow Monitor

MIL_2724



Pipe Height
39.88 in

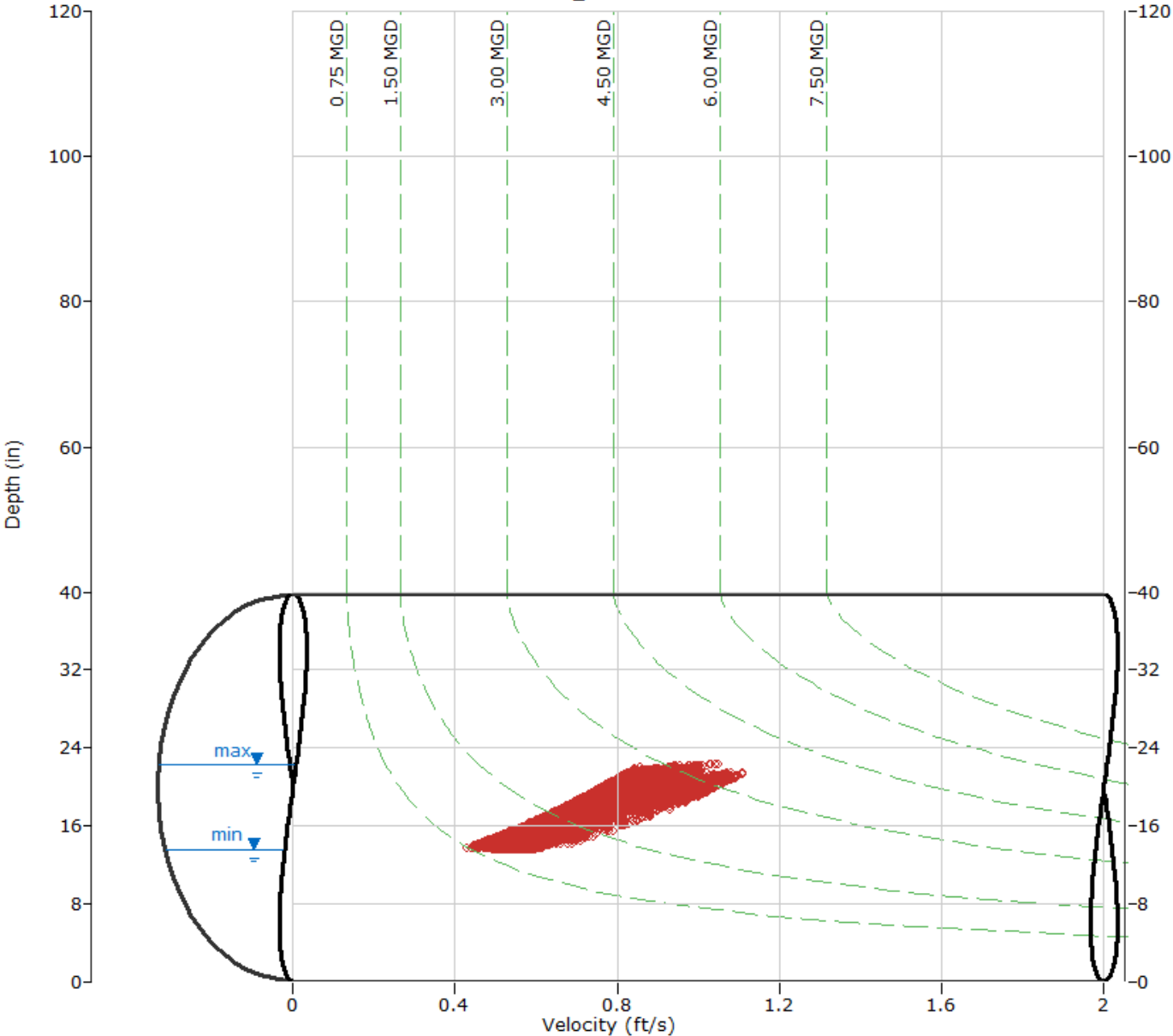
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

ADS ENVIRONMENTAL SERVICES

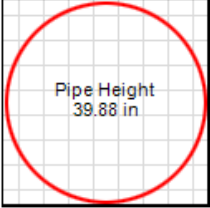


HYDROGRAPH REPORT

MIL_2724

Flow Monitor

MIL_2724



Pipe Height
39.88 in

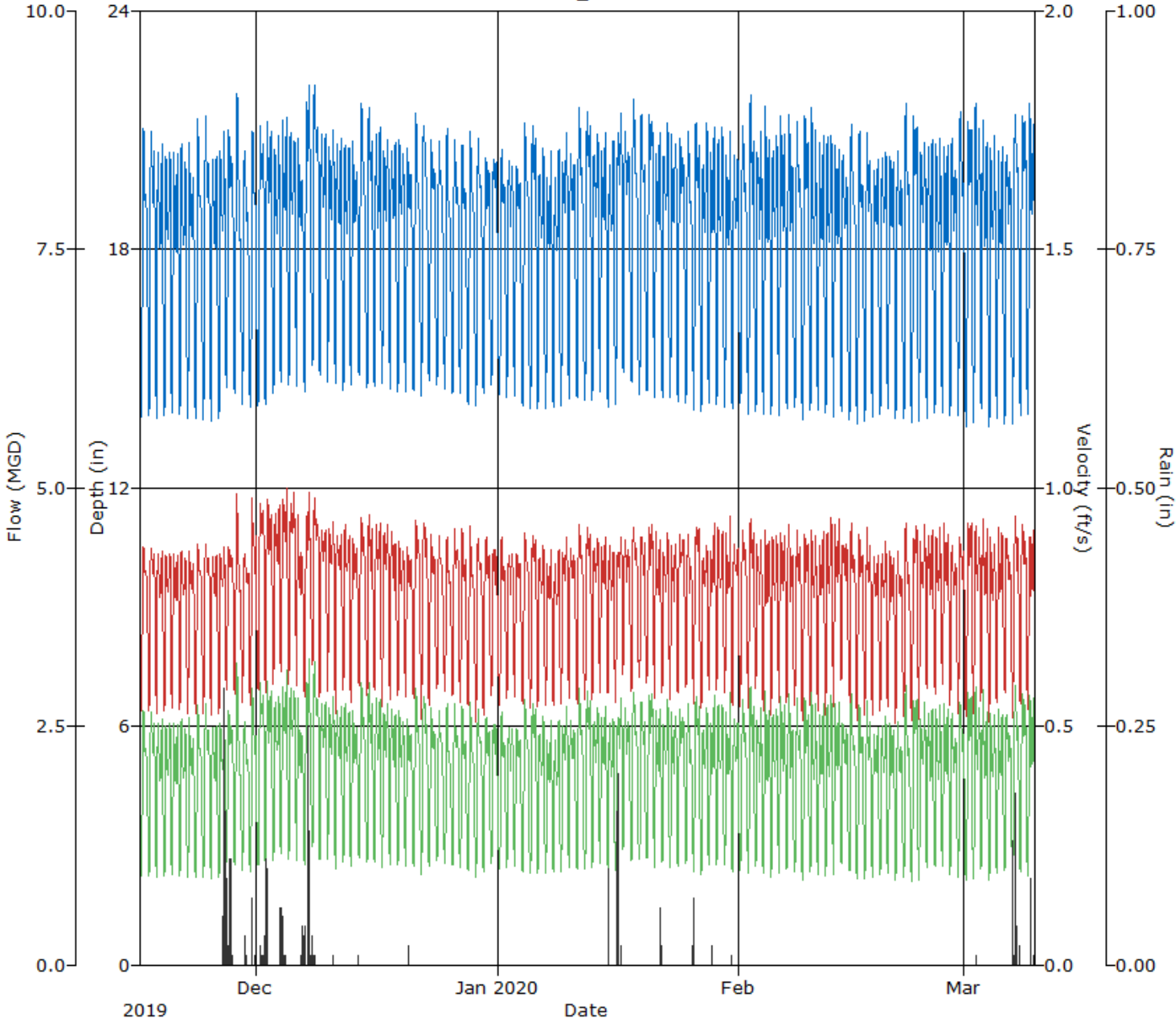
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain

ADS ENVIRONMENTAL SERVICES



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	

1447

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	0.01
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	
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	0.58
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	
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

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_2808

Site Address /Location: N McCarthy Blvd and Ranch Dr, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.433534°

Pipe Size (H x W)

36.00"x36.00"

Pipe Shape

Circular

Longitude:

-121.922138°

Manhole #

2808

System Characteristics

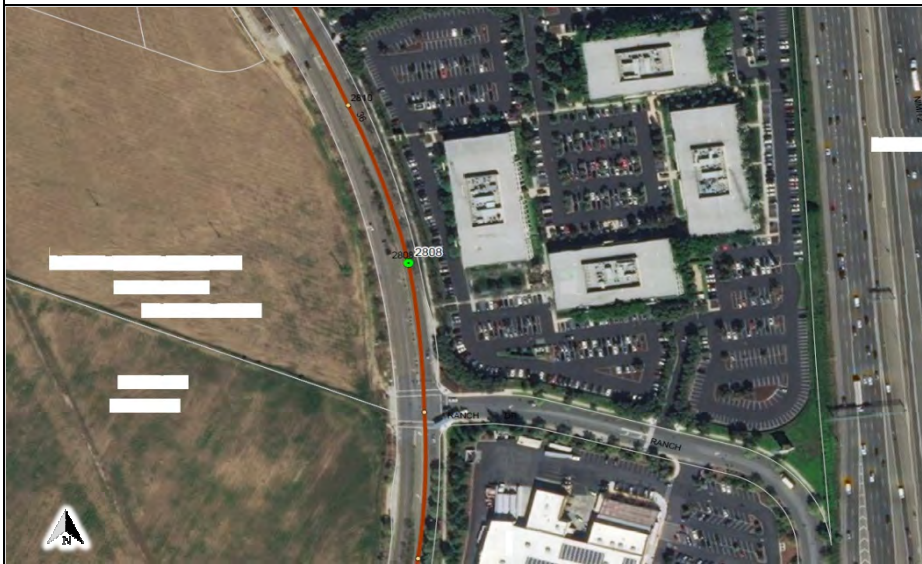
Residential/Commercial

Access

Drive

Traffic

Heavy



Installation Information

Installation Date:

Wednesday, November 13, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

12:08:00 AM

Pipe Size (HxW)

36.00"x36.00"

Depth of Flow (Wet DOF) (in)

11.25"

Range (Air DOF) (in)

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

2.45'

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Smooth flow with deep depth and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

12'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

1451

ADS Project Name: Milpitas.WWTFM.CA2019-2020

ADS Project Number: 22431.11.325

SCATTERGRAPH REPORT

MIL_2808

Flow Monitor
MIL_2808

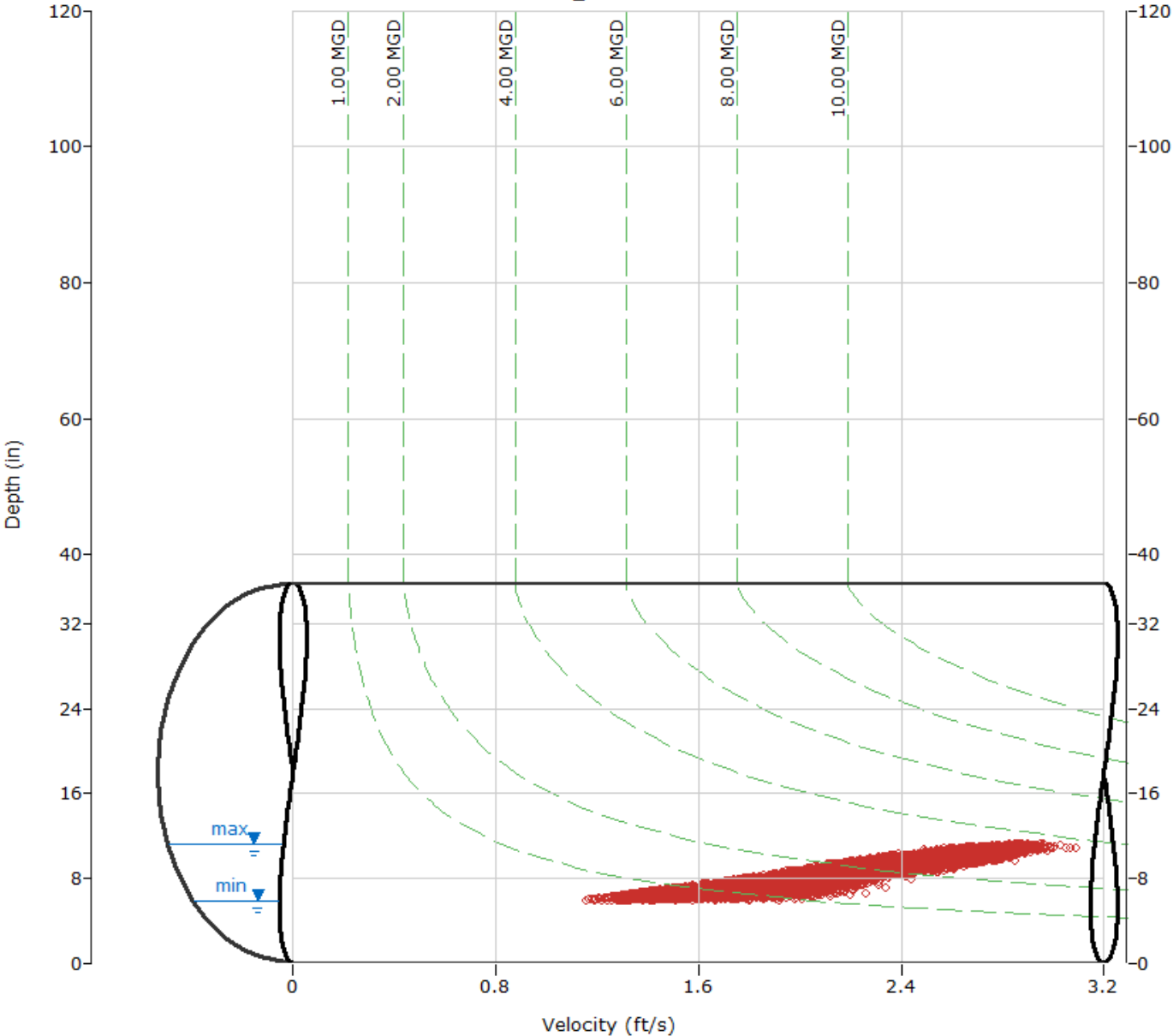
Pipe Height
36.00 in

Report Period
11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

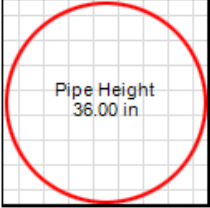
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_2808

Flow Monitor

MIL_2808



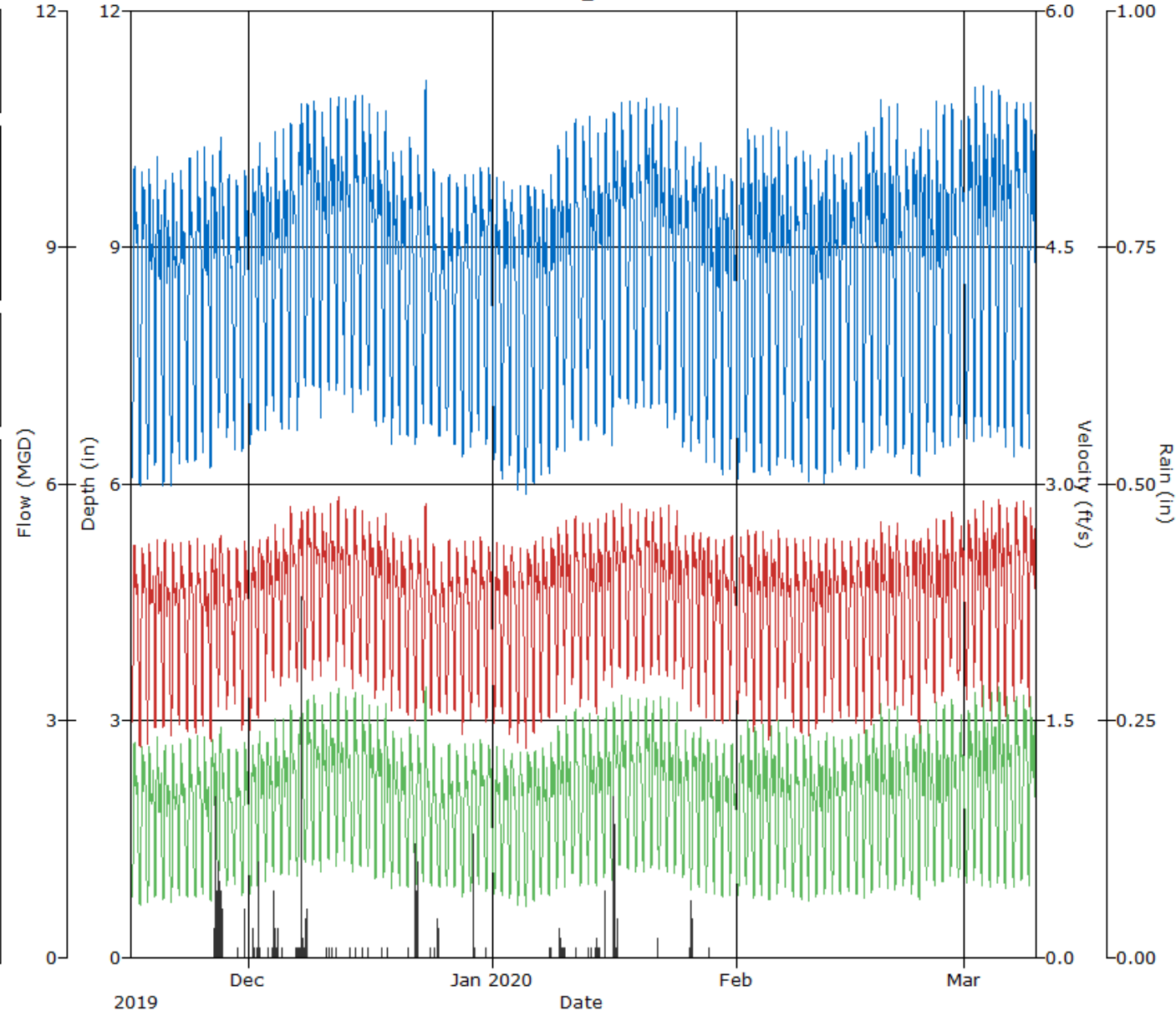
Pipe Height
36.00 in

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	

Item # 16.

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 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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_2840

Site Address /Location: S Abel St and Curtis Ave, Milpitas, CA

Monitor Series

TRITON+

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.433982°

Longitude:

-121.891547°

Pipe Size (H x W)

15.00"x15.00"

Pipe Shape

Circular

Manhole #

2840

System Characteristics

Residential/Commercial

Access

Drive

Traffic

Heavy



West Outlet

East Inlet
(Sensor Location)

Installation Information

Installation Date:

Wednesday, November 13, 2019

Installation Type:

Doppler Standard Ring and Crank

Monitoring Location (Sensors):

Upstream 0-5 FT

Monitor Location:

Manhole

Sensors / Devices:

Peak Combo (CS4)

Pressure Sensor Range (psi)

0 - 5 psi

Installation Confirmation:

Confirmation Time:

11:04:00 AM

Pipe Size (HxW)

15.00"x15.00"

Depth of Flow (Wet DOF) (in)

2.00"

Range (Air DOF) (in)

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

0.25"

Peak Velocity (fps)

1.28'

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Smooth flow with shallow depth and moderate velocity

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

10'

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Unbolted

Manhole Frame

Normal

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Good

Communication Information:

Communication Type

Wireless

Antenna Location

Drilled Pavement / Concrete

Additional Site Info. / Comments:

1458

ADS Project Name: Milpitas.WWTFM.CA2019-2020

161

ADS Project Number: 22431.11.325

SCATTERGRAPH REPORT

MIL_2840

Flow Monitor

MIL_2840

Pipe Height
15.00 in

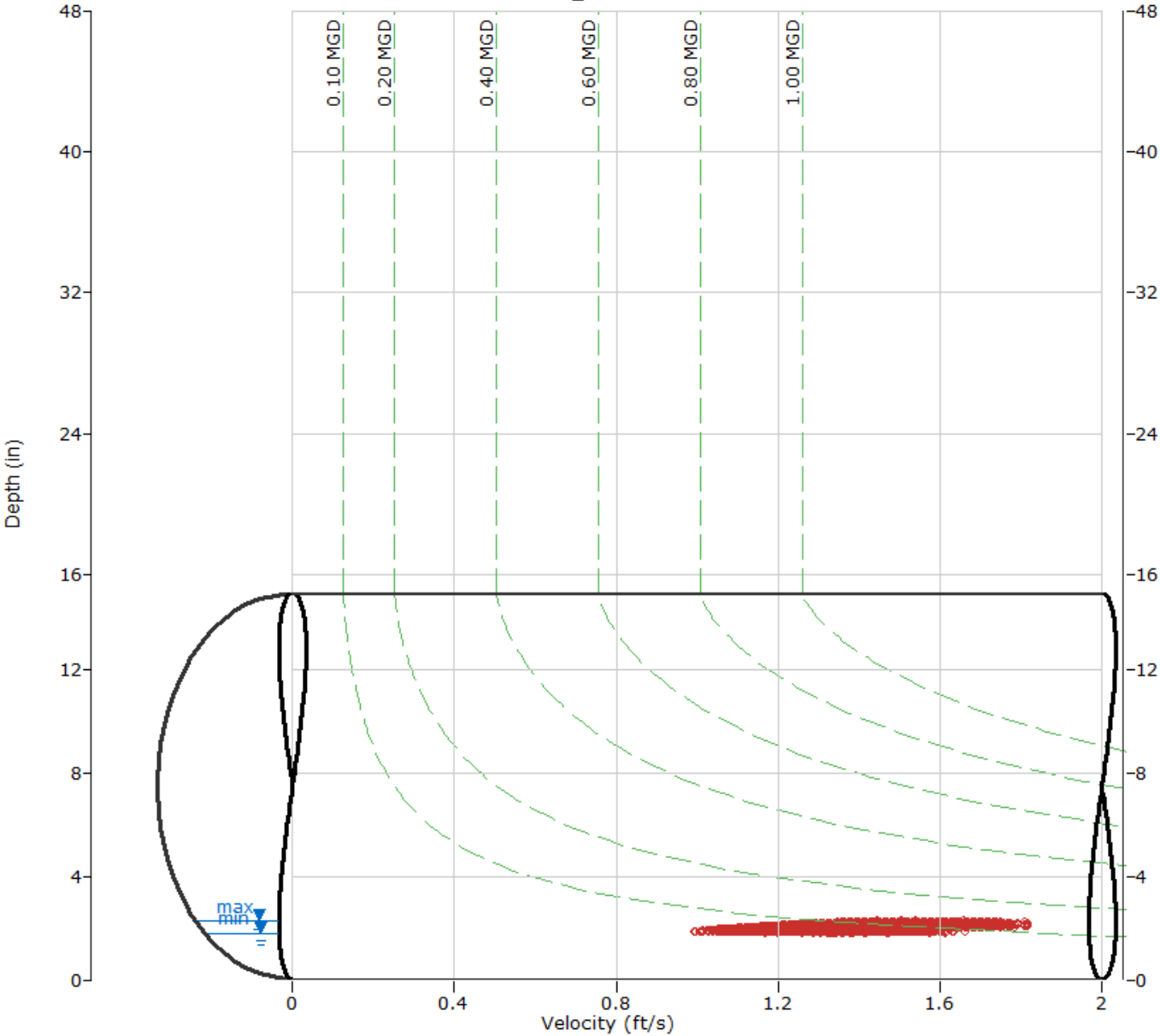
Report Period

11/16/2019
To
3/9/2020

Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth

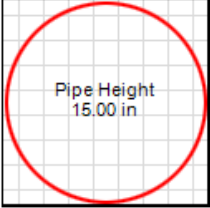
ADS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT
MIL_2840

Flow Monitor

MIL_2840



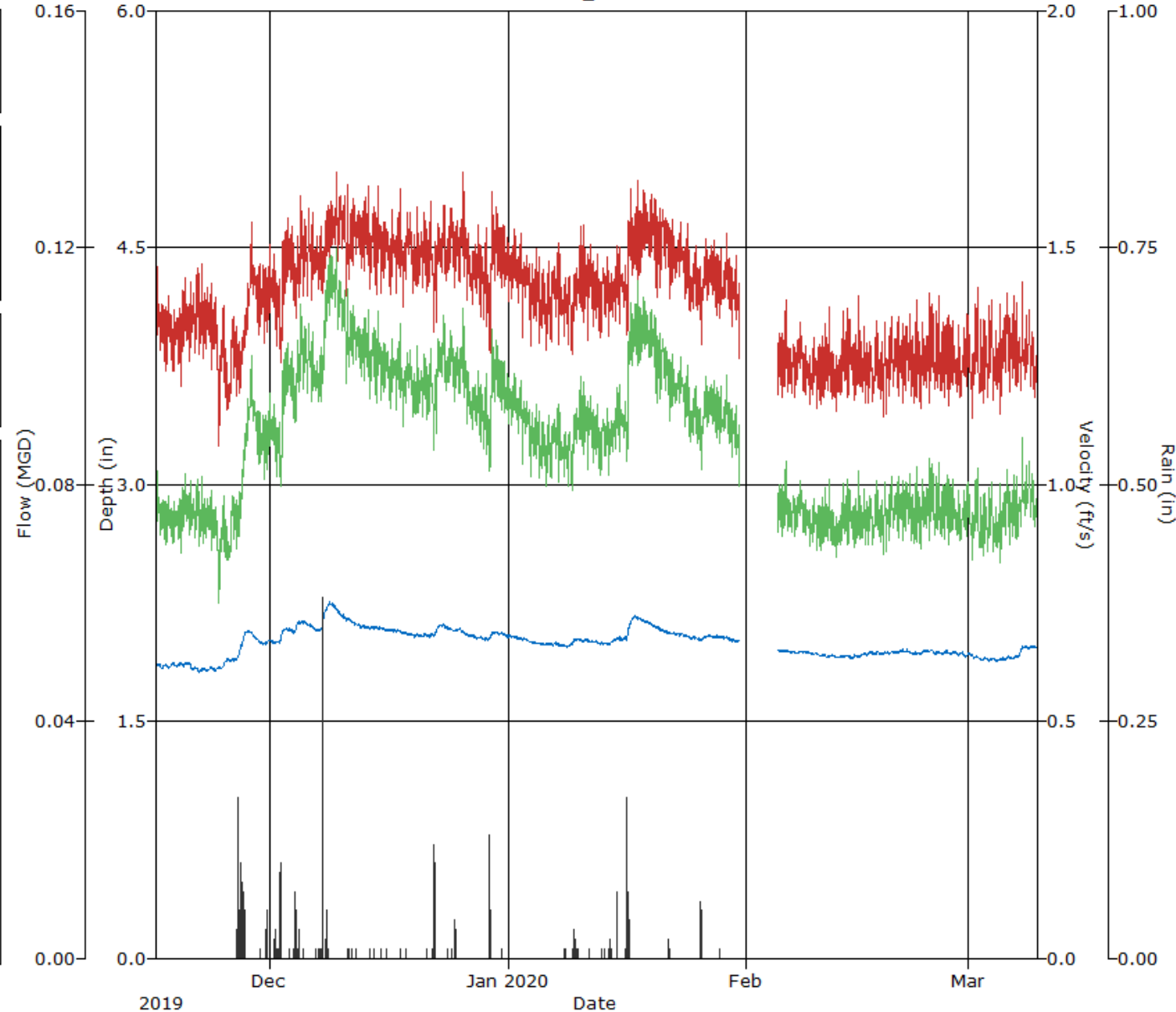
Pipe Height
15.00 in.

Report Period

11/16/2019
To
3/9/2020

Legend

- Depth
- Velocity
- Quantity
- Rain



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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	1
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	

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Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Item # 16.	
	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	

Item # 16.

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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	

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



Site Name

Item # 16.

Flow Monitoring Site Report

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

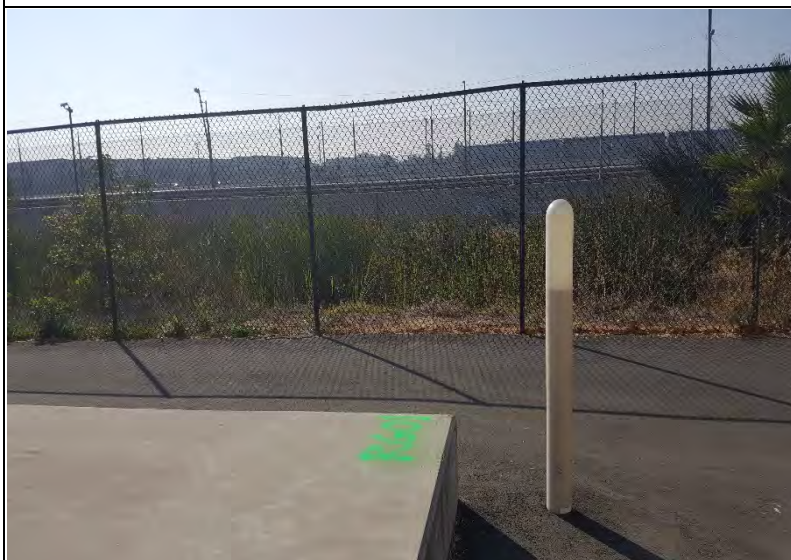
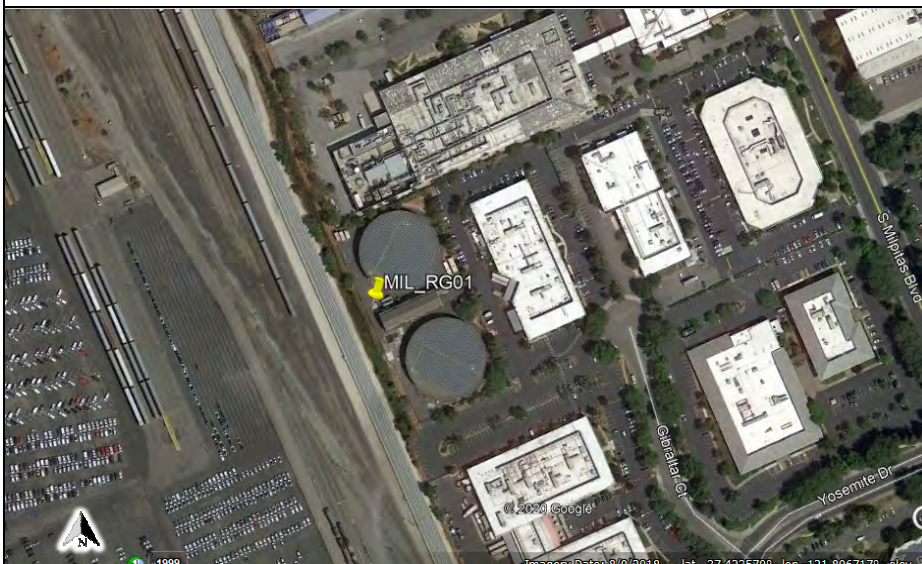
Commercial

Access

Traffic

Drive

Light



Installation Information

Installation Date:

Friday, November 15, 2019

Installation Type:

Rain Gauge

Monitoring Location (Sensors):

Field

Monitor Location:

Building

Sensors / Devices:

Rain Gauge Tipping Bucket

Pressure Sensor Range (psi)

Installation Confirmation:

Confirmation Time:

Pipe Size (HxW)

Depth of Flow (Wet DOF) (in)

Range (Air DOF) (in)

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

Peak Velocity (fps)

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Manhole Frame

Active Drop Connections

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Communication Information:

Communication Type

Wireless

Antenna Location

Additional Site Info. / Comments:

Need key to access.

1465

ADS Project Name: Milpitas.WWTFM.CA2019-2020

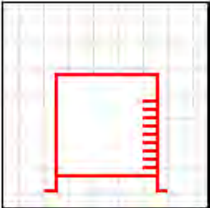
168

ADS Project Number: 22431.11.325



HYDROGRAPH REPORT
MIL_RG01

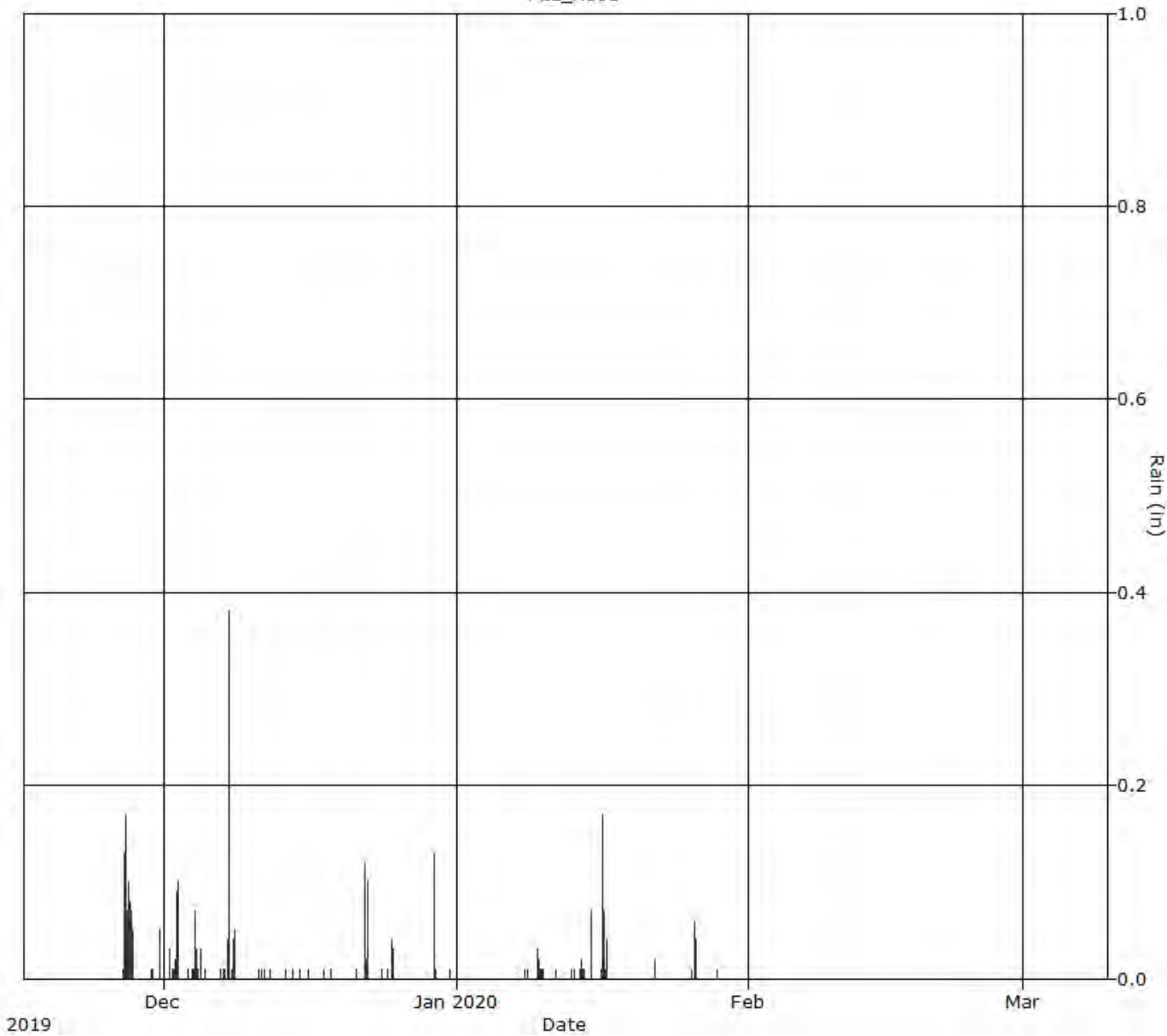
Rain Gauge
MIL_RG01



Report Period
11/16/2019
To
3/9/2020

Legend
— Rain

ADS ENVIRONMENTAL SERVICES



Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59

MIL_RG01 , Silt: --

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																	

1467

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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																	
																1468	

Item # 16.

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																	

Item # 16.

Report Summary For The Period 11/16/2019 00:00 - 03/09/2020 23:59

	Rain (in)
Total	4.90
Avg	

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



Site Name

Item # 16.

Flow Monitoring Site Report

MIL_RG02

Site Address /Location: 1328 Tularcitos Drive, Milpitas, CA

Monitor Series

Rain Alert III

Location Type

Temporary

Site Access Details: DRIVE.

Latitude:

37.455939°

Longitude:

-121.875253°

Pipe Size (H x W)

Pipe Shape

Manhole #

System Characteristics

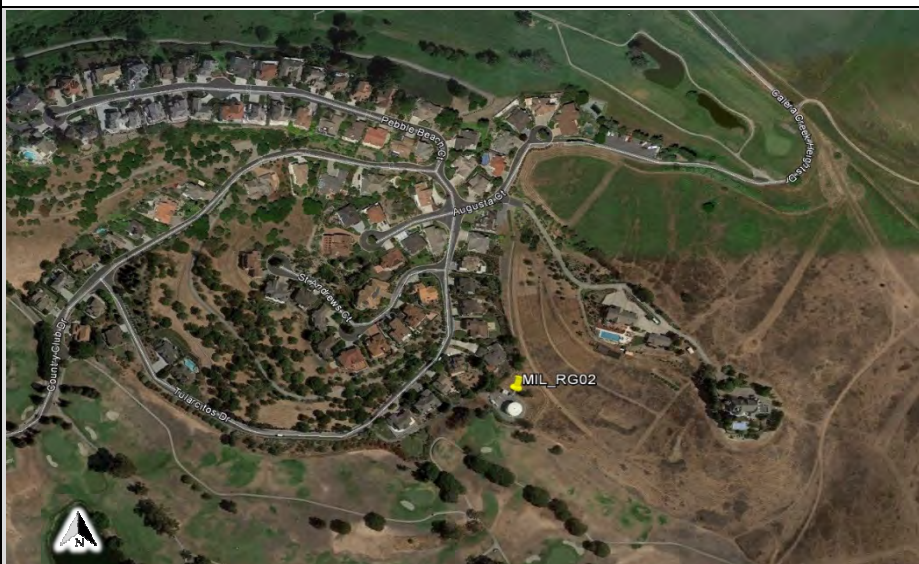
Commercial

Access

Traffic

Drive

Light



Installation Information

Installation Date:

Friday, November 15, 2019

Installation Type:

Rain Gauge

Monitoring Location (Sensors):

Field

Monitor Location:

Building

Sensors / Devices:

Rain Gauge Tipping Bucket

Pressure Sensor Range (psi)

Installation Confirmation:

Confirmation Time:

1:30:00 AM

Pipe Size (HxW)

Depth of Flow (Wet DOF) (in)

Range (Air DOF) (in)

Downlooker Physical Offset (in)

NA

Measurement Confidence (in)

Peak Velocity (fps)

Velocity Sensor Offset (in)

0"

Silt (in)

0.0"

Silt Type

Hydraulic Comments:

Manhole / Pipe Information:

Manhole Depth (Approx. FT):

Manhole Configuration

Single

Manhole Material:

Concrete

Manhole Condition:

Good

Manhole Opening Diameter (in)

26"

Manhole Diameter (Approx.):

54"

Manhole Cover

Manhole Frame

Active Drop Connections

No

Air Quality:

Normal

Pipe Material

Concrete

Pipe Condition:

Communication Information:

Communication Type

Wireless

Antenna Location

Additional Site Info. / Comments:

Tularcitos Pump Station. Needs passcode and key.

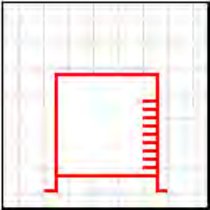
1471

ADS Project Name: Milpitas.WWTFM.CA2019-2020

ADS Project Number: 22431.11.325

HYDROGRAPH REPORT
MIL_RG02

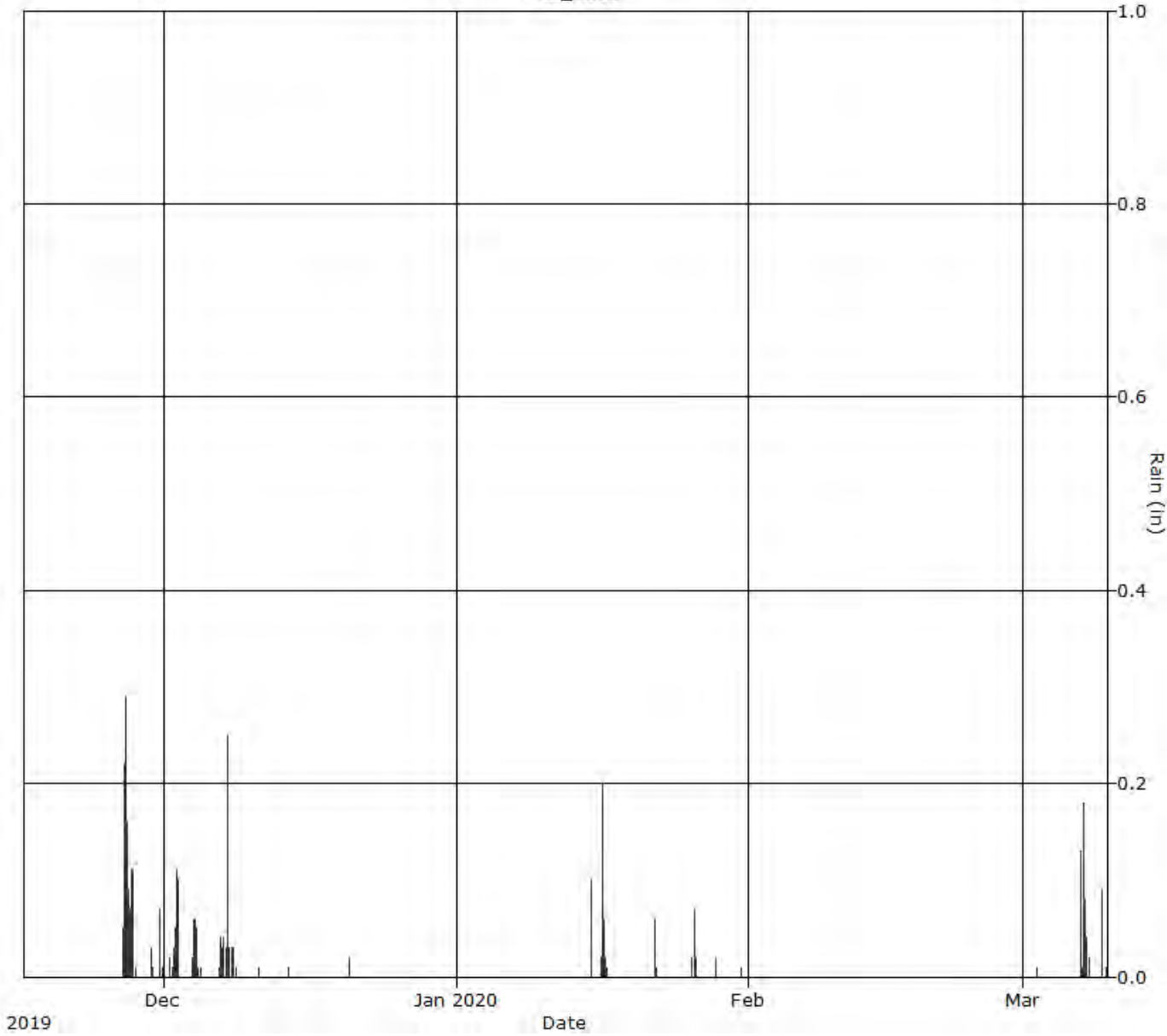
Rain Gauge
MIL_RG02



Report Period
11/16/2019
To
3/9/2020

Legend
— Rain

ADS ENVIRONMENTAL SERVICES



Daily Tabular Report For The Period 11/16/2019 00:00 - 03/09/2020 23:59

MIL_RG02 , Silt: --

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																	

1473

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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																	

Item # 16.

1474

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)					Rain	
	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	

Item # 16.

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.”

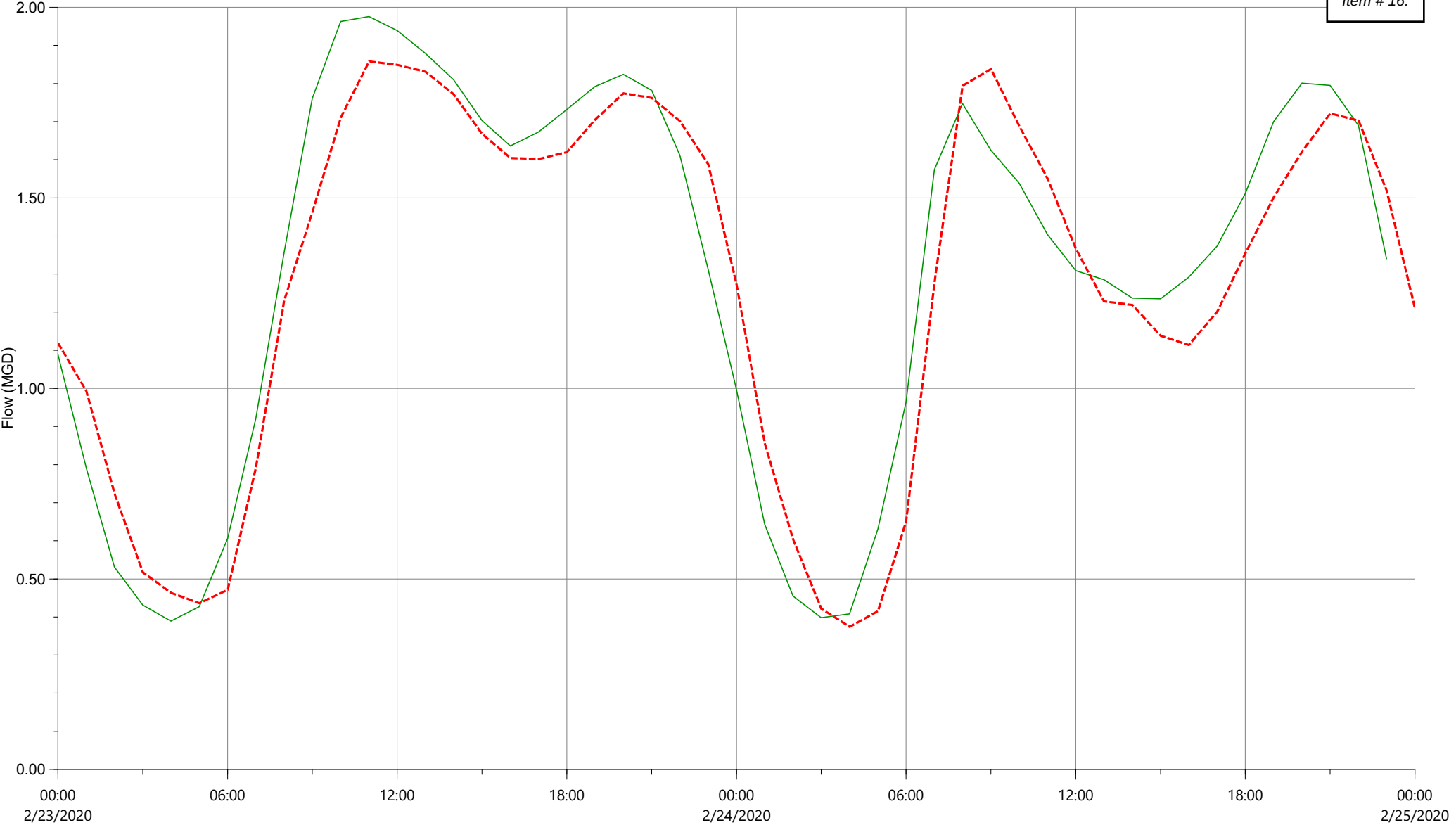
During the GIS update process, the update of model information for areas containing either flow splits or where critical information, such as pipe diameter, material, invert elevations, and year built, was missing was prioritized.

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

Item # 16.

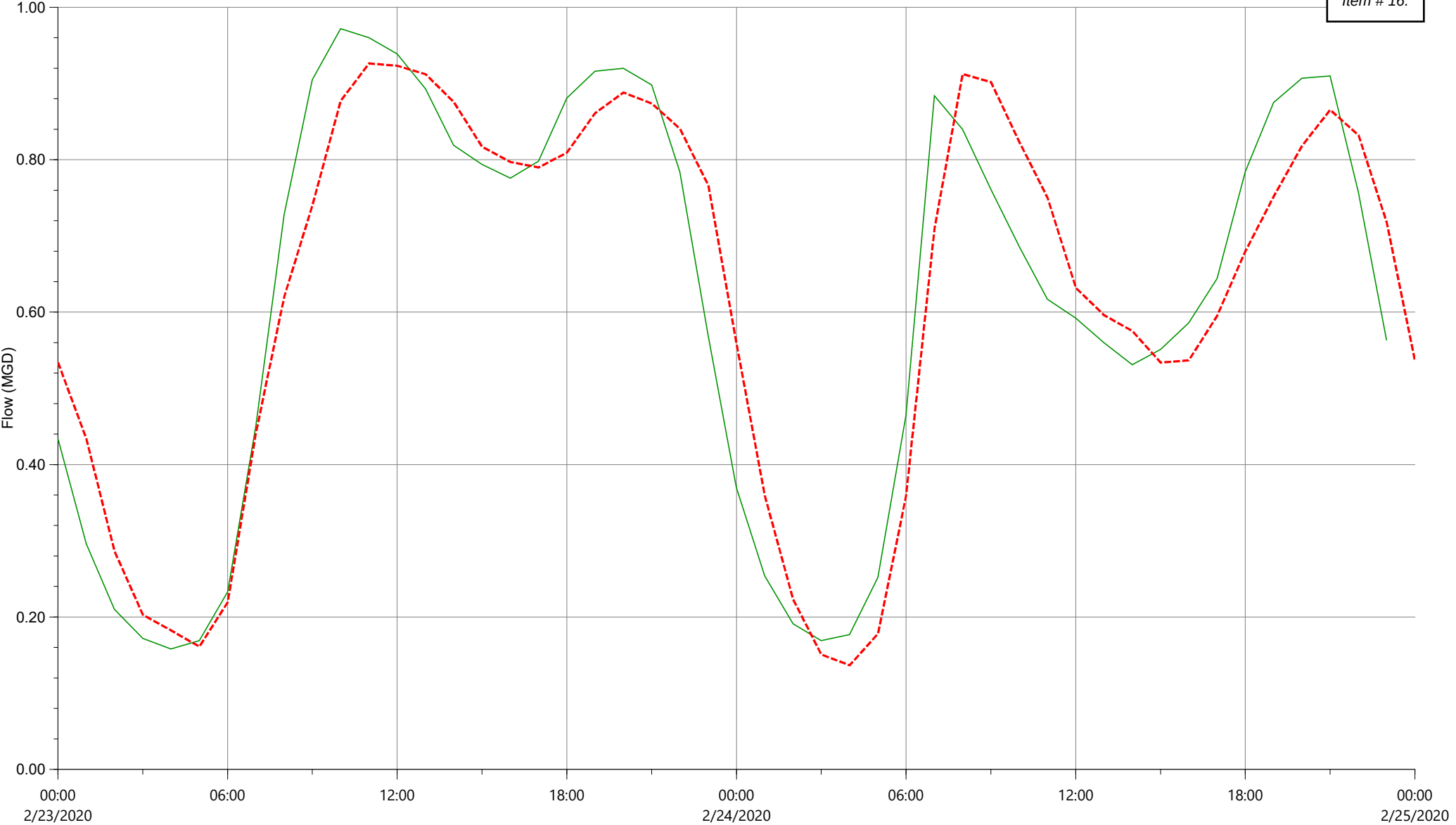


Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.389	1.976	2.570
0.374	1.858	2.572

Item # 16.



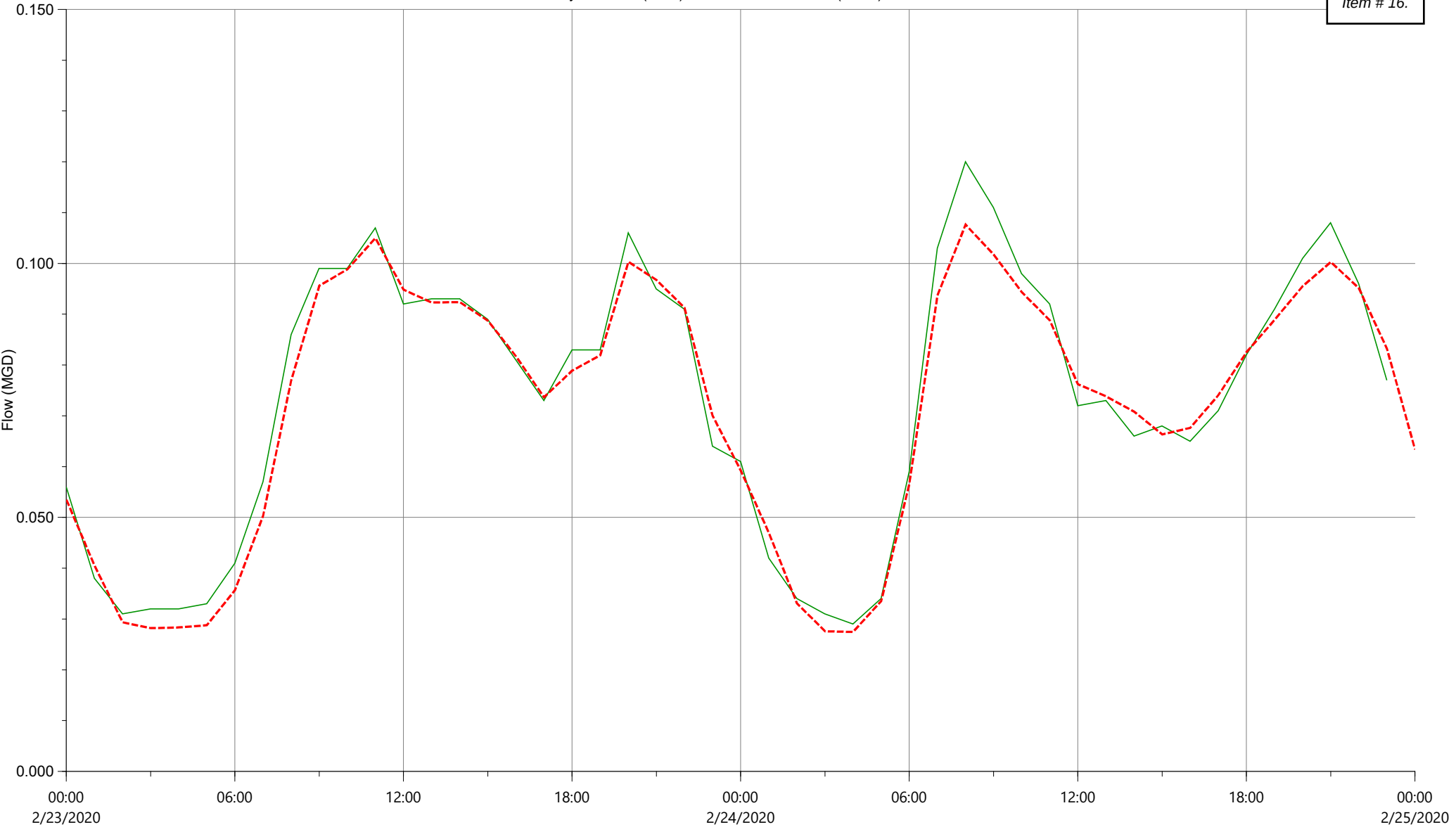
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.158	0.972	1.213
0.137	0.926	1.249

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



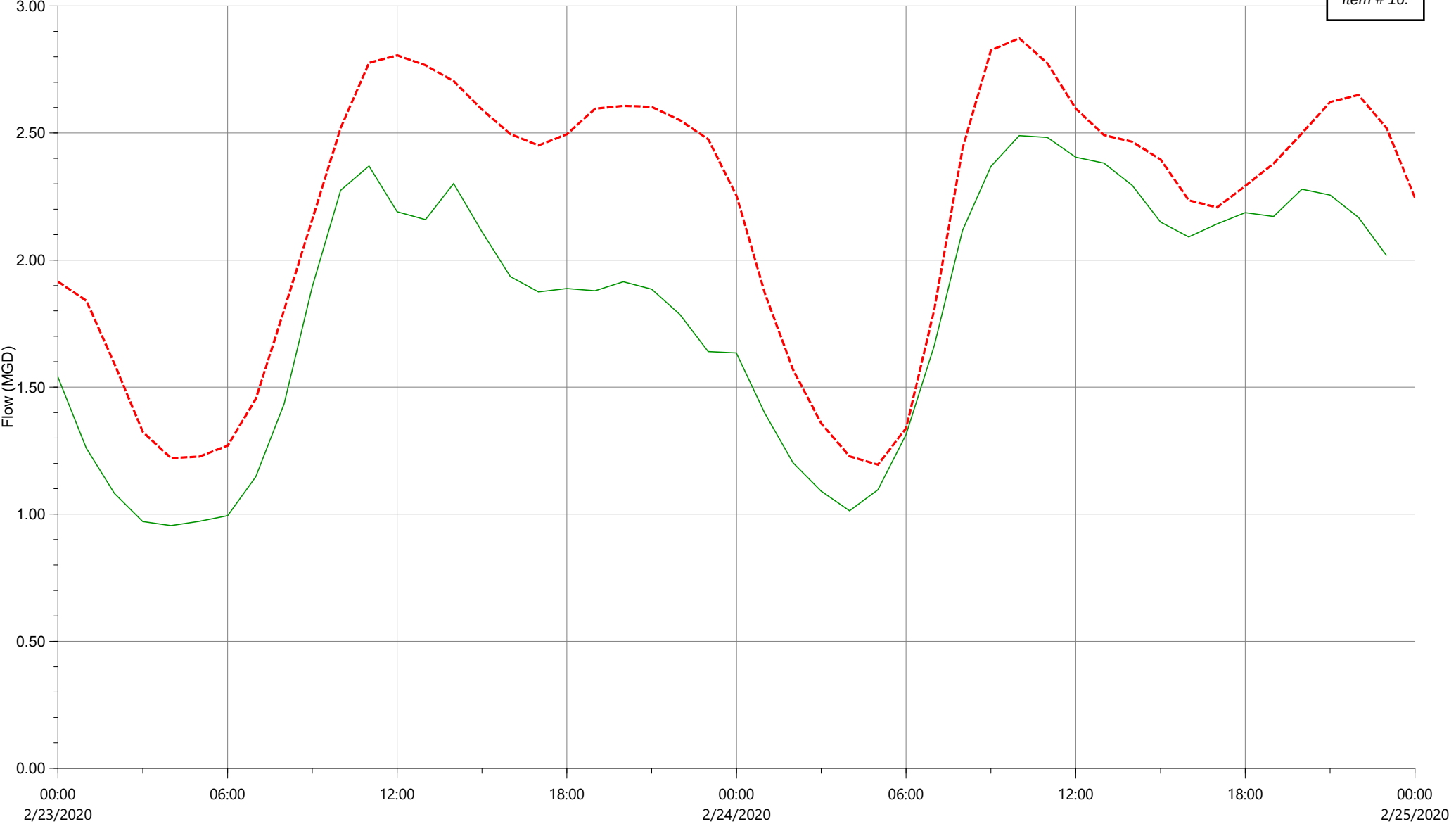
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.029	0.120	0.145
0.027	0.108	0.144

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



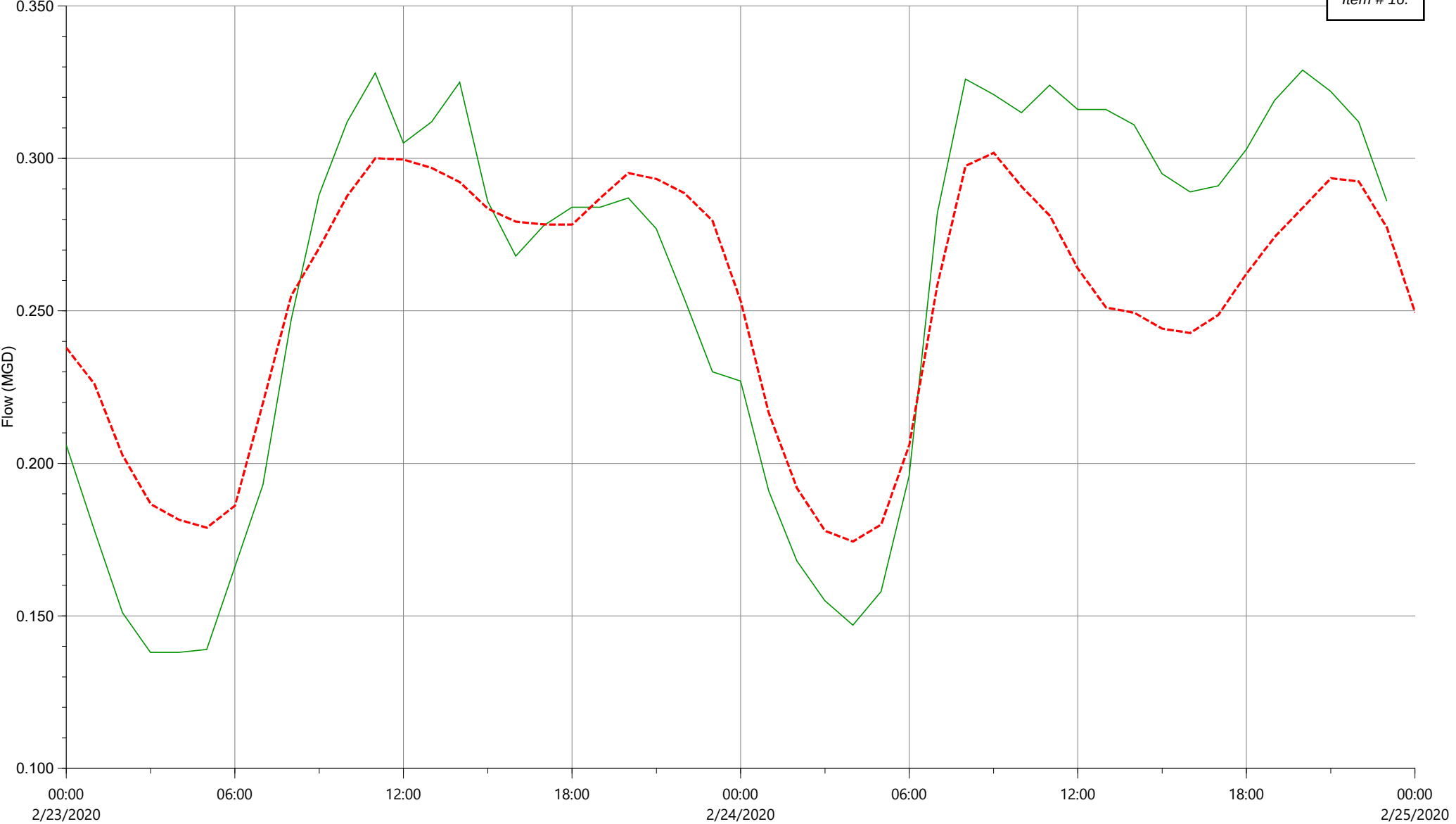
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.955	2.490	3.546
1.196	2.874	4.388

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



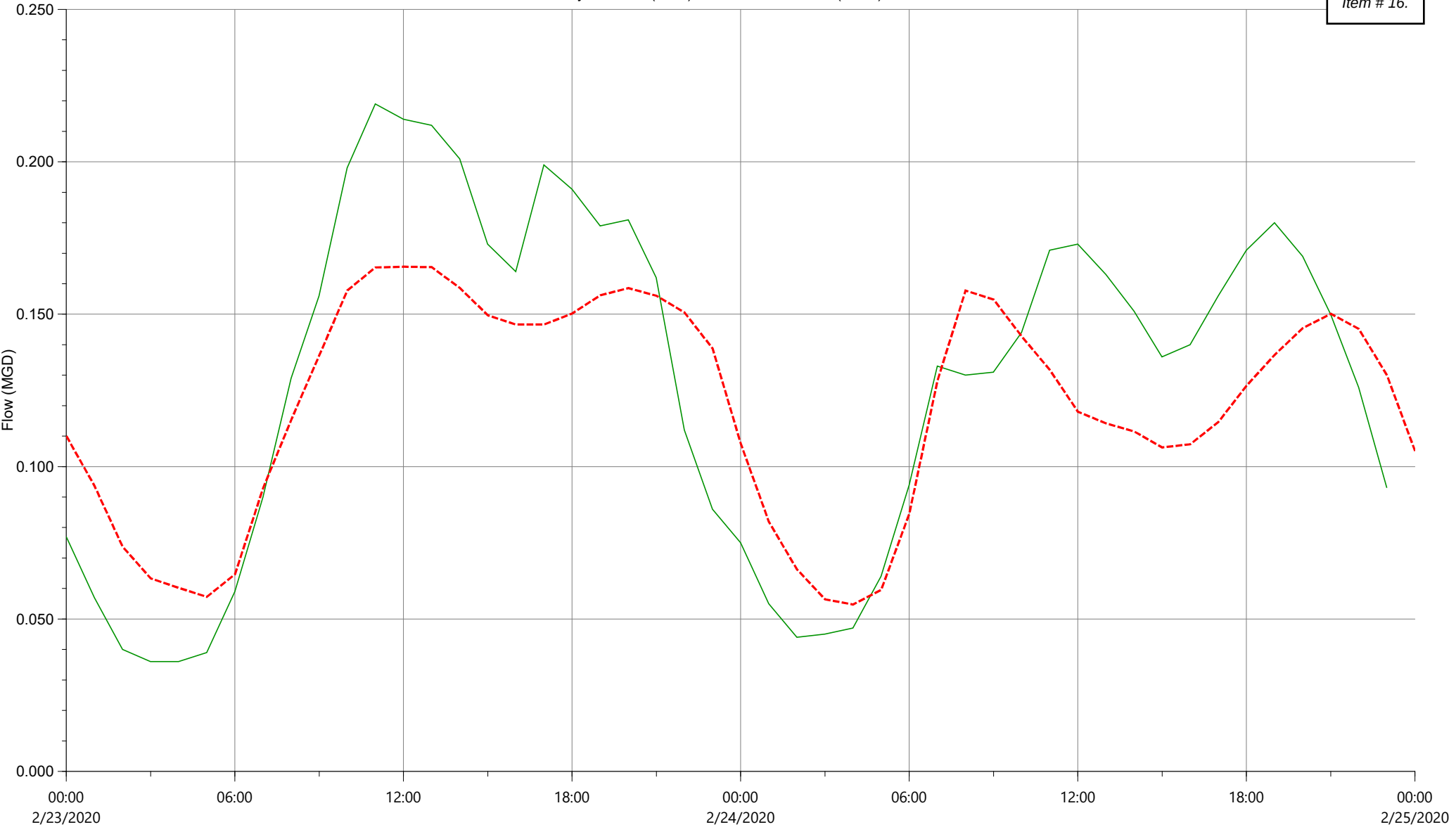
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.138	0.329	0.505
0.174	0.302	0.509

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



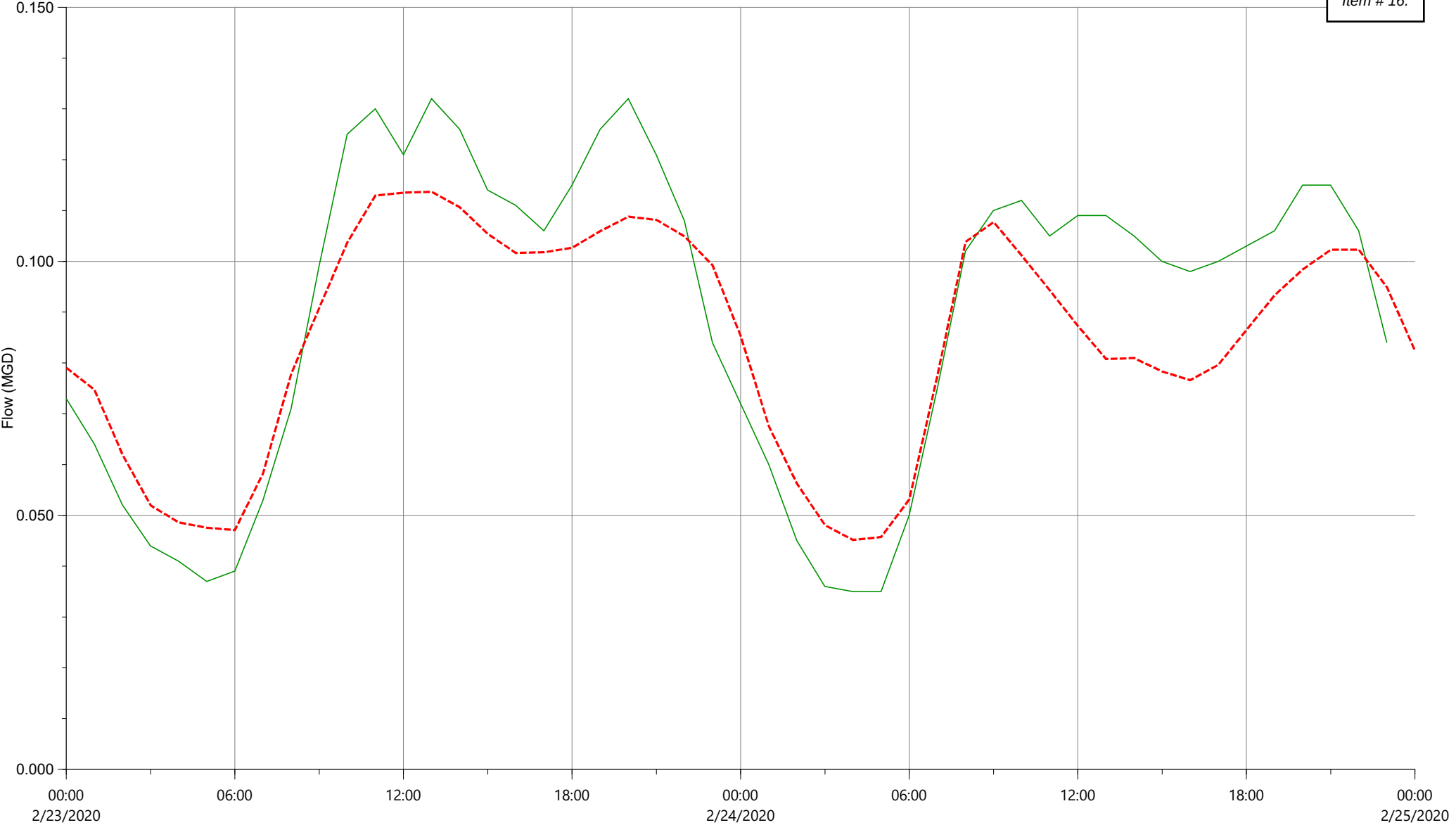
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.036	0.219	0.253
0.055	0.166	0.240

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



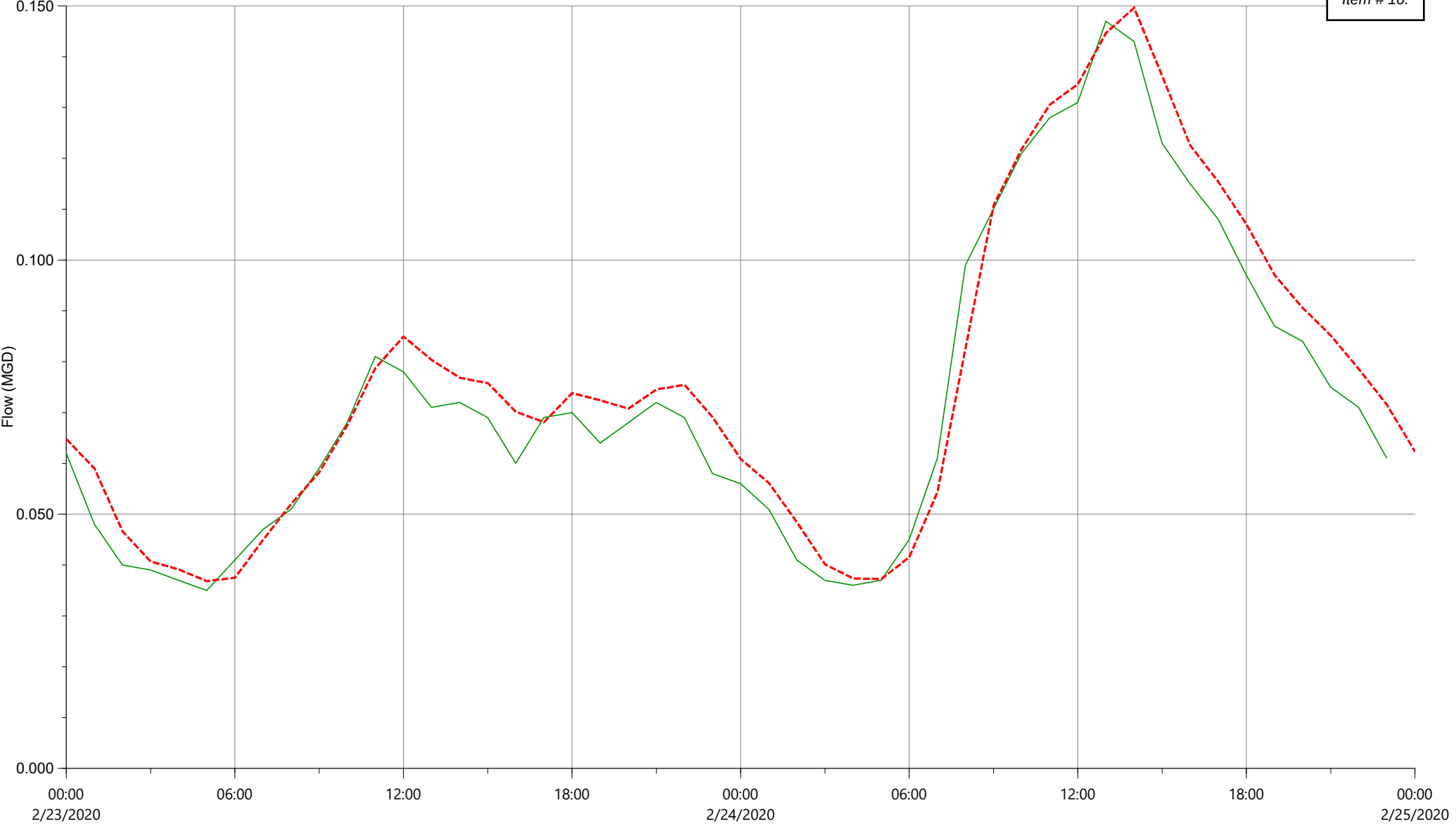
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.035	0.132	0.176
0.045	0.114	0.170

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



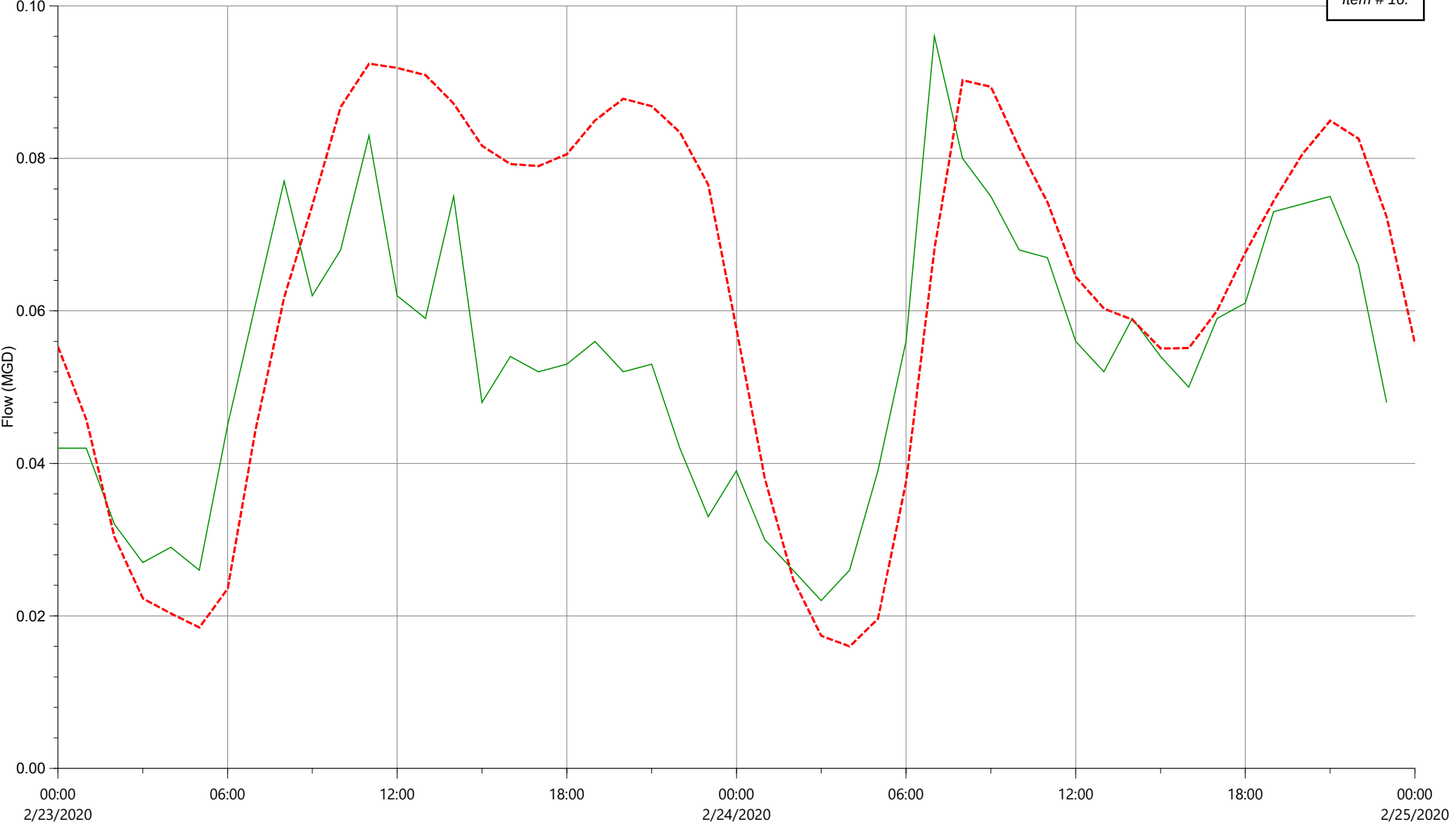
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.035	0.147	0.143
0.037	0.150	0.153

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



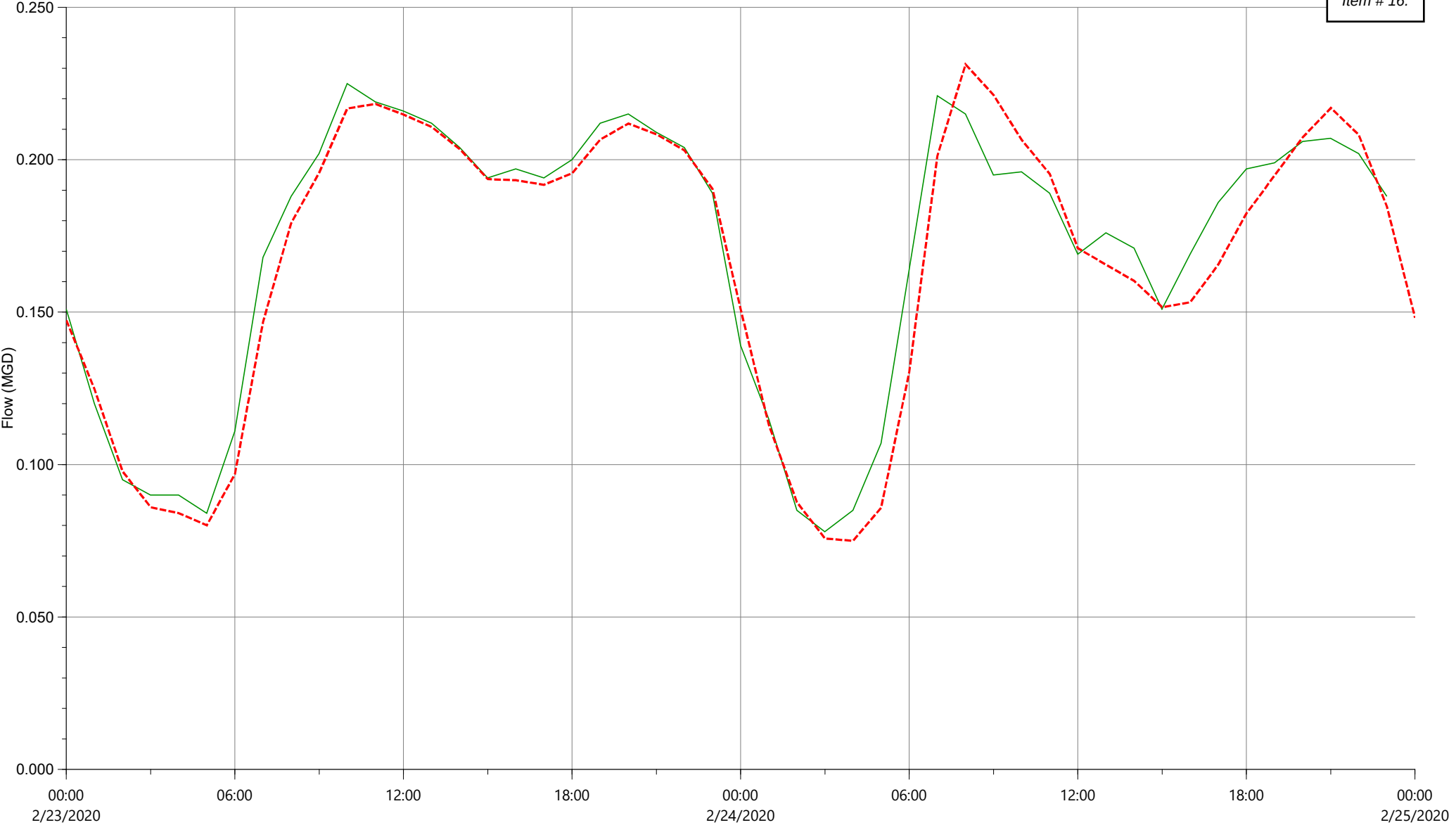
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.022	0.096	0.106
0.016	0.092	0.126

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



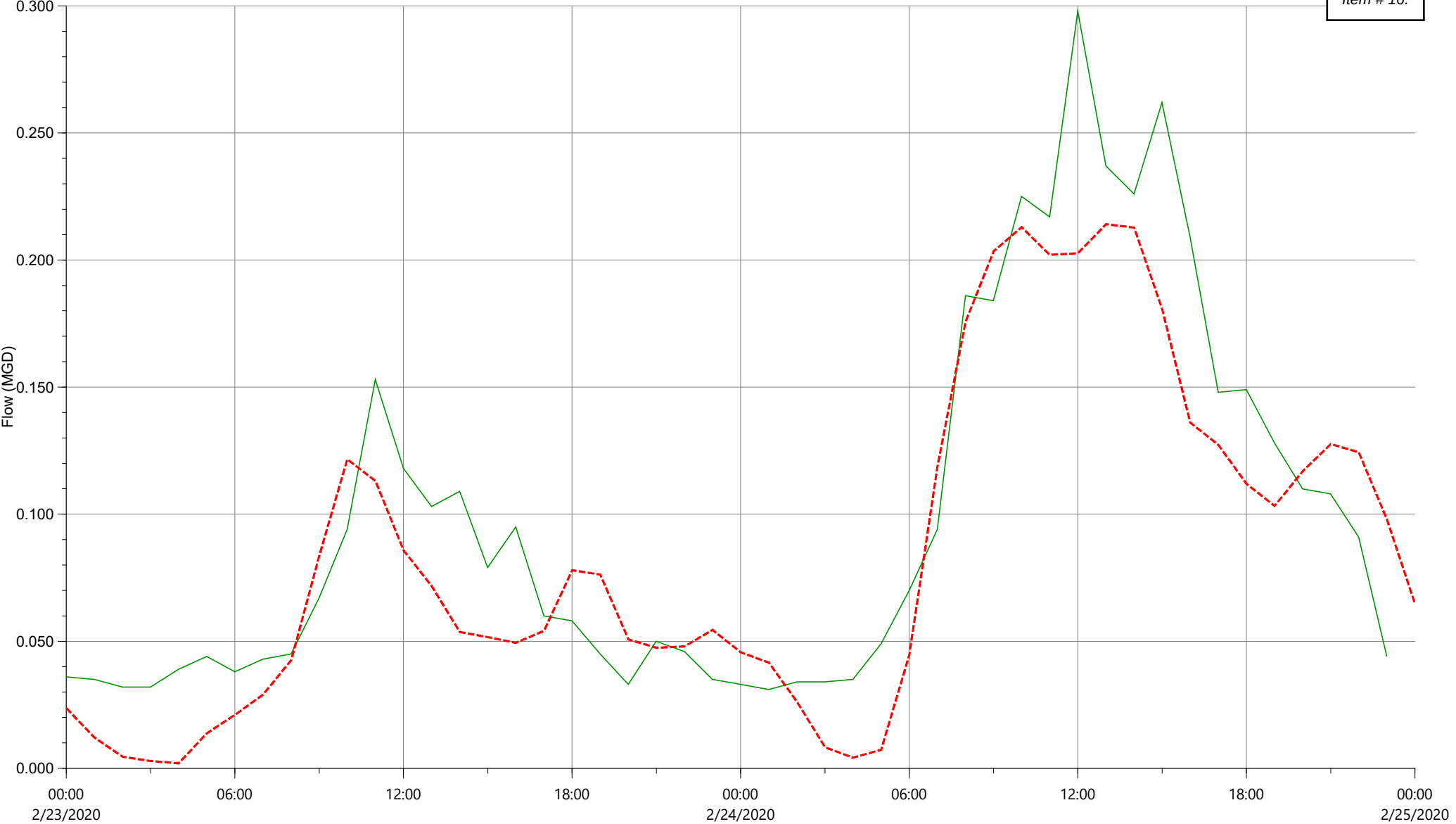
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.078	0.225	0.335
0.075	0.231	0.335

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



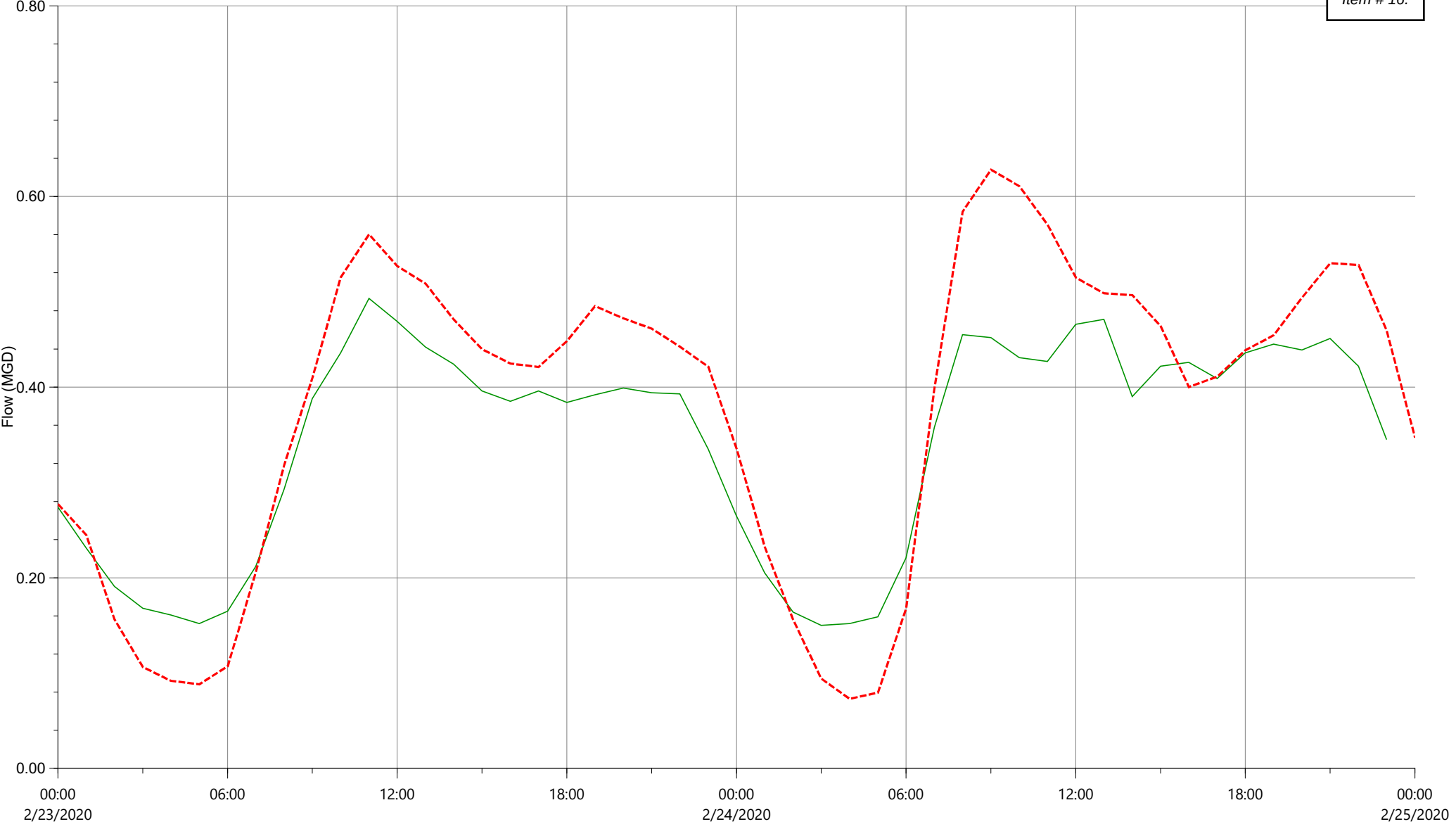
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.031	0.298	0.194
0.002	0.214	0.169

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



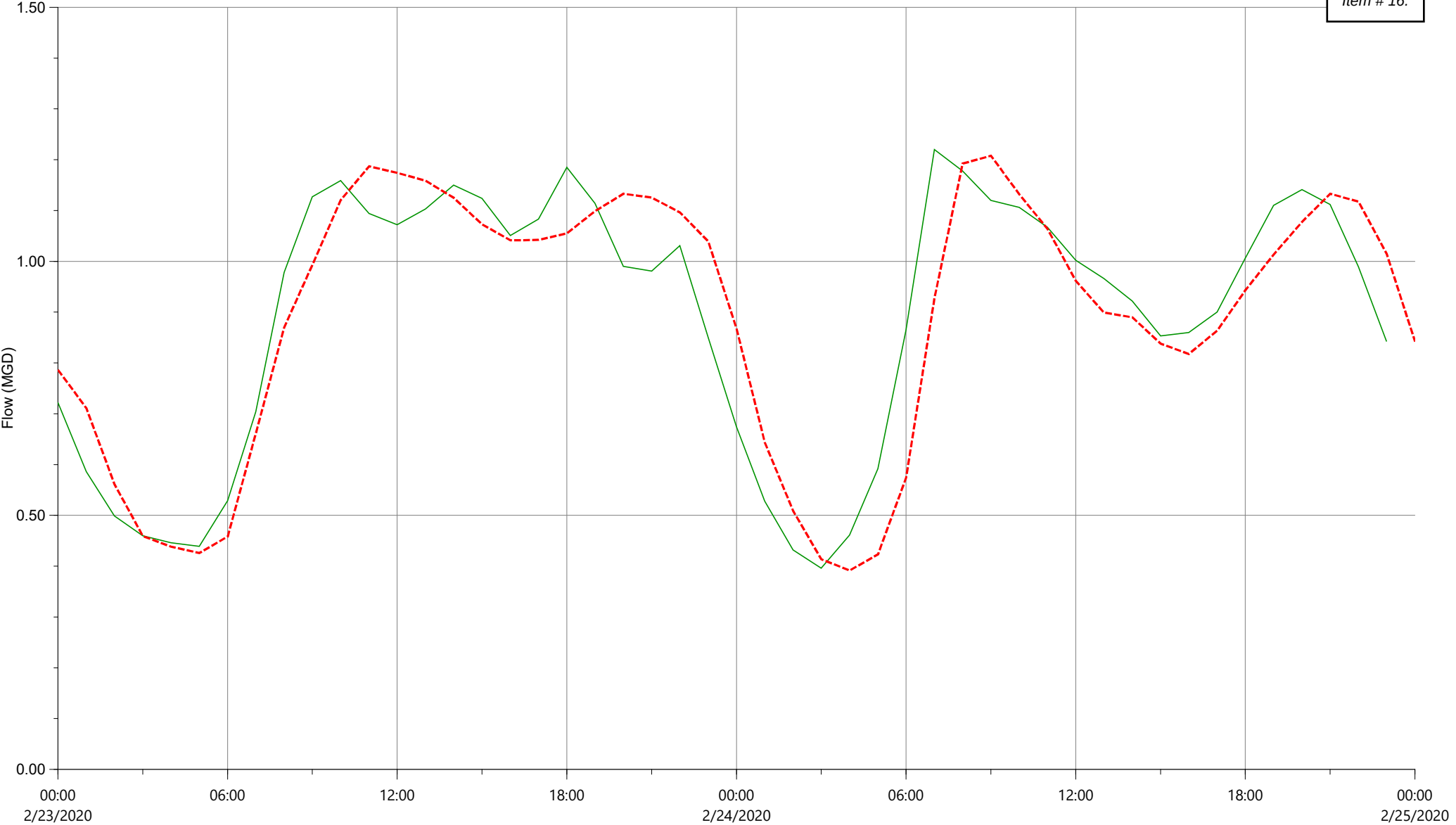
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.150	0.493	0.676
0.073	0.628	0.761

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



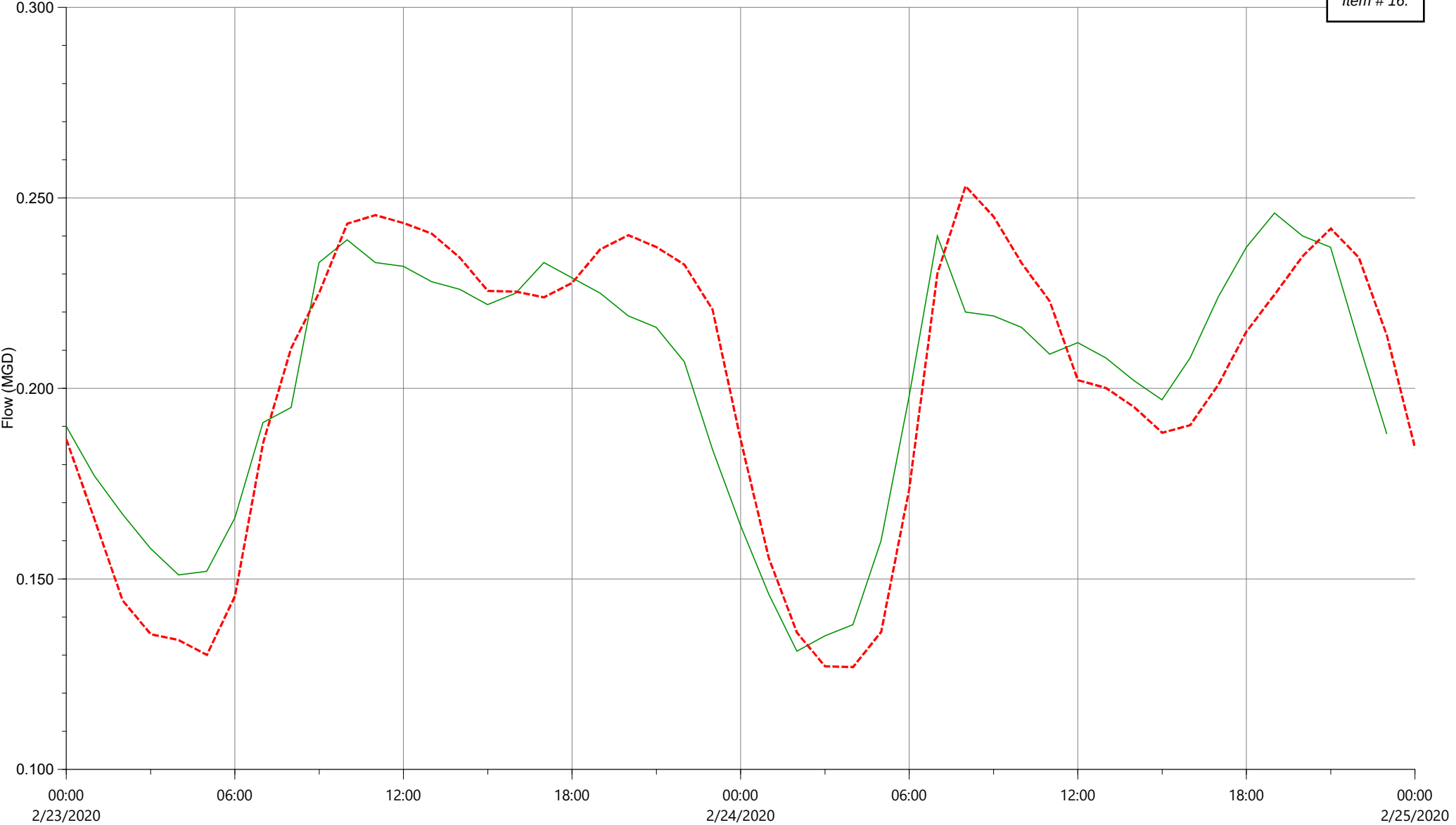
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.396	1.220	1.752
0.392	1.208	1.783

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



Observed
Model

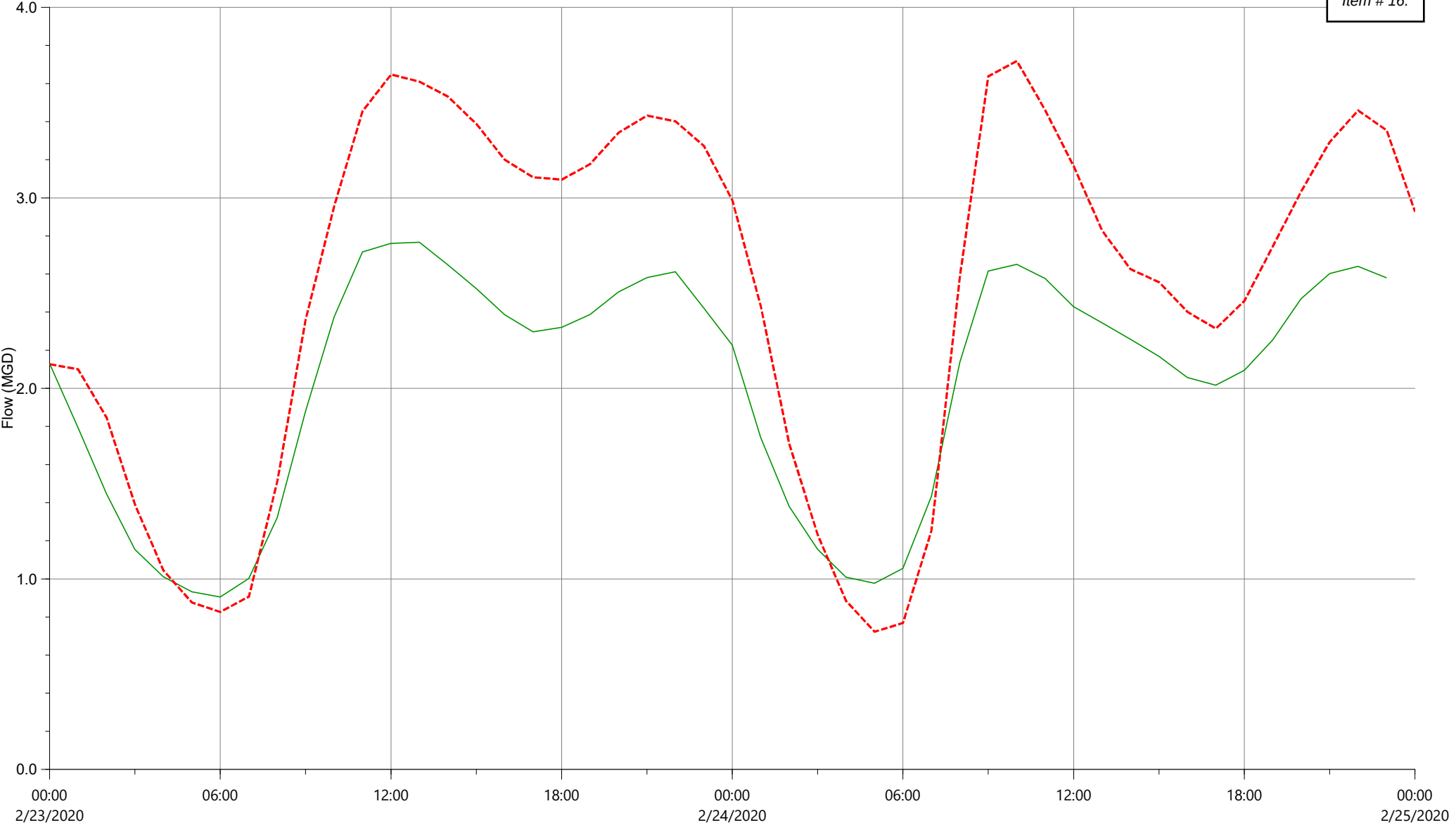
—

- - -

Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.131	0.246	0.396
0.127	0.253	0.404

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.

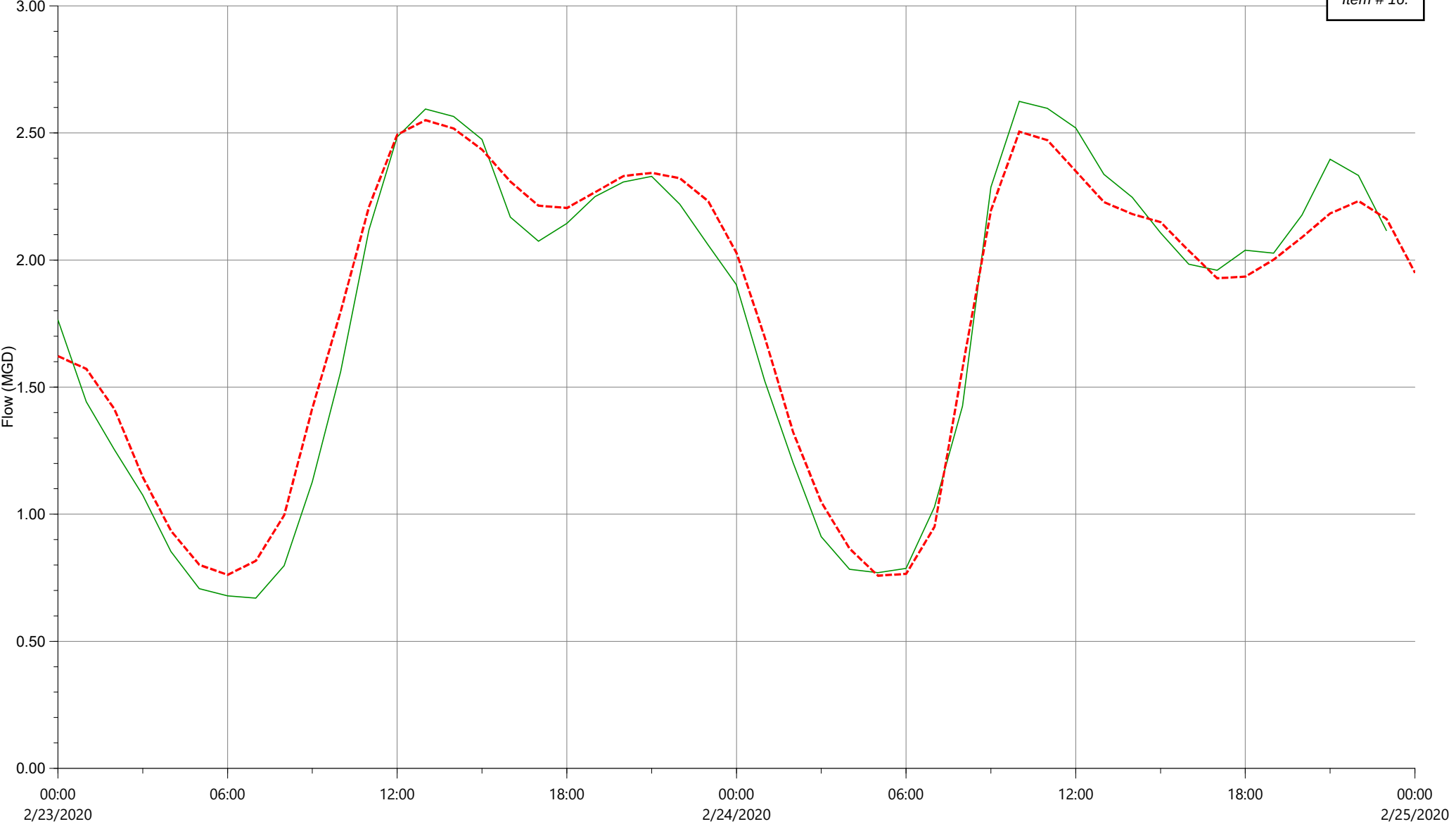


Observed
Model

Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.905	2.767	3.975
0.723	3.719	5.069

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



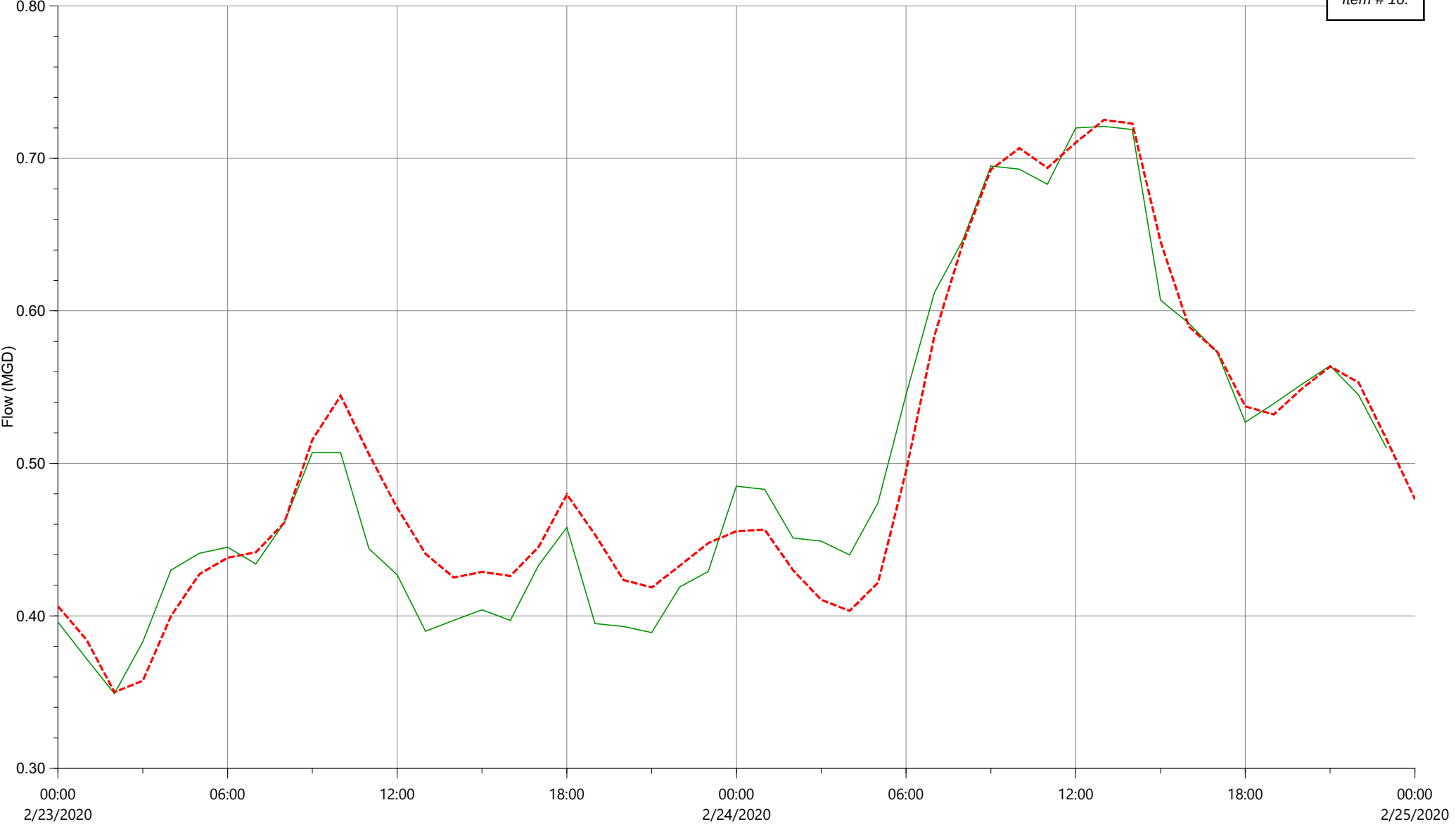
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.670	2.624	3.494
0.758	2.551	3.648

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



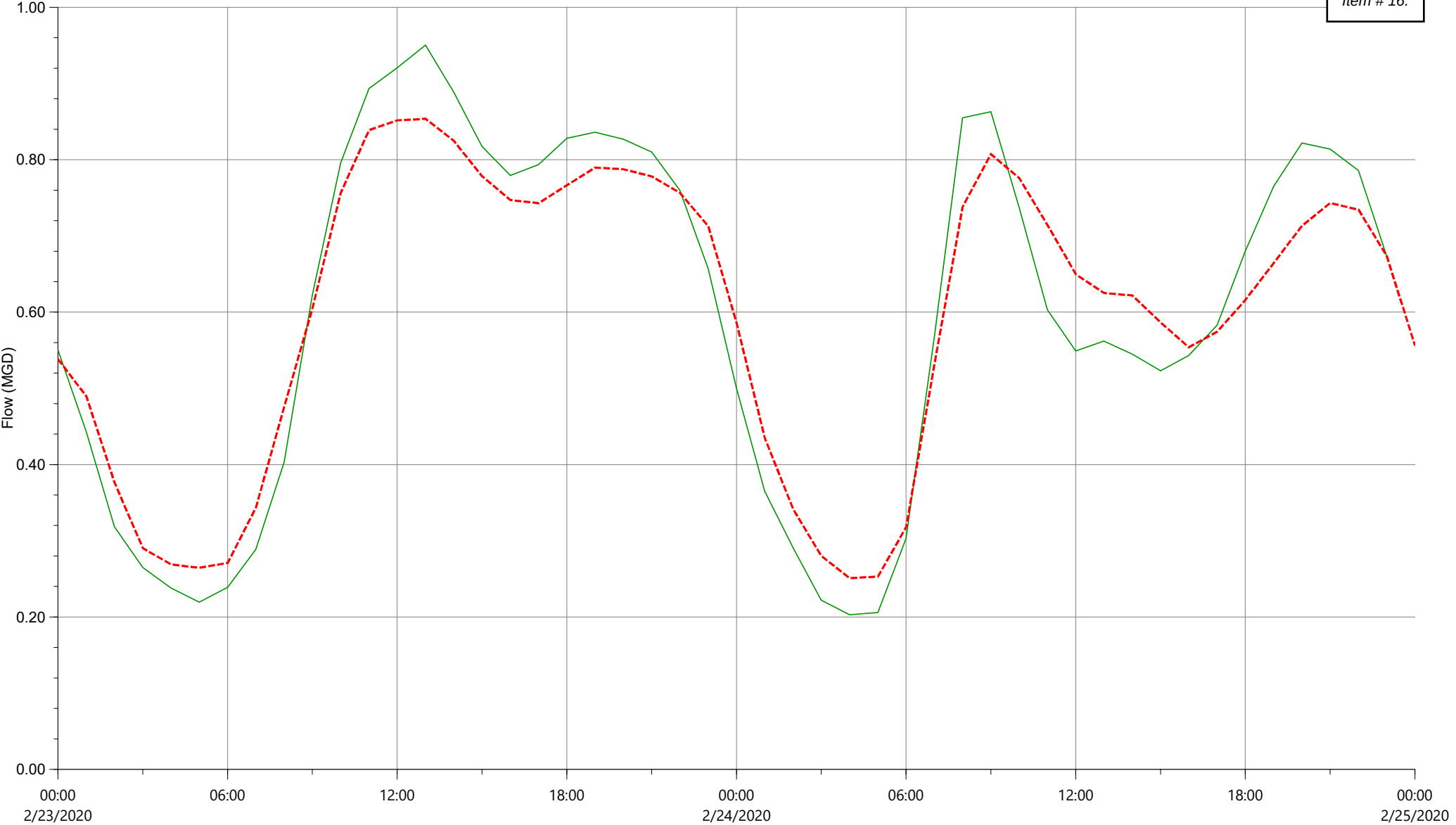
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.349	0.721	0.978
0.350	0.725	1.007

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



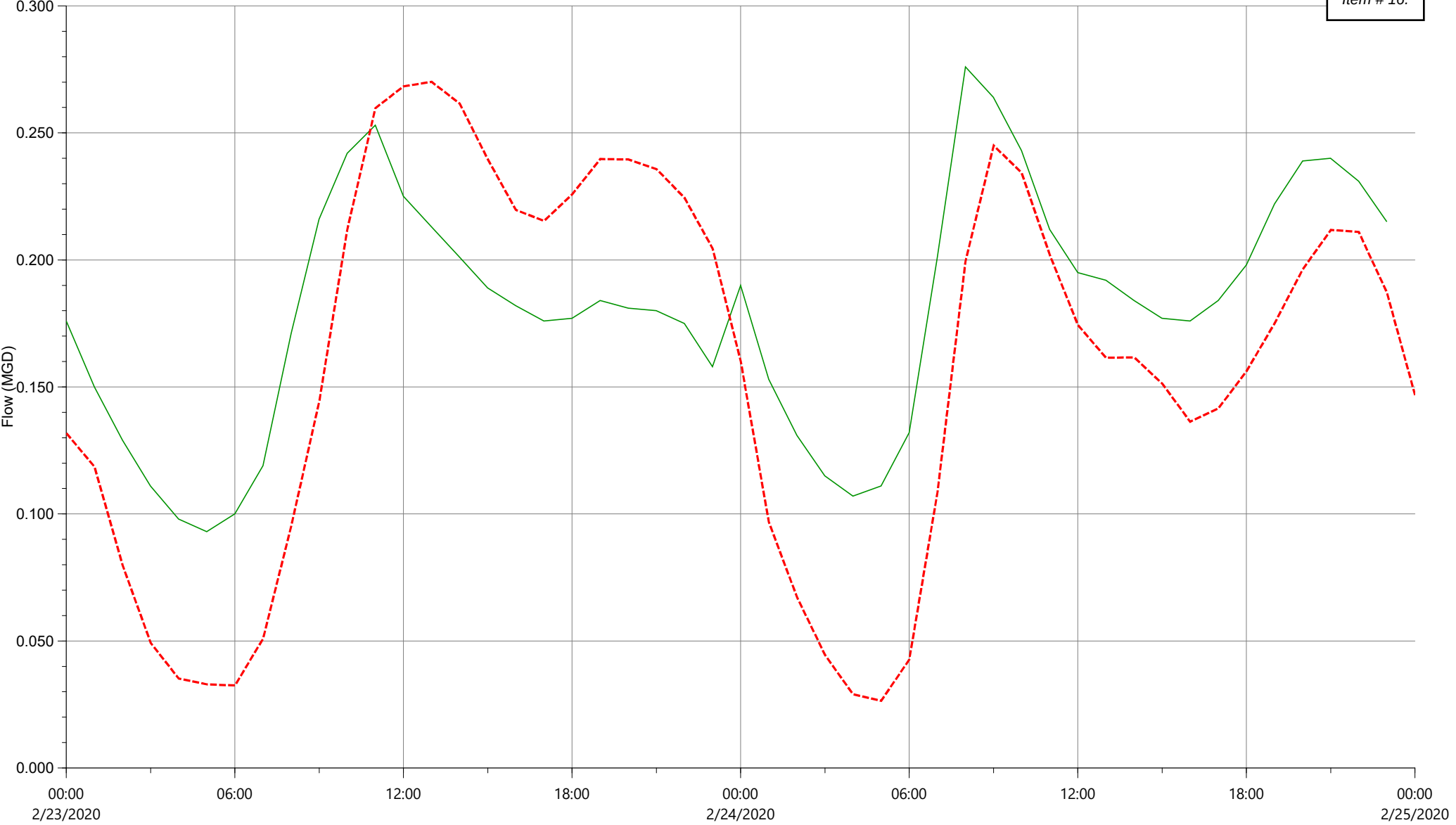
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.203	0.951	1.171
0.251	0.854	1.196

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



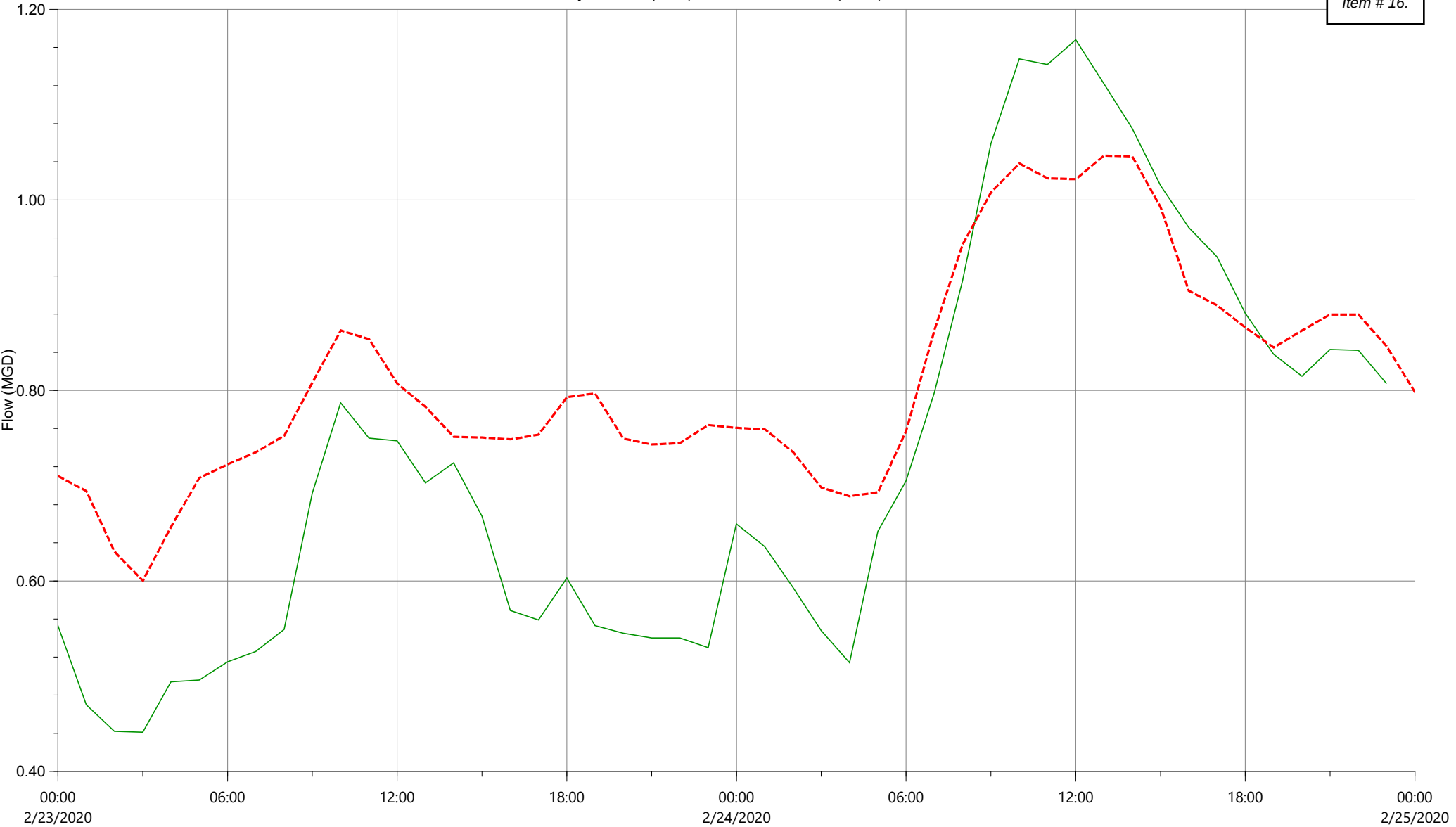
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.093	0.276	0.354
0.027	0.270	0.317

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



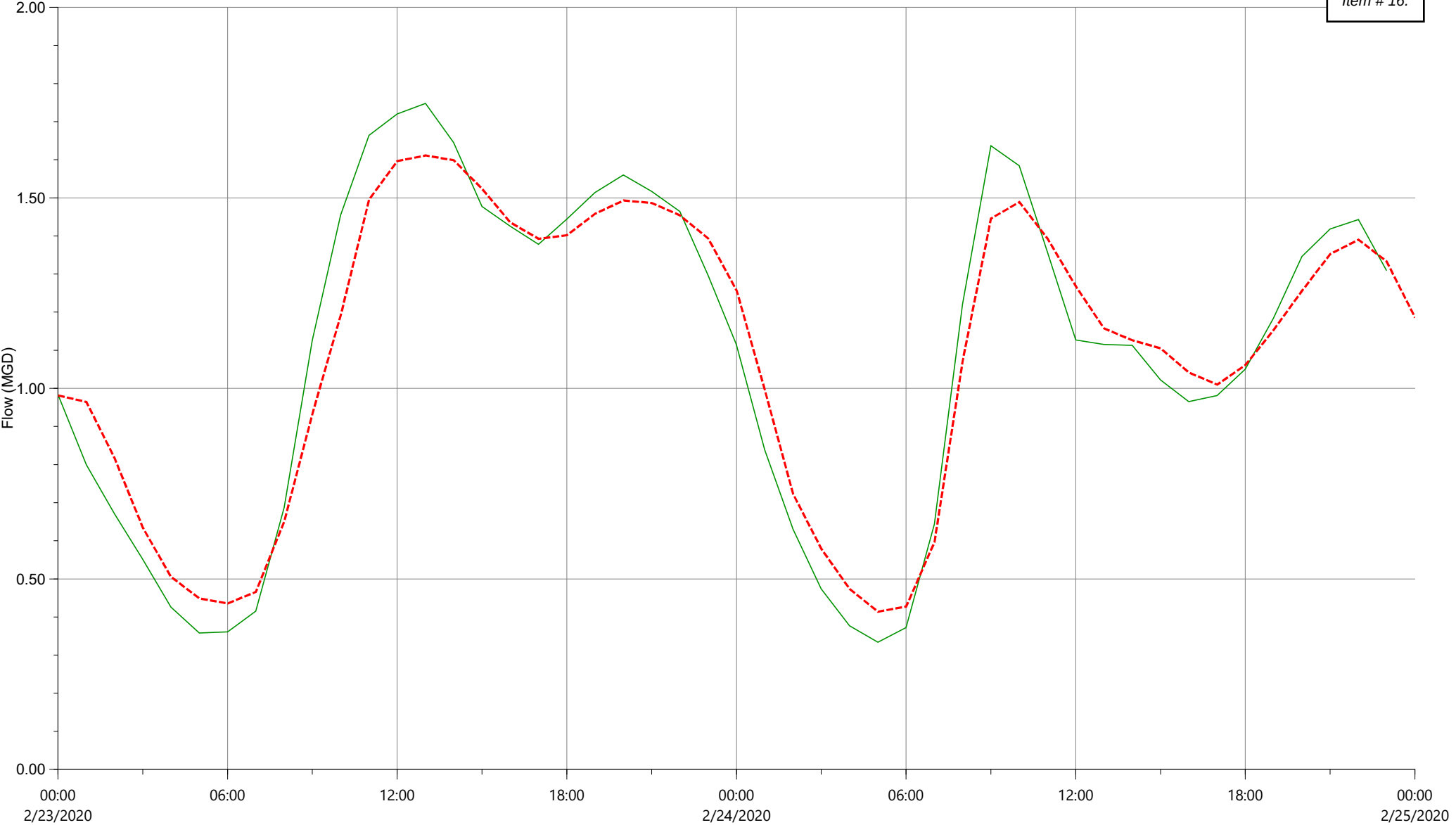
Observed
Model



Flow		Volume (US Mgal)
Min (MGD)	Max (MGD)	
0.441	1.168	1.417
0.600	1.047	1.626

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



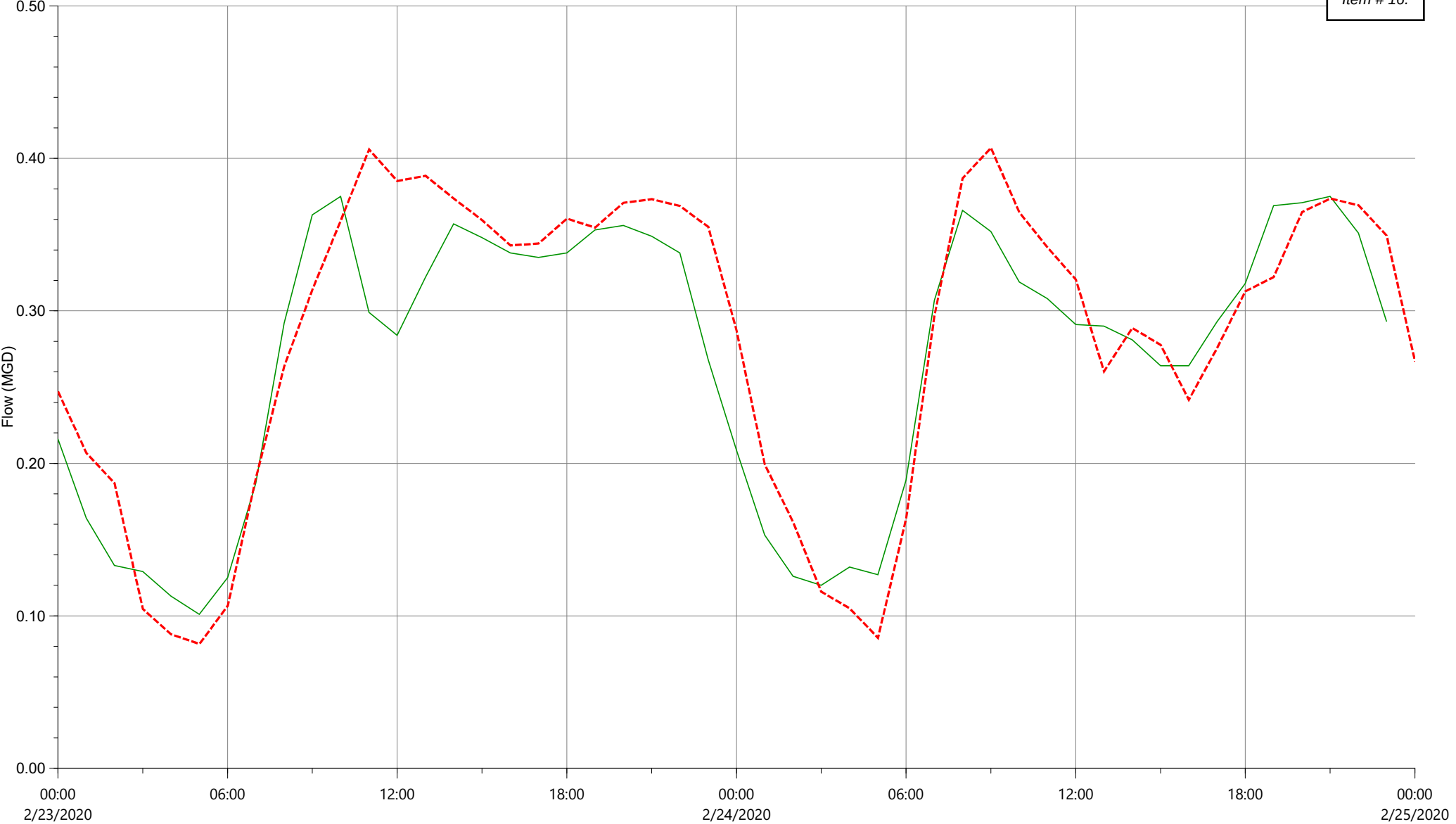
Observed
Model



Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.334	1.748	2.133
0.414	1.611	2.192

Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

Item # 16.



Observed
Model

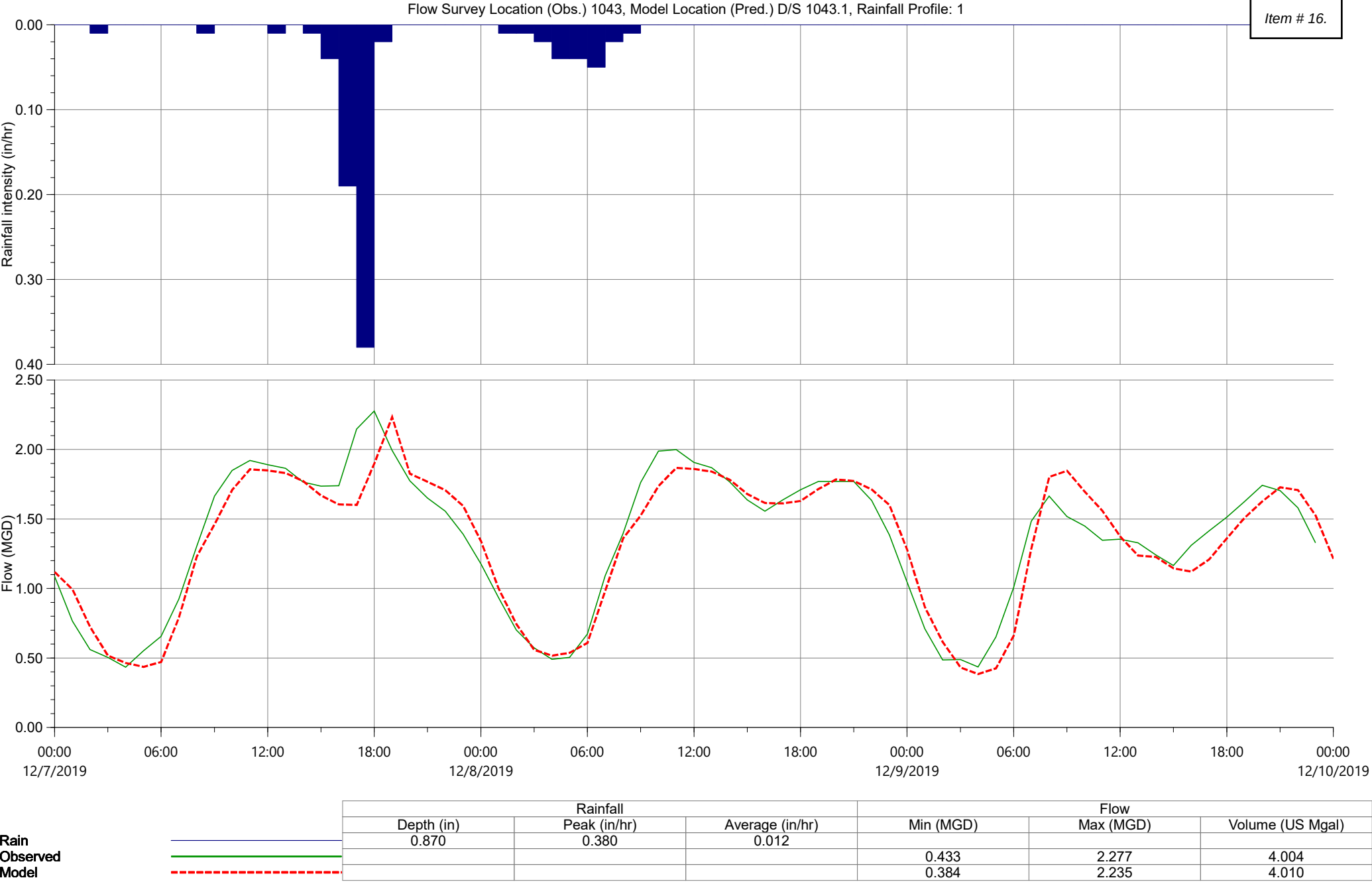


Flow		
Min (MGD)	Max (MGD)	Volume (US Mgal)
0.101	0.375	0.529
0.082	0.407	0.567

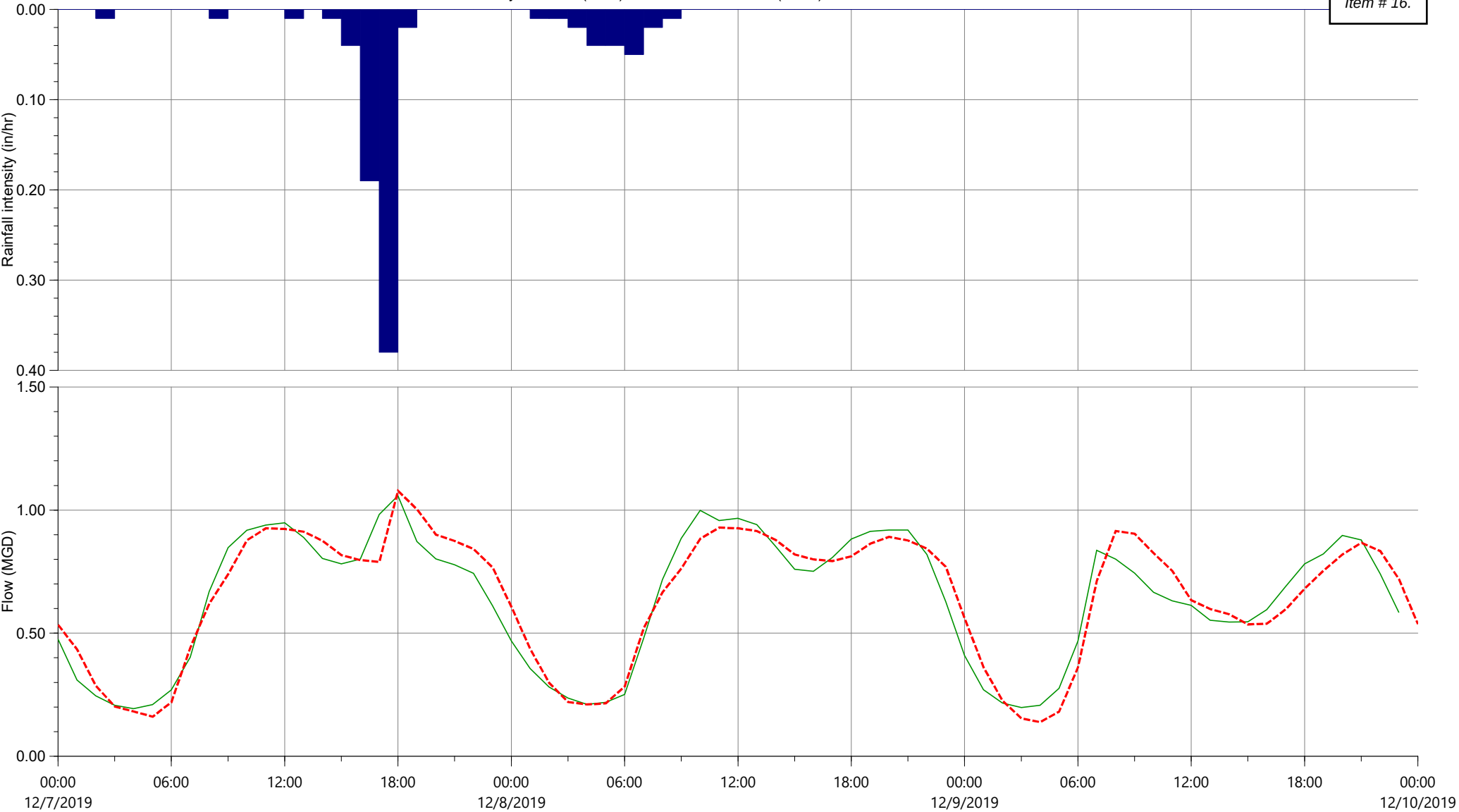
Observed / Predicted Report (Custom graph) - DWF Calibration FINAL

APPENDIX E
City of Milpitas
Sewer Master Plan Study
Wet Weather Calibration Charts

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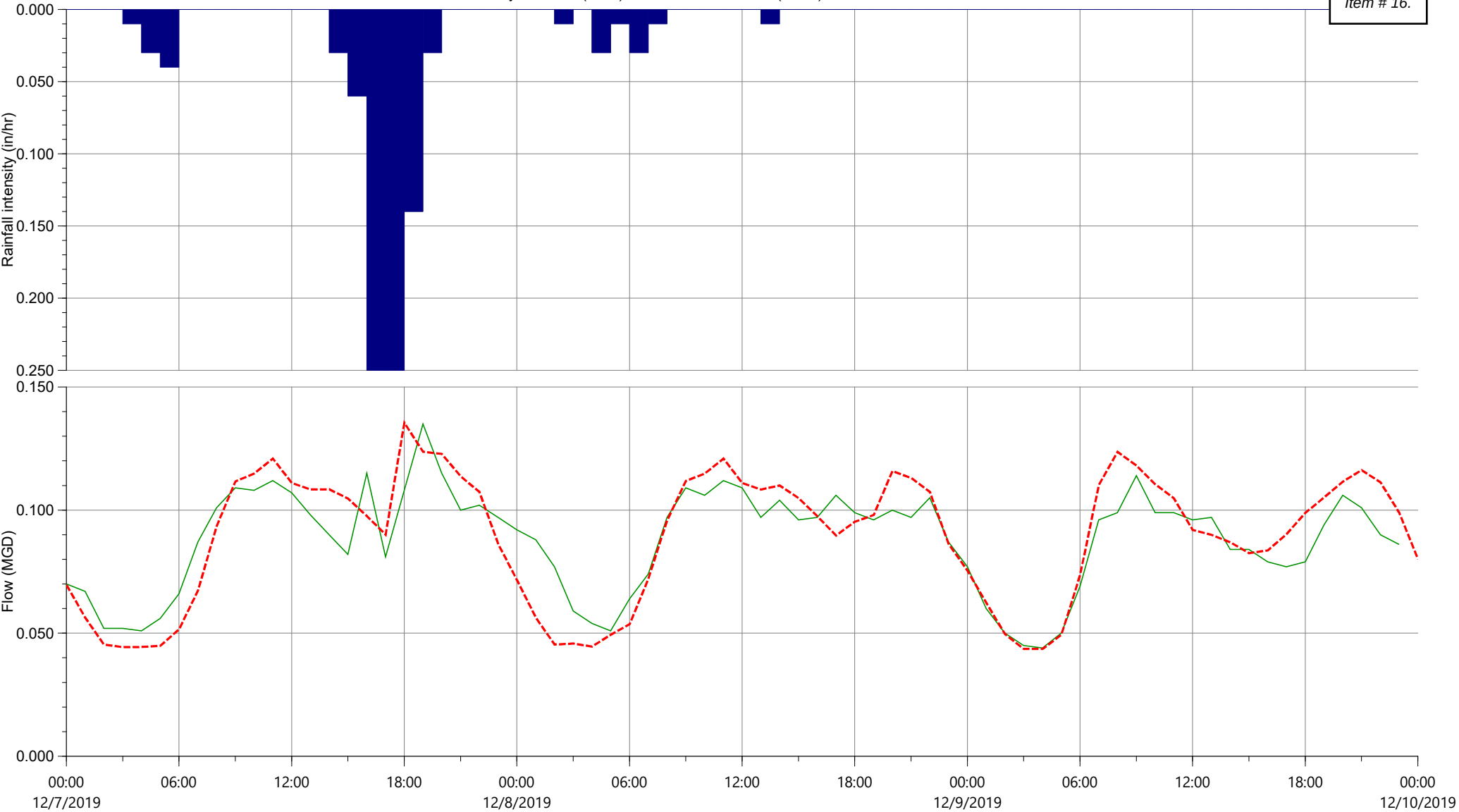
Item # 16.



Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
	0.870	0.380	0.012	0.193	1.058	1.892
Observed				0.139	1.079	1.946
Model						

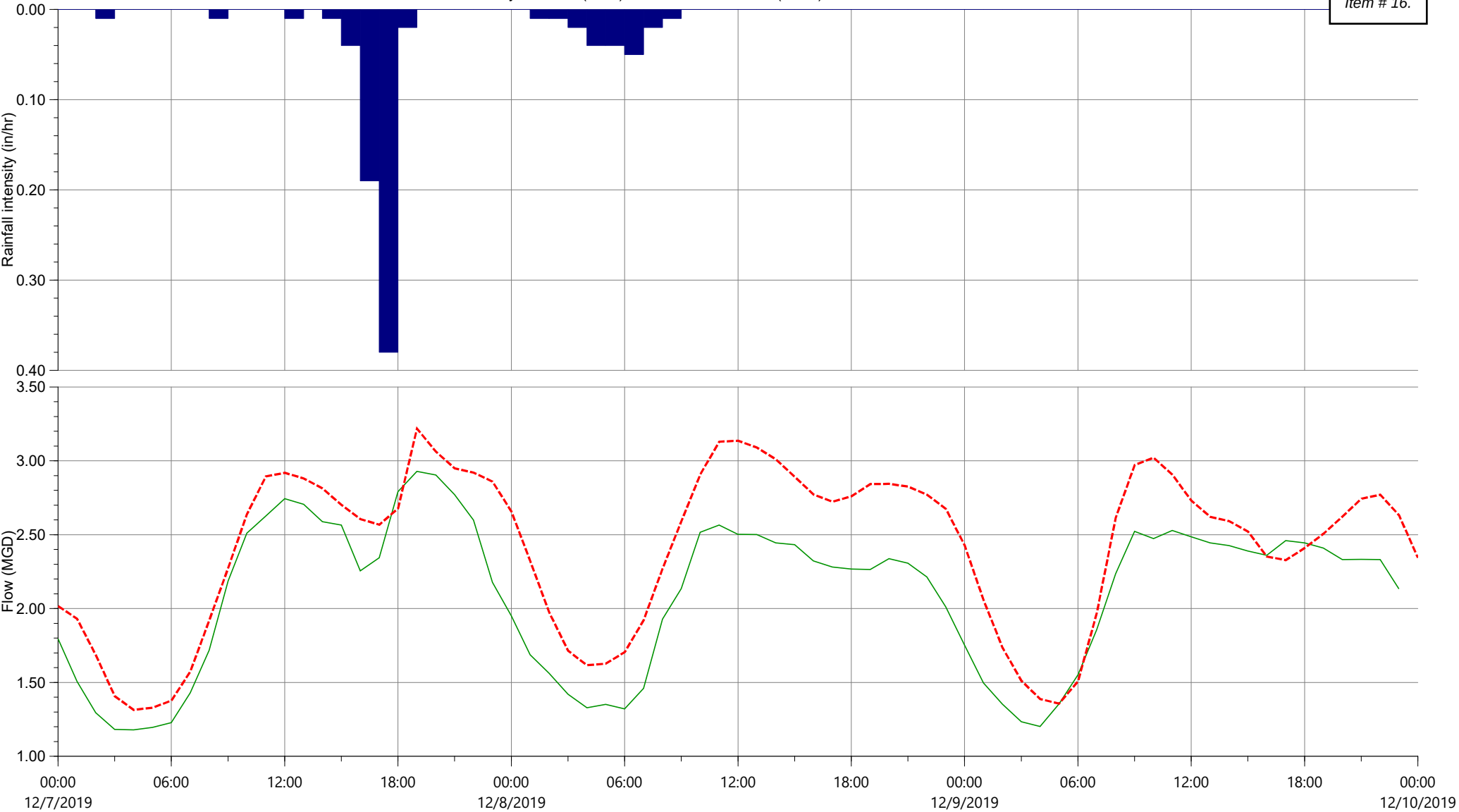
Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Item # 16.



Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.940	0.250	0.013	0.044	0.135	0.260
Model				0.044	0.135	0.268

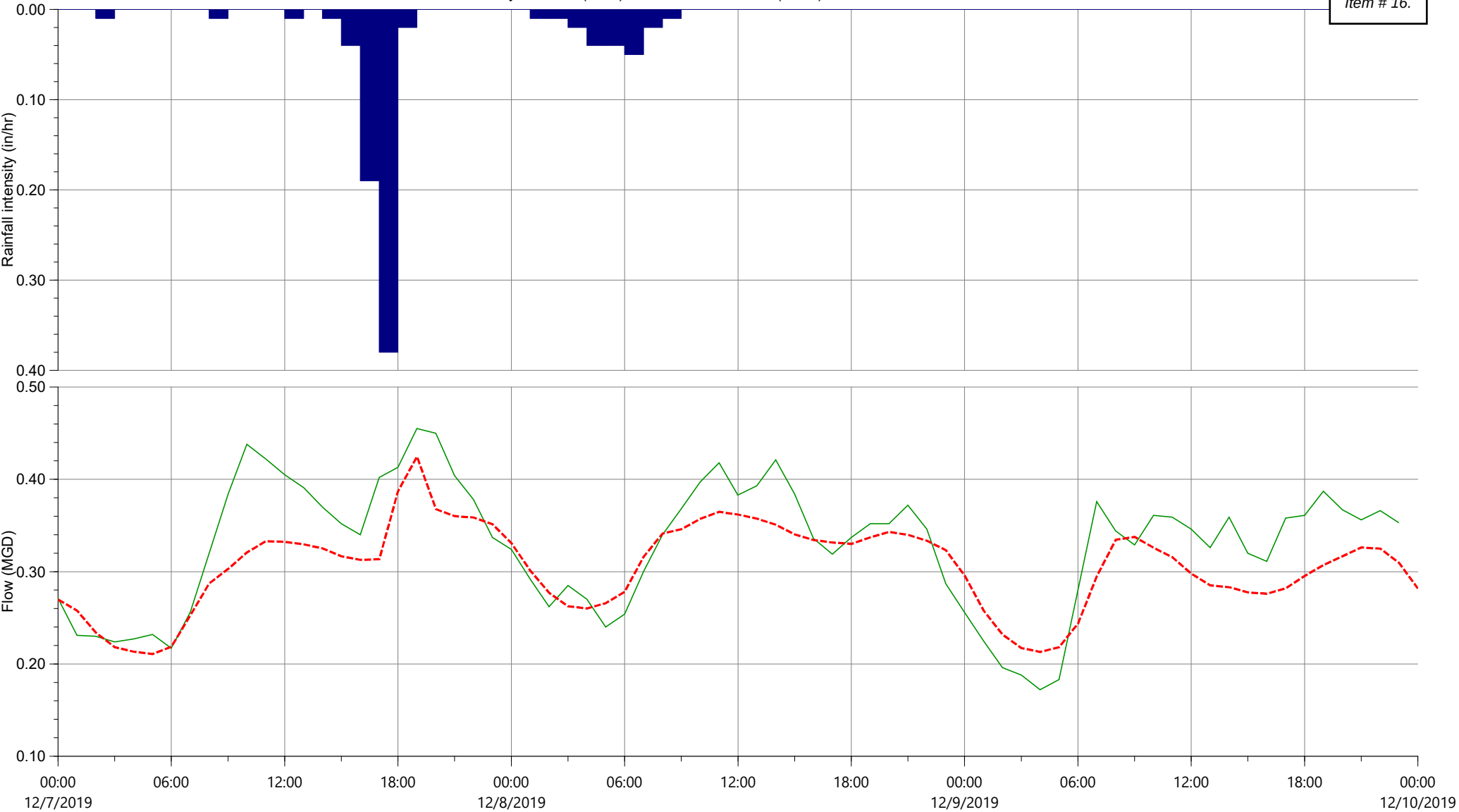
Item # 16.



Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.870	0.380	0.012	1.179	2.929	6.187
Model				1.314	3.219	7.243

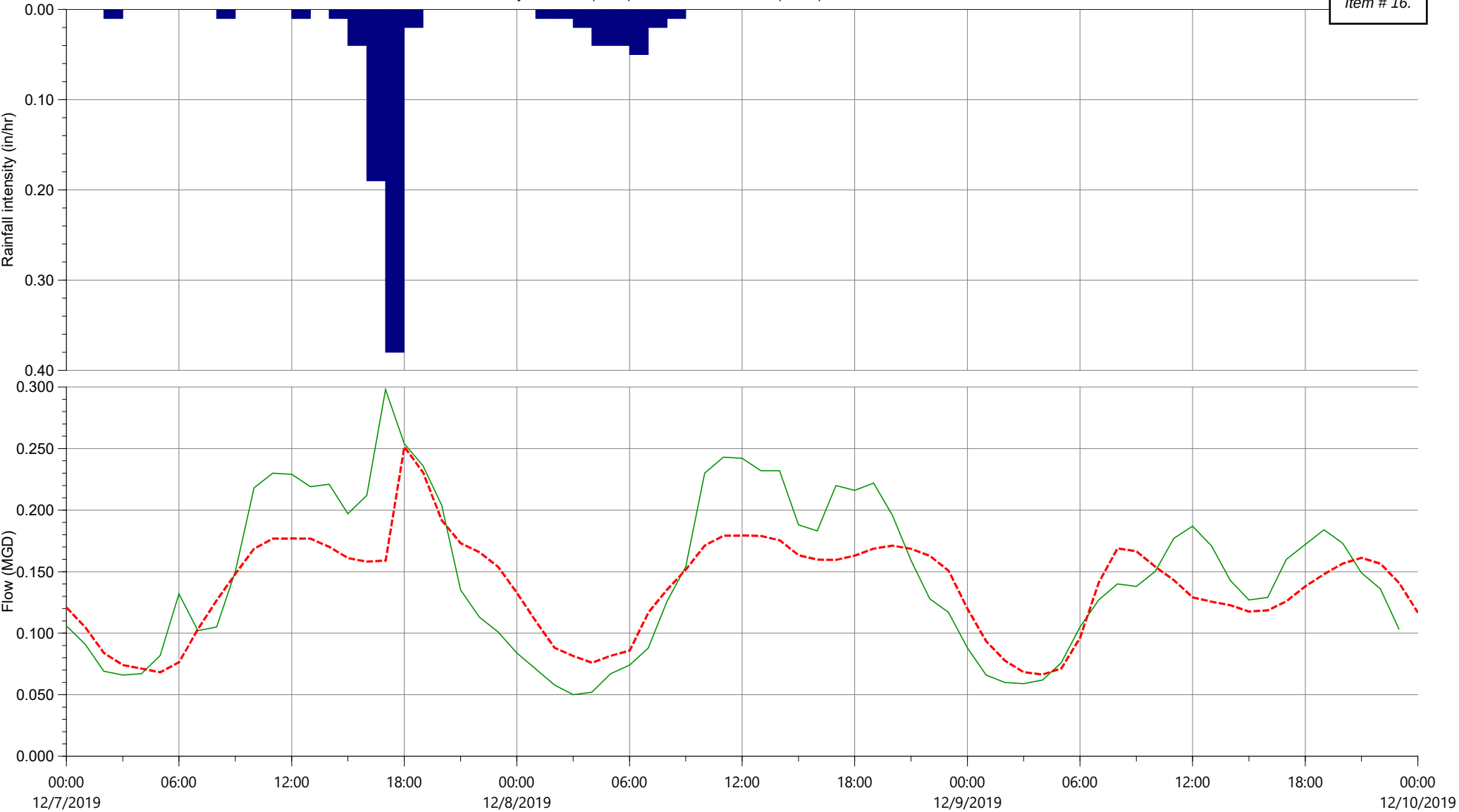
Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Item # 16.



Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.870	0.380	0.012	0.172	0.455	0.973
Model				0.211	0.425	0.915

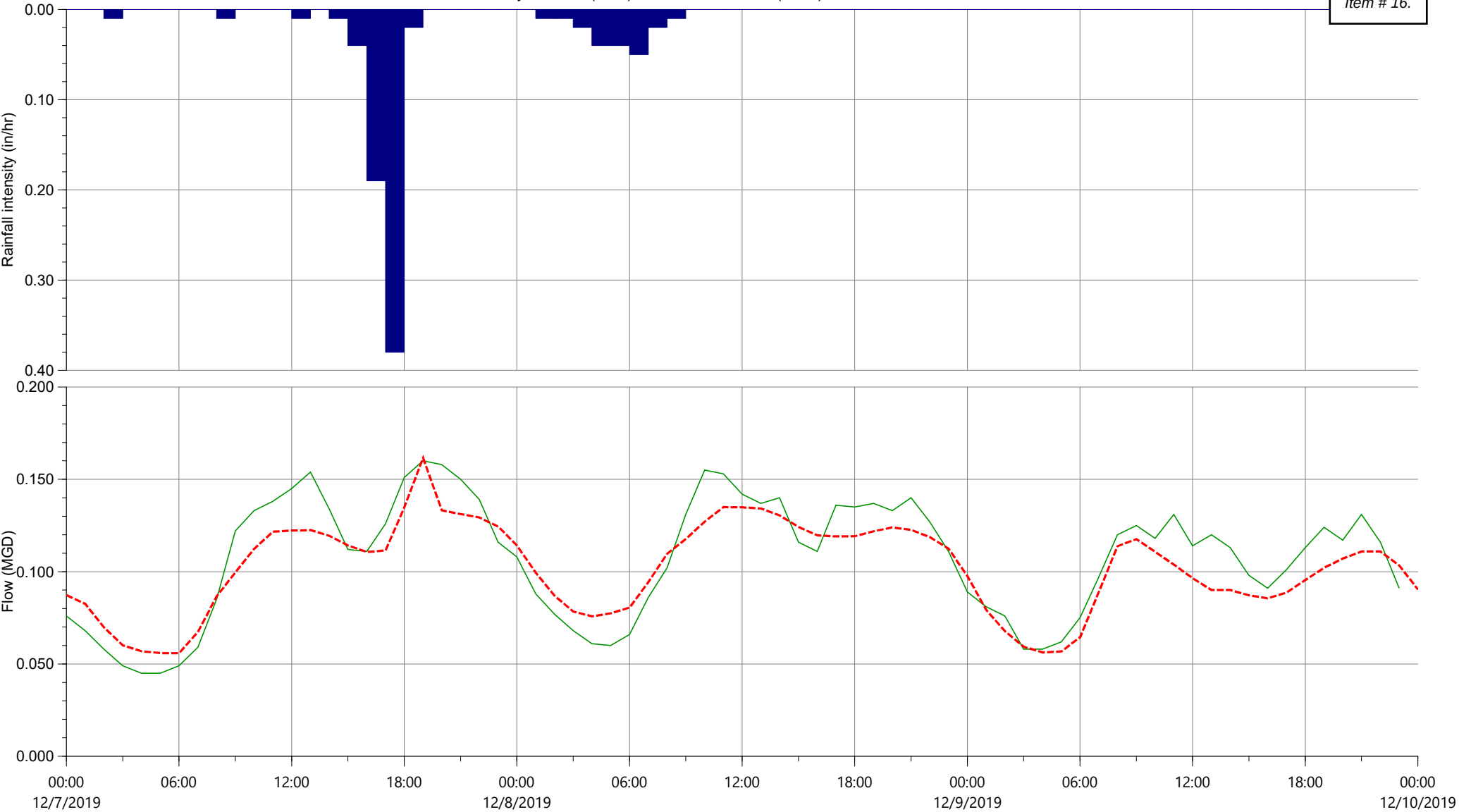
Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL



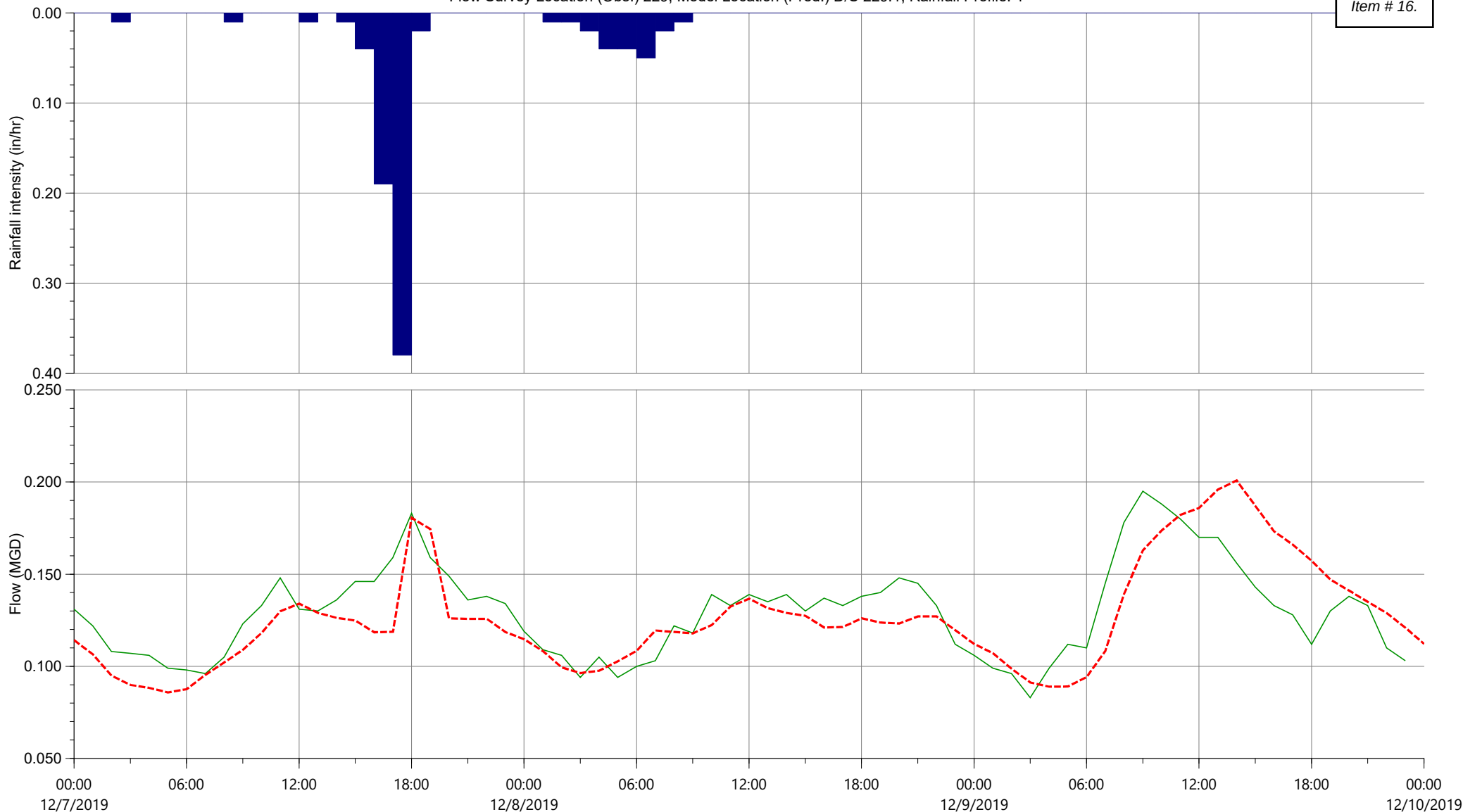
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Rain	0.870	0.380	0.012			
Observed				0.050	0.298	0.435
Model				0.067	0.251	0.413

Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Item # 16.



Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.870	0.380	0.012	0.045	0.160	0.318
Model				0.056	0.162	0.306



Rain
 Observed
 Model



Rainfall			Flow		
Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
0.870	0.380	0.012	0.083	0.195	0.383
			0.086	0.201	0.378

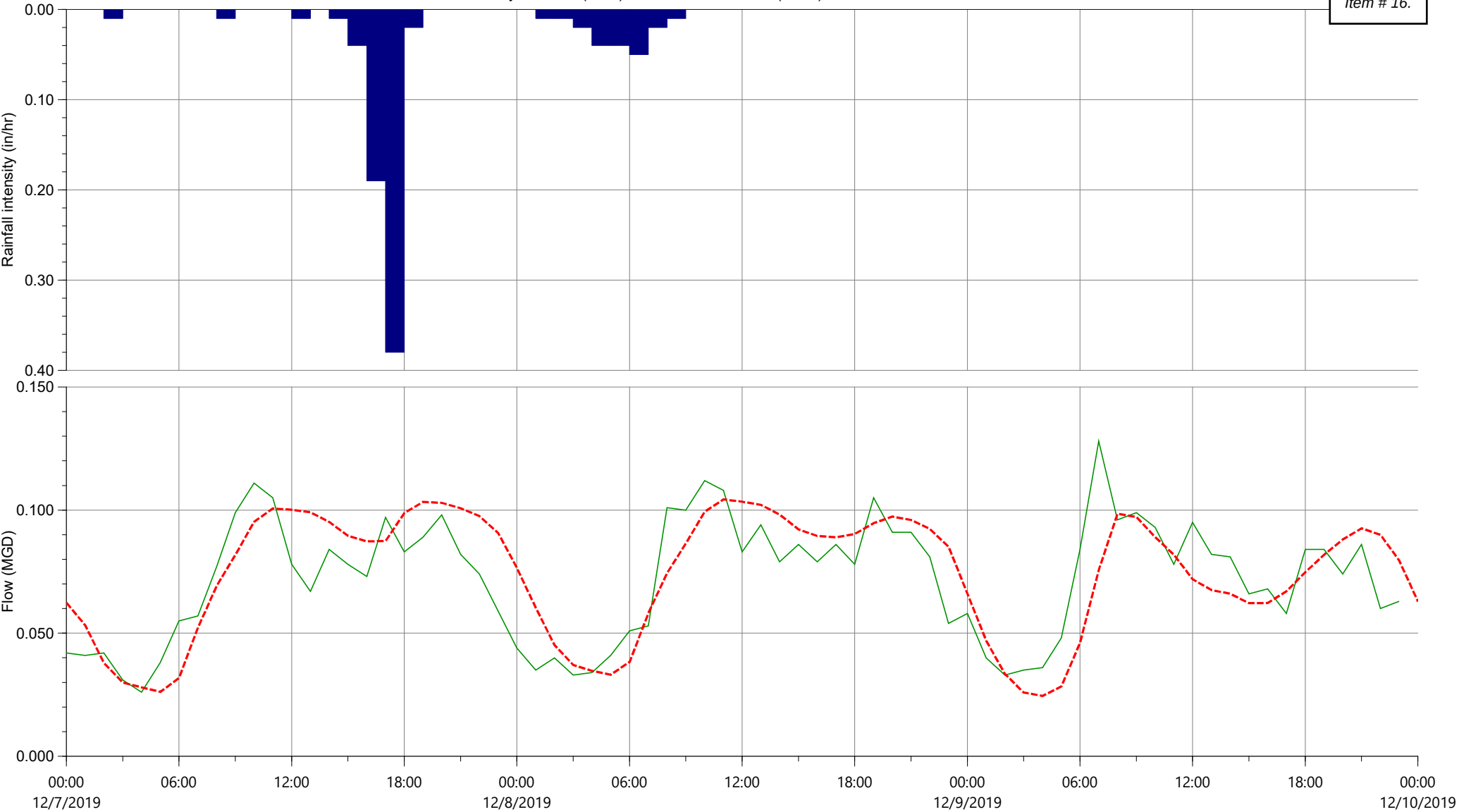
Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

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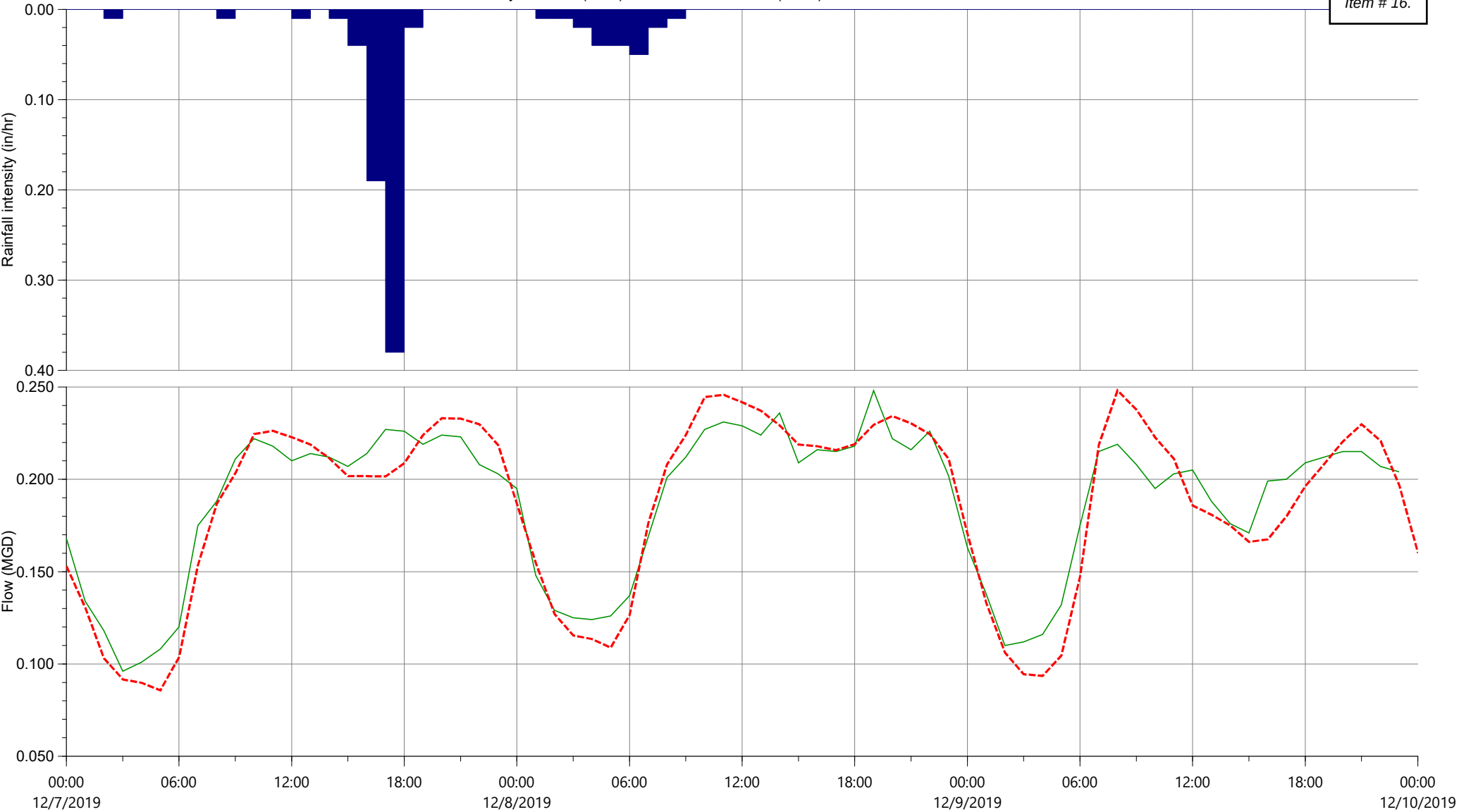
Item # 16.



	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

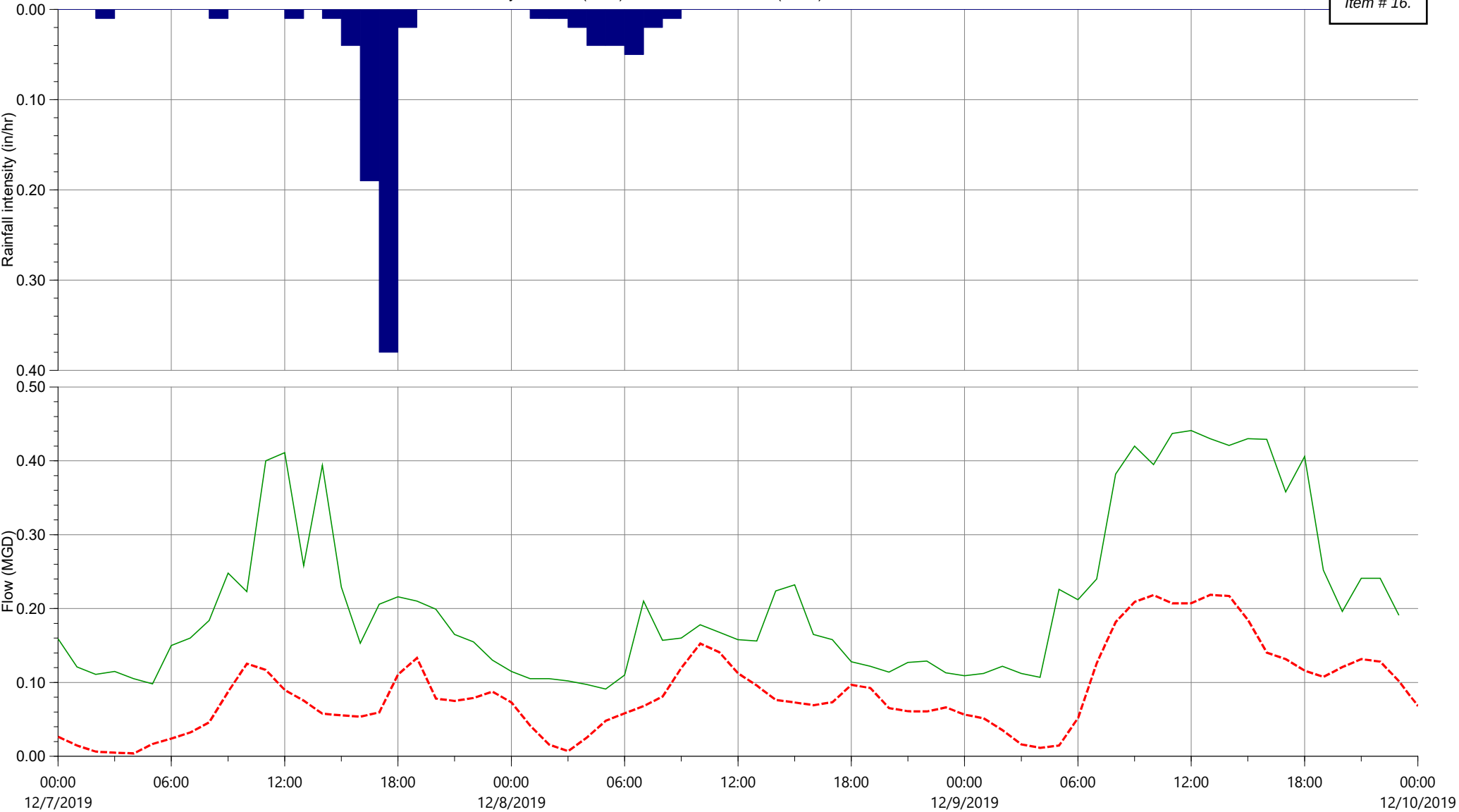
Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Item # 16.



Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.870	0.380	0.012	0.096	0.248	0.555
Model				0.086	0.248	0.559

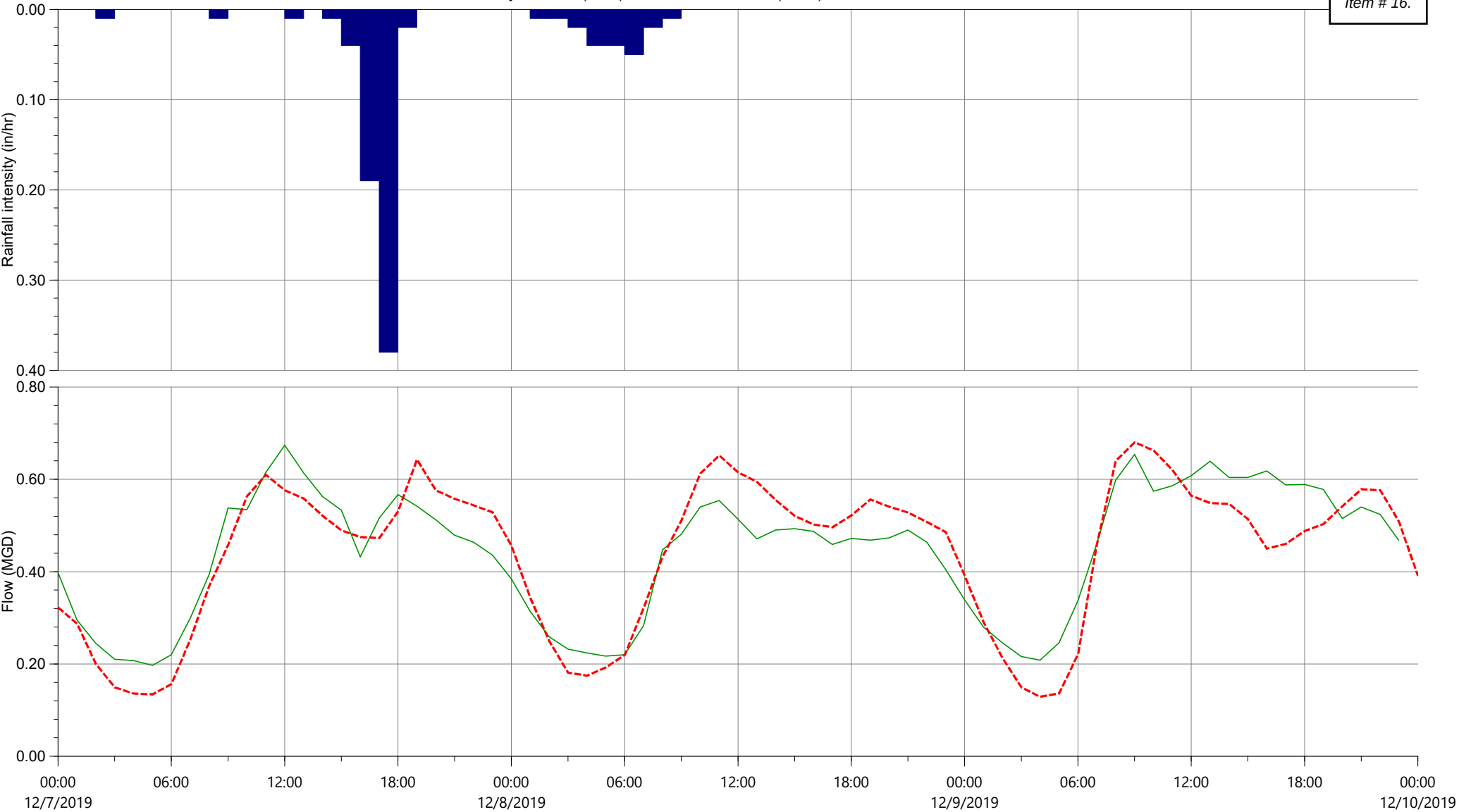
Item # 16.



Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.870	0.380	0.012	0.091	0.441	0.623
Model				0.004	0.219	0.260

Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

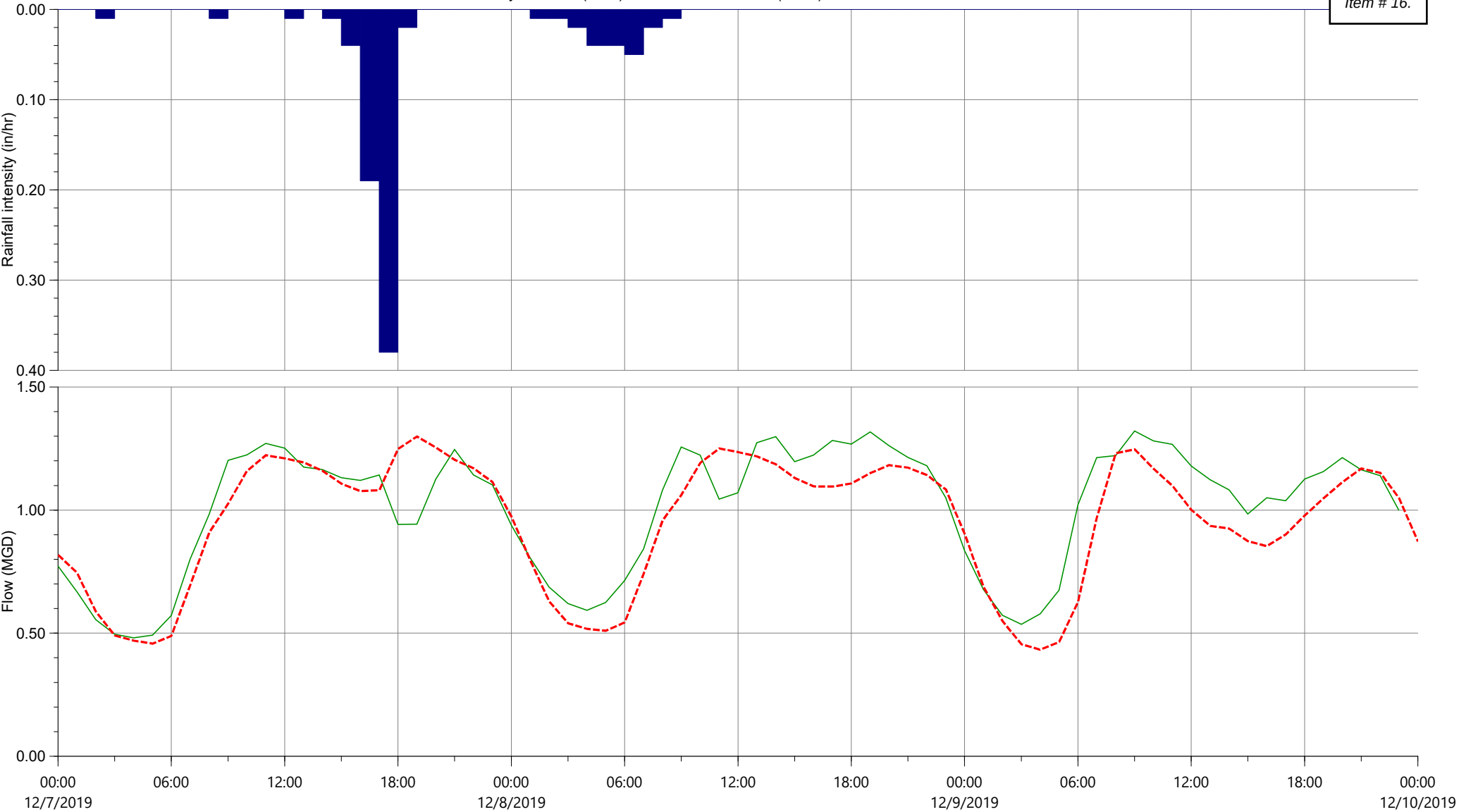
Item # 16.



	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

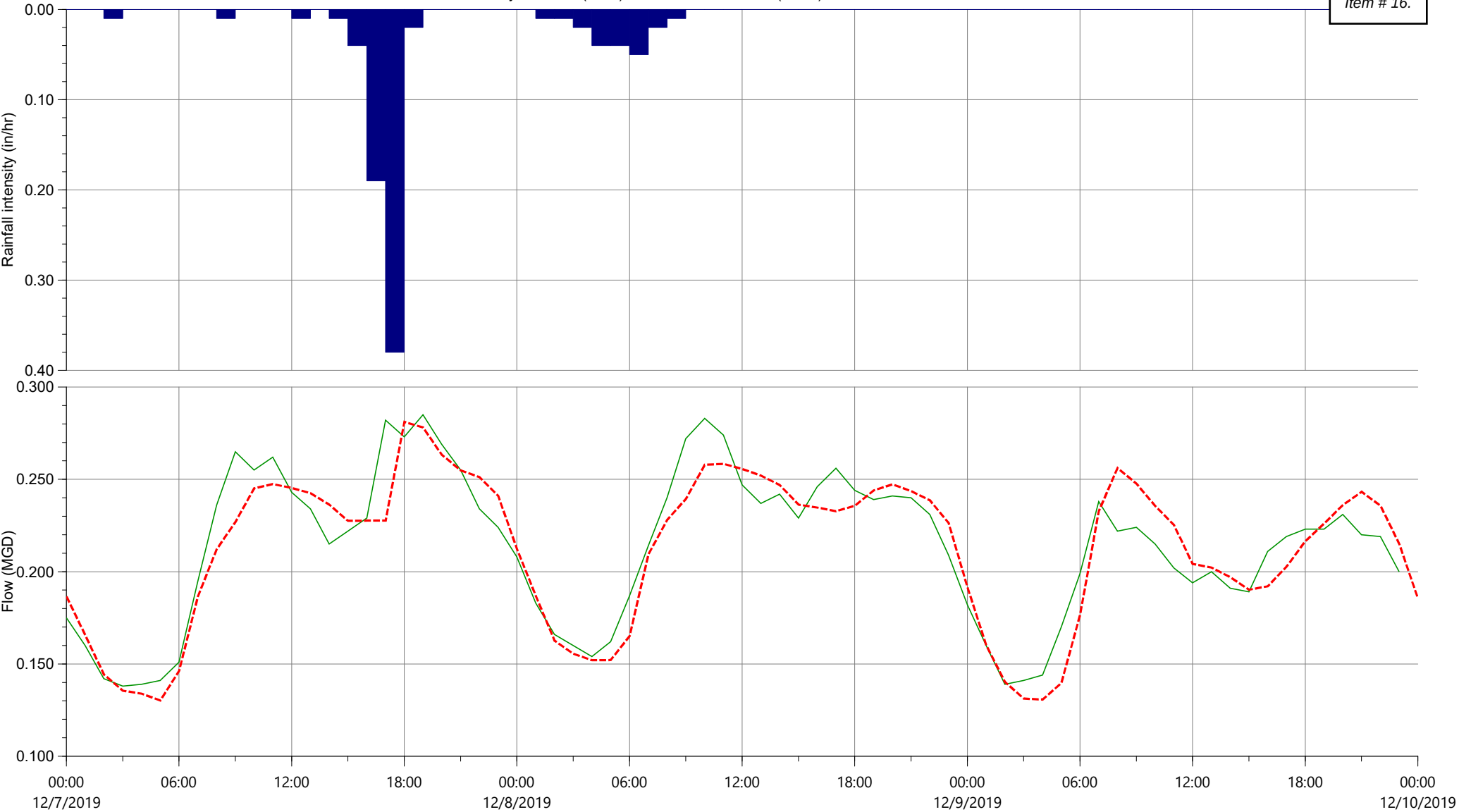
Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Item # 16.



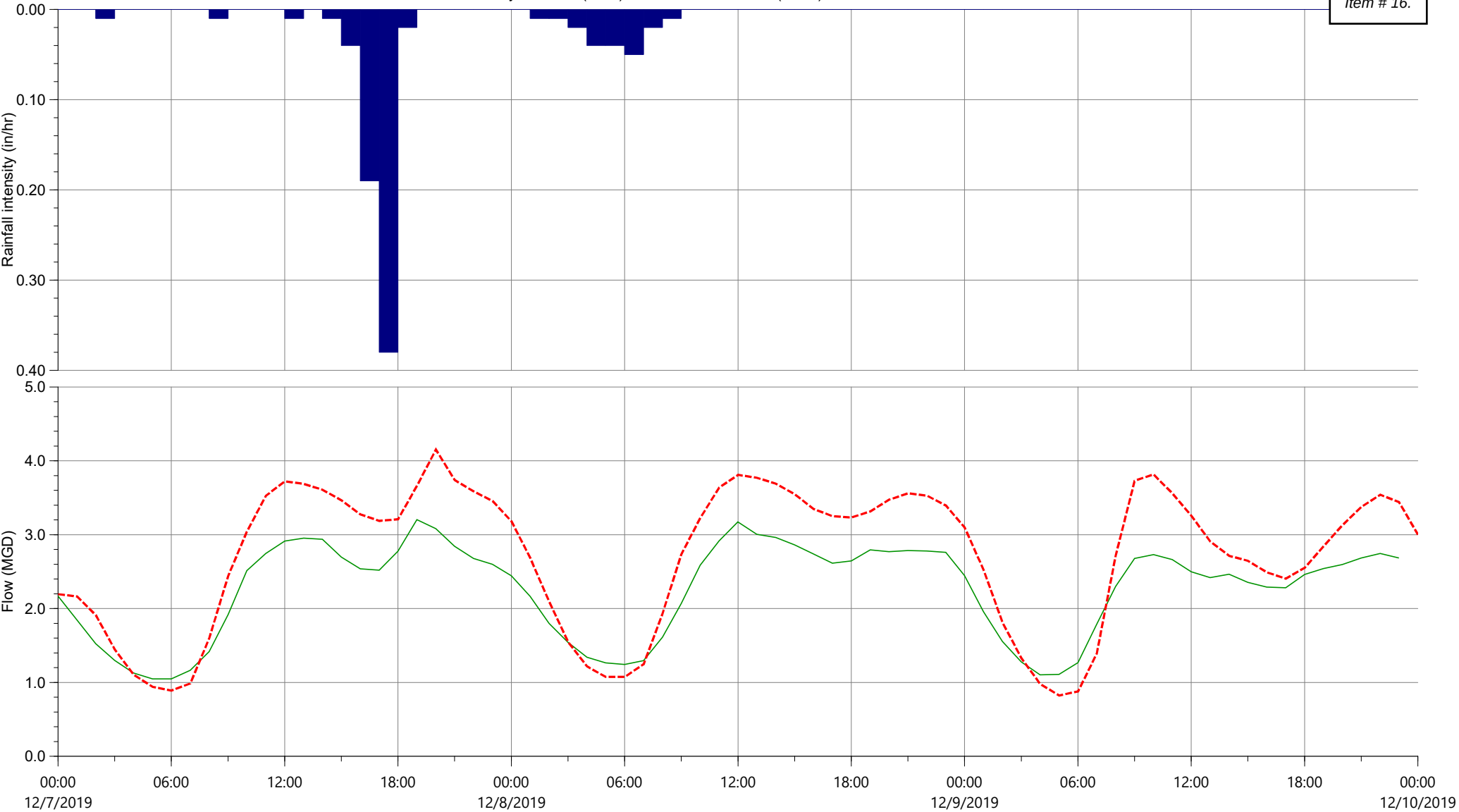
Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
	0.870	0.380	0.012	0.481	1.321	2.985
Observed				0.433	1.299	2.858
Model						

Item # 16.



	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

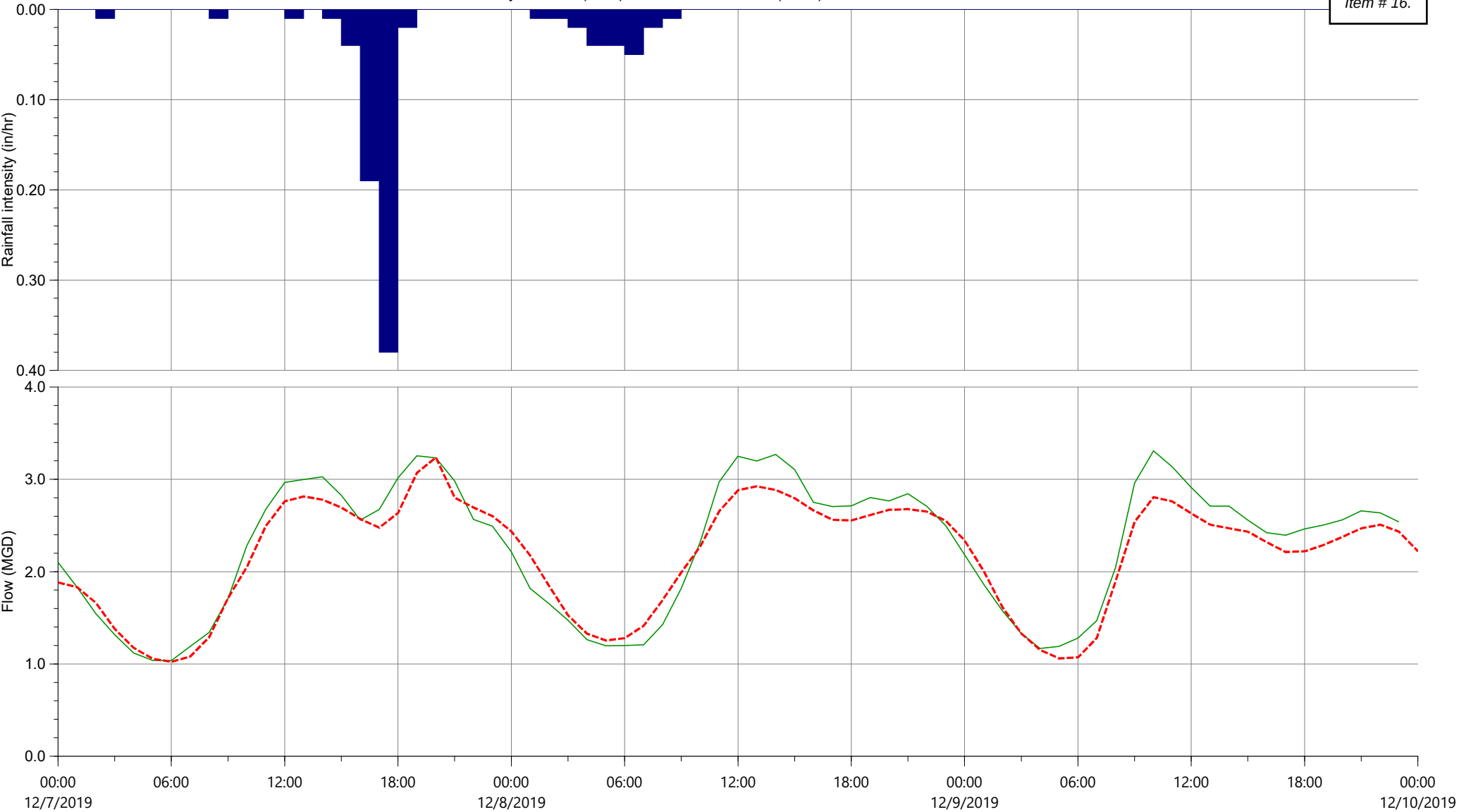
Item # 16.



	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

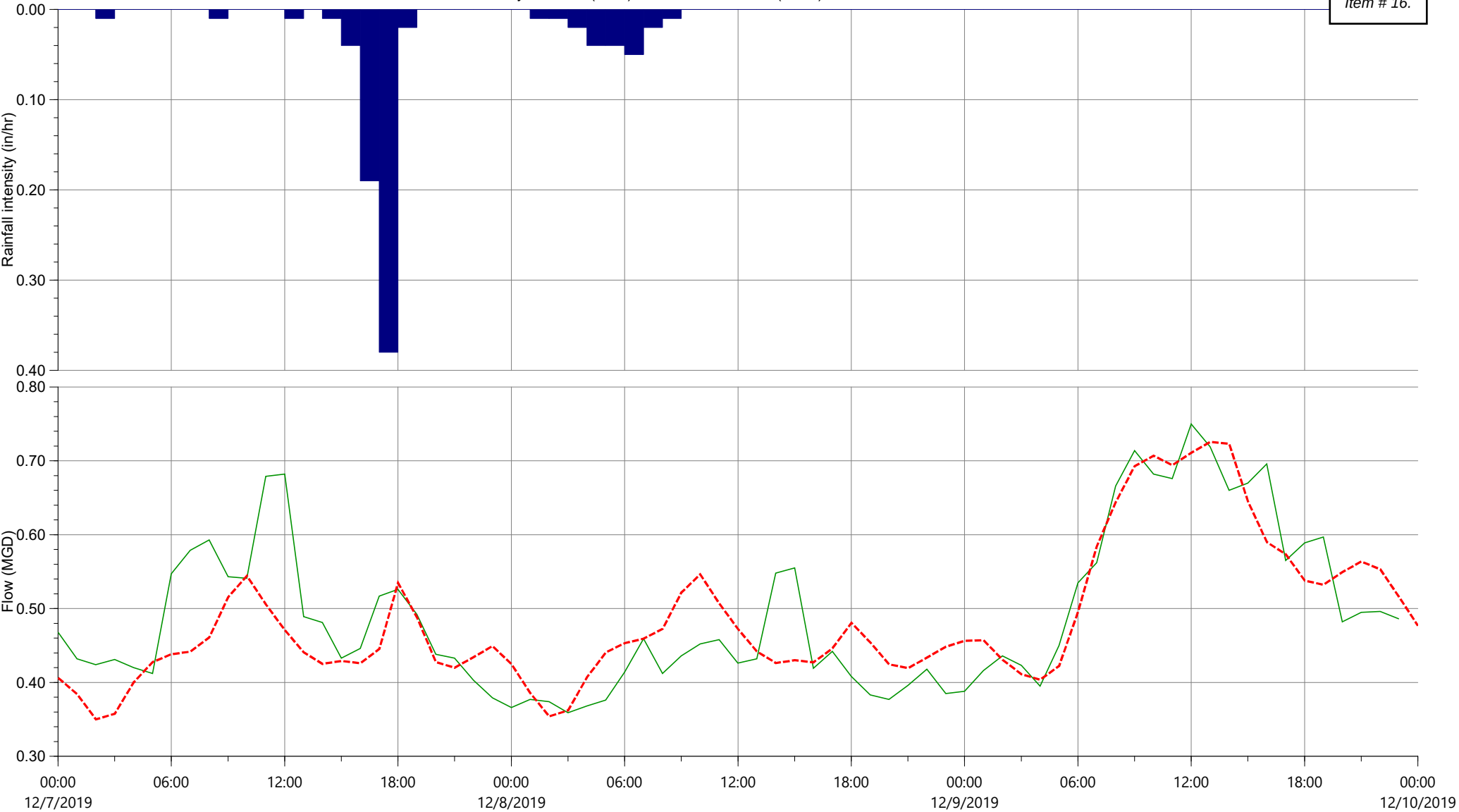
Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

Item # 16.



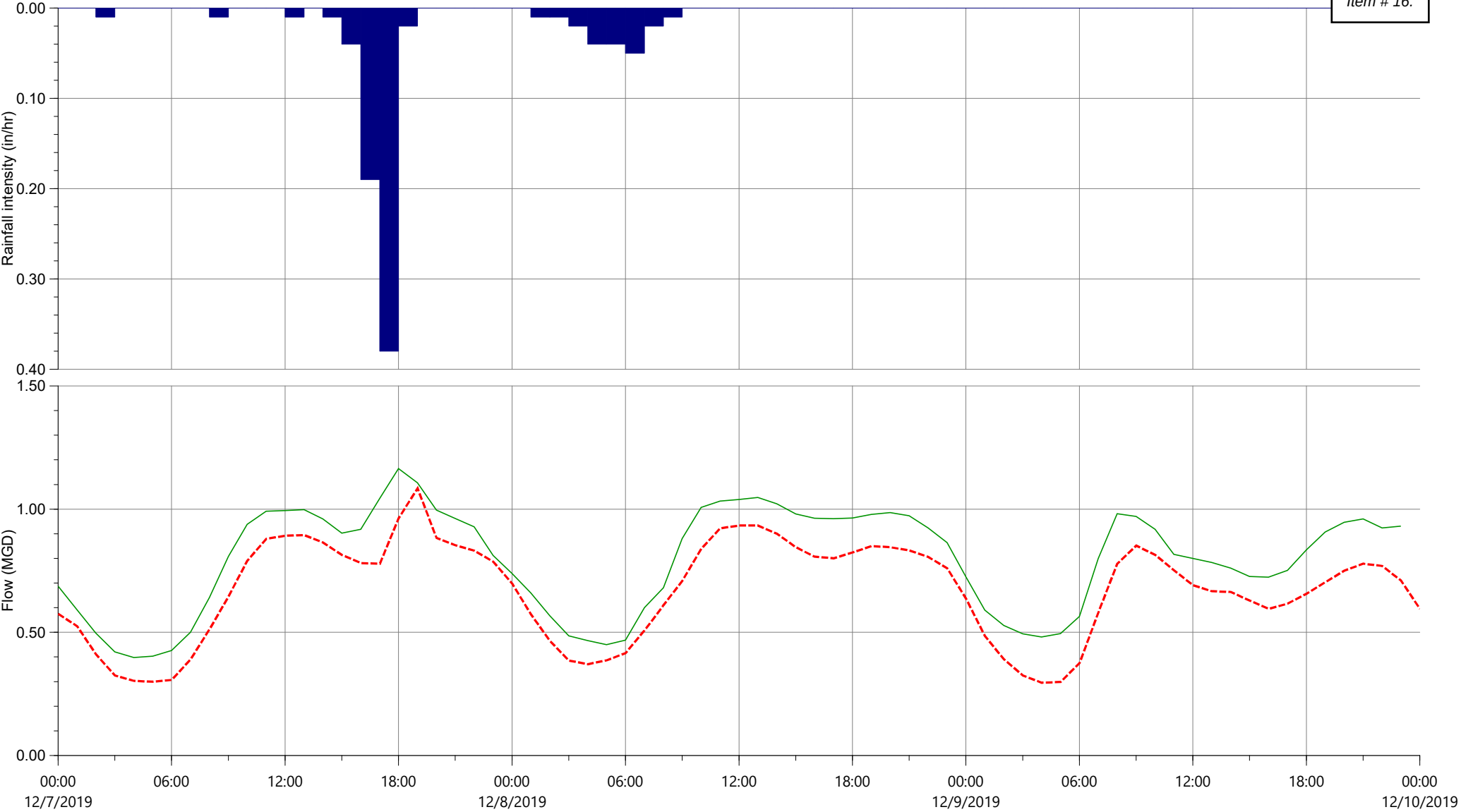
Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.870	0.380	0.012	1.036	3.308	6.717
Model				1.023	3.238	6.544

Item # 16.



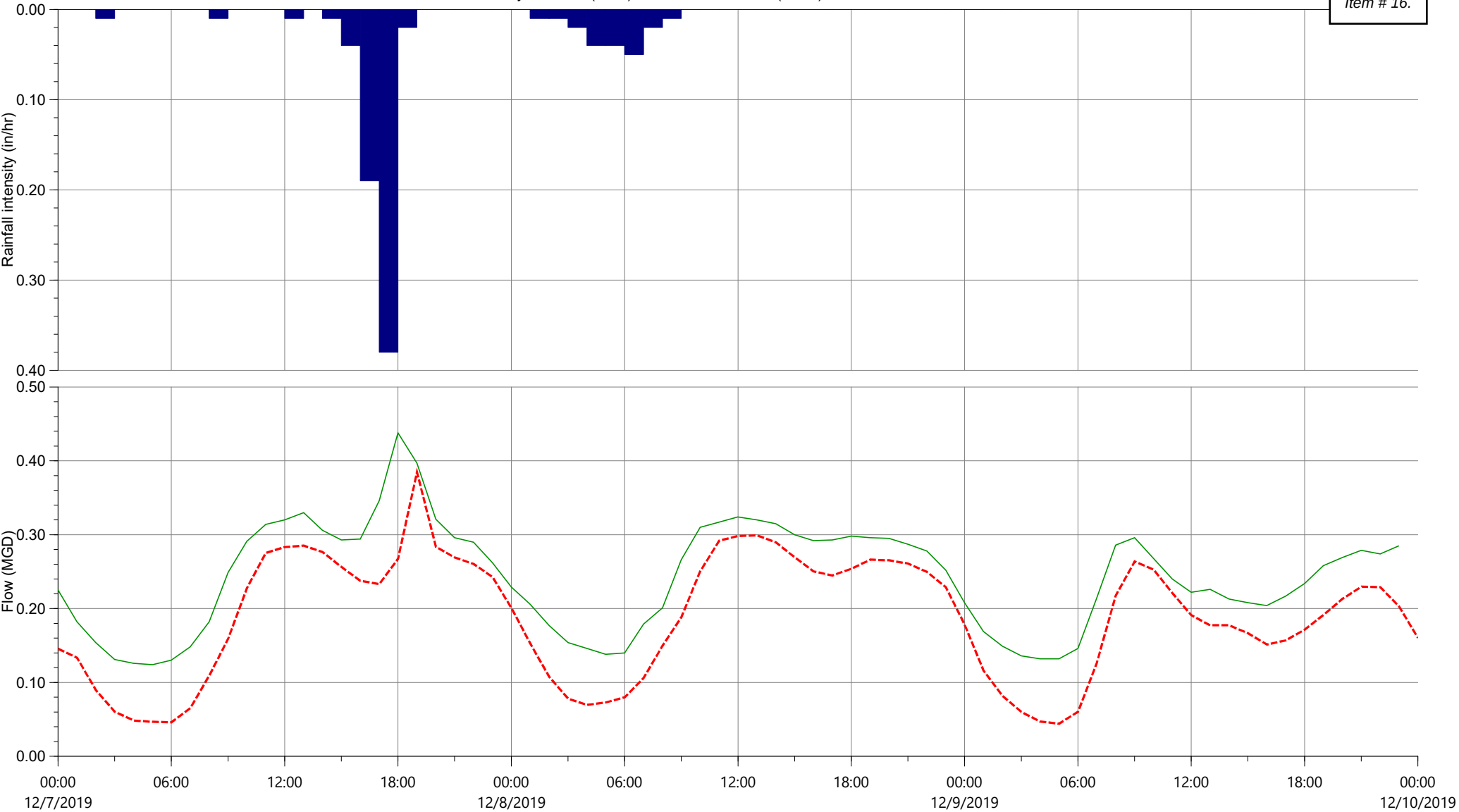
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Rain	0.870	0.380	0.012			
Observed				0.359	0.750	1.454
Model				0.350	0.726	1.455

Item # 16.



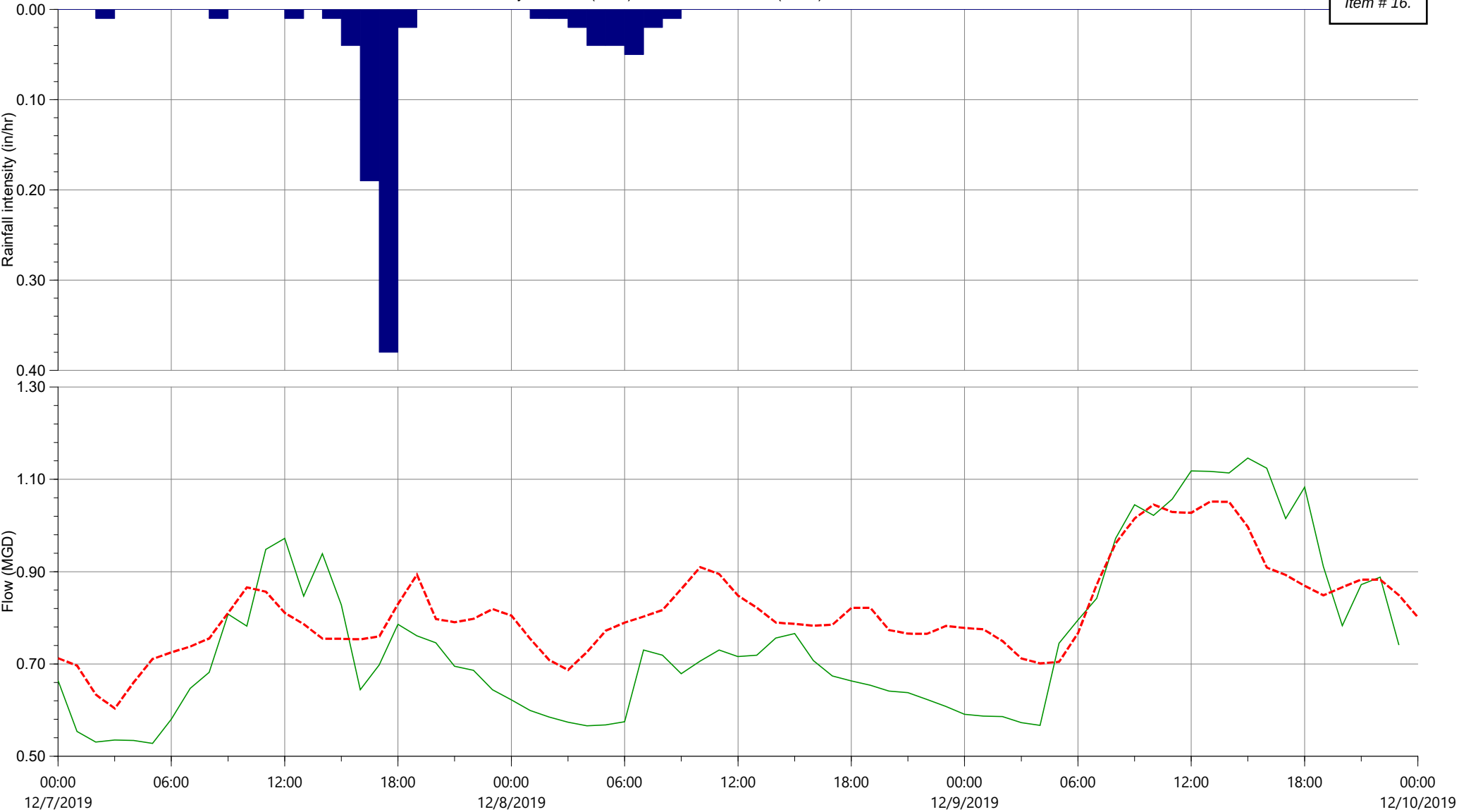
Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
	0.870	0.380	0.012	0.398	1.165	2.351
Observed				0.296	1.085	2.011
Model						

Item # 16.



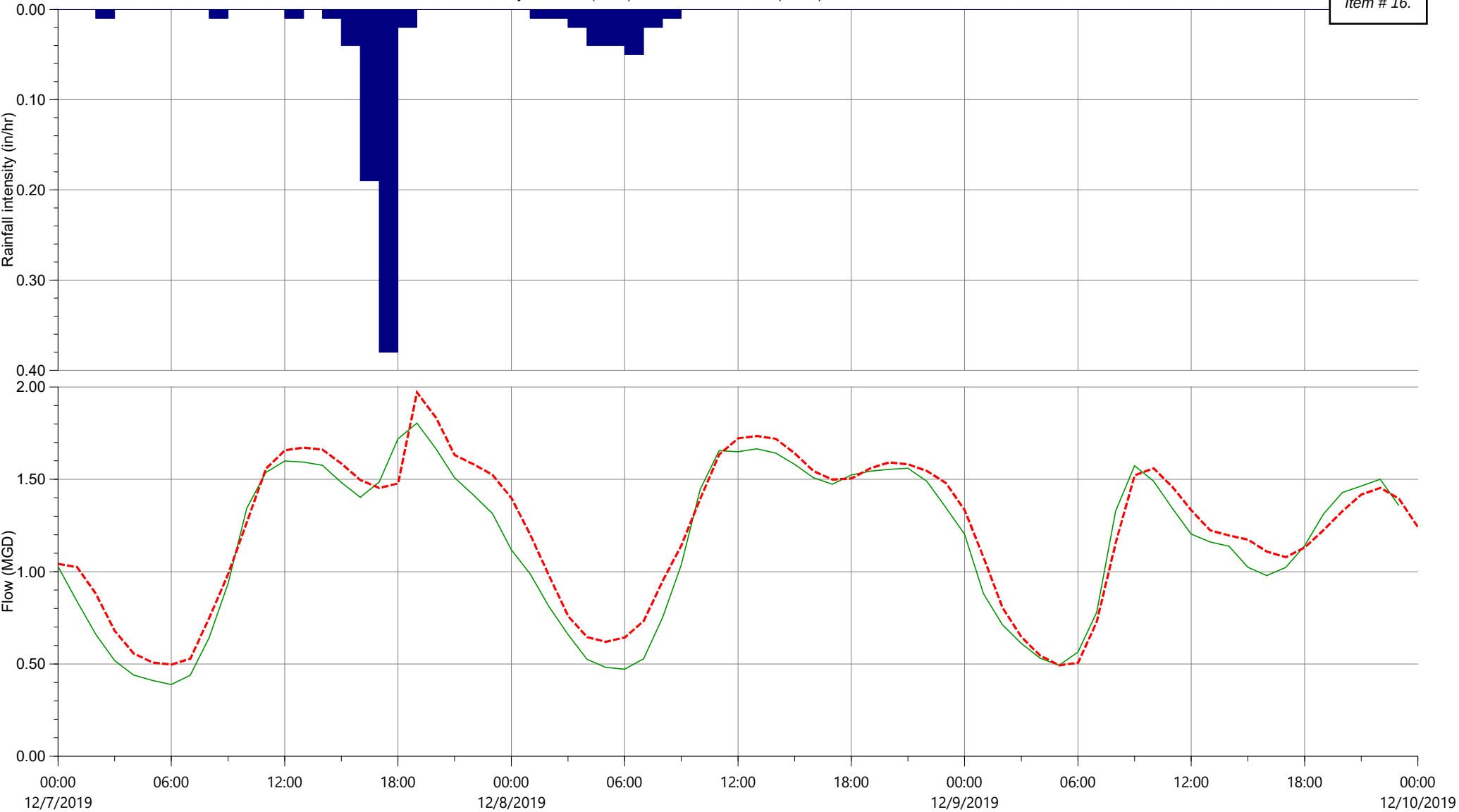
Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.870	0.380	0.012	0.124	0.438	0.715
Model				0.044	0.385	0.565

Item # 16.



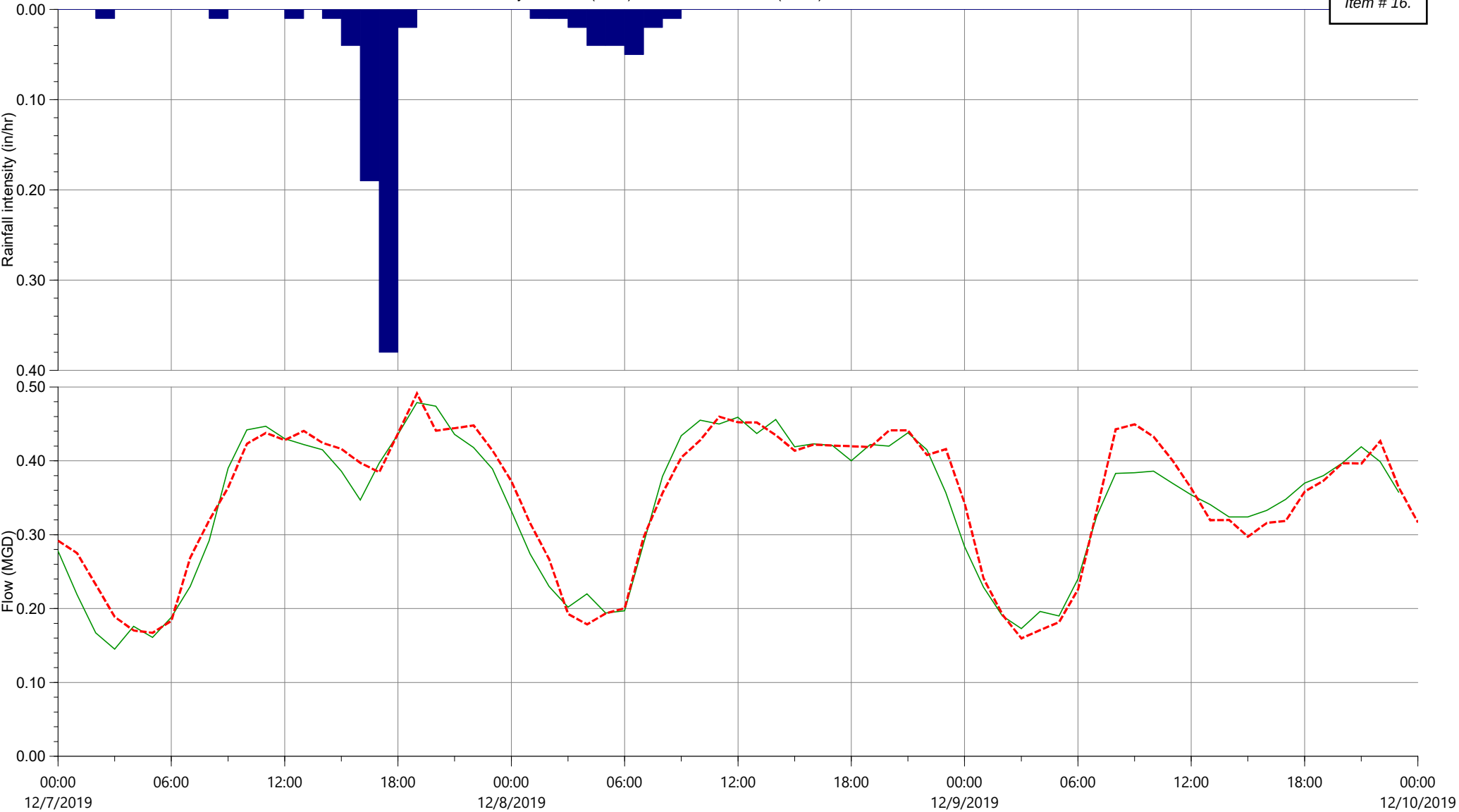
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Rain	0.870	0.380	0.012			
Observed				0.528	1.146	2.227
Model				0.603	1.052	2.445

Item # 16.



	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

Item # 16.



Rain	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (MGD)	Max (MGD)	Volume (US Mgal)
Observed	0.870	0.380	0.012	0.145	0.479	1.011
Model				0.160	0.492	1.047

Observed / Predicted Report (Custom graph) - Wet Weather Calibration FINAL

APPENDIX F
City of Milpitas
Sewer Master Plan Study
Los Esteros Ranch Agreement

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City Engineer's Office

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Milpitas, Ca 95035

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 California

BRENDA DAVIS
 SANTA CLARA COUNTY RECORDER
 Recorded at the request of
 City

RDE # 003
 11/25/2003
 9:18 AM

**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 otherwise 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.

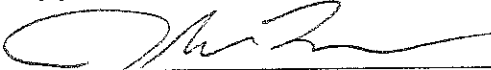
The Parties acknowledge and accept the terms and conditions of this Agreement as evidenced by the following signatures of their duly authorized representatives. It is the intent of the Parties that this Agreement shall become operative on the Effective Date.

PROPERTY OWNER

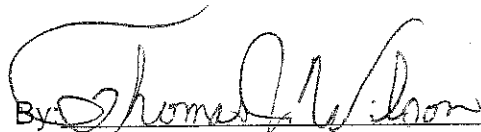

Will Oswald, Partner
Los Esteros Ranch Partnership

MILPITAS

Approved as to Form:



for Steven T. Mattas, City Attorney



By THOMAS 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 before me, LORI L. HORN, NOTARY PUBLIC
Date 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.



WITNESS my hand and official seal.

Lori L. Horn
 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: _____

**RIGHT THUMBPRINT
OF SIGNER**
 Top of thumb here

Signer Is Representing:

Signer's Name: _____

- ☐ Individual
☐ Corporate Officer
 Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Attorney-in-Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

**RIGHT THUMBPRINT
OF SIGNER**
 Top of thumb here

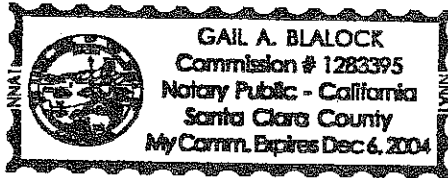
Signer Is Representing:

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California

County of Santa Clara } ss.On 11-20-2003, before me, GAIL A. BLALOCK, Notary Public,
Date 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.

Place Notary Seal Above

Signature of Notary Public

OPTIONAL

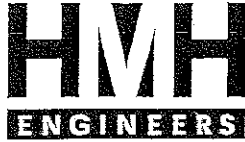
Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached DocumentTitle or Type of Document: Agreement for Sanitary Sewer & WaterDocument Date: August 6, 2003 Number of Pages: 6 + exhibitsSigner(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



San Jose
(408) 487-2200
Pleasanton
(925) 600-7335
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
Page 1 of 2

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 distance 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.

July 9, 2003
HMH 2734-01-099
Page 2 of 2

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

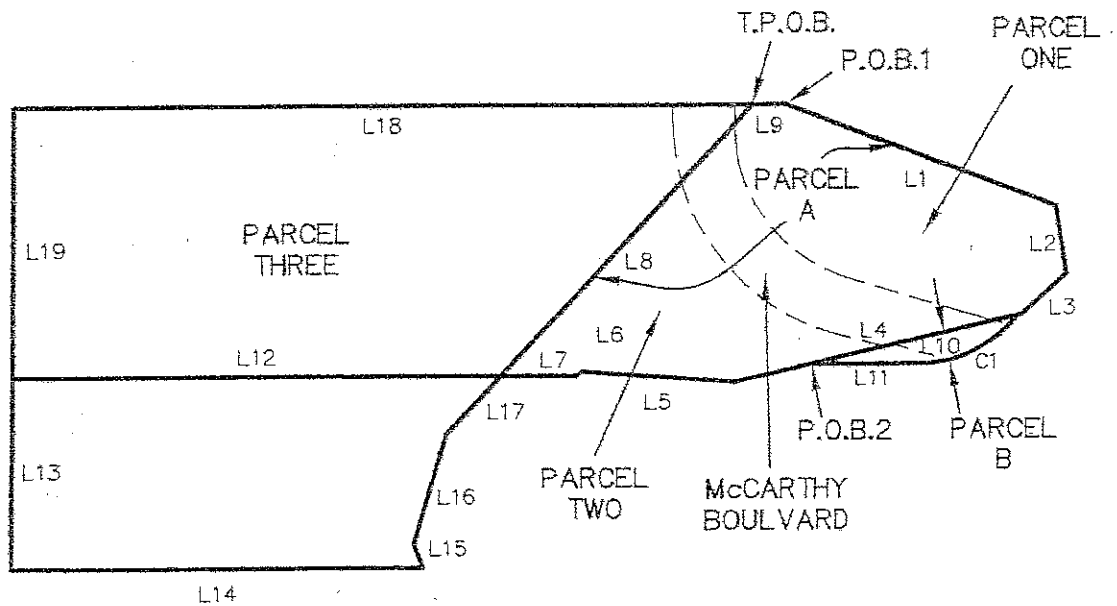
A portion of that certain parcel of land described in the deed from J. E. Filer and Ellie E. Filer, his wife, to A. M. Standish dated September 23, 1946 and recorded in Book 1534 Official Records at page 499, Santa Clara County Records, said portion being bounded and described as follows:

COMENCING at a 3/4 inch iron pipe found in the northerly line of said parcel conveyed from J. E. Filer, et ux 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, on and along the said northerly line of said parcel conveyed to A. M. Standish N. 89° 58' 00" W., 55.46 feet to a one (1) inch iron pipe and the TRUE POINT OF COMMENCEMENT.

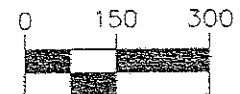
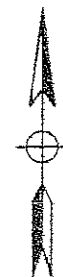
THENCE, along said northerly line N. 89° 58' 00" W., 1203.10 feet to a one (1) inch iron pipe; thence, S. 0° 02' 00" W., 435.60 feet to a one (1) inch iron pine; thence, S. 89° 58' 00" E., 796.90 feet to a one (1) inch iron pipe; thence, N. 43° 02' 00" E., 595.61 feet to the true point of commencement.

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'



GRAPHIC SCALE
1 INCH = 300 FT.

SHEET 1 OF 1

Date: 7-09-03
Scale: 1"=300'
Designed: -
Drawn: dt
Checked: DT
Proj. Engr: -
Draw Name: 2734PL11

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ENGINEERS

San Jose
(408) 487-2200
Pleasanton
(925) 800-7235
Gilroy
(408) 846-0707
www.hmh-engineers.com

PLAT TO ACCOMPANY
EXHIBIT "A"
LOS ESTEROS RANCH PROPERTIES"
SAN JOSE CALIFORNIA

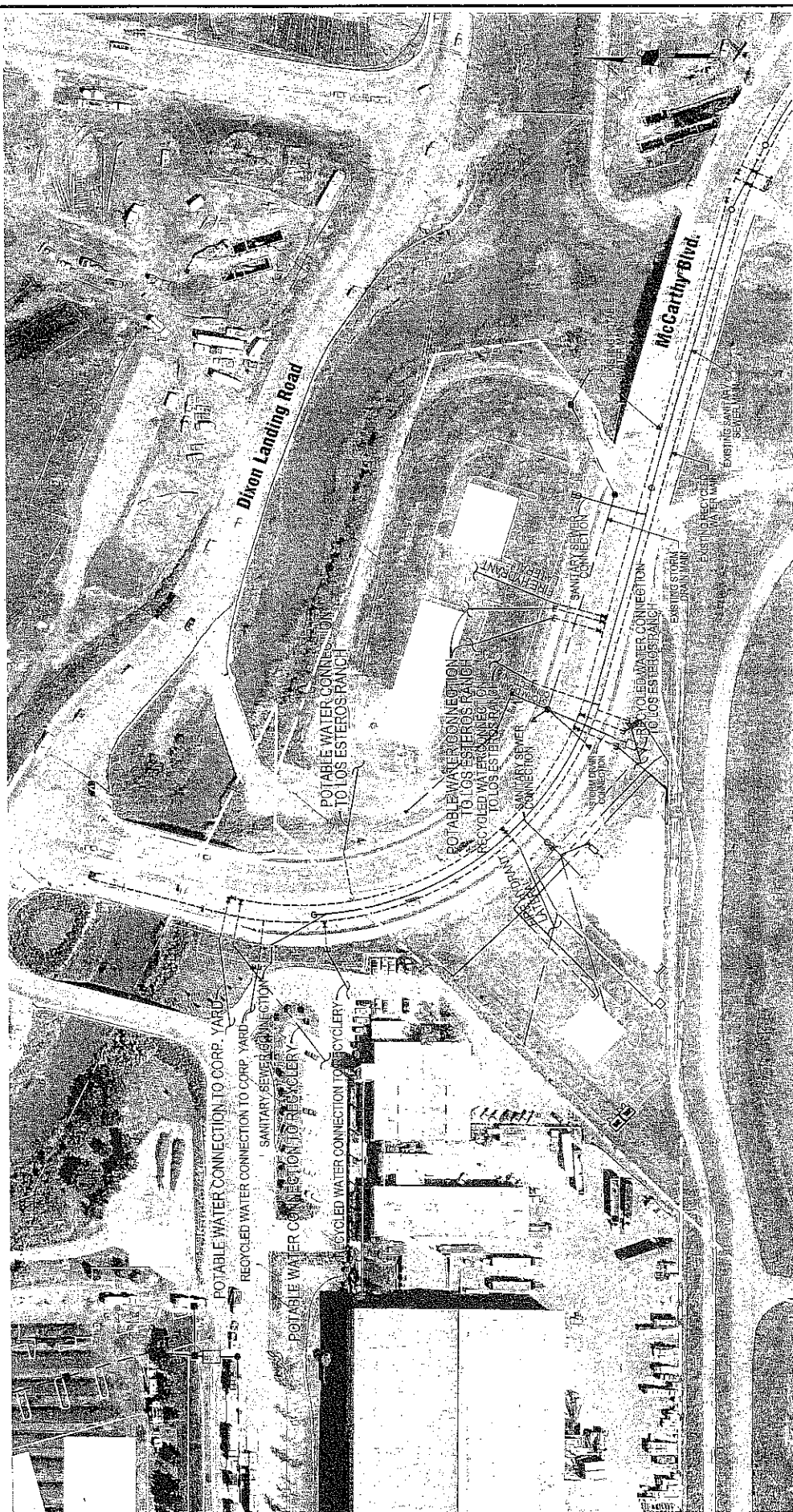
1540

12
200

LEGEND

--- POTABLE WATER LINE ---	--- POTABLE WATER LINE ---	--- POTABLE WATER LINE ---
--- EXISTING ---	--- EXISTING ---	--- EXISTING ---
--- RECYCLED WATER LINE ---	--- RECYCLED WATER LINE ---	--- RECYCLED WATER LINE ---
--- EXISTING ---	--- EXISTING ---	--- EXISTING ---
--- SANITARY SEWER ---	--- SANITARY SEWER ---	--- SANITARY SEWER ---
--- EXISTING ---	--- EXISTING ---	--- EXISTING ---
--- STORM DRAIN ---	--- STORM DRAIN ---	--- STORM DRAIN ---
--- EXISTING ---	--- EXISTING ---	--- EXISTING ---
--- PROPOSED ---	--- PROPOSED ---	--- PROPOSED ---
--- PROPOSED ---	--- PROPOSED ---	--- PROPOSED ---

EXHIBIT B



The Los Esteros Ranch 1125 N. Amphlett San Mateo, CA 94401		HMM ENGINEERS		Scale: 1" = 100' Date: 11/10/17 Drawn: JRS Checked: JRS Designed: JRS Reviewed: JRS Project: 2734-01		The Los Esteros Ranch - Site One & Two BFI Proposed Corporation Yard Utility Connections		Sheet 1 of 1 2734-01	
--	--	-------------------------	--	--	--	--	--	-------------------------------	--

EXHIBIT C

City Agreements

APPENDIX G
City of Milpitas
Sewer Master Plan Study
Raftelis Wastewater Financial Plan Options Report

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Project Memo

DATE: June 9, 2022
TO: Tony Ndah
Public Works Director
FROM: Todd Cristiano
Senior Manager
SUBJECT: Draft Wastewater Financial Plan Options

Introduction

The City of Milpitas retained Raftelis to complete a comprehensive financial planning forecast for their water, wastewater¹, and stormwater utilities². Separate financial plans and memorandums were developed for each utility. This memorandum summarizes the wastewater financial plan results. The analysis included the following:

1. **Revenue forecast.** Includes the projection of rate revenues, the number of accounts, growth in accounts, and billed volume per account; projection of other operating and non-operating income, and development fees.
2. **Expenditures forecast.** Includes the projection of operation and maintenance expenses, transfers to the general fund, payments on existing debt service, and capital projects identified in the most recent master plan documents.
3. **Revenue adjustments.** Optimizing the use of rate revenues and bond issues to minimize revenue adjustments while meeting annual revenue requirements, debt service coverage, and reserve targets.

The forecast presented in this memo is for the study period FY 2022 through FY 2040. The City's wastewater utility is financially self-sufficient with funding for capital and operating requirements derived primarily from rates.

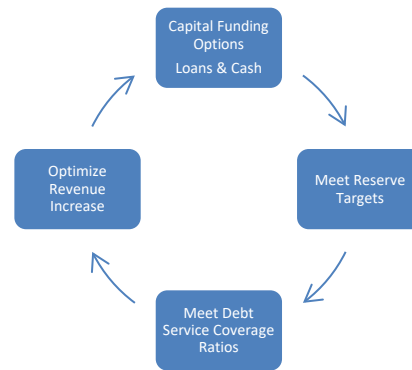
¹ Wastewater and sewer utility are used interchangeably throughout this memo.

² Stormwater activities are currently within the general fund and is not a stand-alone utility. For the purposes of this study, we created a cash flow consolidating the O&M costs for the various areas in the general fund and projects identified in the most recent master plan.

Financial Planning Process

A primary consideration in developing an ‘optimal’ financial plan is minimizing annual revenue increases by balancing the use of reserves, existing rate revenue, and debt proceeds. This balance is subject to the constraints of meeting the City’s target reserve policies and debt service coverage requirements on any proposed debt.

This approach is an iterative process. For example, while issuing debt to fund a capital project may keep revenue increases low, new debt payments may decrease the coverage below the target level. As a result, a revenue increase may be needed to maintain compliance with the target. This revenue may produce an ending balance which exceeds the target reserve. This excess can be used to partially fund the capital project which, in turn, could reduce the proposed debt issuance amount.



Reserves

The City maintains three reserves for the wastewater utility. The excerpts below are from the City’s financial reserve policy 11. These descriptions can also be found in the City’s consolidated annual financial report. The proposed financial plan allows the City to maintain reserves in compliance with this policy.

Capital reserves for emergencies. The City will maintain capital reserves in the Water and Sewer utility enterprise funds to provide for future capital projects and unanticipated emergencies. The City will attempt to maintain a capital reserve of approximately 30% of the annual operating and maintenance expenses for the Water utility fund and 25% of the annual operating and maintenance expenses for the Sewer utility fund.

Rate stabilization reserve. The City will maintain a Rate Stabilization Reserve (RSR) in the Water and Sewer utility enterprise funds with a goal of at least 16.67% or two months of the respective annual operating expenditures after the Capital Reserve requirements have been met. The RSR shall be used to mitigate the effects of occasional shortfalls in revenue or unanticipated expenditures that cannot be rebalanced within existing budgeted resources in any given fiscal year.

Public Employees Retirement (PERS) Rate Stabilization Reserve. The City will maintain in the Utility Enterprise Funds or in a Section 115 Trust a Public Employees Retirement (PERS) Rate Stabilization Reserve to be funded by 20% of any General Fund or Enterprise Funds annual operating surpluses. The Water and Sewer Utility Enterprise Funds’ portion of the Unfunded Actuarial Liability for the Miscellaneous Retirement Plan is 8.5% and 6.6%, respectively. The Utility Funds’ portion of the contribution to the PERS Rate Stabilization Reserve shall be consistent with the General Fund contributions and only be funded after the Capital Reserve and Rate Stabilization Reserve (RSR) requirements in the Water and Sewer utility funds have been met.

Wastewater Utility Findings

Raftelis used the assumptions shown in Table 1 to develop the financial plan options. Changes in these assumptions could materially affect the results. These assumptions were based on information provided by Staff over the course of the study which included annual budgets, detailed billing data, forecasts of new customer connections, and master plan reports. The detailed wastewater cash flows are attached at the end of this memorandum.

Table 1: Wastewater Utility Assumptions

Item	Description
FY 2022 Beginning Fund Balance	
Capital Reserve for Emergencies	\$3,675,927
Rate Stabilization Reserve	\$2,451,108
Capital Fund	\$35,522,844
TASP Fund	\$0
Debt Issues	
Term	20 years
Interest Rate	4.25%
Debt Service Coverage Target	1.25x debt service payments
Average growth in number of accounts	2.2%
Annual average O&M Inflation [1]	3.5%
Average Annual Capital Projects Inflation	6.0% (FY 2023 – FY 2026) 4.0% (FY 2027 – FY 2040) Study period average ~4.3%
San José-Santa Clara Regional Wastewater Facility O&M Inflation	4%
[1] Include the City's portion of the Jose San José-Santa Clara Regional Wastewater Facility costs	

The wastewater utility financial plan consists of three sub-funds:

- **Operating Fund.** Funds activities associated with annual operation and maintenance of the utility, debt service payments, the City's portion of the San José-Santa Clara Regional Wastewater Facility treatment costs, maintaining emergency and rate stabilization reserves, and transfers of any surplus to the Capital Fund.
- **Capital Fund.** Tracks activities associated with previously adopted CIP projects, projects identified in the master plan, and the City's capital portion of the San José-Santa Clara Regional Wastewater Facility costs. Primary sources of funding include transfers from the operating fund and debt issuance proceeds.
- **TASP Fund.** Tracks funding and projects that have specifically been identified as being funded by TASP or future METRO development fees.

Operating Fund

Sources of Funds

Sources of funds consist primarily of rate revenue, other operating income, and non-operating income. Rate revenues with proposed increases is projected to increase from \$21.7 million in FY 2023 to \$27.1 million in FY 2040. This includes an average annual account growth of 2.2% from FY 2023 to FY 2040 based on future METRO plan development forecasts.

Uses of funds

Uses of Funds consist of operation and maintenance expense, debt service on the existing Series 2017 and Series 2019, and transfers to the capital fund to assist in funding the capital improvement program. O&M consists of the items required to collect wastewater and the costs the City pays to San Jose for wastewater treatment services, as well as costs associated with administration of the utility, and customer services. San José-Santa Clara Regional Wastewater Facility costs are projected to increase 4.0% annually based on information from San Jose. O&M expenses for the City's core operations (personnel services, general supplies, contractual services excluding water purchases, etc.) will increase by 4.0% from FY 2023 through FY 2025. This short-term inflation estimates are based on publications from the Philadelphia Federal Reserve. Inflation from FY 2026 through FY 2040 is estimated at 3.0% based on historical trends of the Consumer Price Index (CPI). Total O&M including wastewater treatment expense will increase by an average of 3.5% annually over the study period or from \$13.0 million in FY 2023 to \$24.0 million in FY 2040.

Capital Fund

Sources of Funds

Primary sources of funding include transfers from the operating fund and bond proceeds. Transfers from the operating fund are made in years where operating revenue exceeds operating expenses and required transfers to reserve funds.

Uses of Funds

Expenditures include capital projects identified in the adopted FY 2023 – FY 2040 capital budget and the master plan as well as the capital portion of the San José-Santa Clara Regional Wastewater Facility treatment capital costs from San Jose. Capital improvement program costs total \$208.6 million for the study period which includes annual inflation of 6.0% from FY 2023 through FY 2025 and 4.0% from FY 2026 through FY 2040.

Revenue Requirement

Revenue from rates and other miscellaneous revenue should be sufficient to meet annual revenue requirements in the operating and capital funds; however, the City could issue a bond to accelerate implementation of critical projects. Revenue requirements include operation and maintenance expenses, capital project funding, payments on proposed debt service, and meeting target debt service coverage and reserves. Raftelis and City staff developed a financial plan to fully fund expenses, including the master plan projects, using revenue derived from rates and an option to issue bonds to accelerate project implementation.

Financial Plan Options

Raftelis and City staff developed two financial planning options to fully fund the expenses described above. Each option will ensure that the City is able to meet its obligations to San Jose for the San José-Santa Clara Regional Wastewater Facility expenses, continue to make debt service payments, operate and maintain the wastewater collection system, complete all projects identified in the master plan, and meet required reserve targets. The primary difference in the financial plan options relate to the timing and funding source for the Force main A project, which is a 40-year steel pipeline which conveys sewage from the City to the San José-Santa Clara Regional Wastewater Facility for treatment. The pipeline is in a corrosive environment and the condition of the pipeline is unknown due to the inability to dewater and inspect the pipeline

Option 1 – Bond Financing

Under this option, the City would issue a \$30 million revenue bond in FY 2025 to fund the Force main A project. In addition to funding the O&M and capital expenditures described above, the City could make the required annual debt service payments (estimated at \$2.3 million per year) with annual rate increases of 4.0% from FY 2024 through FY 2040.

- **Operating and Capital Fund.** Annual increases to sewer user charges of 4.0% are required in FY 2024 through FY 2040 in order to meet the annual revenue requirements. The revenue from these increases will adequately fund O&M, sewer treatment, reserve requirements, and provide surplus revenue to transfer to the CALPERS and capital funds.
- **Bill Impact.** Based on the rate increases proposed for this option, the bimonthly bill for typical single-family residential customer is projected to increase \$4.97 from \$124.14 to \$129.11.

Option 1 has the following advantages:

- **Lower rate impact on customers** (4% increase in FY 2024) versus Option 2 (6% increase in FY 2024).
- **Intergenerational equity.** The use of bonds recovers the cost of the asset over a time horizon that is closer to its useful life ensuring that future users, who will also benefit from the use of the force main, will participate in funding it.
- **No reliance on development fees.** Does not rely on revenue from future METRO development fees that have not yet been determined
- **Timely replacement.** Since the current condition of the Force main is unknown, it is safer to replace it sooner than later.

Option 2 – Cash and TASP Financing

Under this option, the Force main A project would be completed in FY 2030 and be 20% funded by future METRO development fees. This plan requires wastewater rate increases of 6% each year from FY 2024 to FY 2029 and 4% each year thereafter. This higher rate increase allows the City to generate the cash needed to fund approximately \$29 million of the Force main A project expense. Additionally, the City must ensure that future METRO development fees are sufficient to provide \$7.3 million by FY 2030 for the remainder of the project.

- **Operating and Capital Fund.** Annual increases to sewer user charges of 6.0% are required from FY 2024 through FY 2029 and 4.0% from FY 2029 through FY 2040. The revenue from these increases will adequately fund O&M, sewer treatment, reserve requirements, and provide surplus revenue to transfer to the CALPERS and capital funds.
- **Bill Impact.** Based on the rate increases proposed for this option, the bimonthly bill for typical single-family residential customer is projected to increase \$7.45 from \$124.14 to \$131.59.

The primary advantage of this option is the savings on interest expense by cash funding the CIP rather than debt funding (Option 1). In addition, cash financing the CIP will not impact debt service coverage.

Reliance on City Provided Data

During this project, the City (and/or its representatives) provided Raftelis with a variety of technical information, including cost and revenue data. Raftelis did not independently assess or test for the accuracy of such data – historic or projected. Raftelis has relied on this data in the formulation of our findings and subsequent recommendations, as well as in the preparation of this memorandum.

There are often differences between actual and projected data. Some of the assumptions used for projections in this memorandum will not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the data or results projected in this memorandum and actual results achieved, and those differences may be material. As a result, Raftelis takes no responsibility for the accuracy of data or projections provided by or prepared on behalf of the City, nor do we have any responsibility for updating this memorandum for events occurring after the date of this memorandum.

APPENDIX H
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





CITY OF MILPITAS

Engineering Department

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.

CITY OF MILPITAS

Engineering Department



Figure 1- Ariel Map of City Force Mains

SITE INVESTIGATION FINDINGS/CHALLENGES

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

CITY OF MILPITAS

Engineering Department

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.

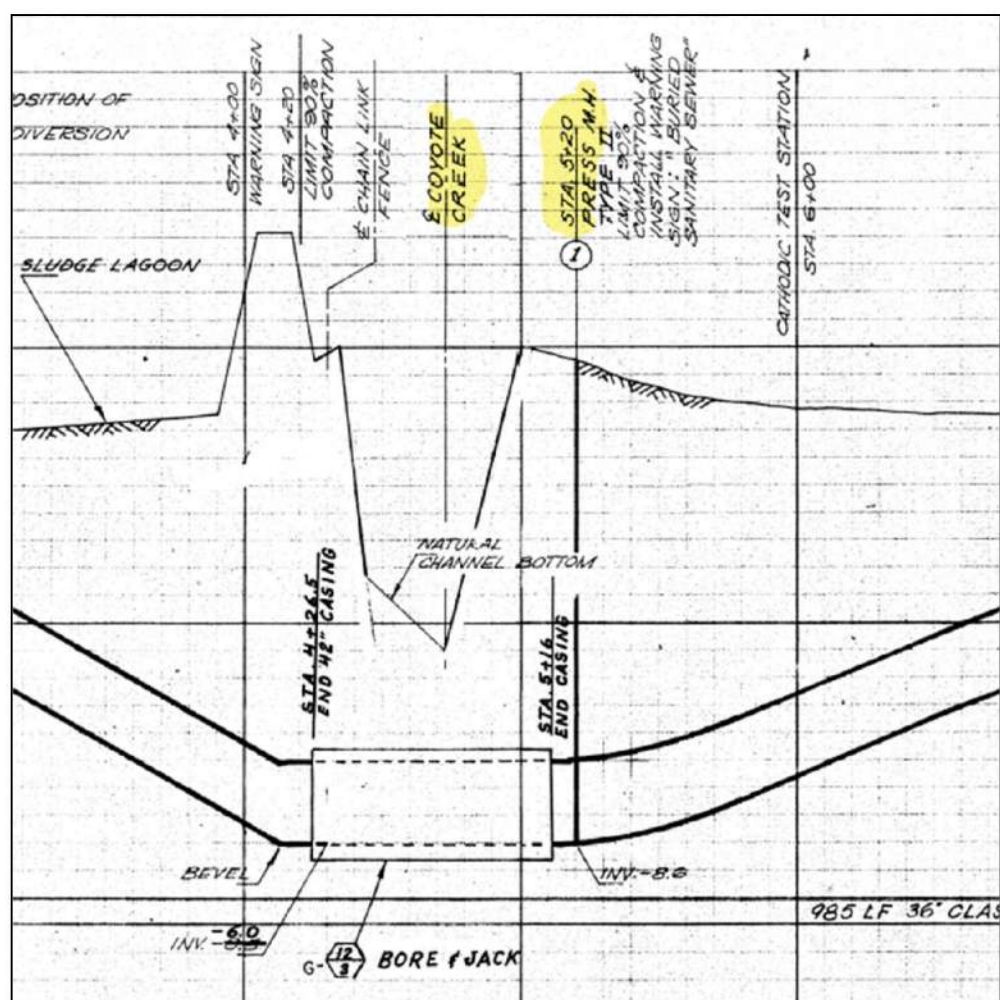


Figure 3- Manhole #1 Location Per As built

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 knowledge 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**.

CITY OF MILPITAS

Engineering Department

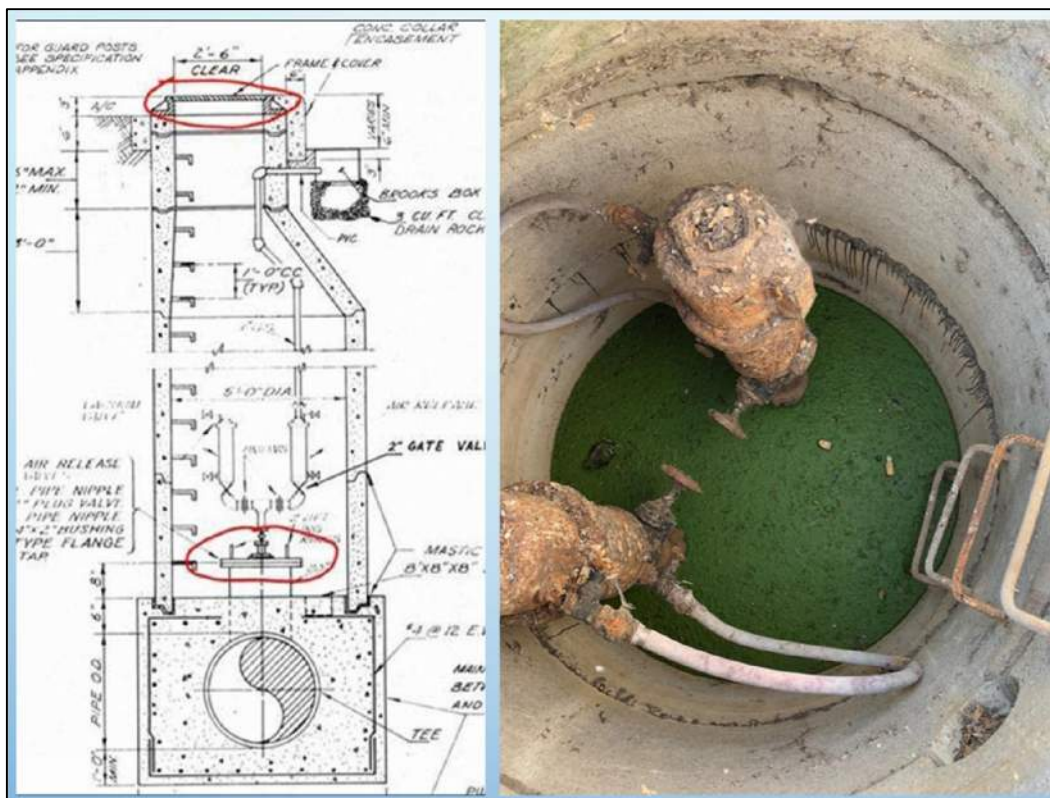


Figure 8: Force Main Manhole



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.

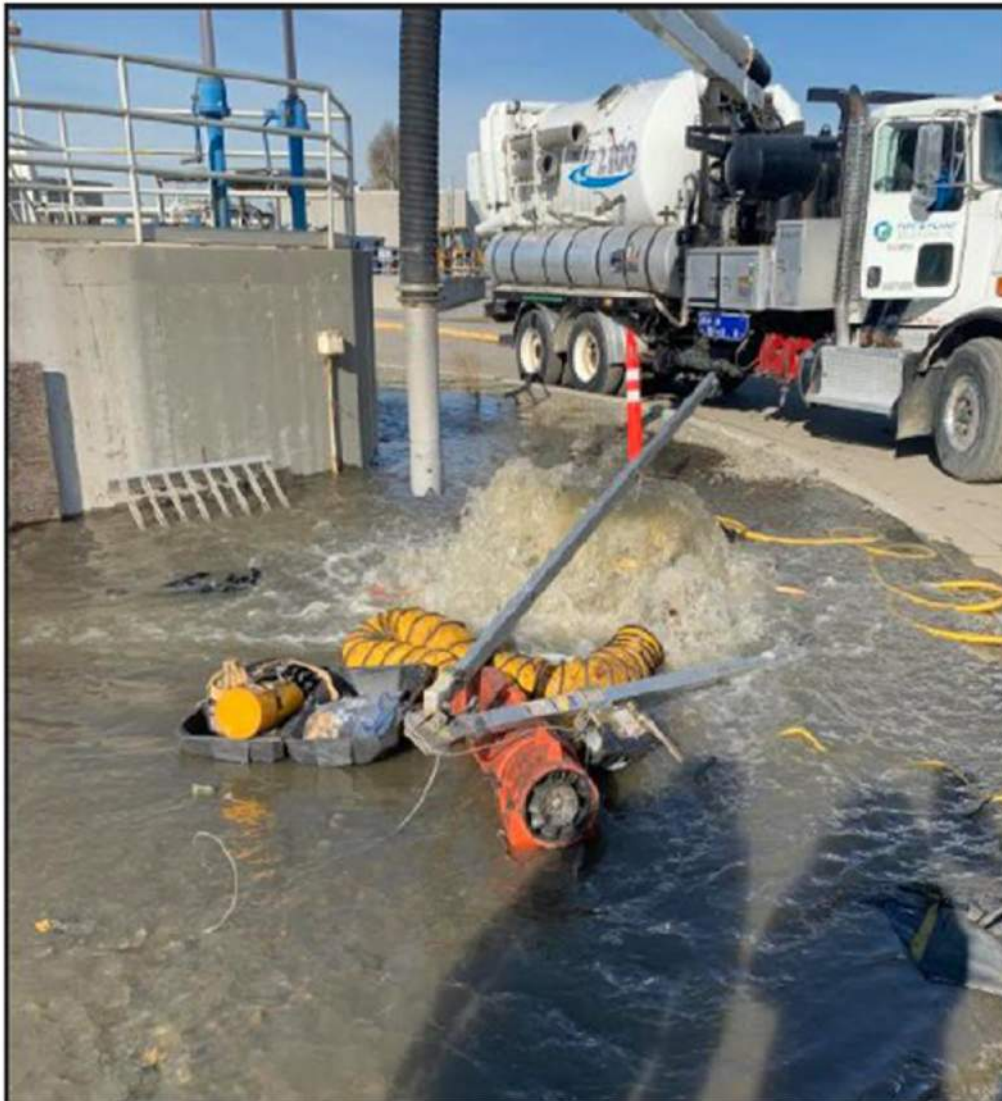


Figure 10: Sewer Overflow at MH #12

CITY OF MILPITAS

Engineering Department

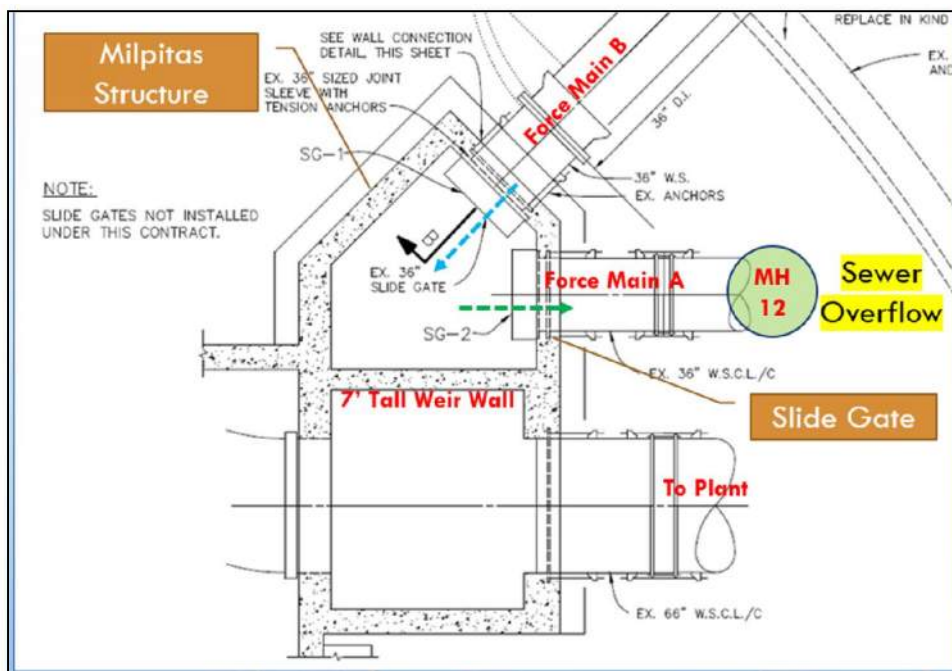


Figure 11: Milpitas Structure Drawing



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**.

CITY OF MILPITAS

Engineering Department



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



HydroScience is a civil engineering firm that plans, designs, and manages the construction of water, wastewater, and recycled water projects. With offices in Berkeley, San Jose, and Sacramento, we understand and address the complex water and wastewater needs of Northern California.

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City of Milpitas Storm Drain Master Plan 2021



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- Appendix B. Pump Station Recommendations
- Appendix C. Stormwater Financial Plan Report

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).

Milpitas 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 storm drainage systems within the city eventually discharge into a Valley Water-managed facility. Valley Water is keenly interested in any storm drain project that might impact one of their receiving creeks. In turn, Milpitas 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 Storm Drain Master Plan must address 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 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 assuming a six percent interest rate. This revenue stream includes high priority capital project, long-term equipment replacement, and annual operations and maintenance. Low priority projects that are optional or potential ancillaries to other site development or public projects are not included.

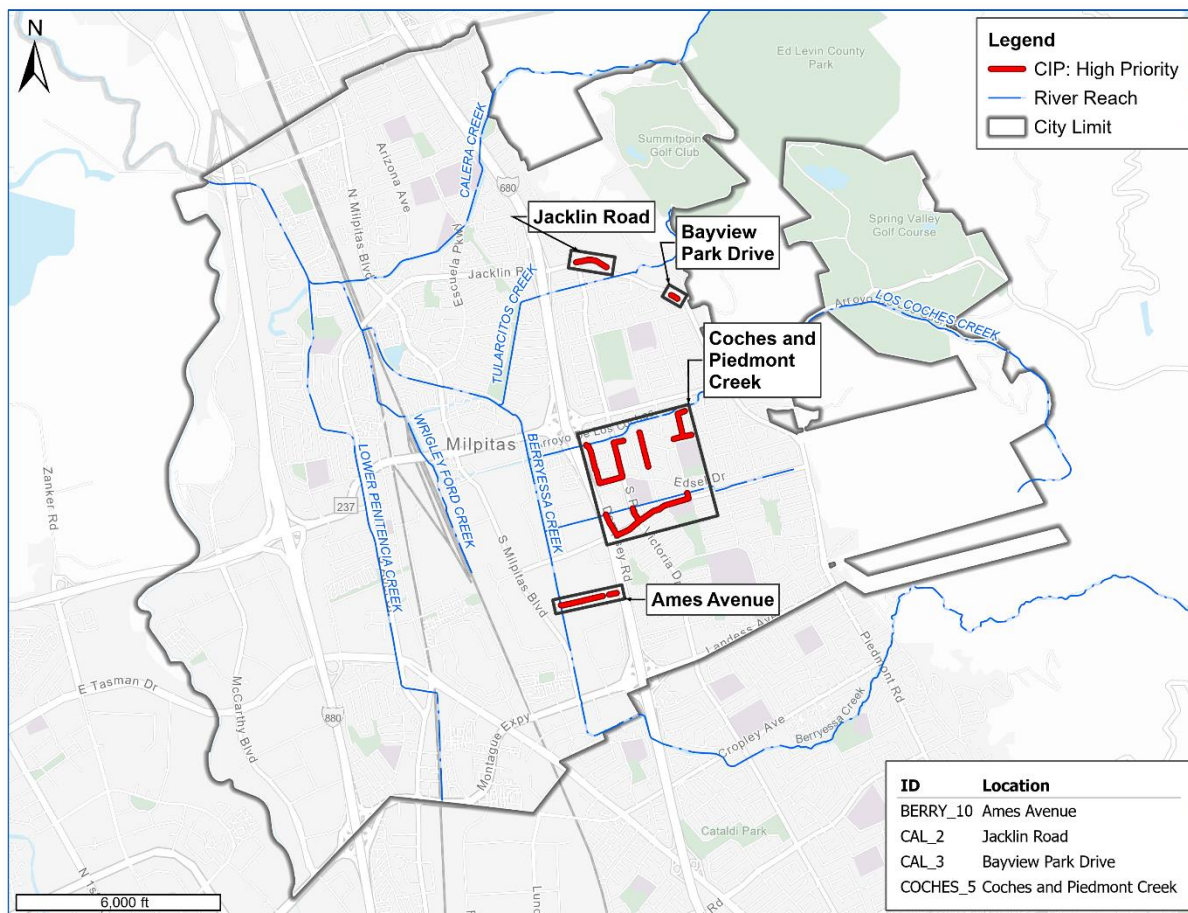


Figure ES-1: High Priority CIP

Table ES-1: Capital Improvement Program Costs

Category	Cost
High Priority CIP	\$40,000,000
Low Priority CIP	\$24,000,000
Extension CIP	\$1,000,000
Total	\$65,000,000

Table ES-2: Summary of Storm Drainage Budget Requirements

Category	Present Worth	Annualized Cost
High Priority Capital Improvements and Extension CIP	\$40,000,000	\$3,500,000
Long-Term Equipment Replacement	\$43,000,000	\$3,500,000
Annual Operations and Maintenance		\$2,500,000
Total Budget	\$83,000,000	\$9,500,000

The total CIP cost for the stormwater system through 2040 is approximately \$59 million (2020 dollars), of which \$26 million is stormwater main replacement or rehabilitation, and \$33 million is for replacement and rehabilitation of pump stations.

After the projects above were developed, the City contracted with the financial consulting firm Raftelis to develop fiscal impact models and to assess the financial feasibility of the Master Plan projects, beginning FY 2024 through FY 2040. The financial models are intended to evaluate the stormwater utility revenues and expenses and analyze the impacts of the master plan projects on City funds. The Stormwater Financial Plan Report is attached as Appendix C.

Unlike the water and sewer utilities, the stormwater utility does not have a dedicated funded source. Any expenditure for the stormwater utility, including operation and maintenance (O&M) expenses, are funded by the General Fund. In order to maintain the stormwater utility, staff estimates approximately \$5 million annually is needed for O&M and capital expenses. The Capital Improvement Program for the storm system is currently funded with an annual \$500,000 transfer from General Government CIP Fund, while O&M is funded from the General Fund. The O&M budget for FY 2022-23 amounts to approximately \$1.0 million.

The fiscal impact models developed by Raftelis indicate the current funding is insufficient to fund capital projects described in the master plan. The preliminary stormwater financial plan presented in Appendix C makes recommendations for the City to formally examine options in order to provide \$5 million per year for stormwater O&M, capital costs, and proposed debt service.

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.

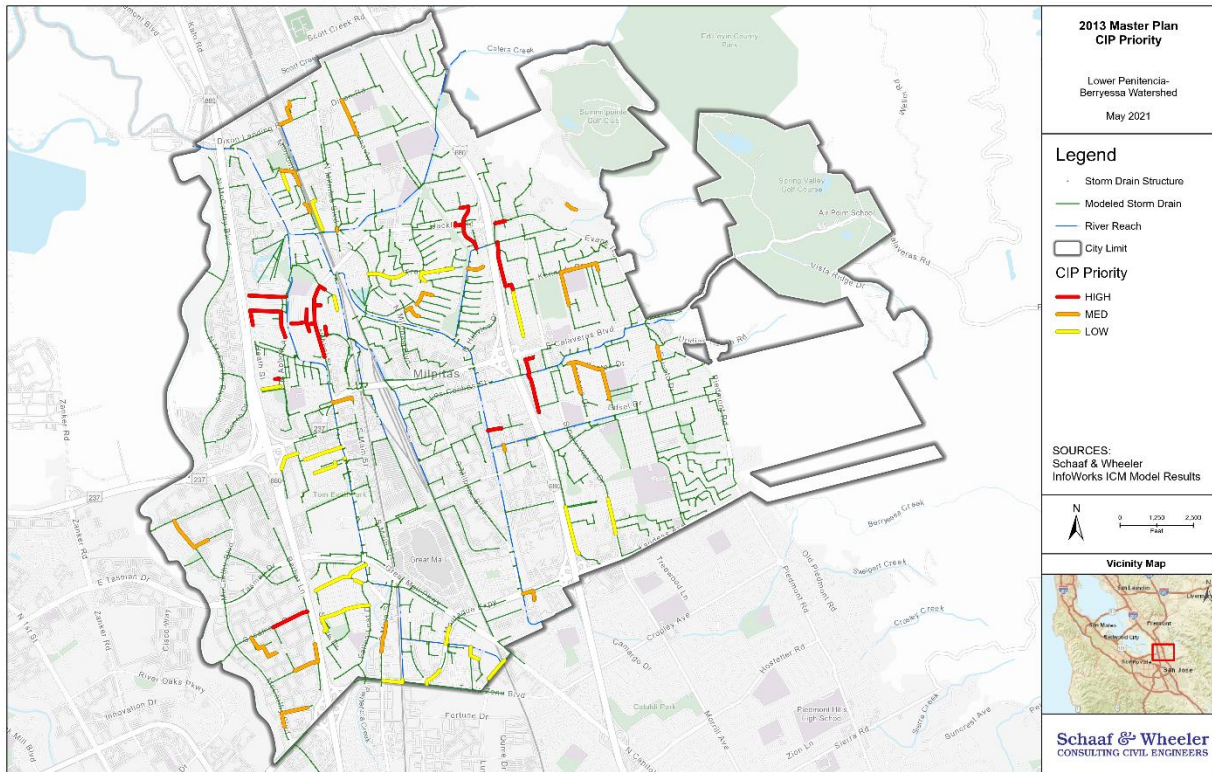


Figure ES-2: 2013 Master Plan CIP Priority

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.

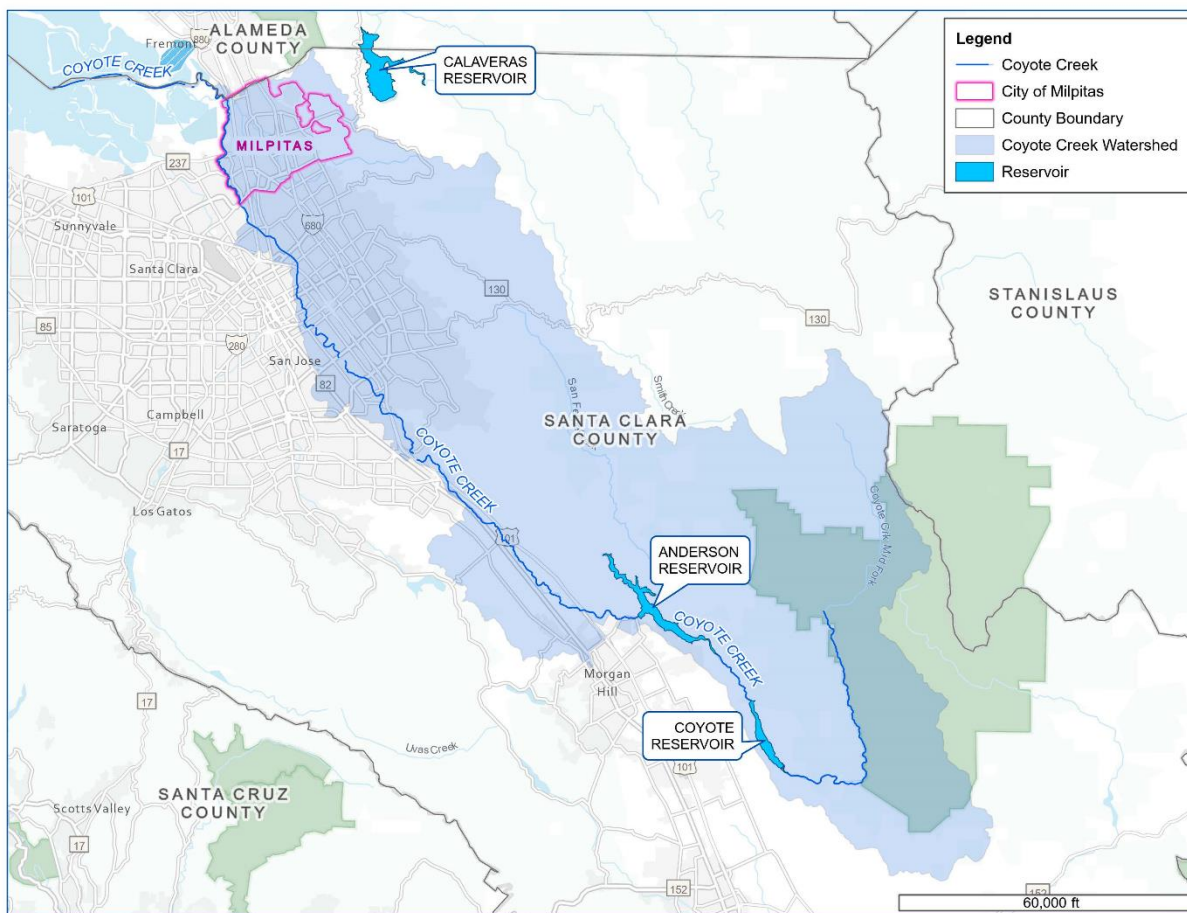


Figure 1-1: City of Milpitas within the Coyote Creek Watershed

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. Most 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 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 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):

$$\text{NGVD} + 2.78 \text{ feet} = \text{NAVD (88)}.$$

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

¹ SCVWD 2013: Precipitation Gage Data and Depth-Duration-Frequency Analysis. Revised from Saah et al. 2004

$$P_{f,d} = A_{f,d} + B_{f,d}(MAP)$$

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

$A_{f,d}$ and $B_{f,d}$ values used are displayed below in Table 2-1 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.

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.

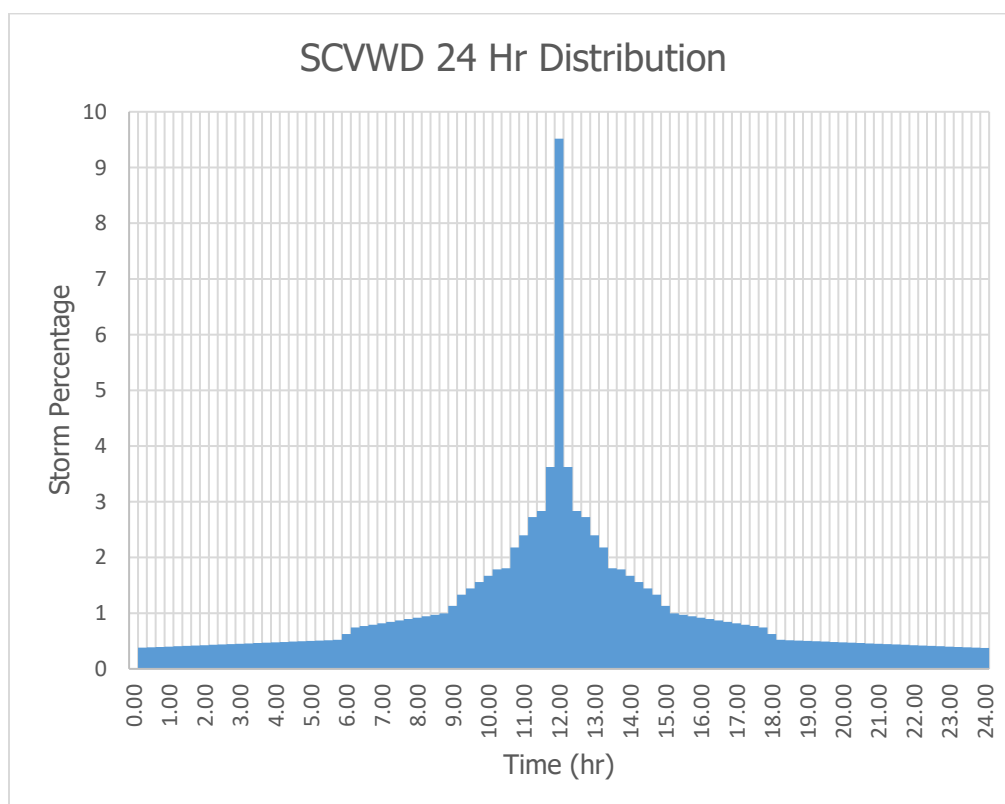


Figure 2-1: Valley Water 24hr Storm Distribution

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.

$$\text{Horton Loss Equation:}^2 f_p = f_c + (f_0 - f_c) e^{-\beta t}$$

where:

f_p = Infiltration Capacity

f_c = Constant Rate

f_0 = Maximum Infiltration Rate

β = Decay constant

Table 2-4: Horton Loss Equation Parameters³

Hydrologic Soil Group	Max. Infiltration Rate Range (in/hr)	Min. Infiltration Rate Range (in/hr)	Decay Const. Range (1/hr)	Drying Time Range (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

² Handbook of Hydrology, David R. Maidment, 1993

³ Storm Water Management Model User's Manual, Version 5.0, EPA, Revised July 2010

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.

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

⁴ Alameda County Hydrology and Hydraulics Manual, ACPWA, 2003

LAND USE TYPE	Impervious (%)		Pervious (%)
	Directly Connecting	Non-Directly Connecting	Area
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)
Fallow - No Residue	0.008-0.012	Engman (1986)
Conventional Tillage - No Residue	0.06-0.12	Engman (1986)
Conventional 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)
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.

$$\text{Snyder UH Equation:}^5 Q_p = 640 * C_p * A / t_L$$

Where:

$$Q_p = \text{Peak discharge of the unit hydrograph (cfs)}$$

⁵ Handbook of Hydrology, David R. Maidment, 1993

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.

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 7 MANNING'S ROUGHNESS COEFFICIENT	
Type of Facility	<i>n</i>
Reinforced Concrete Pipe	
Conduit > 36" diameter	0.012
Conduit ≤ 36" diameter	0.014
Corrugated Metal Pipe	
Annular	0.021
Helical	0.018
Concrete-Lined Channels	
Smooth-troweled	0.015
Distric 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

(Chow 1959, District 1989)

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 stormdrain 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 $|d - 0.33W_1|$ and $|d - 0.33W_2|$ controls whether 1 plane or 2 plane KW, and the appropriate width calculated will be used as the representative watershed “plane”.

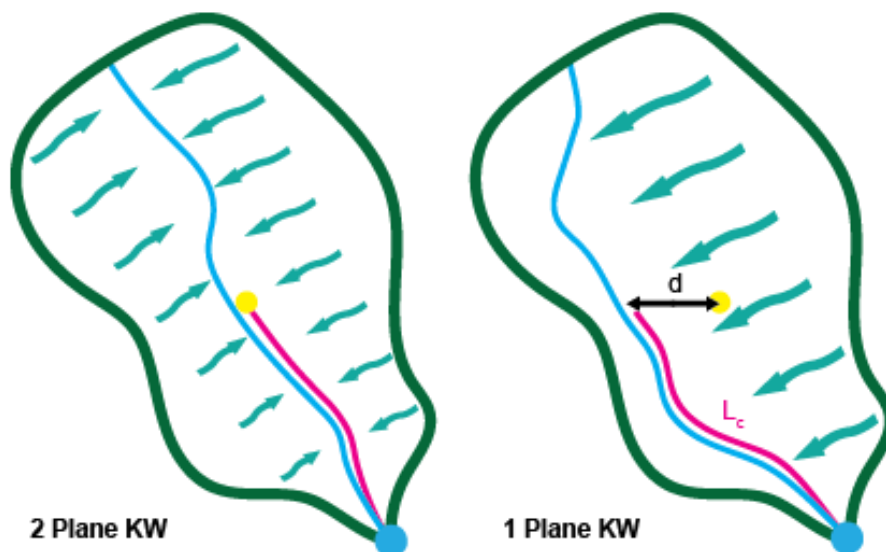


Figure 2-5: KW Planes

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.

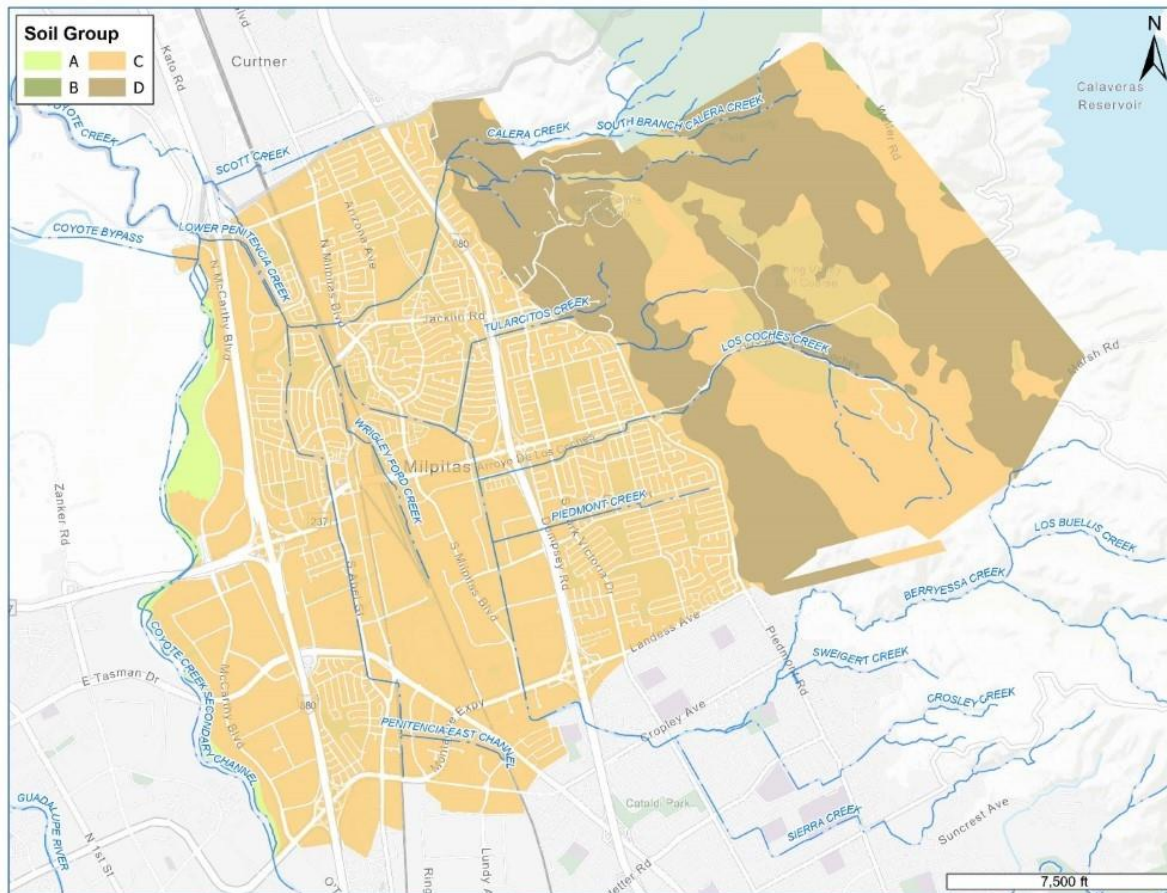


Figure 2-6: NRCS Soil Classification Map for the Berryessa/Penitencia Watershed

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.

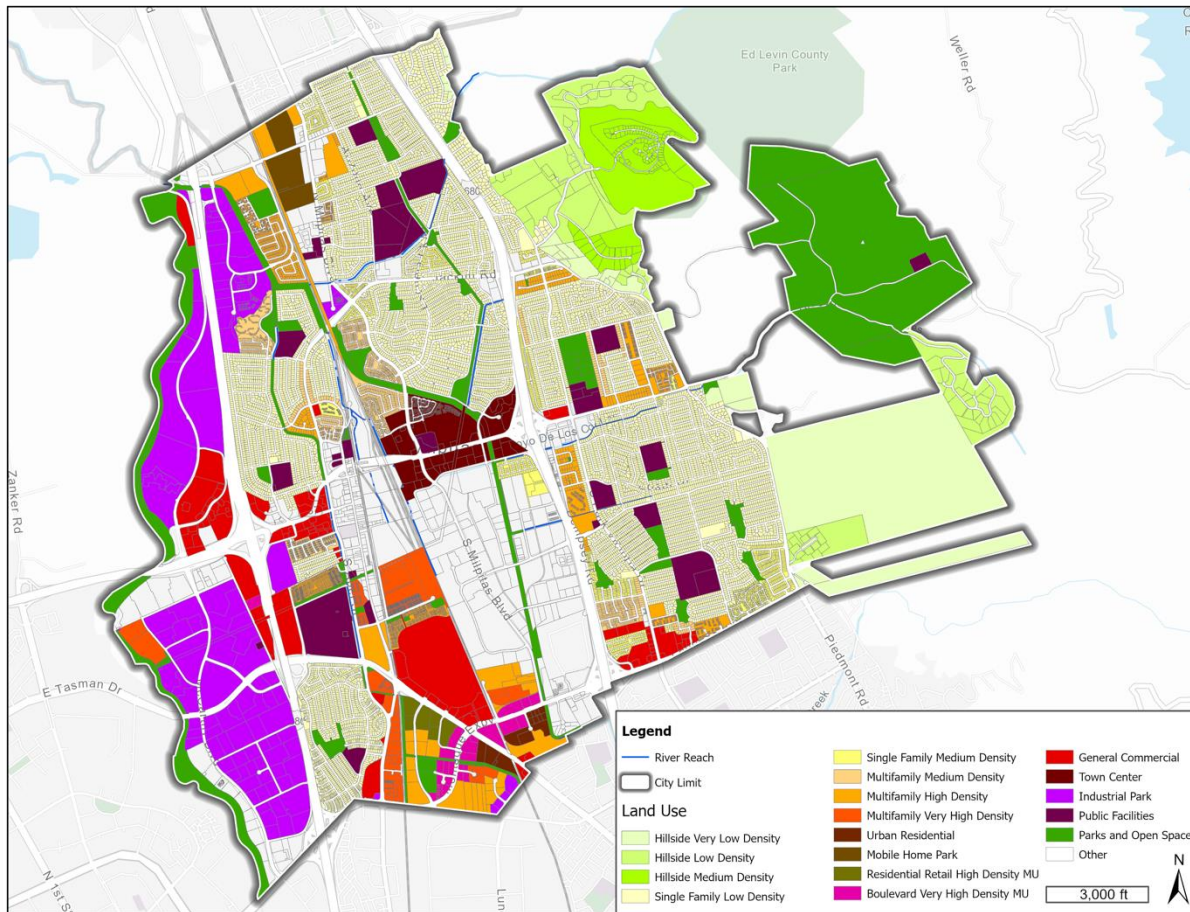


Figure 2-7: Milpitas Land Use

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 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.

⁶ Engineering ToolBox, (2004). Manning's Roughness Coefficients. [online] Available at: https://www.engineeringtoolbox.com/mannings-roughness-d_799.html [2020]

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.

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.

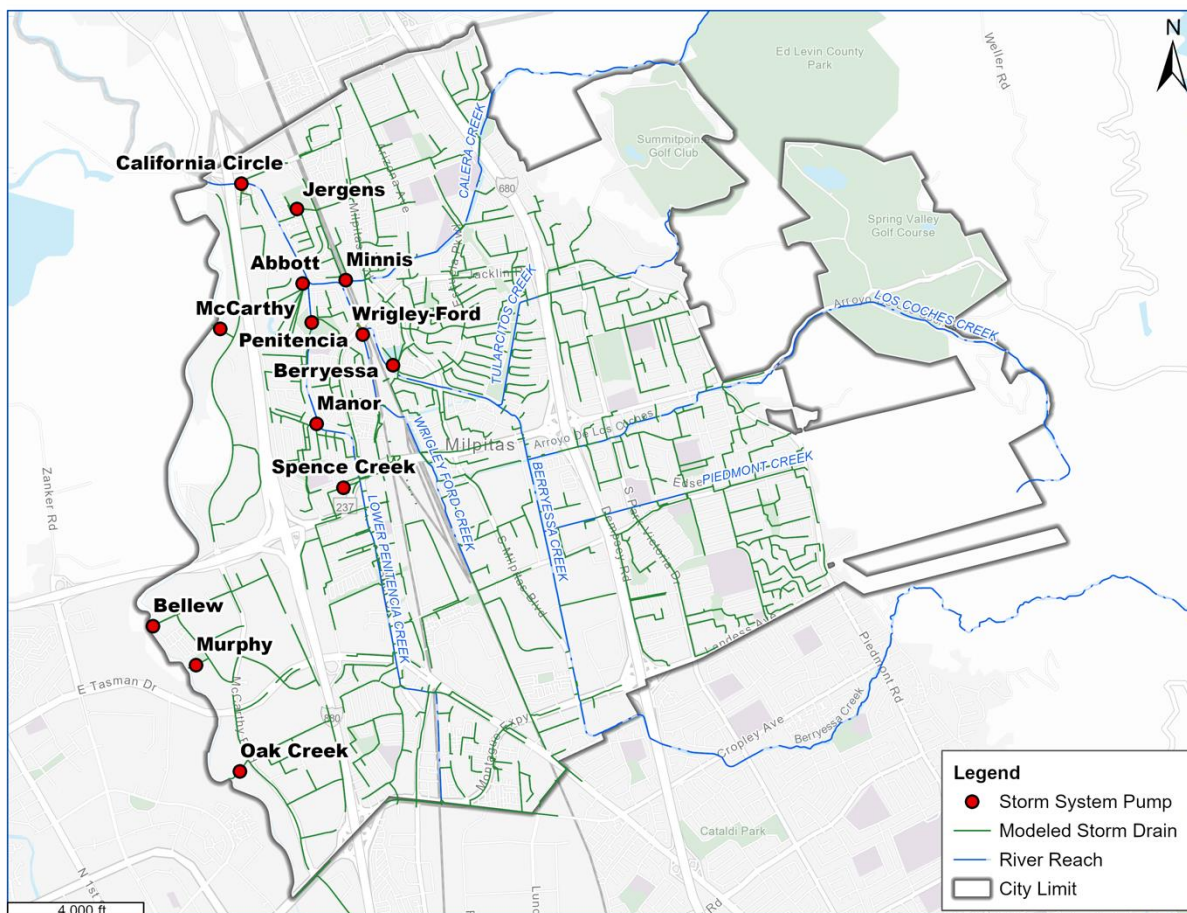


Figure 2-8: Pump Station Locations

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 their 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.

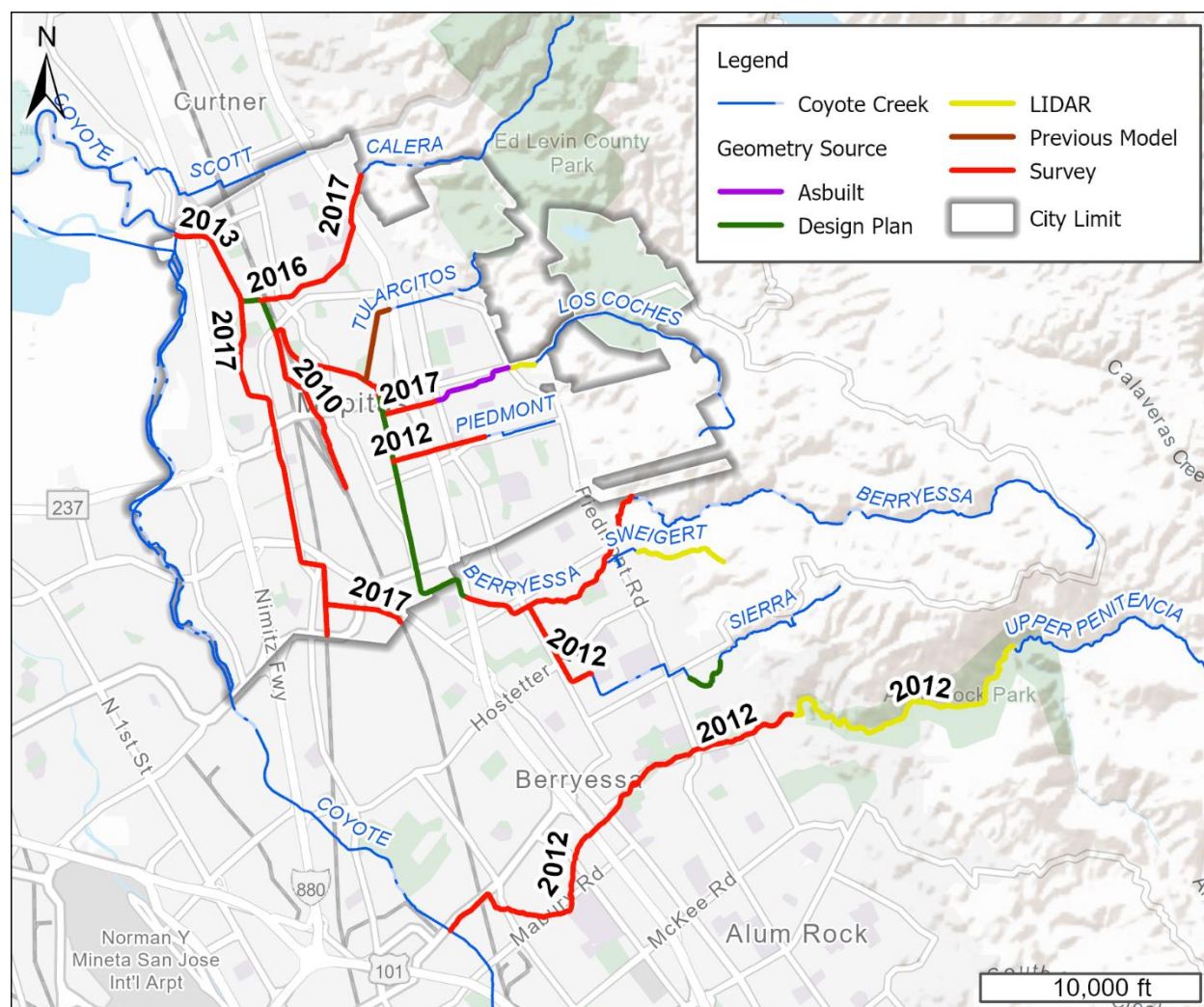


Figure 2-9: Map of Channel Cross Sectional Geometry Source

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 associated with a pump station 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. These 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.

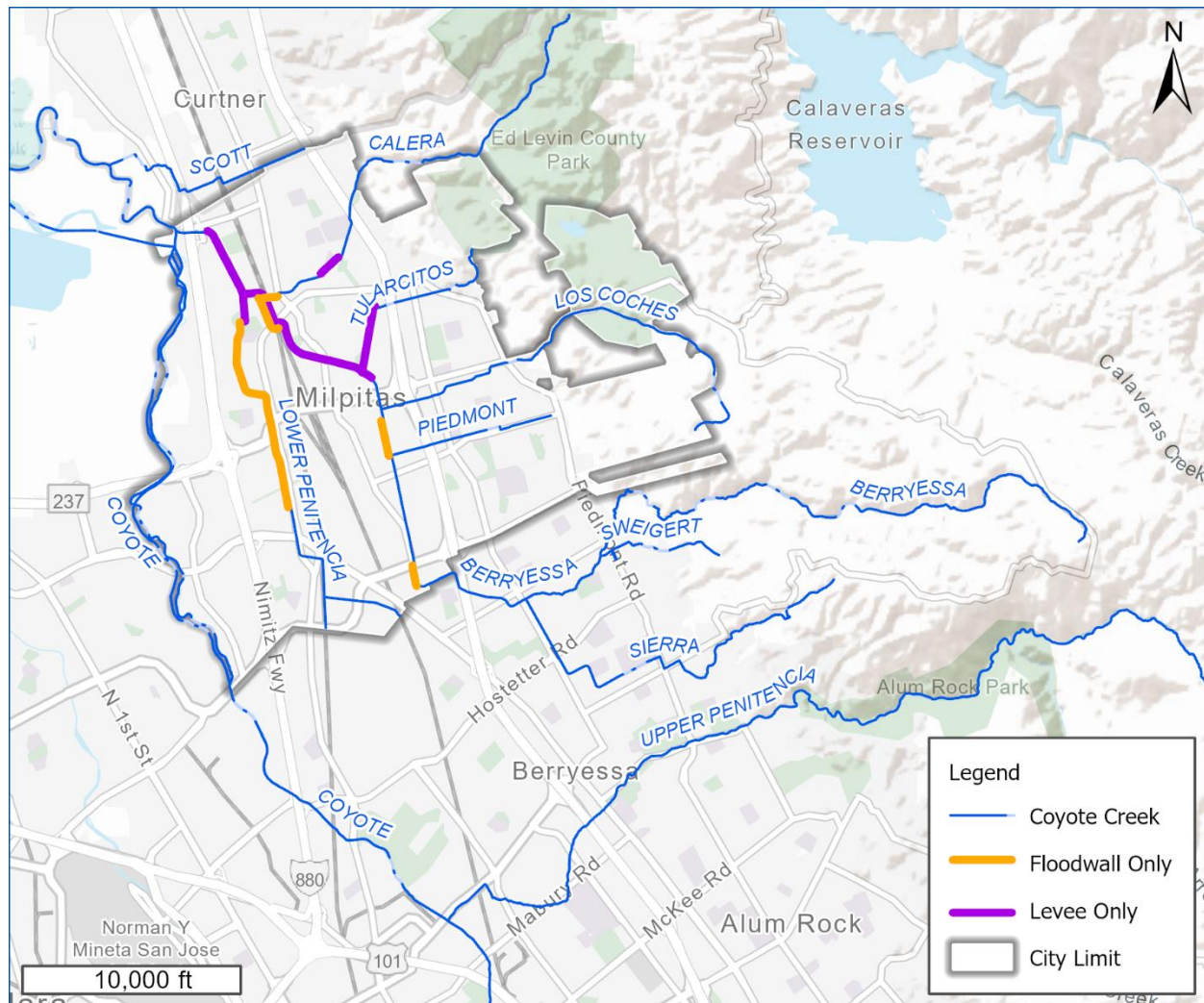


Figure 2-10: Flood Wall and Levee Map of the Berryessa/Penitencia Watershed

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.

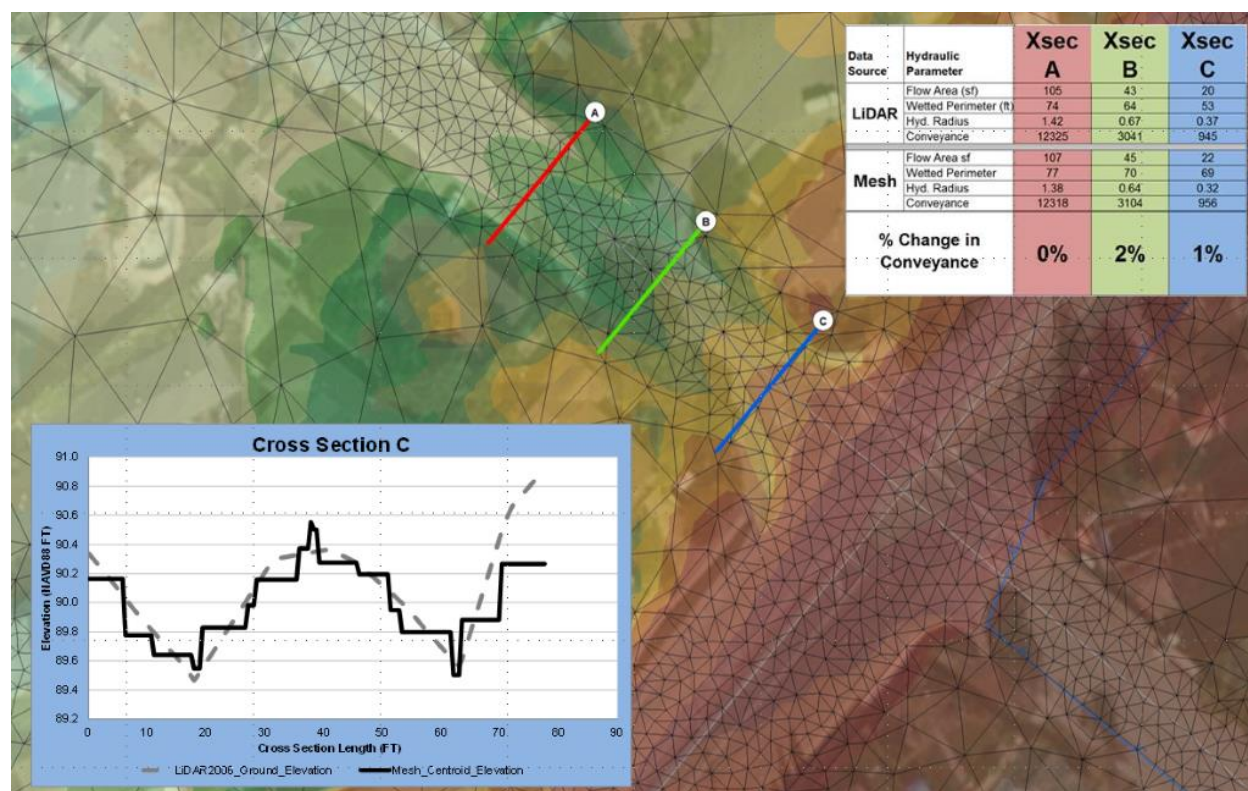


Figure 2-11: Cross Section Comparison between the Modeled vs. Terrain

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.

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.

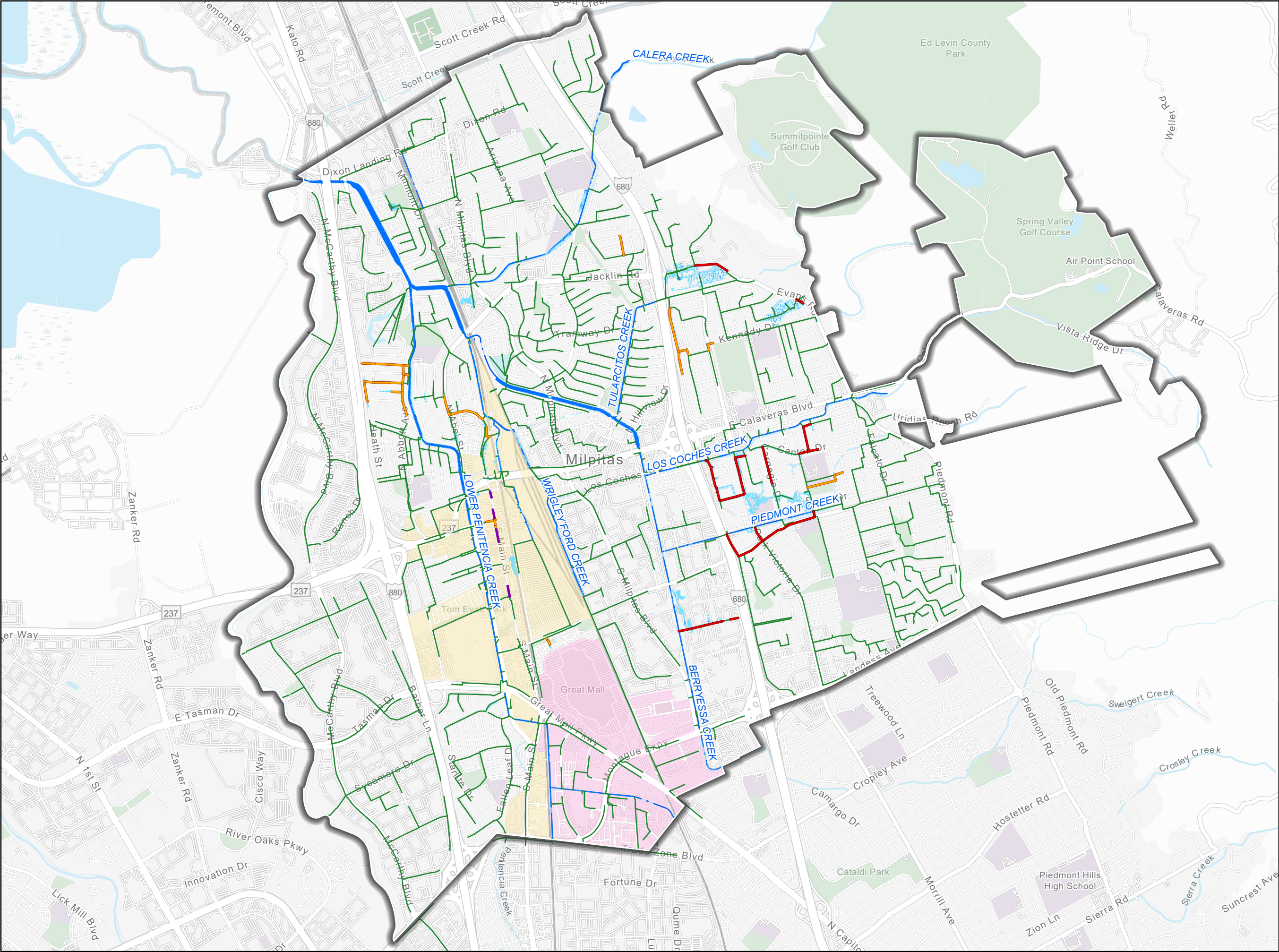
City-owned storm drainpipes 12 inches and larger in diameter have been evaluated. Pipes that act as laterals are not in the mainline analysis but are assumed to be part of the system that delivers flow into the main drainage lines.

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.



Existing Conditions

10-Year Floodplain

Lower Penitencia-Berryessa Watershed

September 2021

Item # 16.

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

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Figure 3-1

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.)

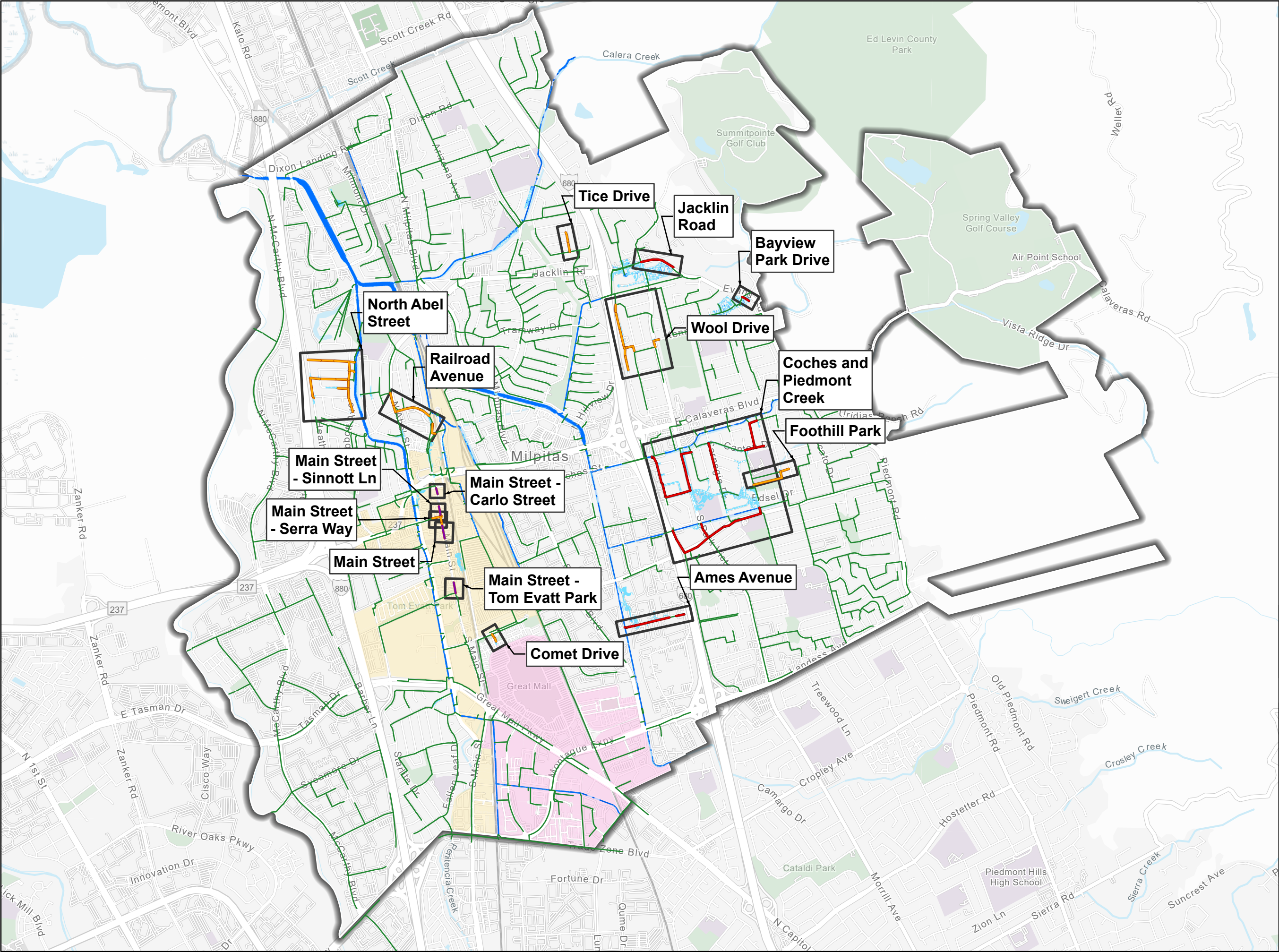
Therefore, the default project for in-street improvements is a parallel relief drain, while the default project for improvements within existing off-street easements is pipe replacement. The CIP assumes storm drain size is not allowed to decrease in the downstream direction. Thus, an additional downstream 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 Dixon Landing Park has been intentionally flooded by design, to avoid a larger pump station when Jurgens Pump Station was constructed in 1983. However, this situation has proved to be untenable. A high priority CIP for Jurgens Pump Station is identified to provide the necessary pumping capacity and remedy this problem.



Existing Condition

10-Year Floodplain

Lower Penitencia-Berryessa Watershed

August 2021

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 - Specific Plan

Main Street Gateway

Milpitas Metro

SOURCES:

Schaaf & Wheeler

InfoWorks ICM Model Results

N

0 1,250 2,500

Feet

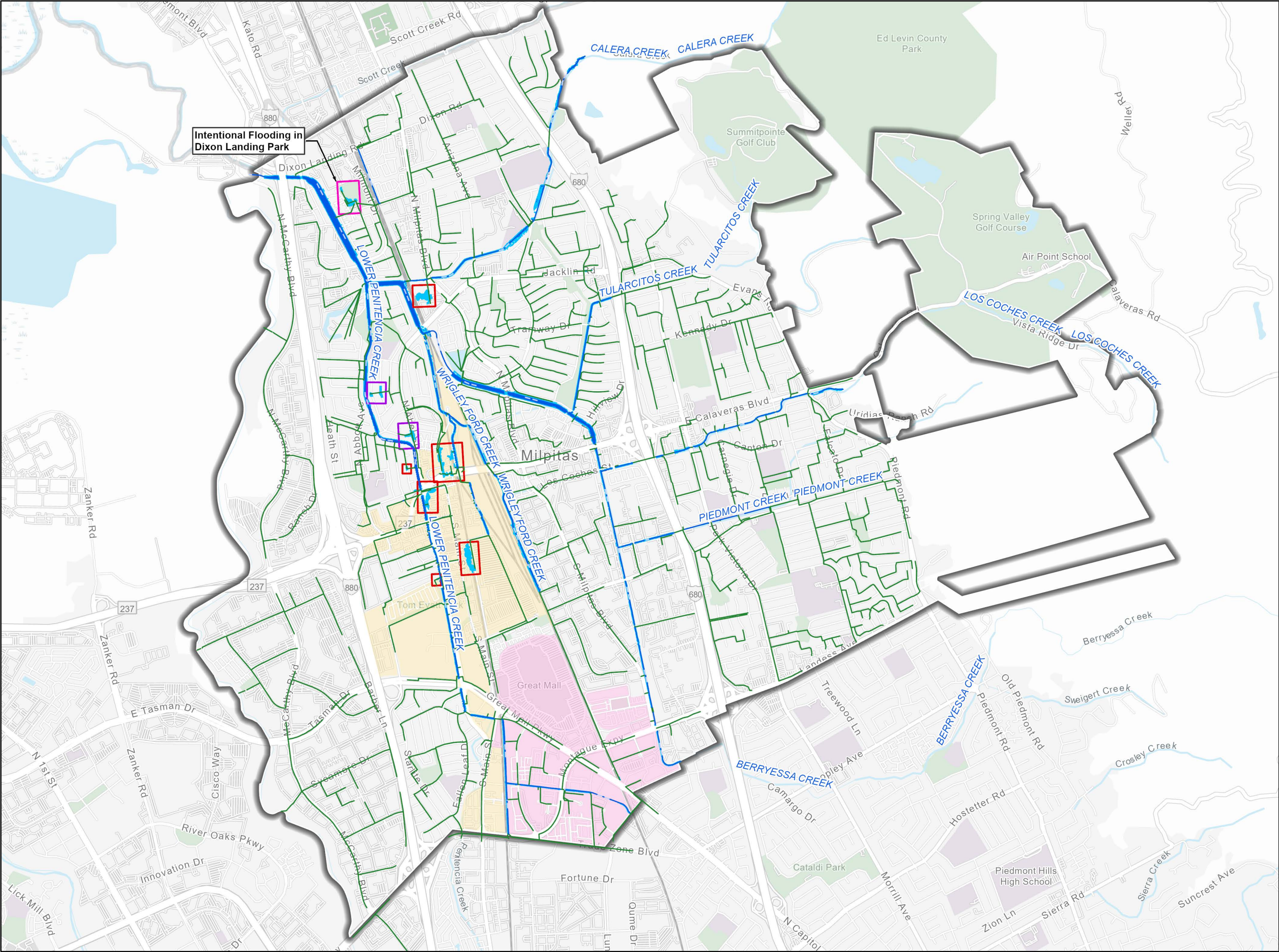
Vicinity Map

Schaaf & Wheeler

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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



0 1,250 2,500
Feet

Vicinity Map

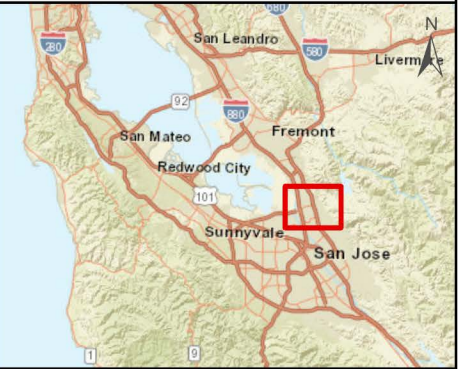


Figure 3-3

Milpitas Storm Drain

Item # 16.

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)

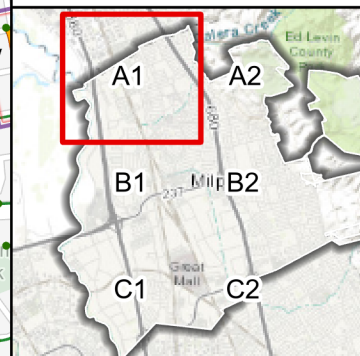
- 0 - 1.0
- > 1.0

*Pipe annotation: "x to y" where x is existing size and y indicates proposed



1 inch : 1,200 feet

Vicinity Map



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)

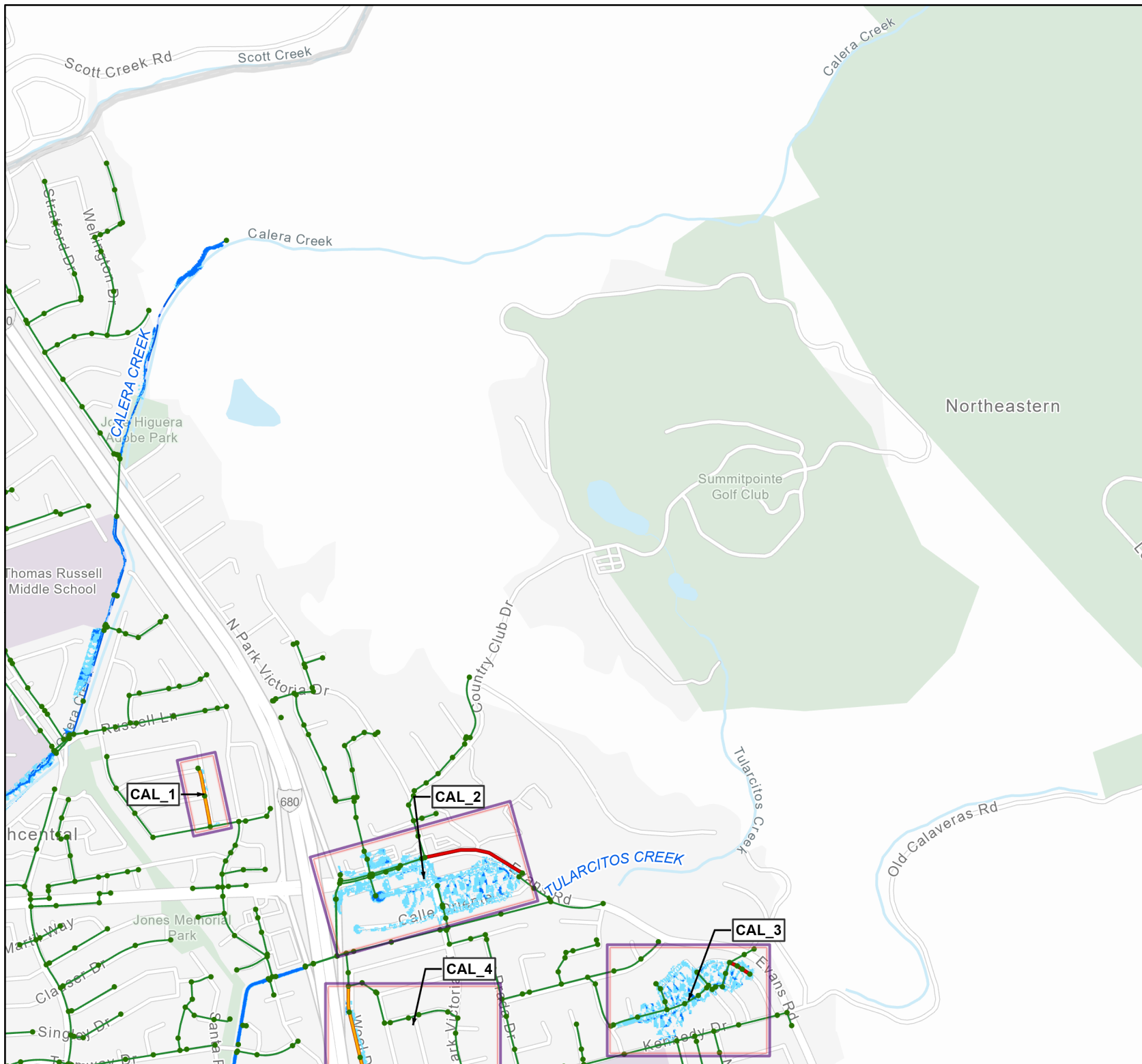
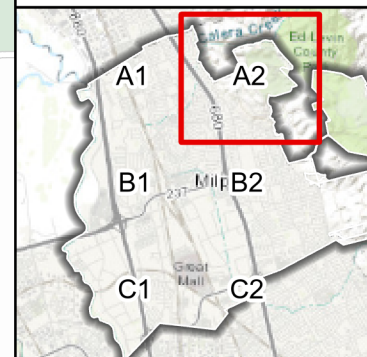
- 0 - 1.0
- > 1.0

*Pipe annotation: "x to y" where x is existing size and y indicates proposed



1 inch : 1,200 feet

Vicinity Map



B1

SD Improvements

Page 3 of 6

Legend

- Storm Drain Manhole
- Modeled Storm Drain
- River Reach
- ▭ Inundation Addressed

CIP Priority

- Low
- High

Flood Depth (ft)

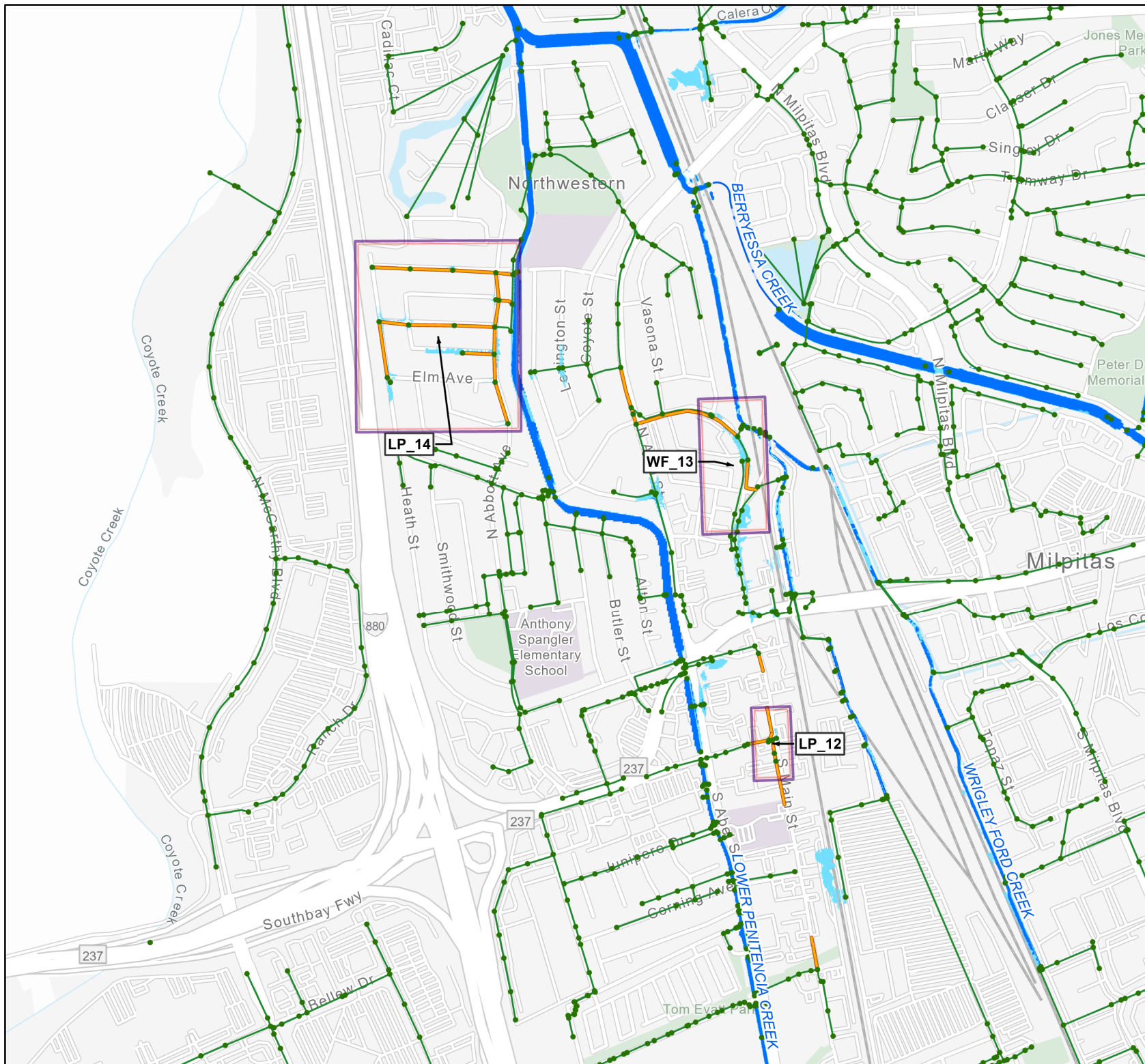
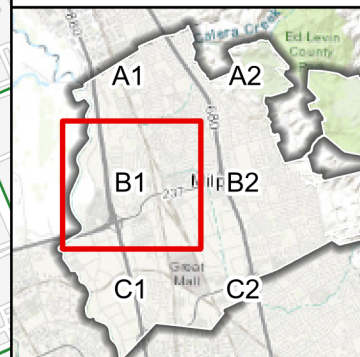
- 0 - 1.0
- > 1.0

*Pipe annotation: "x to y" where x is existing size and y indicates proposed



1 inch : 1,200 feet

Vicinity Map



Legend

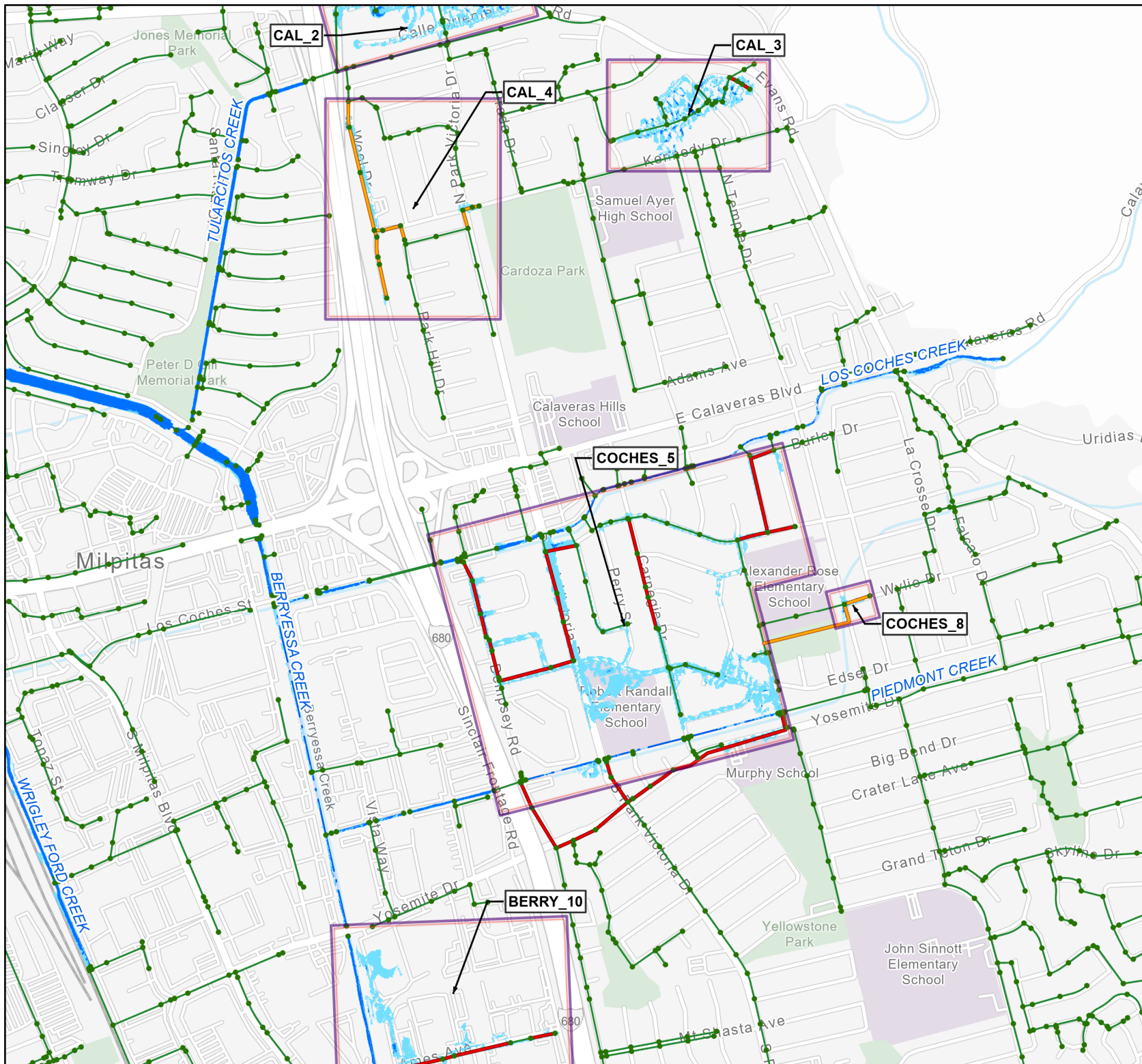
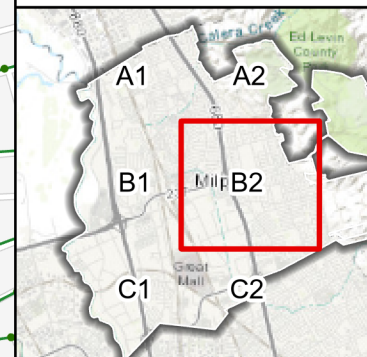
- Storm Drain Manhole
 - Modeled Storm Drain
 - River Reach
 - ▭ Inundation Addressed
- CIP Priority**
- Low
 - High
- Flood Depth (ft)**
- 0 - 1.0
 - > 1.0

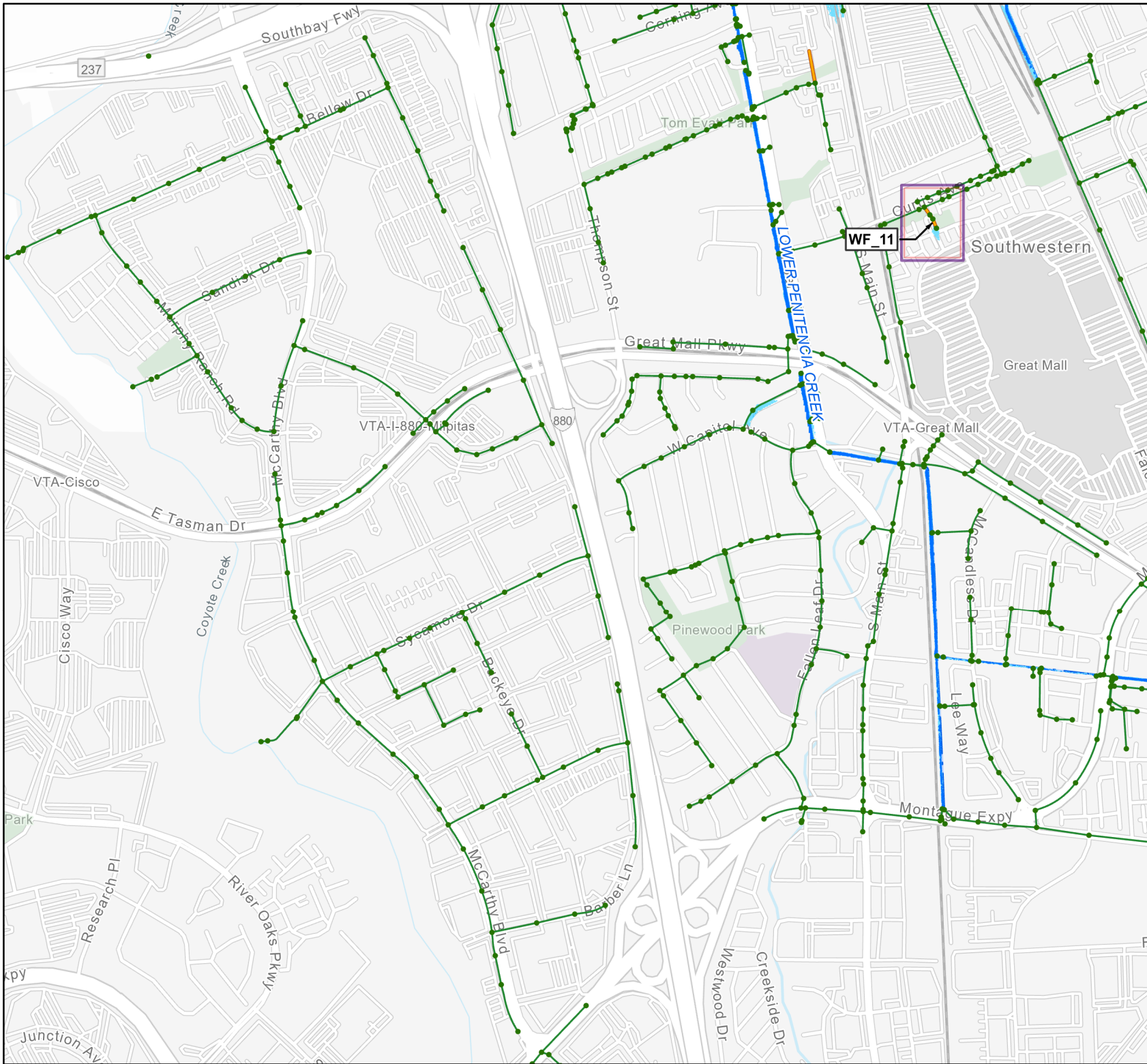
*Pipe annotation: "x to y" where x is existing size and y indicates proposed



1 inch : 1,200 feet

Vicinity Map





Milpitas Storm Drain

Item # 16.

C1

SD Improvements

Page 5 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

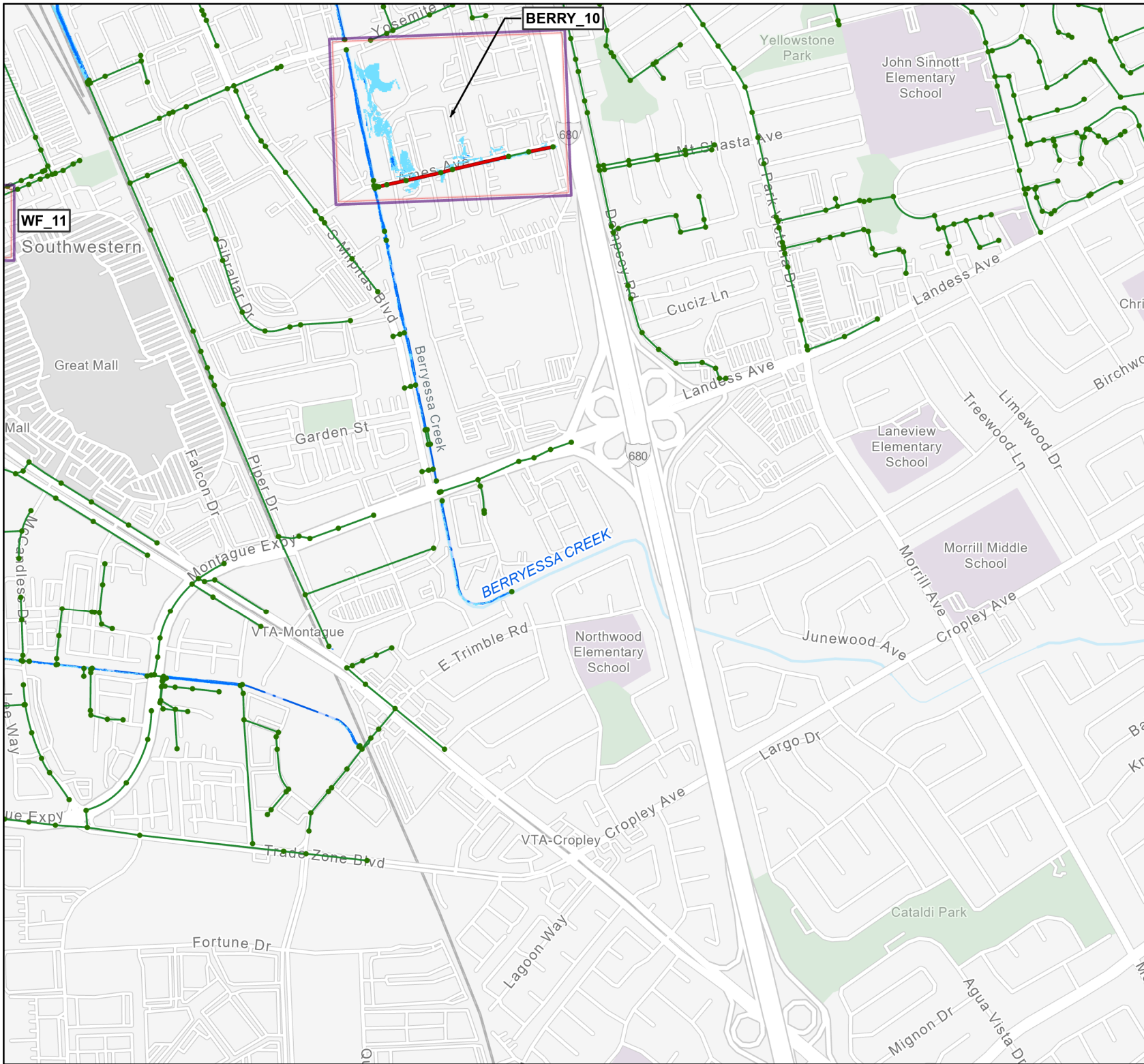
*Pipe annotation: "x to y" where x is existing size and y indicates proposed

N

1 inch : 1,200 feet

Vicinity Map

Schaaf & W... CONSULTING CIVIL EN... 1621



Milpitas Storm Drain

Item # 16.

C2

SD Improvements

Page 6 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

Schaaf & Williams
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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 intersects with approximately 920 LF of new 24-inch RCP to direct flow away from Los Coches Creek.	Use replacement option for connect existing at Burley Drive outfall to 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	Use replacement option.

ID	Project	Priority	Replacement Option	Parallel Option
			between Yosemite Dr and the outfall with 60-inch RCP. 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 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 18- inch RCP, 420 LF of existing 21-inch RCP, and 370 LF of existing 24-inch RCP with 42-inch RCP.	Install approximately 1,060 LF of 36-inch RCP in 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	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.

ID	Project	Priority	Replacement Option	Parallel Option
			Kennedy Dr. Replace approximately 660 LF of existing 27-inch RCP on Wool Dr with 36-inch RCP between Kennedy Dr and Traughber St.	
			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 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.	Use replacement option.
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's 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) within the city. The Milpitas Metro Specific Plan area is now almost entirely built out, and there are no longer identified areas that do not have adequate storm water runoff collection systems.

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.

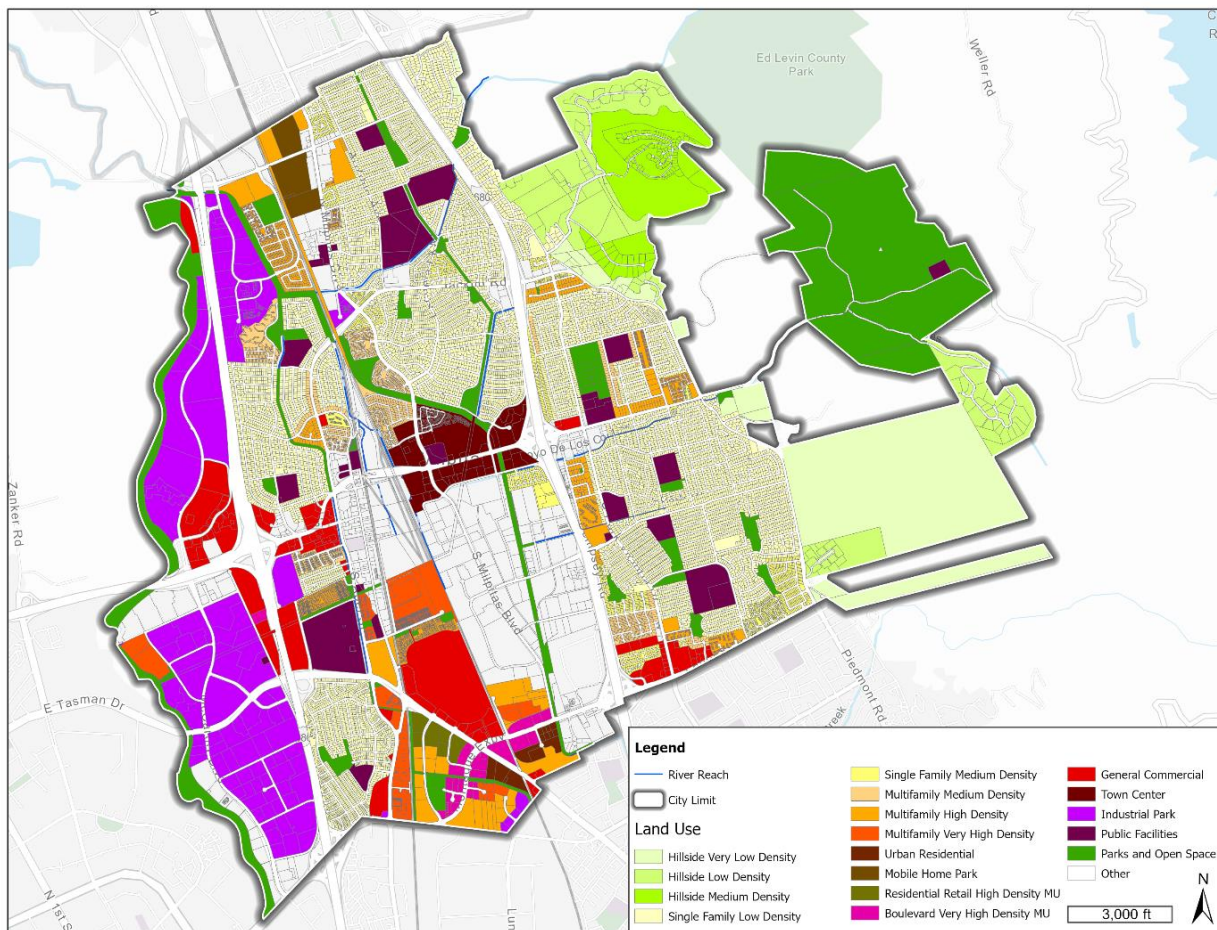


Figure 3-10: Milpitas Future Plan Land Use Map

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.

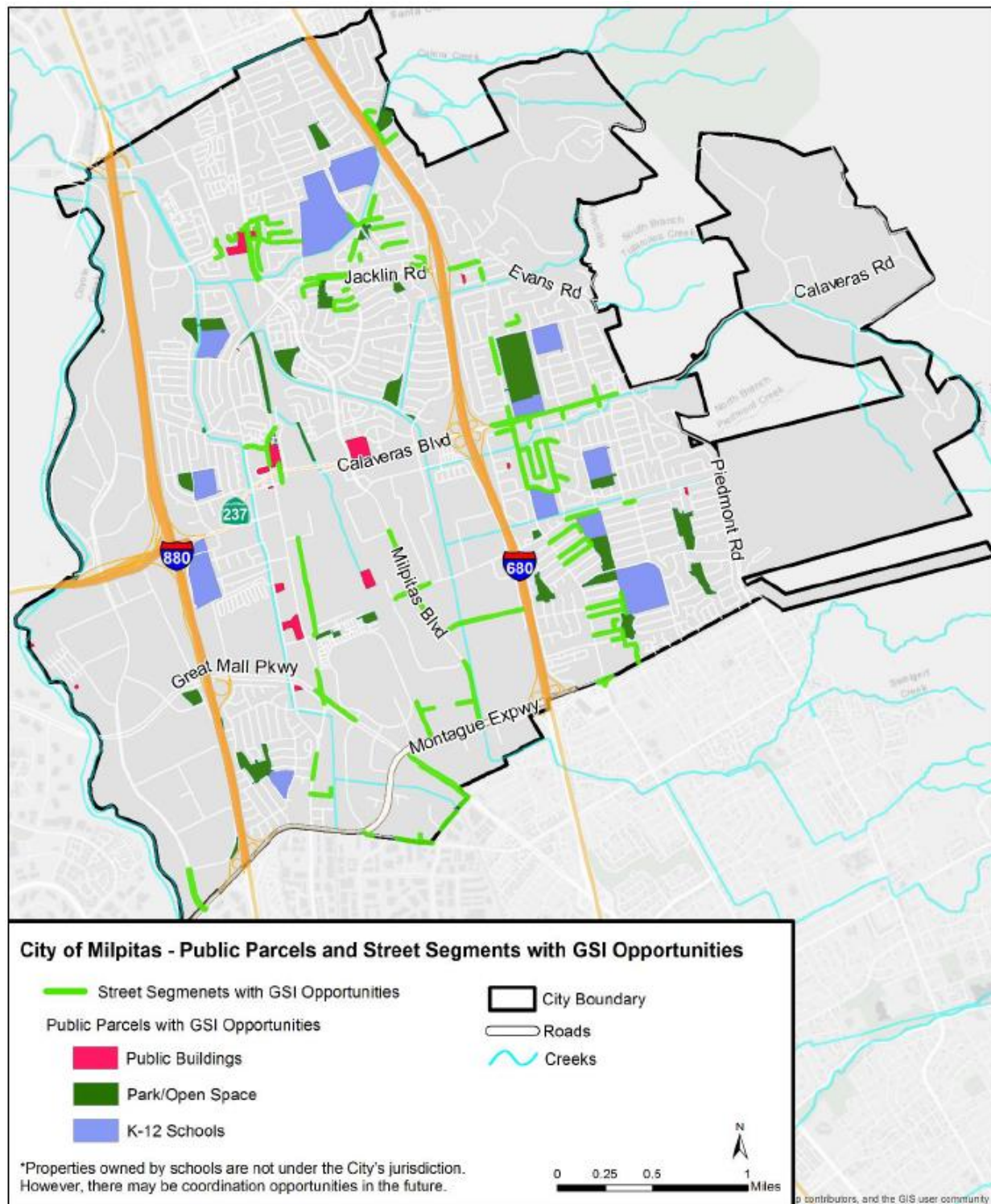


Figure 3-11: Green Stormwater Opportunity Map from Santa Clara Basin Stormwater Resource Plan

Storm Trouble Spots

City staff have 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.

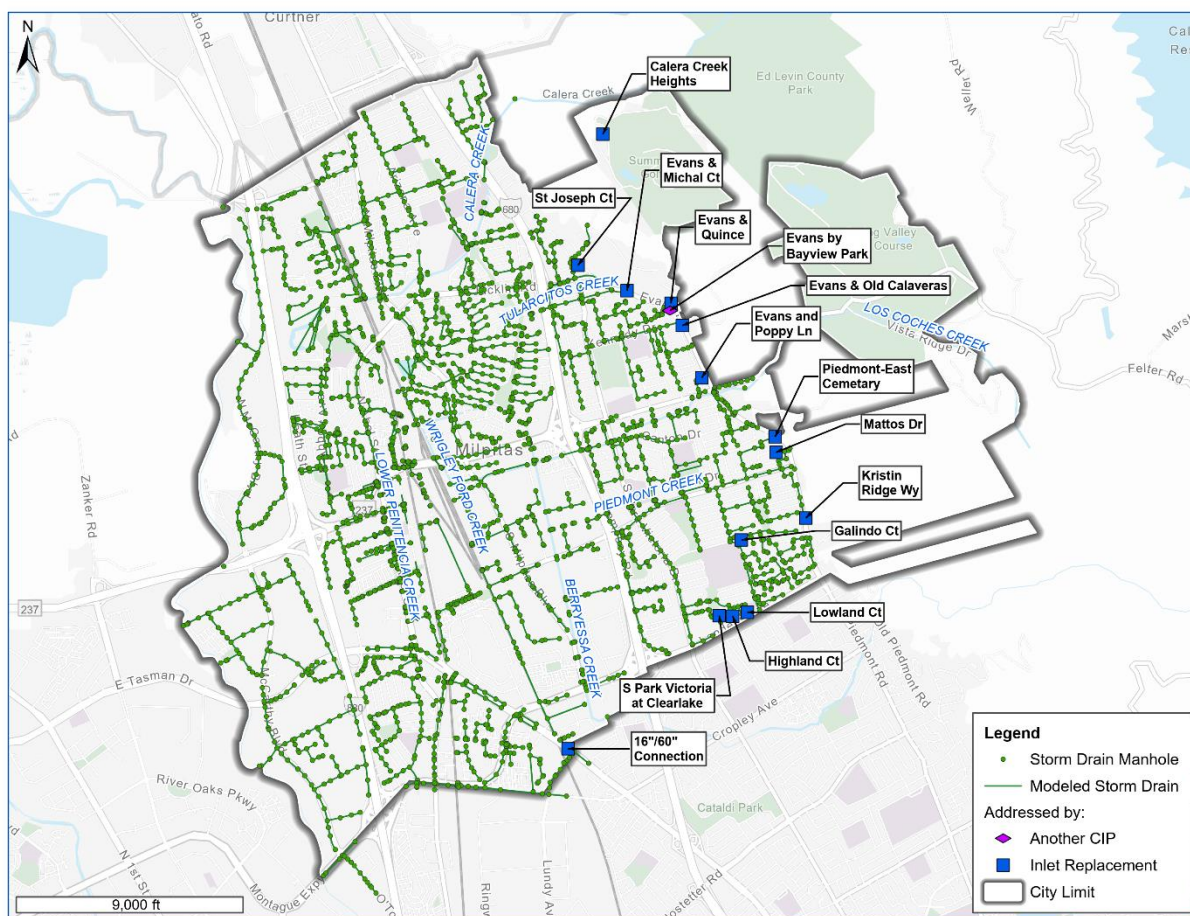


Figure 3-12: Storm Trouble Spots

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:

1. **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.
2. **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

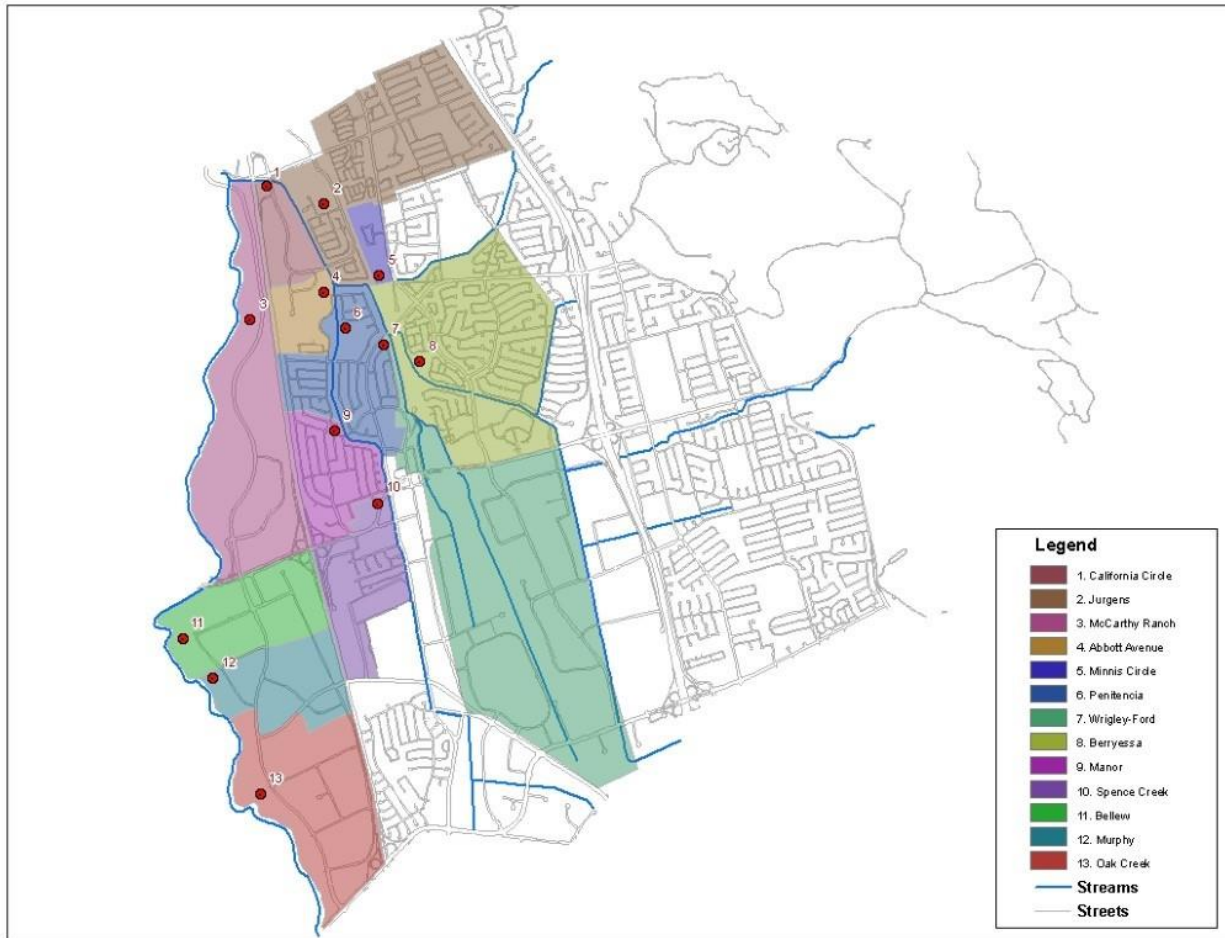


Figure 4-1: Storm Water Pump Stations in Milpitas

Table 4-2: Pump Station CIP Summary

Pump Station	Priority	CIP Details
Jurgens	High	Pump station replacement to provide increased level of design protection and eliminate the periodic flooding of Dixon Landing Park
Abbott	Low	Provide complete station replacement, including raising floor above base flood elevation
Penitencia	High	Complete pump station replacement
Spence Creek	Low	Provide permanent standby power
Murphy	High	Control system rehabilitation
Oak Creek	High	Control system rehabilitation

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 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.

$$\text{WSEL}_{100} = 12.0 \text{ feet NAVD (2 feet above finished floor)}$$

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) is required. It is not feasible to retrofit the existing pumping facility to nearly double its capacity. Such a project would entail building an upsized replacement pump station while the existing station continues to operate in parallel, replacing the existing 72-inch diameter discharge pipe to Lower Penitencia Creek with at least a 96-inch diameter discharge pipe, and once the replacement pump station is fully tested and operational, demolishing the old pump station. This method of construction reduces risk to the City and eliminates the need for very costly bypass pumping capacity during construction. Park reconfiguration of the park will be necessary.

An order of magnitude estimate of construction cost is \$10 to \$15 million. This is part of the Capital Improvement Plan as a **High 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) (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 high priority pump station replacement project is delayed and 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 for increased capacity 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.

During the February 2017 flood event on Coyote Creek, during which the water surface in the creek was within a few feet from the top of the levee at this pump station, backwater in the creek caused water to spill out of the pump station discharge surge chamber. Each of the pump discharge pipes has an individual 48-inch diameter flap gate. Access to the surge chamber is through a bolt-down steel plated cover designed for pressure conditions. Further investigation into the condition and operational efficacy of the bolt-down cover and each individual pump discharge flap gate within the surge chamber is recommended.

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 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 soon.

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 1983 (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.

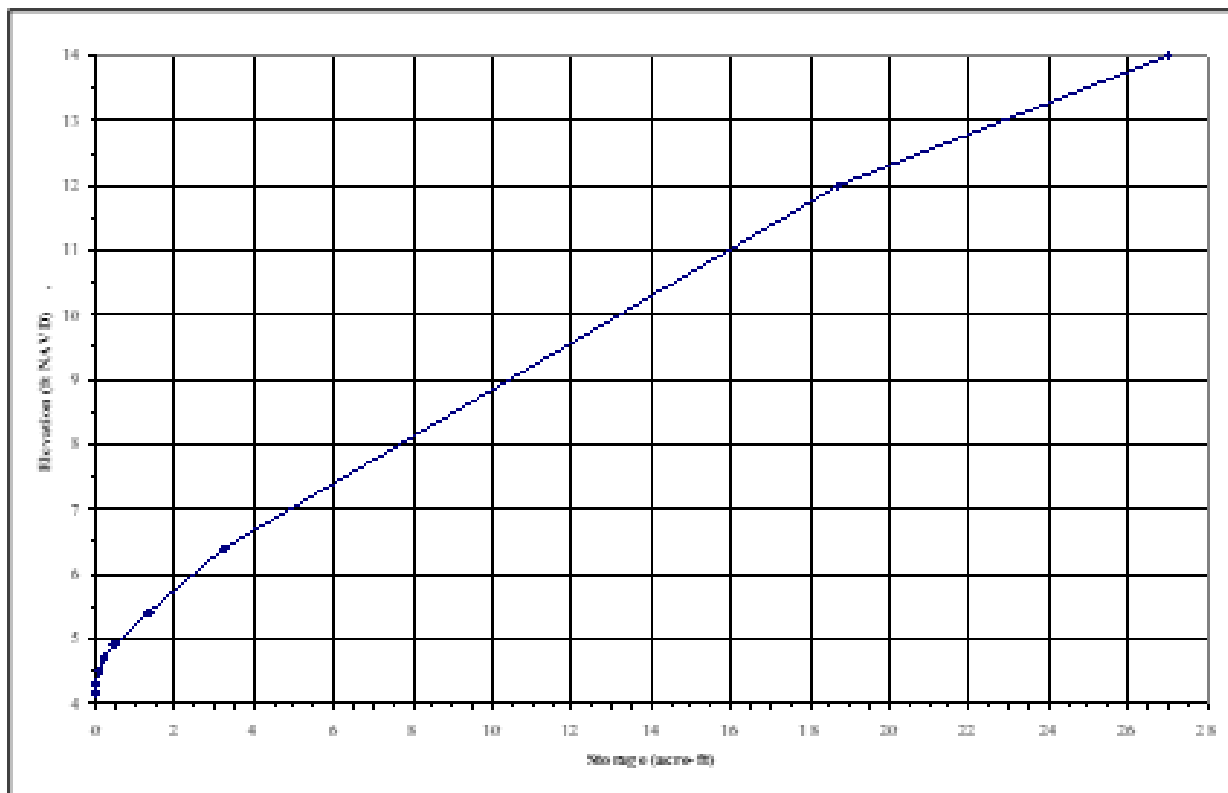


Figure 4-3: Storage Elevation Curve for Hall Memorial Park Lagoon

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.

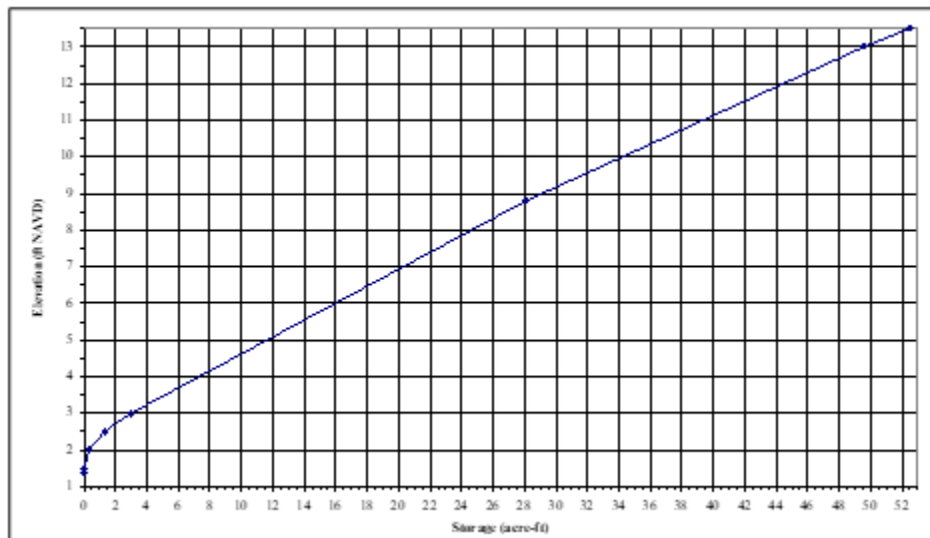


Figure 4-4: Storage Elevation Curve for Hidden Lake

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, 3 ϕ 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	650 kW 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 (direct drive engine) 1,450 gallons for diesel generator
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 soon.

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) Cummins 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. Figures 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.

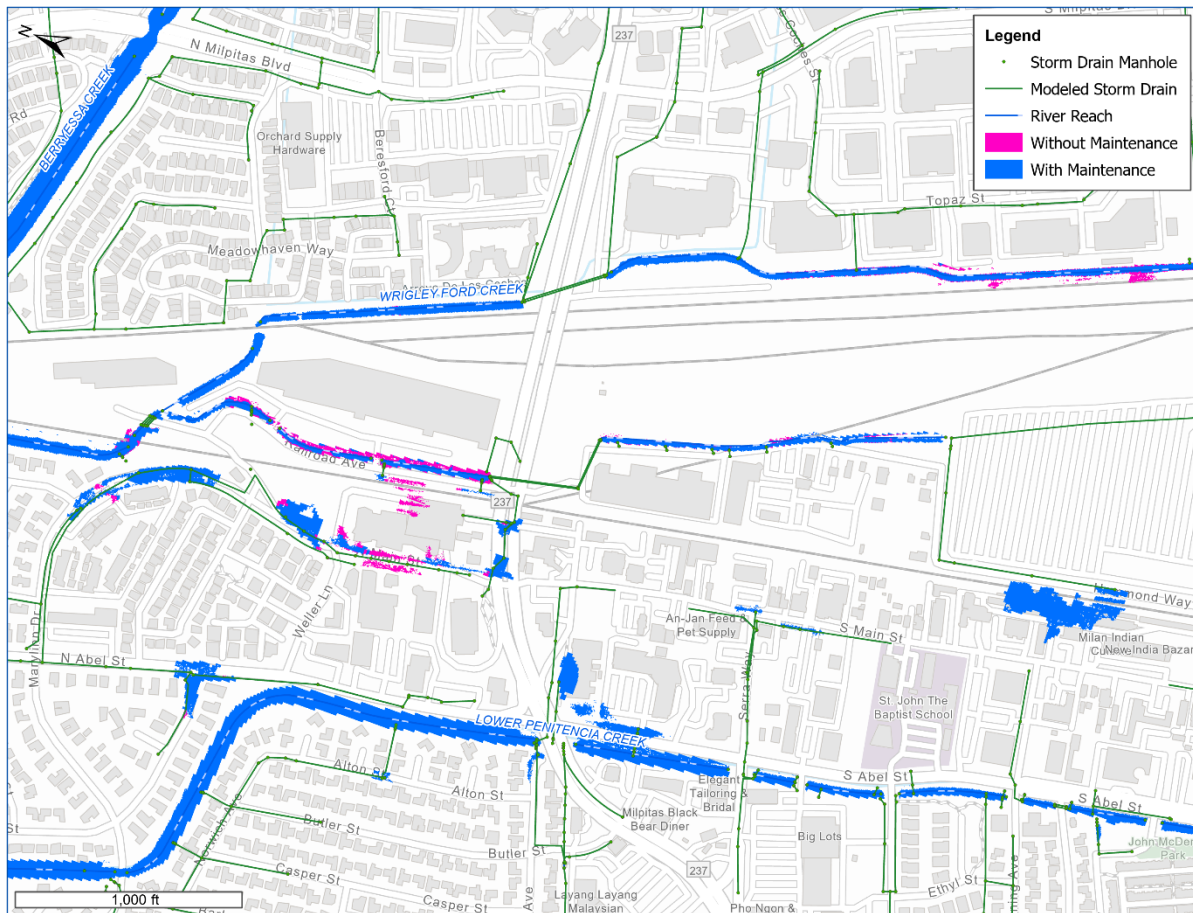


Figure 5-2: Wrigley-Ford Creek Flooding with and Without Maintenance for 10-Year Storm

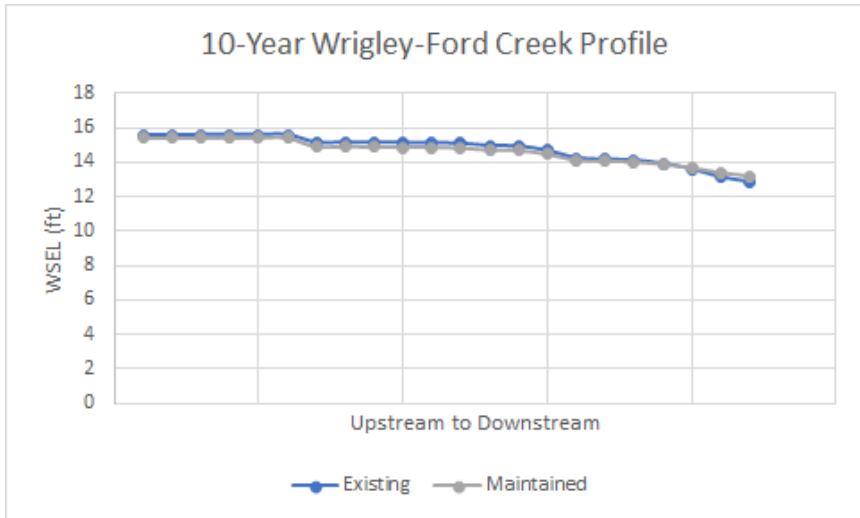
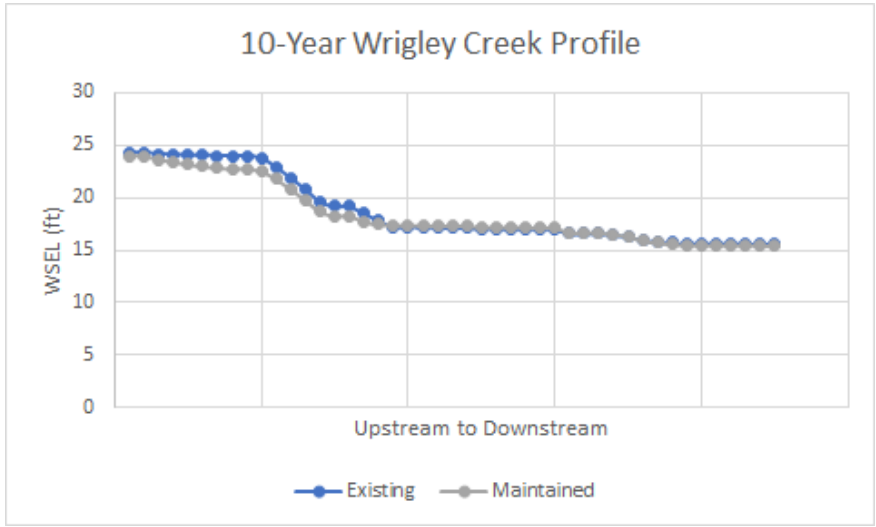
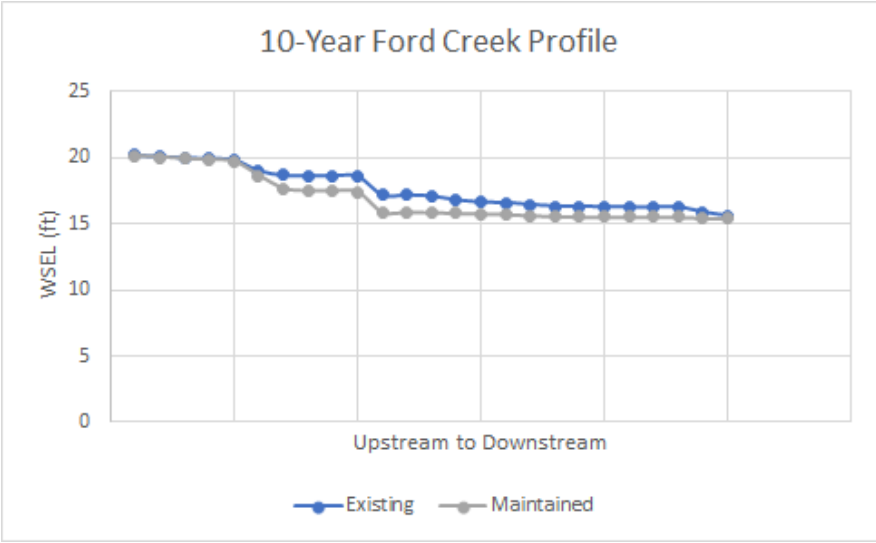


Figure 5-3: 10-Year Storm Profile with and without Maintenance on Wrigley, Ford, and Wrigley-Ford Creek

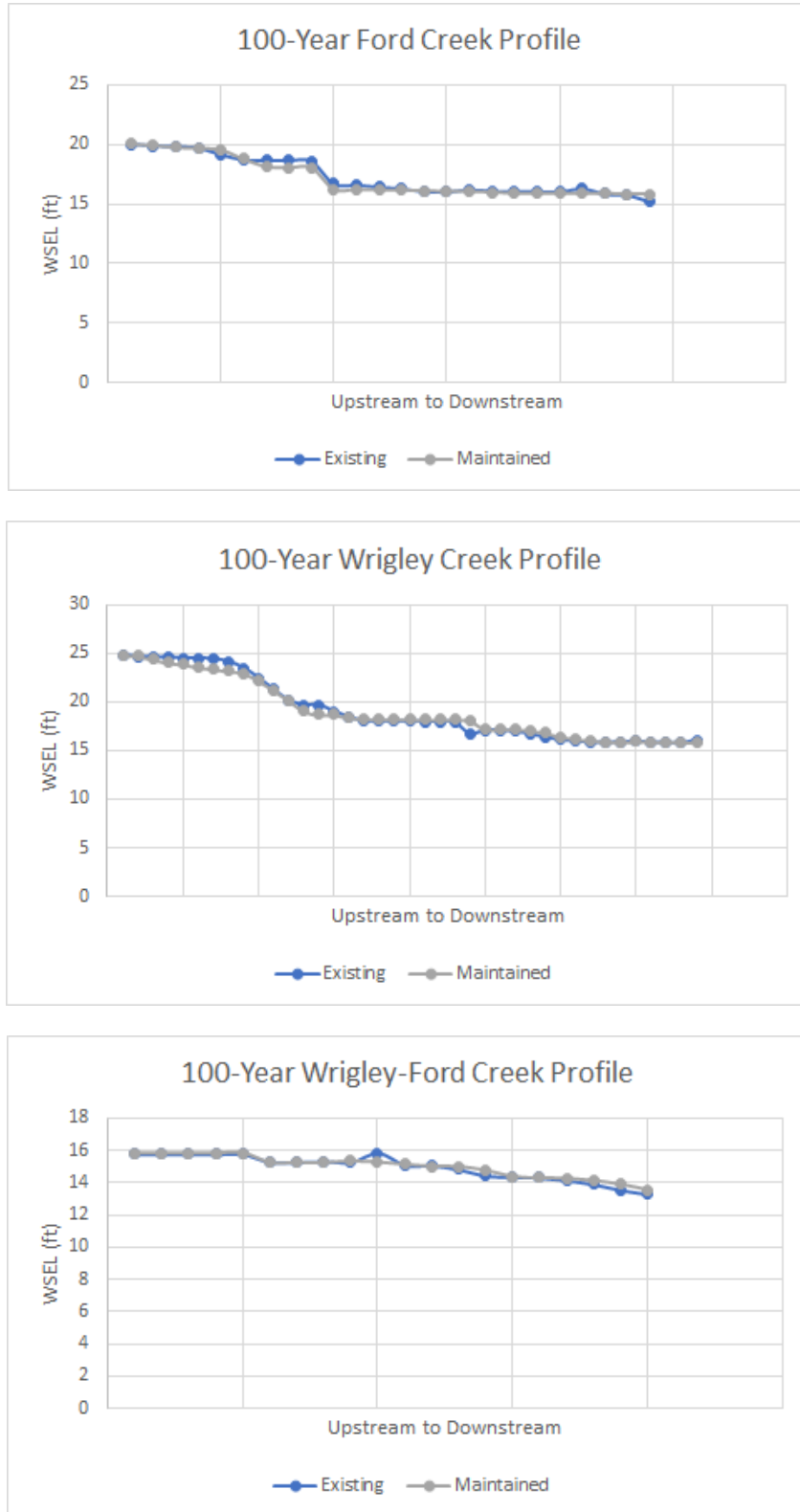


Figure 5-4: 100-Year Storm Profile with and without Maintenance on Wrigley, Ford, and Wrigley-Ford Creek

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, 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 should be retrofit to do so.

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

Trash originating from the city's Municipal Separate Sewer System (MS4) must be captured before it enters the waterways by the year 2022 (the 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 Cr	1983	38		2030	2070
2	Jurgens	1989	32	Ventilation	High Priority CIP	High Priority CIP
3	McCarthy	1994	27		2045	2075
4	Abbott	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	2040	2070
10	Spence Ck	1988	33		2030	2065
11	Bellew ³	1985	36		2060	2060
12	Murphy	1983	38		2035	2070
13	Oak Creek	1979	42		2025	2055

¹Scheduled as High-priority CIP

²All pumping, electrical, and control equipment replaced and flood-proofed in 2006

³Two 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	High
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. To set 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	\$40,000,000	\$3,500,000
Long-Term Equipment Replacement	\$43,000,000	\$3,500,000
Annual Operations and Maintenance	---	\$2,500,000
Total Budget	\$83,000,000	\$9,500,000

Spread over Milpitas' 6,048 acres of developed or developable land, the average annual cost per acre is \$1,570 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. Table 6-5 summarizes the calculation of estimated CIP cost by Master Plan improvement priority. Costs are based on bids and other data 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: Storm Drain Capital Improvements Costs

(All costs in 2020 dollars)

Category	Cost
High Priority CIP	\$40,000,000
Low Priority CIP	\$24,000,000
Extension CIP	\$1,000,000
Total Budget	\$65,000,000

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; ENR = 13,500)

Category	Cost
Annual Operations	\$600,000
Preventative Maintenance	\$500,000
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 Item # 16.
Storm Drainage CIP

CAL_1
Tice Drive
SD Improvements

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Legend

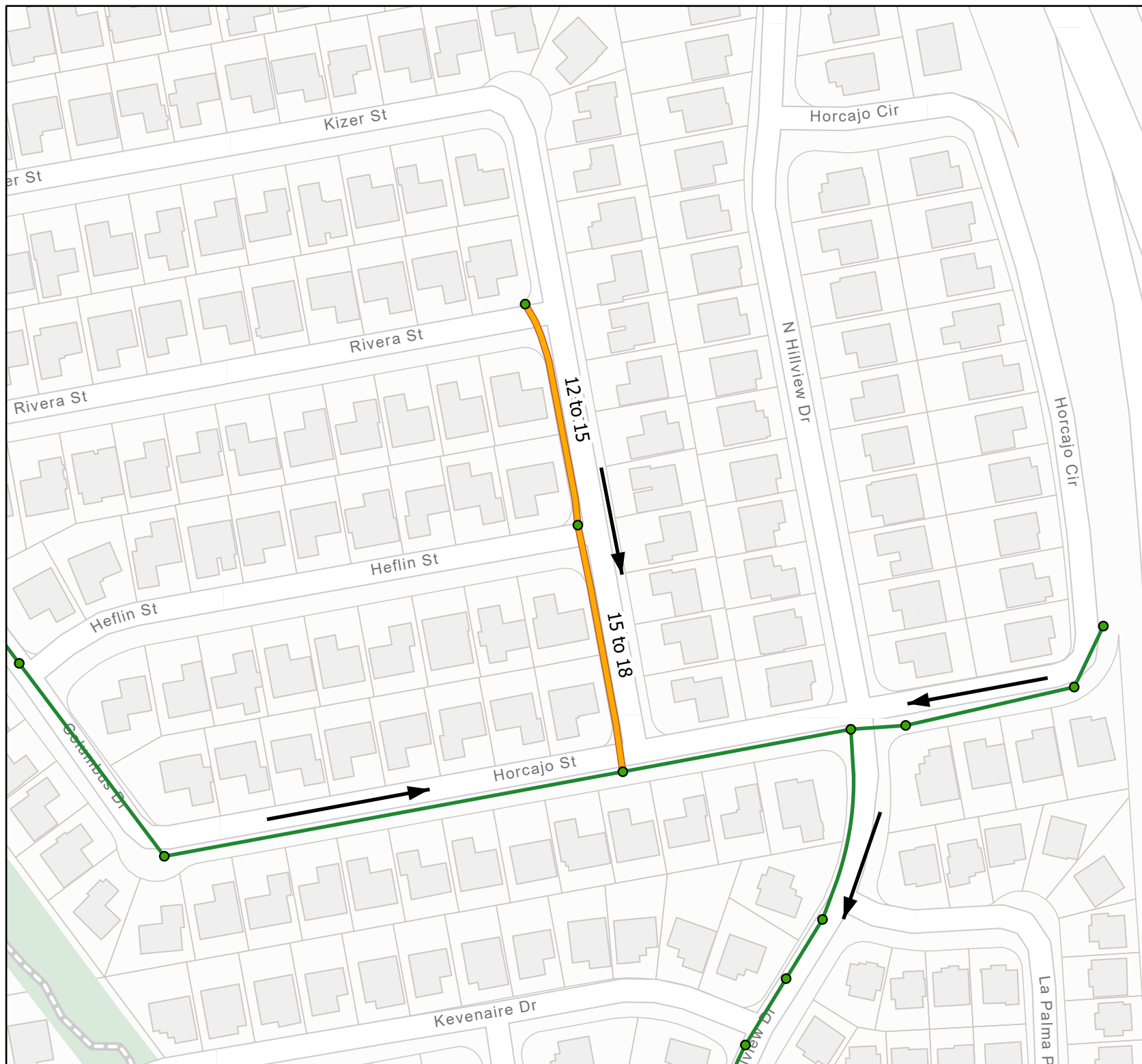
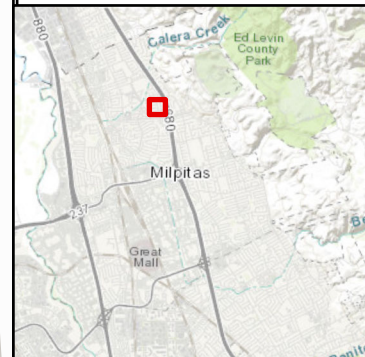
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority
 - New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 150 feet

Vicinity Map



Milpitas
Storm Drainage CIP

Item # 16.

CAL_2
Jacklin Road
SD Improvements

Page 2 of 15

Legend

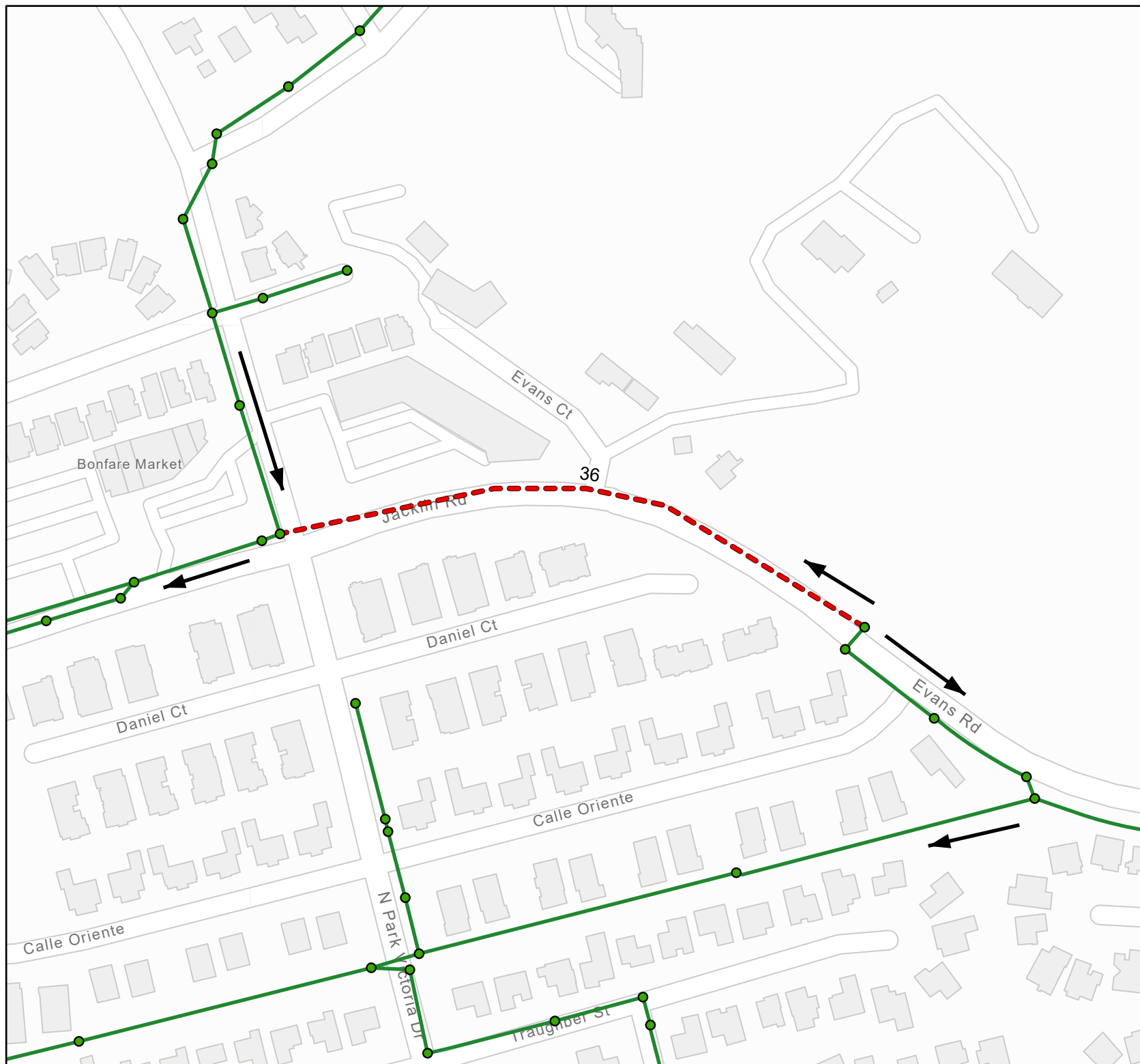
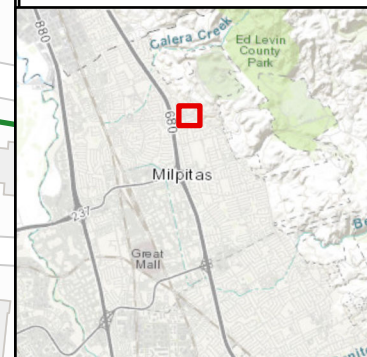
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority
 - New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 200 feet

Vicinity Map



Milpitas Item # 16.
Storm Drainage CIP

CAL_3
Bayview Park Drive
SD Improvements

Page 3 of 15

Legend

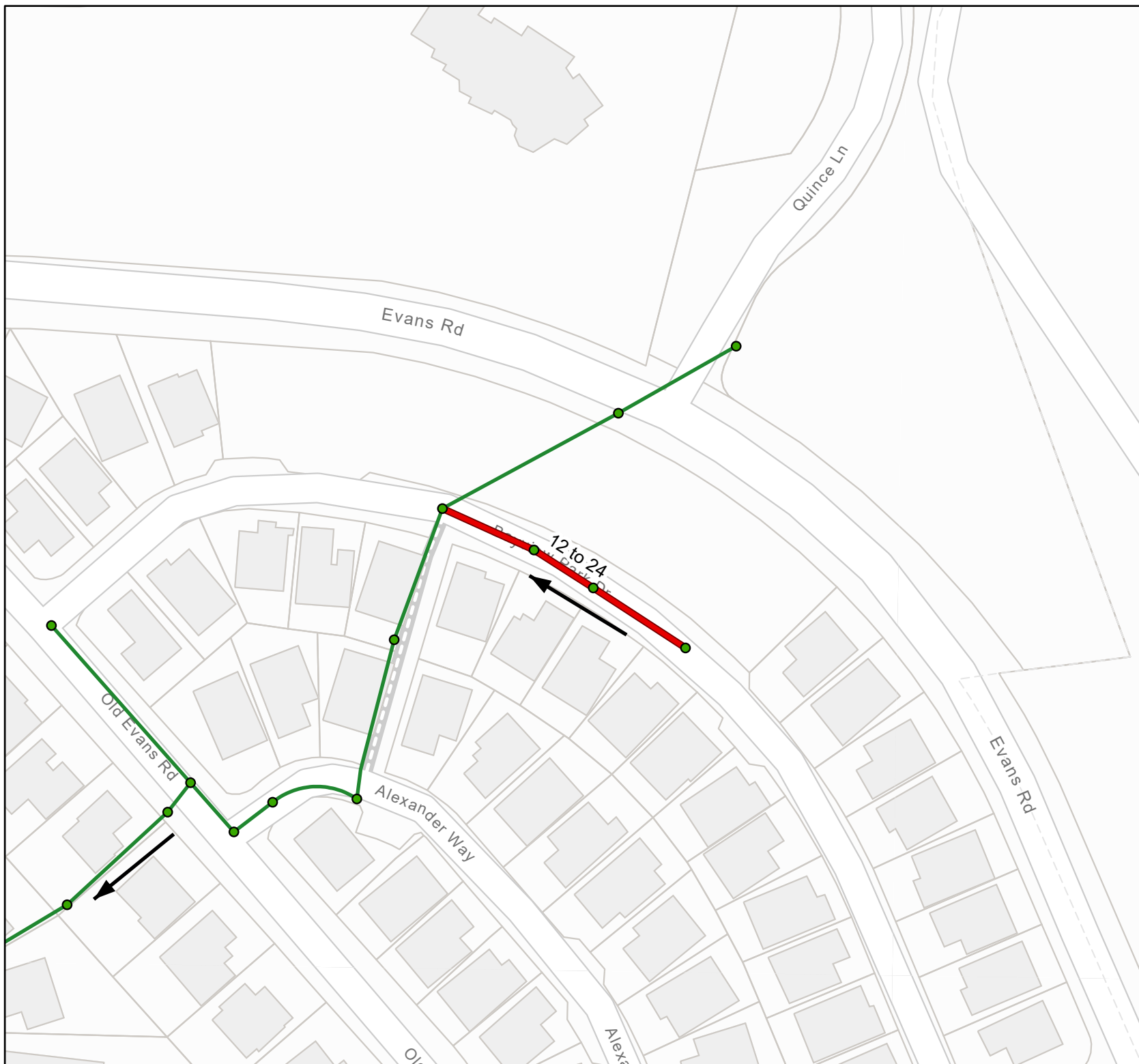
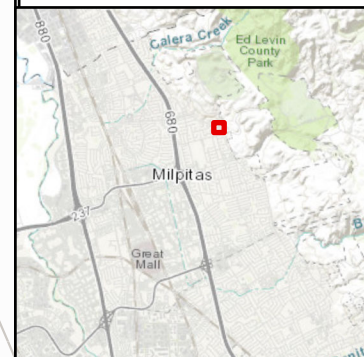
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority
 - New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 100 feet

Vicinity Map



Milpitas Item # 16.
Storm Drainage CIP

CAL_4
Wool Drive
SD Improvements

Page 4 of 15

Legend

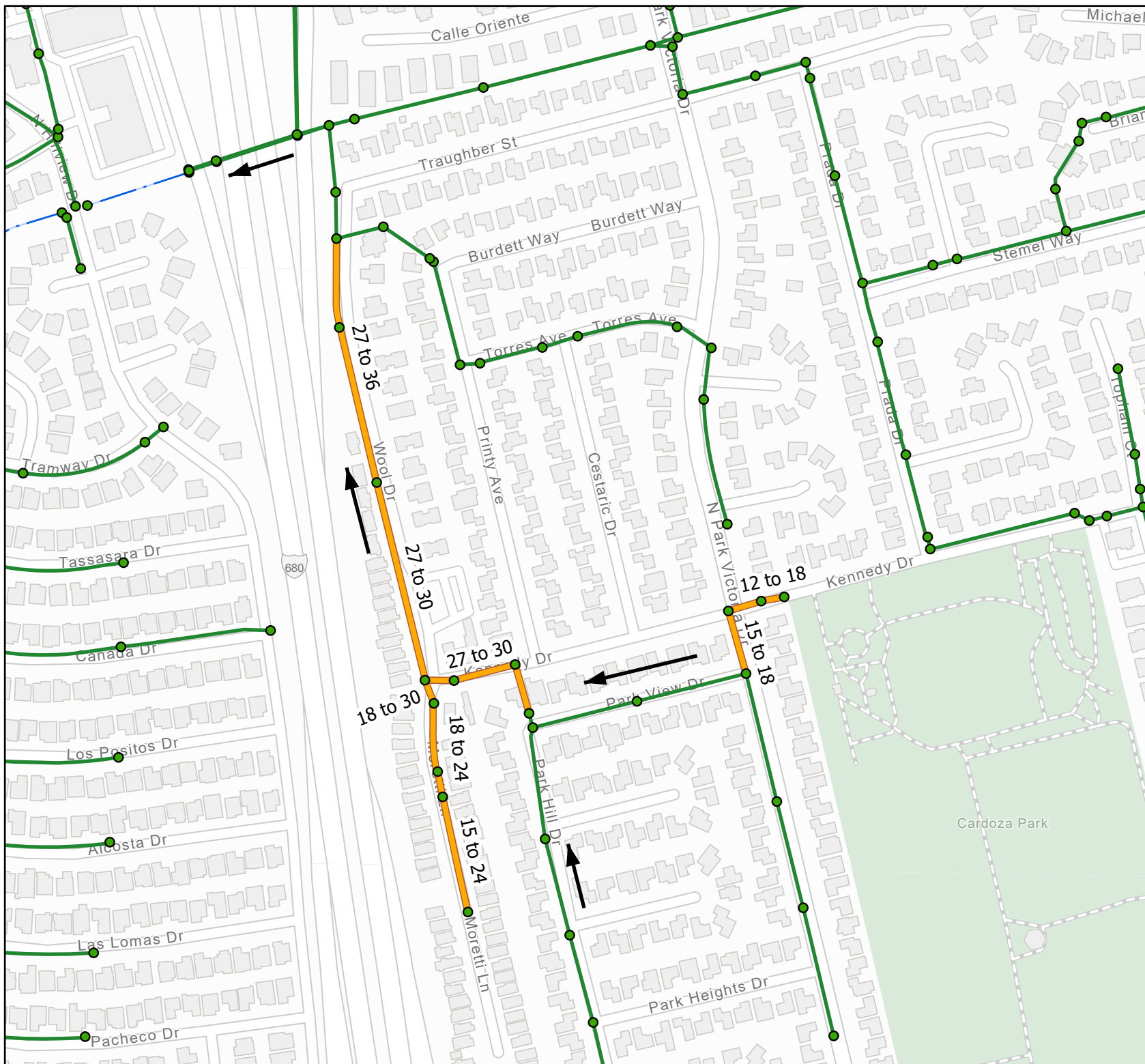
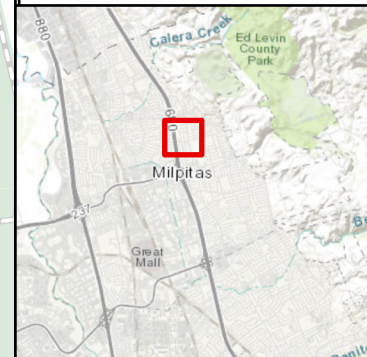
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority
 - New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 350 feet

Vicinity Map



Milpitas Item # 16.
Storm Drainage CIP

COCHES_5
Coches and Piedmont Creek
SD Improvements

Page 5 of 15

Legend

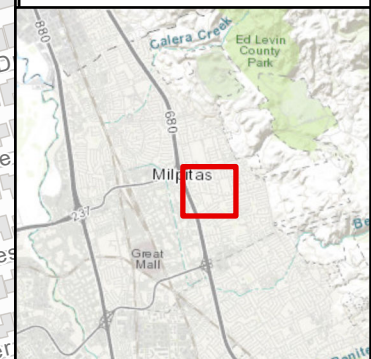
- Storm Drain Structure
 - Modeled Storm Drain
 - River reach
- CIP Priority
- New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is
existing size and 'b' indicates proposed



1 inch : 500 feet

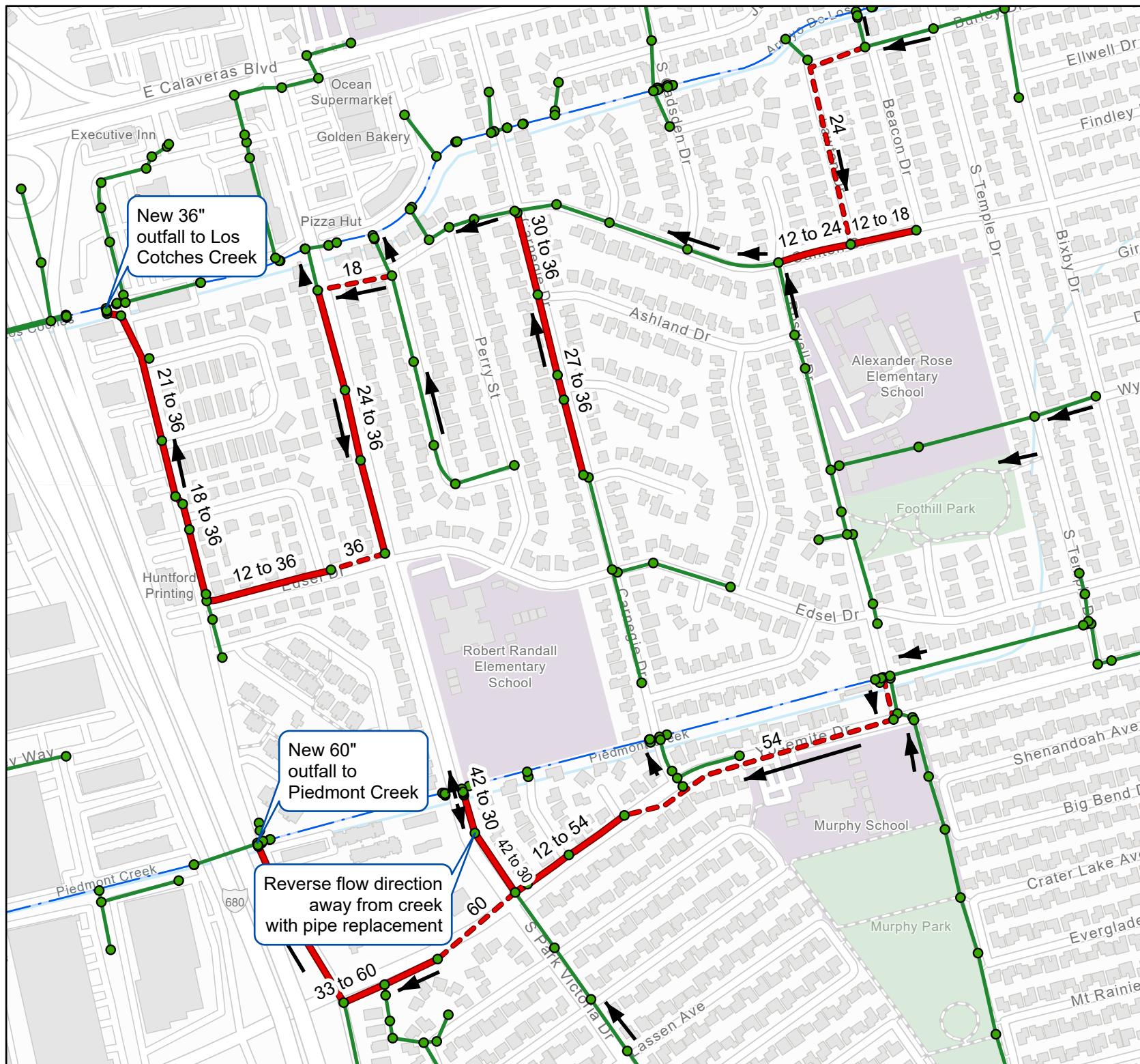
Vicinity Map



New 36"
outfall to Los
Coches Creek

New 60"
outfall to
Piedmont Creek

Reverse flow direction
away from creek
with pipe replacement



Milpitas Item # 16.
Storm Drainage CIP

COCHES_8
Foothill Park
SD Improvements

Page 6 of 15

Legend

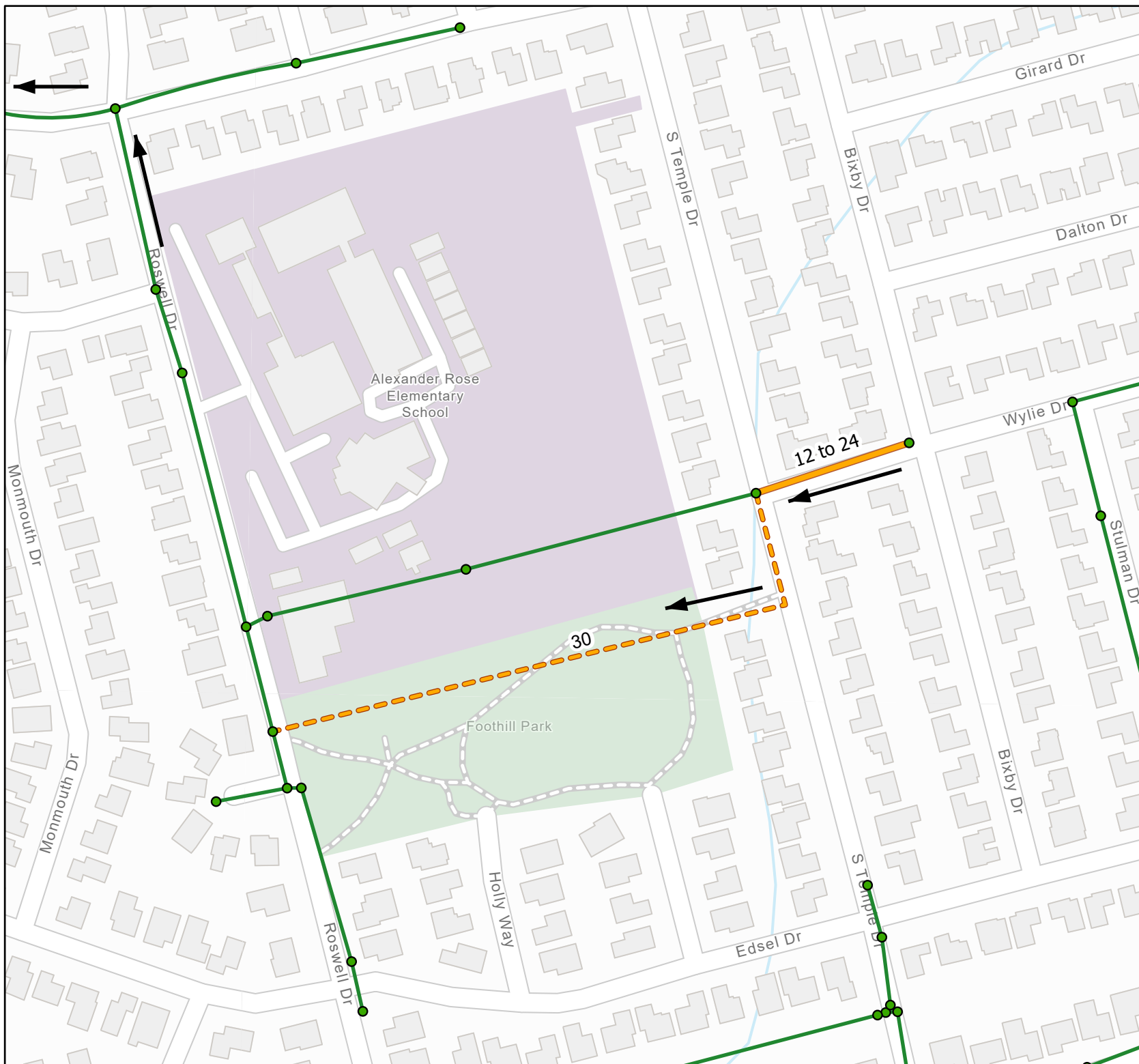
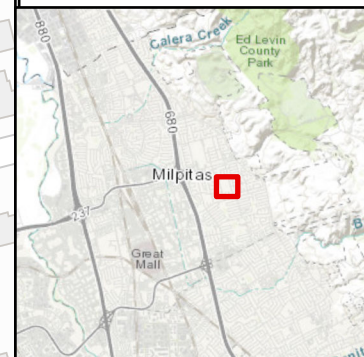
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority
 - New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 200 feet

Vicinity Map



Legend

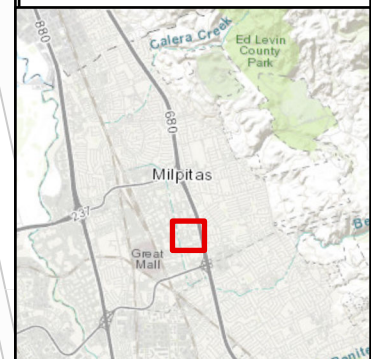
- Storm Drain Structure
 - Modeled Storm Drain
 - River reach
- CIP Priority
- ■ New High Priority SD
 - ■ New Low Priority SD
 - ■ Specific Plan SD Extension
 - ■ Low Priority SD Replacement
 - ■ High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 300 feet

Vicinity Map



Milpitas Storm Drainage CIP

Item # 16.

WF_11
Comet Drive
SD Improvements

Page 8 of 15

Legend

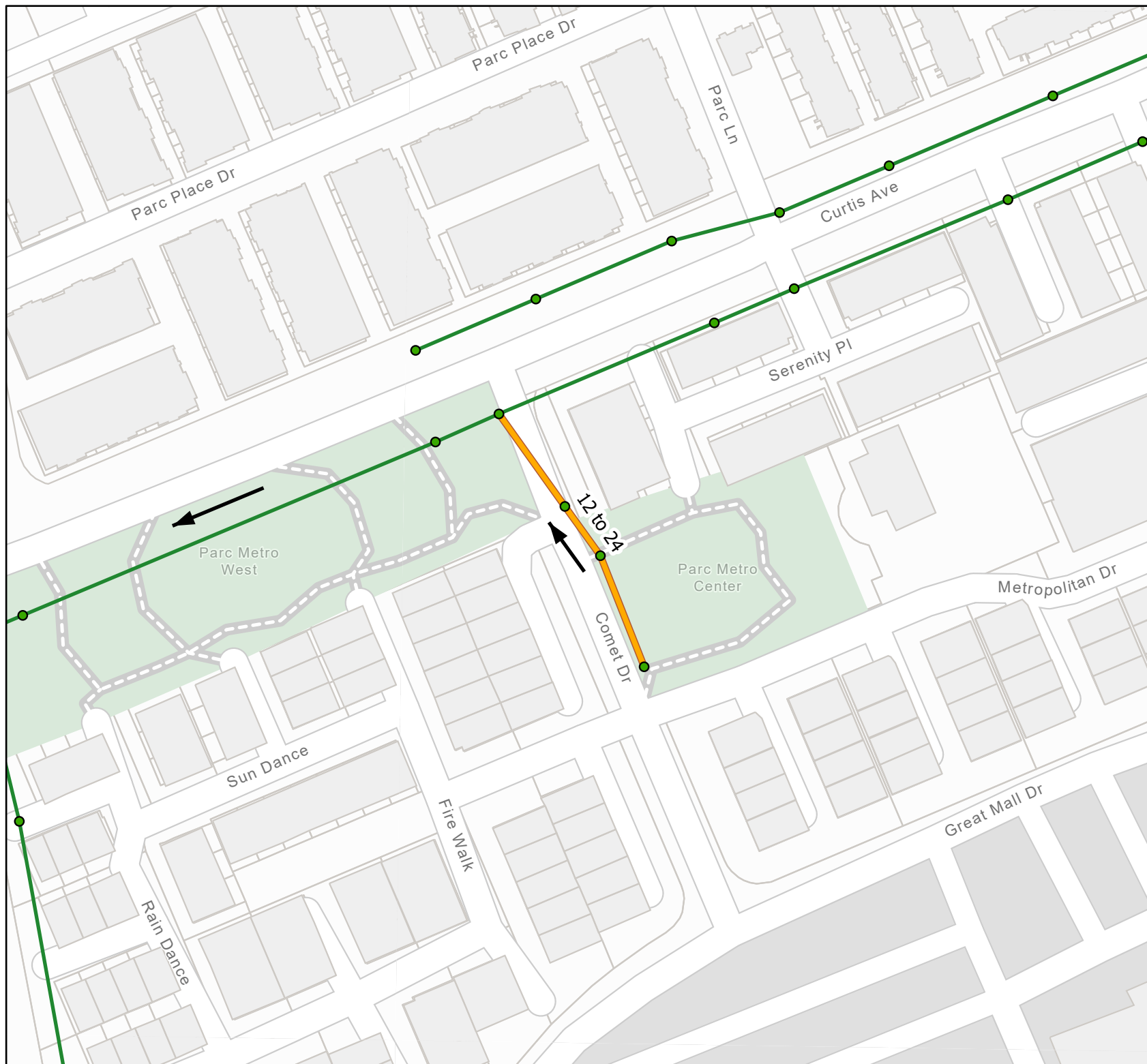
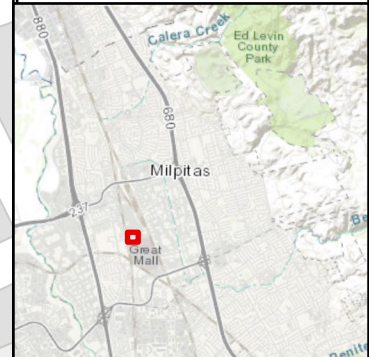
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority**
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 100 feet

Vicinity Map



Legend

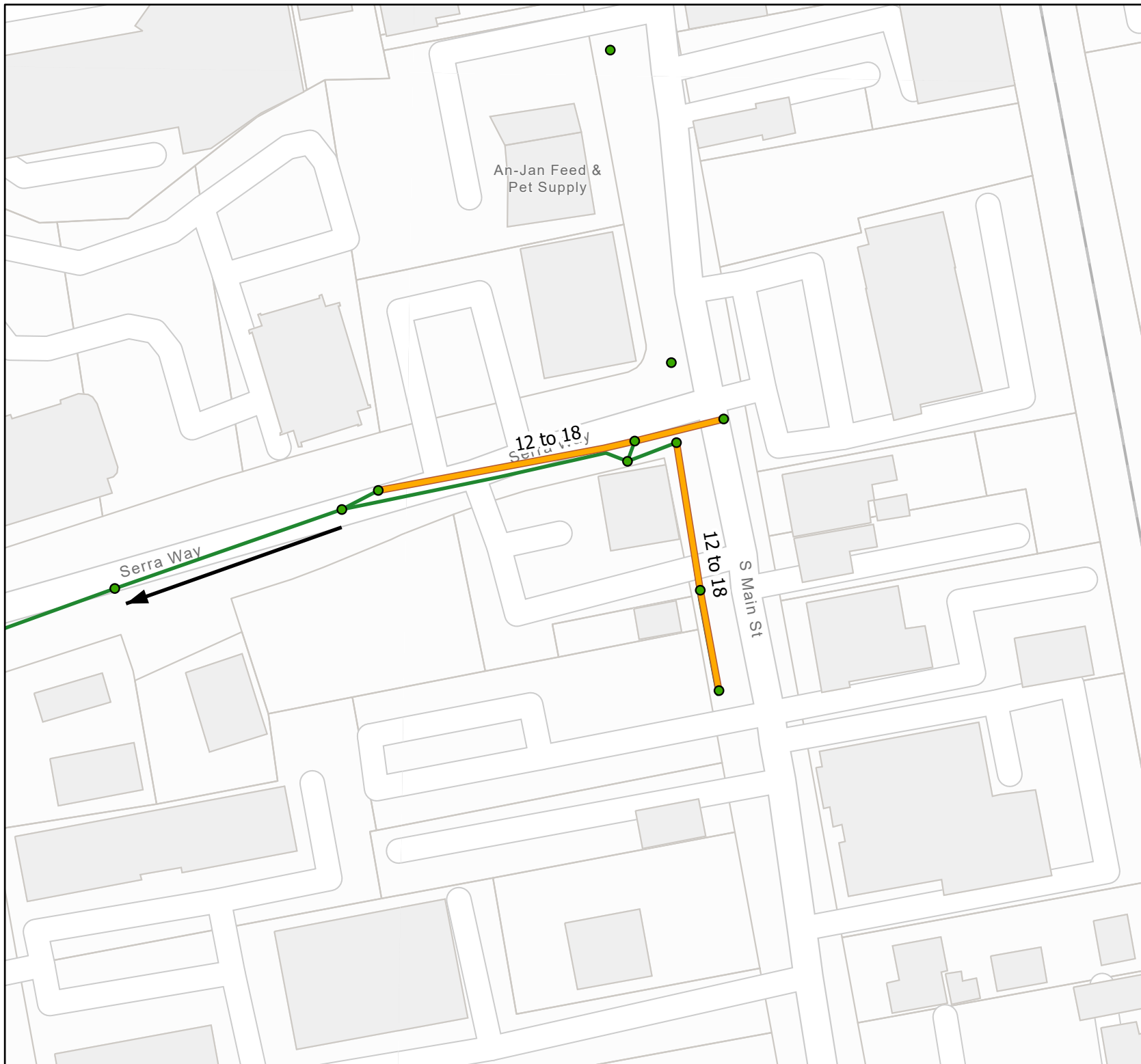
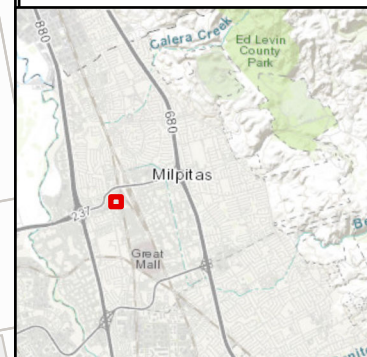
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority
 - New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 100 feet

Vicinity Map



Milpitas Item # 16.
Storm Drainage CIP

WF_13
 Railroad Avenue
 SD Improvements

Page 10 of 15

Legend

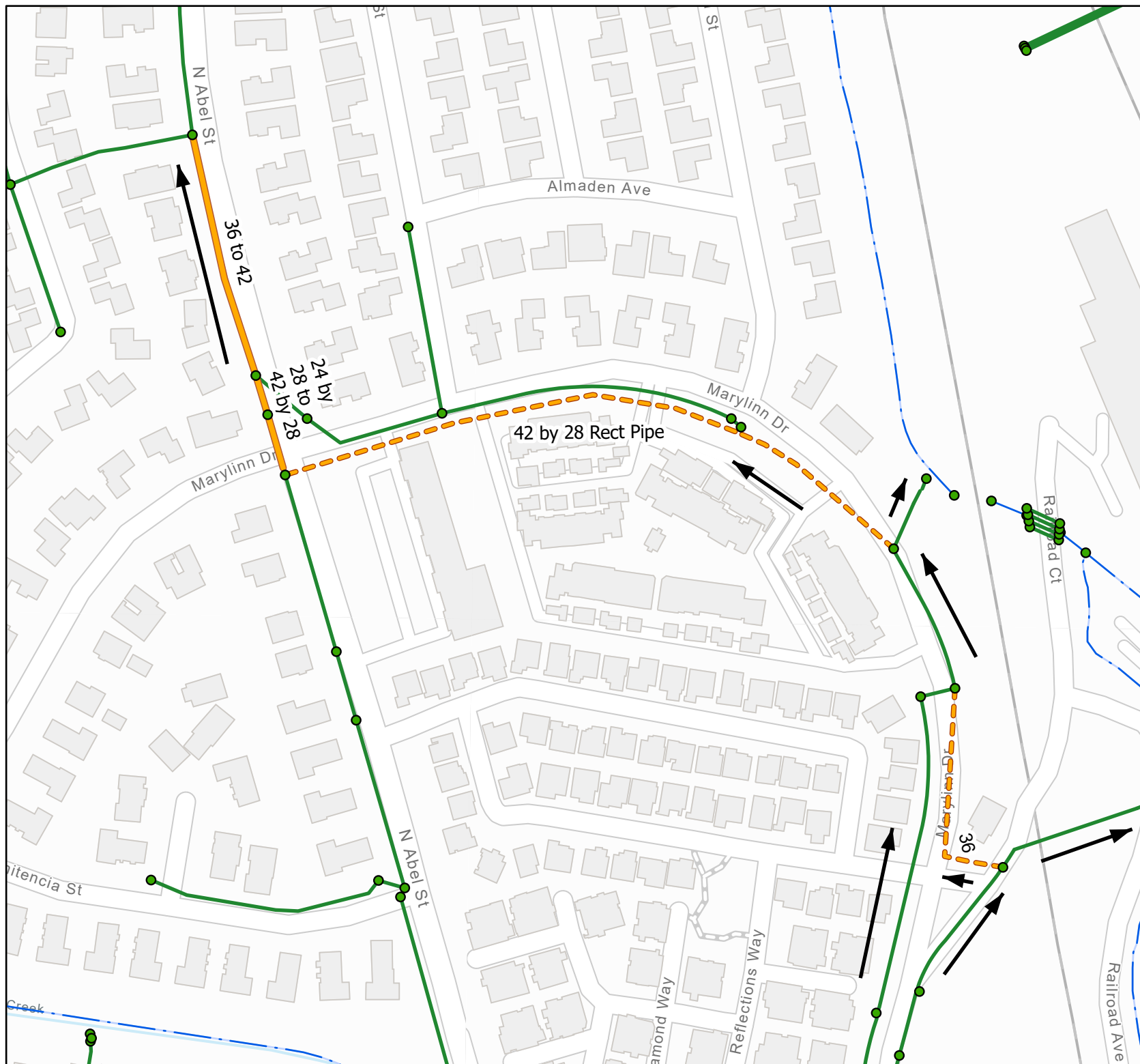
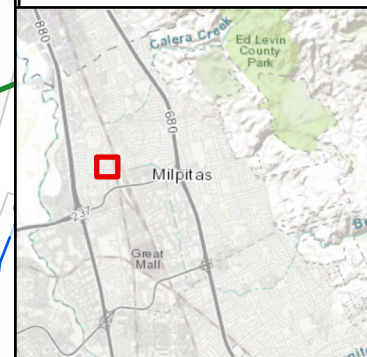
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority**
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 200 feet

Vicinity Map



Milpitas Item # 16.
Storm Drainage CIP

LP_14
North Abel Street
SD Improvements

Page 11 of 15

Legend

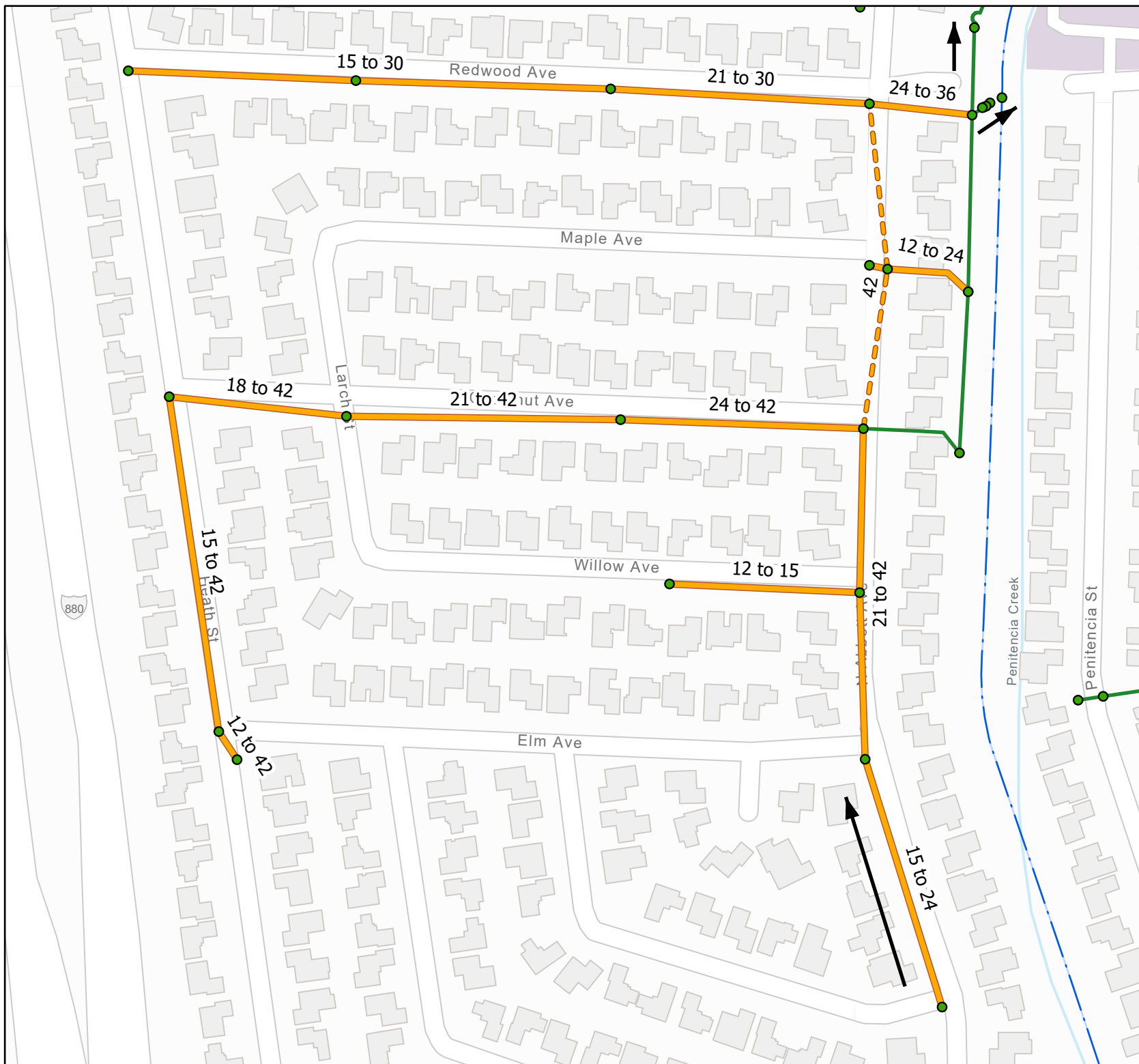
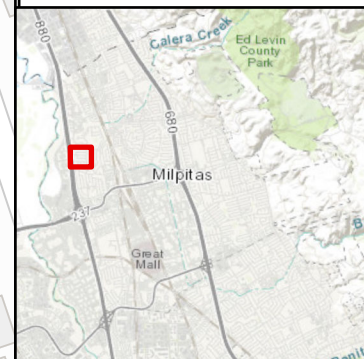
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority
 - New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

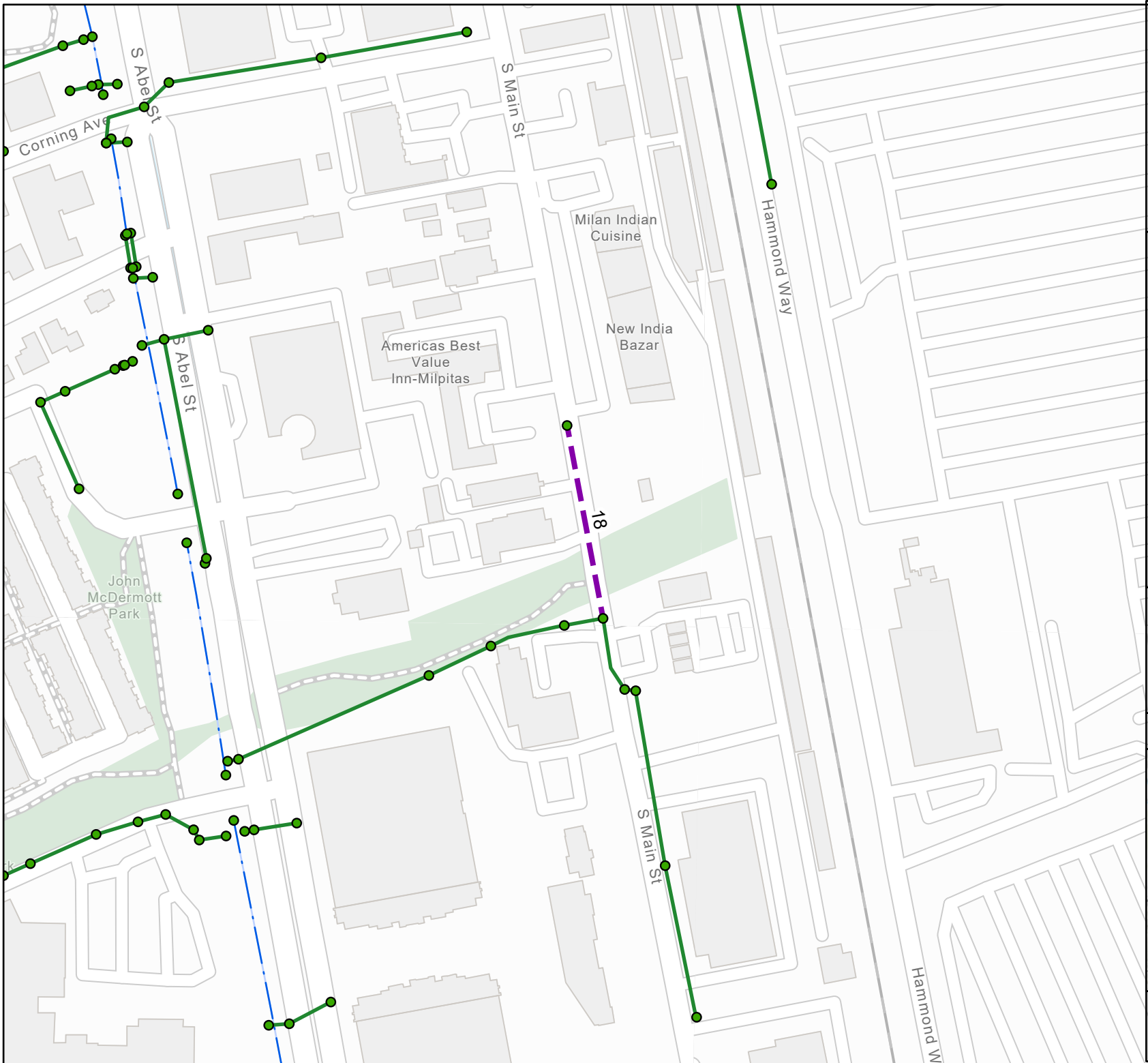
*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 200 feet

Vicinity Map





Milpitas

Item # 16.

Storm Drainage CIP

Under-served Area

LP_15

Main Street - Tom Evatt Park

SD Improvements

Page 12 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

Schaaf & Williams

CONSULTING CIVIL ENGINEERS

1679

Milpitas Item # 16.
Storm Drainage CIP
 Under-served Area
 LP_16
 Main Street
 SD Improvements

Page 13 of 15

Legend

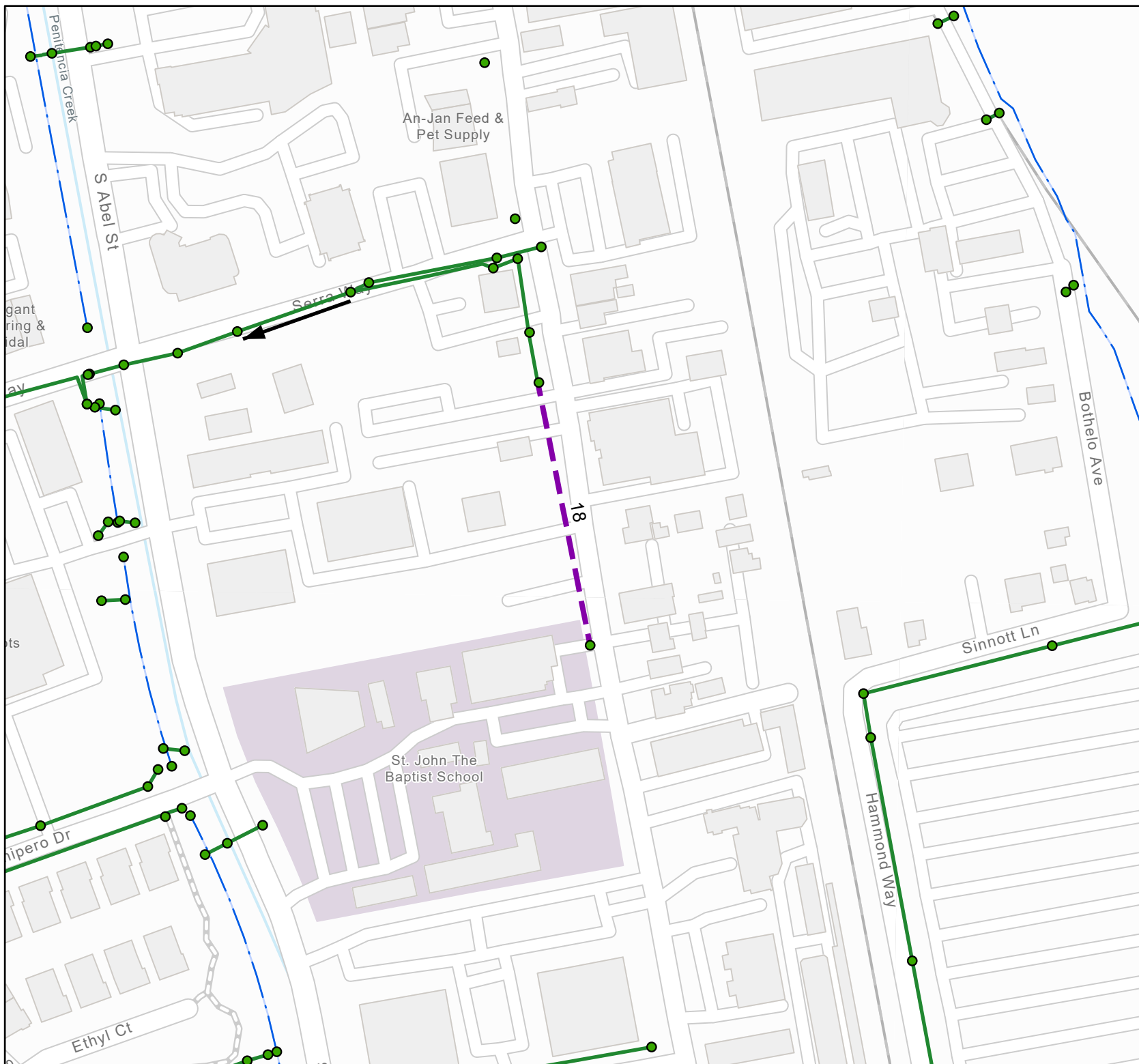
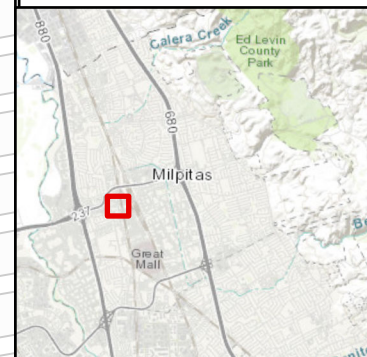
- Storm Drain Structure
- Modeled Storm Drain
- River reach
- CIP Priority**
- New High Priority SD
- New Low Priority SD
- Specific Plan SD Extension
- Low Priority SD Replacement
- High Priority SD Replacement

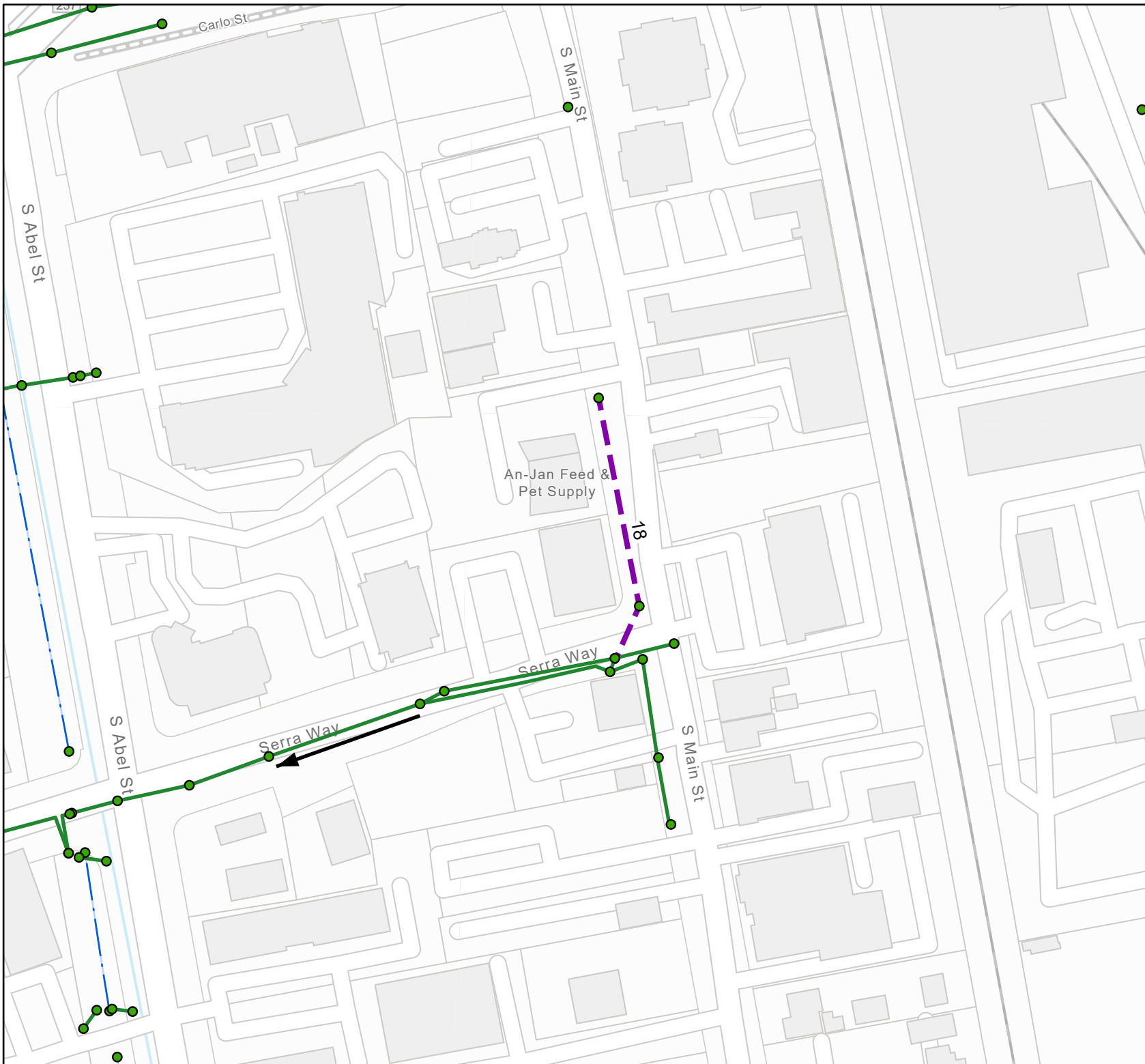
*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 200 feet

Vicinity Map





Milpitas

Item # 16.

Storm Drainage CIP

Under-served Area

LP_17

Main Street - Sinnott Ln

SD Improvements

Page 14 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 : 150 feet

Vicinity Map

Schaaf & Williams

CONSULTING CIVIL ENGINEERS

1681

Milpitas Item # 16.
Storm Drainage CIP
Under-served Area
LP_18
Main Street - Carlo Street
SD Improvements

Page 15 of 15

Legend

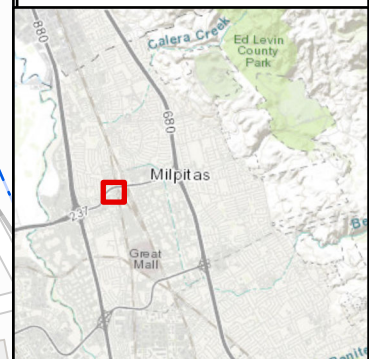
- Storm Drain Structure
 - Modeled Storm Drain
 - River reach
- CIP Priority
- New High Priority SD
 - New Low Priority SD
 - Specific Plan SD Extension
 - Low Priority SD Replacement
 - High Priority SD Replacement

*Pipe annotation: "a to b" where 'a' is existing size and 'b' indicates proposed



1 inch : 200 feet

Vicinity Map



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 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 a direct drive engine 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 most 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:

$$Vol_p = t \left(\frac{Q_i}{Q_p} \right) (Q_p - Q_i)$$

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 can 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 = submergence (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 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 system, 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 feed 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

Maintenance Task	Operating Time	Calendar Time
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.)

Appendices

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

Appendix C Stormwater Financial Plan Report

Project Memo

DATE: June 8, 2022
TO: Tony Ndah
Public Works Director
FROM: Todd Cristiano
Senior Manager
SUBJECT: Stormwater Financial Plan

Introduction

The City of Milpitas retained Raftelis to complete a comprehensive financial planning forecast for their water, wastewater, and stormwater utilities¹. Separate financial plans and memorandums were developed for each utility and this memorandum summarizes the stormwater financial plan results for the study period FY 2024² through FY 2040. The financial plan cash flow tables are attached at the end of this memo. The analysis included the following:

1. **Sources of funds.** Includes the projection of transfers required from the general fund to meet annual operation and maintenance expenses and capital projects identified in the stormwater master plan.
2. **Expenditures forecast.** Includes the projection of operation and maintenance expenses, transfers to the general fund, payments on existing debt service, and capital projects identified in the most recent master plan documents.

Stormwater Utility Findings

Per the City's Fiscal Policies, the City endeavors to transfer \$500,000 annually from the General Fund to the Storm Drain Fund for the purpose replacing and repairing storm drain pump stations. In addition, the City receives stormwater impact fee revenues. The impact fee revenues, however, are variable and not predictable.

In recent years, the City has not been able to achieve the goal of a \$500,000 general fund revenue transfer. Even if fully funded, \$500,000 is insufficient to fund capital projects described in the master plan. In addition, City staff has identified \$2.5 to \$3 million in reasonable O&M expenses for the system that are currently being funded by the General Fund. A preliminary stormwater financial plan is presented below in Table 1.

¹ Stormwater activities are currently within the general fund and is not a stand-alone utility. For the purposes of this study, we created a cash flow consolidating the O&M costs aggregated from the various areas in the general fund and projects identified in the most recent master plan.

² It is assumed this stormwater funding strategy would begin in FY 2024.

Raftelis recommends that the City formally examine options to provide \$5 million per year for stormwater O&M, capital costs and proposed debt service.

While one such option could be to continue funding stormwater from the general fund at an increased level, the City could develop another, dedicated funding source to supplement or supplant the current funding method. Since funding stormwater from the general fund at an increased level would have impacts upon the ability of the City to provide other needed services, a dedicated revenue source is preferable, if can be achieved. The dedicated revenues can be housed in a separate storm drainage utility fund, a proprietary fund similar to the water and sewer funds. The revenues could be used to fund operation and maintenance, PAYGO capital and debt service on bond-funded capital.

The two primary options for a dedicated funding source are a property-related fee or a special parcel-based tax. Either of these would require public approval, however, which could be obtained through a balloting process.

Either a new dedicated funding source, described above, or general fund revenues could be used to pay debt service on bond-funded capital improvements. If capital improvements are financed through bonds, instead of cash-funded, the annual revenue requirements can be kept at lower, more manageable levels, allowing for lower rates. In addition, financed capital promotes intergenerational equity since both current and future rate or taxpayers will pay for the capital improvements, not just today's customers.

Stormwater Funding Source Development Process

Current stormwater revenues fall short of program needs and will be outpaced by growing program and regulatory requirements in the coming years.

The process of developing a dedicating funding source is a process with several major components:

1. determining current and future stormwater program funding needs,
2. evaluating alternative implementation approaches,
3. developing an implementation process, and finally
4. implementing fees designed to sustainably support the program

Phase 1: Determining Program Funding Needs – the Stormwater Cost of Service and Rate Study

Stormwater Financial Planning

Revenue Requirement Analysis

Initially, the City will need to build upon the prepared Expenditures of Funds projections provided as an appendix, refining or capturing any additional revenue requirements over a planning period of five to ten years, focusing on system operational and maintenance costs, regulatory costs, indirect operational costs, capital costs as defined in the recent stormwater system infrastructure assessment, and related categories. It would also be appropriate to capture any nuanced impacts to revenue requirements such as uncollectable debt and revenues from miscellaneous sources, such as its developer fees, that could offset

the requirement. The plan can include scenarios for debt-funding capital improvements.

Cost of Service Analysis and Rate Structure Review

Next, a cost of service evaluation should be conducted using a cost allocation methodology based on industry best practices. Program components such as water quality and flood control services are evaluated with respect to the primary cost drivers behind them, to determine a fair basis for cost recovery. Once costs are categorized, they can then be appropriately allocated to unique customer classes based on their individual costs of service, pursuant to Proposition 218 proportionality requirements. Based on the plan and cost of service evaluation, the City can review the fairness and proportionality of a proposed structure or structures. The most common rate structure is one based on measured or estimated impervious area rate structure, while other components can be considered such as gross land area, land use, fixed charges, and others. In this step, a preliminary rate structure should be agreed upon.

Development of Data to Support Rate Structure

If data are not already available to support the selected rate structure, data to support the rate structure will need to be developed. Under an impervious area rate structure, the process begins with developing impervious area data for statistically significant sample residential customers to determine the appropriate stormwater fee billing unit, the equivalent residential unit (ERU). Next, the number of impervious area billable units throughout the entire service area should be determined. The results of the rate design analysis will be incorporated into the model to estimate monthly stormwater fees and project stormwater fee revenues over the planning period.

Proposed Rates over Five-Year Planning Period

Based on the five- or ten-year revenue requirements and the cost of service analysis, stormwater fees and stormwater fee revenues can be projected. Proposed rates should be calculated to sustain the program throughout the planning period and adhere to financial policies and goals of the City.

Phase 2: Evaluating Alternative Implementation Approaches

In conjunction with the foregoing work, the City must evaluate funding options and determine a path forward. A critical part of this evaluation includes implementation time, effort, and cost considerations given current staff availability, the regulatory and political climate, public opinion, and advantages and disadvantages associated with implementing the funding alternatives. Two funding alternatives, balloted property-related fees and balloted parcel-based special taxes are discussed below.³ The process for financing the capital program through a General Obligation bond is not discussed specifically in this section, since issuing GO bonds is a process more familiar to the City than the development of a stormwater parcel-related fee or a parcel special tax.

Balloted Property-Related Fee

Public approval is required for property-related fees through both a public hearing and a ballot process. The process begins with a public notice sent to all property owners, 45 days before a public hearing. At

³ California Stormwater Quality Association and SCI Consulting Group. "Stormwater Funding Barriers and Opportunities" (2017): A.1-1-A.1-2, A.1-5-A.1-7.

the public hearing the property owners have the opportunity to protest the proposed fee, and should a majority of property owner protest, the fee would not be sent to ballot. Following the public hearing, the local agency determines whether the fee is submitted to balloting of all registered voters or just those property owners that would be subject to the proposed fee, which is the option that is more often selected.

Balloting can commence at least 45 days after the public hearing. The ballot is required to have specific information about the proposed fee including the amount, basis for calculation, and reason for the fee. Approval of the fee when just property owners are balloted is determined by a simple majority of the ballots cast by the property owners.

Required Documents for a property-related fee:

- Fee Report
- Resolution Calling for Mailing of Notices
- Resolution Calling for Mailing of Ballots
- Ballots
- Resolution Directing Fees to be Charged

Balloted Parcel-Based Special Tax

Unlike property-related fees, parcel-based special taxes are always voted on by all registered voters and require a two-thirds instead of a simple majority to approve. Special taxes can be voted on in person during primary or general elections or through single issue special tax mailed ballots. Mailed ballots for special taxes are required to have a ballot question (75 words or less), the full ballot text (300 words or less), and pro and con arguments.

Required Documents for a parcel-based special tax

- Ordinance or Resolution stating tax type, rates, collection method, election date, and service provided
- Notice to the Register of Voters of Measure Submitted to Voters
- Measure Text including Ballot Question, Full Ballot Text, and Arguments in favor or against

Comparison of Property-Related Fee and Parcel-Based Special Tax

Property-related fees are most commonly used for stormwater programs, but special taxes have also been successfully implemented for stormwater programs because the process is familiar to Californians who are used to other special taxes. While special taxes are less commonly used for stormwater programs, in general, property owners are more familiar with the special tax process than with the property fee process.

Property-related fees require a standardized methodology for charging all properties, which can have a major impact on large public properties with substantial impervious area. Special taxes are usually parcel based, but allow for the option to determine rates based on features of the property such as use or size.

Both funding options have strong legal ground and have not faced significant legal challenges, although the Proposition 218 requirements must be carefully followed for the property-related fee process. Property-related fees only require a 50% majority as opposed to the two-thirds majority required by

special taxes, and are often voted on just by property owners. Therefore, property-related fees can be less politically challenging.

Phase 3: Developing an Implementation Approach:

Public Polling and Research

Given the expense of taking a balloted measure out to the public, agencies often elect to gather public opinions to help inform their approaches. Opinion research can help shape elements such as the timing of a measure, and ballot measure wording.

Research may range from:

- Meta-analysis of existing opinion data for the area regarding storm drainage
- Online survey
- Mailed survey
- Telephone survey
- Focus groups

The first two (relying on existing data or an online survey) may sacrifice some clarity in the results either because they do not perfectly address the City's key questions or because of they may not provide statistically significant results, respectively. On the other hand, a mailed or telephone survey or a focus group are more effort and expense to administer.

A polling team can design, produce, and assist the City with administering and analyzing the results of a survey that explores perceptions of a potential stormwater fee, stormwater program effectiveness, stormwater needs, communication strategy effectiveness, and community desires as they related to stormwater management, as well as gauging the feasibility of other potential funding measures.

Community Outreach

Public polling and research results will influence the City's engagement and communication program that must accompany a balloted measure. These actions, goals and objectives should be documented in a rate communication work plan. The work plan will guide education and outreach efforts and ensure internal stakeholders are in agreement about the goals, objectives, responsibilities and timelines associated with stormwater fee communication. Key elements of the work plan will include:

- Accounting for the City's existing branding, outreach and education activities, policies and projects, while acknowledging specific stakeholder audiences.
- Outlining outreach and education goals and objectives.
- Identifying audiences and stakeholders, and methods for reaching the audiences.
- Developing key messages that clarify purpose, need and objectives.

The City would need to prepare materials and messaging that effectively convey the reasons for the rate structure and rate changes. Some potential communications materials may include collateral such as fact sheets, that are accessible to different audiences and address key concerns and information needs across a varied knowledge base. The goals for the materials are ones that are understandable, visually appealing, and optimized for effective digital and printed distribution.

Outreach activities should include City-wide engagement and participation forums and formats for public meetings.

Phase 4: Funding Measure Implementation

As described above, if the City moves forward with a balloted measure on stormwater funding, the next steps would include drafting ballot language informed by polling results (if applicable), develop public hearing information, and conduct public hearing meetings with the City. The City would also then administer ballot-related activities such as: creating, printing, and mailing notices; designing, printing, and mailing ballots, and; tabulating and reporting results.

Assuming that the funding measure is successful, additional activities to finalize and implement billing of the fee would be needed, as follows.

Stormwater Billing Methodology

The City's means for conveying the fee would need to be evaluated and modified as necessary to convey the fee. The City should consider its current utility and tax billing systems and how the systems could convey the stormwater charge on bills for existing utility or tax accounts and new accounts created for customers who only have stormwater service (either non-utility parcels or tax-exempt property owners). The City will need to carry out implementation and ongoing billing maintenance processes steps such as uploading stormwater fee information and creating new accounts, as well as the options for collections, including establishing a payment hierarchy, separating and remitting stormwater fee payments, and pursuing enforcement action for nonpayment will need to be developed and implemented. The City will also need to be prepared to provide customer service associated with the new fee.

Stormwater Funding Considerations

There are a number of important considerations which factor into the decision to establish a dedicated stormwater funding source.

1. Reliable funding
2. Equitable cost recovery
3. Fee transparency
4. On-site customer parcel mitigation
5. Administrative burdens
6. Prop 218 requirements

Reliable Funding. As an infrastructure program, stormwater services require a reliable and dedicated funding source to support planning, capital and operation and maintenance to, in turn, provide stormwater services to Milpitas customers in a way that protects public health and safety.

Equitable Cost Recovery. As noted above, stormwater fees generally charge customers based on its demand upon the stormwater system, most often, based on measured impervious area or a surrogate for impervious area. This may be more equitable compared to funding a stormwater program through property taxes because parcels with high assessed value may, or may not, have large amounts of

impervious area and vice versa. Note that a parcel-related fee would be charged to all customers, including tax-exempt and government-owned properties. Finally, residential properties, which currently face a wide-range of property tax impacts, would likely see that impact narrow under a stormwater fee because these fees are generally flat (same for all single family residential properties) or tier based (falling into 2 or 3 “ranges” of impervious area).

Fee Transparency. The current approach to funding stormwater costs through property taxes means the program is funded through general fund sources such as property taxes. A dedicated fee, coupled with a robust public engagement and education process, could be an opportunity to have a broader conversation around the importance of stormwater management and how to fairly recover the associated costs. A stormwater enterprise fund would have a dedicated source of funding with transparent cost recovery from those who most intensely use the system, which may improve support for the program.

Recognize private investment and demand. Unlike a general funded stormwater program, a parcel-related fee provides a means, a credit program, for recognizing private investments to treat stormwater that result in a property’s reduced demand upon the stormwater system. A credit program allows properties a reduced fee if they have implemented specific stormwater practice on their sites. The credit program would reinforce the City’s environmental goals and policies.

Administrative effort. Since a fee would rely on data that needs to be maintained over time, the City would incur some additional administrative effort associated with its establishment and maintenance over time. The City can include consideration of this factor during the development and implementation process, balancing administrative burden with equity in selection of the rate structure, along with other factors. In addition, as described above, the process of implementing a dedicated funding source requires investment and effort by the City. The return for the effort would be a more stable, predictable and reliable funding source for stormwater, however, to support an infrastructure program that requires planned, funded investments over time.

Reliance on City Provided Data

During this project, the City (and/or its representatives) provided Raftelis with a variety of technical information, including cost and revenue data. Raftelis did not independently assess or test for the accuracy of such data – historic or projected. Raftelis has relied on this data in the formulation of our findings and subsequent recommendations, as well as in the preparation of this memorandum.

There are often differences between actual and projected data. Some of the assumptions used for projections in this memorandum will not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the data or results projected in this memorandum and actual results achieved, and those differences may be material. As a result, Raftelis takes no responsibility for the accuracy of data or projections provided by or prepared on behalf of the City, nor do we have any responsibility for updating this report for events occurring after the date of this memorandum.

Table C-1
City of Milpitas, CA
Stormwater Cash Flow

Line No. Description	Projected									
	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Sources of Funds										
1 Beginning Balance	\$ -	\$ 304,661	\$ 669,823	\$ 868,470	\$ 1,397,652	\$ 2,122,048	\$ 1,814,729	\$ 765,632	\$ (3,375,367)	\$ (8,723,094)
2 Proposed Bonds			\$ 13,000,000			\$ 20,000,000				
3 General Fund Transfer	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000
4 Subtotal: Sources	\$ 5,000,000	\$ 5,304,661	\$ 18,669,823	\$ 5,868,470	\$ 6,397,652	\$ 27,122,048	\$ 6,814,729	\$ 5,765,632	\$ 1,624,633	\$ (3,723,094)
Uses of Funds										
5 O&M	\$ 2,818,927	\$ 2,931,685	\$ 3,048,952	\$ 3,170,910	\$ 3,297,746	\$ 3,429,656	\$ 3,566,843	\$ 3,709,516	\$ 3,857,897	\$ 4,012,213
6 CIP Projects	\$ 1,876,412	\$ 1,703,153	\$ 14,752,401	\$ 322,051	\$ -	\$ 20,899,804	\$ -	\$ 2,949,229	\$ 4,007,575	\$ 1,885,896
7 Debt Service	\$ -	\$ -	\$ -	\$ 977,858	\$ 977,858	\$ 977,858	\$ 2,482,255	\$ 2,482,255	\$ 2,482,255	\$ 2,482,255
8 Subtotal: Uses	\$ 4,695,339	\$ 4,634,837	\$ 17,801,353	\$ 4,470,819	\$ 4,275,604	\$ 25,307,318	\$ 6,049,097	\$ 9,141,000	\$ 10,347,727	\$ 8,380,363
9 Ending Balance	\$ 304,661	\$ 669,823	\$ 868,470	\$ 1,397,652	\$ 2,122,048	\$ 1,814,729	\$ 765,632	\$ (3,375,367)	\$ (8,723,094)	\$ (12,103,457)
CIP Adjustments										
10 Completion Percentage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
11 Annual Cost Inflation	6.0%	6.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
12 Cumulative Inflation Rate	112.4%	119.1%	123.9%	128.8%	134.0%	139.3%	144.9%	150.7%	156.7%	163.0%

Table C-1
City of Milpitas, CA
Stormwater Cash Flow

Line No.	Description	Projected										
		FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040	FY 2041	FY 2042	FY 2043	FY 2044
		\$	\$	\$	\$	\$	\$	\$	\$			
Sources of Funds												
1	Beginning Balance	\$ (12,103,457)	\$ (16,991,135)	\$ (20,852,783)	\$ (24,969,608)	\$ (29,351,815)	\$ (34,684,284)	\$ (44,414,422)	\$ (51,867,486)	\$ (49,009,007)	\$ (79,504,711)	\$ (97,281,353)
2	Proposed Bonds											
3	General Fund Transfer	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	\$ 5,000,000
4	Subtotal: Sources	\$ (7,103,457)	\$ (11,991,135)	\$ (15,852,783)	\$ (19,969,608)	\$ (24,351,815)	\$ (29,684,284)	\$ (39,414,422)	\$ (46,867,486)	\$ (44,009,007)	\$ (74,504,711)	\$ (92,281,353)
Uses of Funds												
5	O&M	\$ 4,172,701	\$ 4,339,609	\$ 4,513,194	\$ 4,693,721	\$ 4,881,470	\$ 5,076,729	\$ 5,279,798	\$ -	\$ -	\$ -	\$ -
6	CIP Projects	\$ 3,232,722	\$ 2,039,785	\$ 2,121,376	\$ 2,206,231	\$ 2,968,744	\$ 7,171,154	\$ 4,691,011	\$ 2,141,521	\$ 35,495,704	\$ 22,776,642	\$ -
7	Debt Service	\$ 2,482,255	\$ 2,482,255	\$ 2,482,255	\$ 2,482,255	\$ 2,482,255	\$ 2,482,255	\$ 2,482,255	\$ -	\$ -	\$ -	\$ -
8	Subtotal: Uses	\$ 9,887,678	\$ 8,861,649	\$ 9,116,824	\$ 9,382,207	\$ 10,332,469	\$ 14,730,137	\$ 12,453,064	\$ 2,141,521	\$ 35,495,704	\$ 22,776,642	\$ -
9	Ending Balance	\$ (16,991,135)	\$ (20,852,783)	\$ (24,969,608)	\$ (29,351,815)	\$ (34,684,284)	\$ (44,414,422)	\$ (51,867,486)	\$ (49,009,007)	\$ (79,504,711)	\$ (97,281,353)	\$ (92,281,353)
CIP Adjustments												
10	Completion Percentage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	200.0%	300.0%	400.0%	500.0%
11	Annual Cost Inflation	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
12	Cumulative Inflation Rate	169.5%	176.3%	183.4%	190.7%	198.3%	206.2%	214.5%	223.1%	232.0%	241.3%	250.9%



memorandum

date March 11, 2022

to Tony Ndah, P.E., Public Works Director, City of Milpitas
Harris Siddiqui, P.E., Principal Engineer, City of Milpitas

from Alisa Moore, Project Director
Meryka Dirks, Project Manager,
Deja Newton, Deputy Project Manager

subject City of Milpitas Utility Master Plans – Addendum to the Environmental Impact Report for the
Milpitas General Plan Update (SCH# 2020070348)

1.0 Introduction

This memorandum serves as the California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) Addendum (Addendum) to the Milpitas General Plan Update EIR (Milpitas GP EIR; State Clearinghouse No. 2020070348). The City of Milpitas (City) adopted the Milpitas GP EIR for the on March 9, 2021.

The CEQA Guidelines (Sections 15162 and 15164) require that a lead agency prepare an addendum to a previously certified EIR if some changes or additions to the environmental evaluation of a project are necessary, but none of the following occurs:

1. Substantial changes are proposed in the project which will require major revisions of the previous Environmental Impact Report 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 Environmental Impact Report due to 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 Environmental Impact Report was adopted, shows any of the following:
 1. The project will have one or more significant effects not discussed in the previous Environmental Impact Report;
 2. Significant effects previously examined will be substantially more severe than shown in the previous Environmental Impact Report;

3. 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
4. Mitigation measures or alternatives which are considerably different from those analyzed in the previous Environmental Impact Report would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

This Addendum summarizes the Milpitas Utility Master Plans (the Plans) as considered in the Certified Milpitas General Plan EIR (GP EIR), describes additional changes to the Plans made since the certification of the GP EIR, and analyzes any change in environmental effects associated with those changes. As discussed further in section 4.0 Conclusions and Recommendations', the Plans would not result in any new significant impacts not previously disclosed in the circulated EIR; nor would it result in a substantial increase in the magnitude of any significant environmental impact previously identified. For these reasons, an addendum to the certified EIR is sufficient to meet the requirements of CEQA Guidelines Section 15164. An addendum need not be circulated for public review under CEQA Guidelines Section 15164, but can be included in or attached to the final certified EIR. The City must consider the addendum with the certified EIR prior to making a decision on the Plans. This Addendum also serves as documentation that the Plans' changes do not trigger any of the conditions in CEQA Guidelines Section 15162; therefore, a subsequent EIR is not required.

2.0 Project Description

2.1 Project Location

Milpitas is located near San Francisco Bay in what is colloquially referred to as Silicon Valley (refer to **Figure 1**). Downtown San José is eight miles to the south of Milpitas; 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.

2.2 Milpitas General Plan Update and EIR

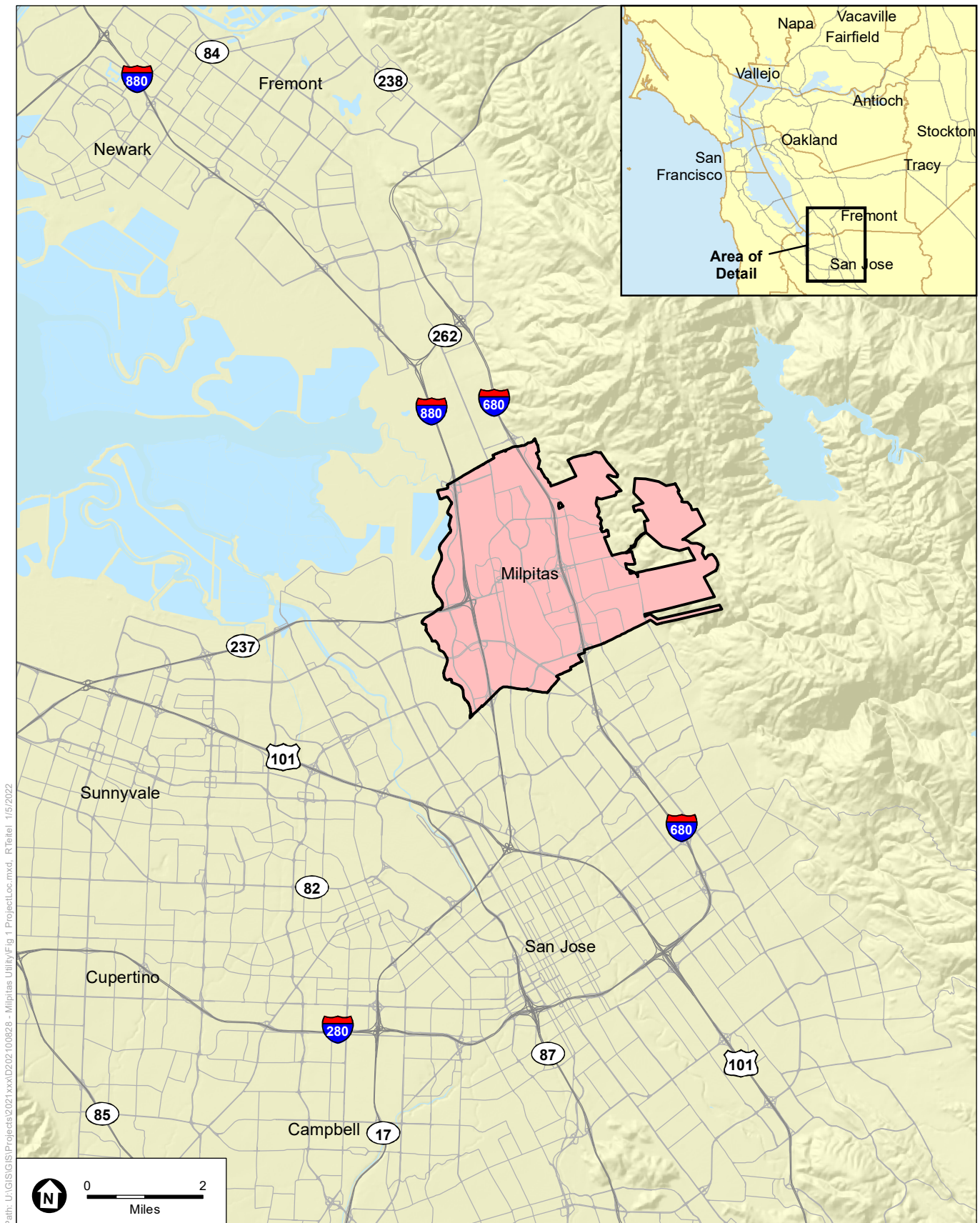
In March of 2021, the City adopted the Milpitas General Plan Update (hereon as the Milpitas GP) (City of Milpitas, 2021). The City prepared the Milpitas GP to identify the community's vision for the future and provide a framework that guides decisions on growth and resources that are consistent with the quality of life desired by the city's residents and businesses. The Milpitas GP carries forward some of the major goals of the 1994 General Plan, but has been substantially updated and reorganized to address current local conditions and the city's goals.

The City was the lead agency for the Milpitas GP EIR. The EIR evaluated potential environmental impacts that could occur as a result of implementing the Milpitas GP. The EIR included a program-level analysis, which considers broad environmental effects. The impact analysis is intended to programmatically cover the construction and operation of actions to be taken under the Milpitas GP, such as new utilities and other elements of utilities master plans. However, the Milpitas GP EIR also acknowledges that individual projects that fulfil implementation of the Milpitas GP may require separate CEQA analysis at the time they are proposed.

The Milpitas GP includes policies and actions designed to minimize potential adverse effects, including those associated with new utilities (i.e., stormwater conveyance) and updates to the City utilities master plans. The Milpitas GP EIR incorporated these policies and actions to reduce impacts, including the following:

- Action UCS 3a: periodically review and update the Sewer Master Plan and the Sewer System Management Plan.
- Action UCS 2a: Periodically review and update the City's Water Master Plan and Urban Water Management Plan in order to meet regulatory requirements and to ensure the documents address existing and projected demand.
- Action UCS 4a: Regularly review and update the Storm Drainage Master Plan.
- Action UCS 4c: Identify which stormwater drainage facilities are in need of repair and address these needs through the City's Capital Improvement Program.

Since completion of the Milpitas GP and the EIR, the City has prepared updated utility master plans for sewer, water and storm drainage as required in the Milpitas GP.



Path: U:\GIS\GIS\Projects\2021\100228 - Milpitas Utility\Fig 1\ProjectLoc.mxd, R:tel: 1/5/2022

SOURCE: ESRI

City of Milpitas Utility Master Plan Addendum



Figure 1
Planning Area

2.3 Utility Master Plans

Storm Drain Master Plan

The City of Milpitas completed its first storm drain master plan in 2001, which was last updated in 2013. The 2013 updated plan comprehensively evaluated storm drain system performance in addition to flood hazard mapping. This effort utilized work completed with Santa Clara Valley Water District as part of the Cooperating Technical Partner program sponsored by the Federal Emergency Management Agency (FEMA). The 2021 draft master plan focuses on storm drainage infrastructure. The 2021 draft master plan is intended to serve as a guide for the City to implement a prioritized capital improvement program (CIP) and secure sufficient funds for annual operation and maintenance, and long-term system replacement. The 2021 draft master plan includes a list of potential projects, but does not propose or approve their implementation. If they are carried forward, they may require individual CEQA coverage.

Sewer Master Plan

The City's wastewater system infrastructure was first constructed in the 1950s when the City was established, and it was expanded with the growth of the City. The most recent sewer master plan was completed in 2002 with a revision completed in 2004 and an update completed in 2009. The 2021 master plan develops a CIP to address physical and hydraulic deficiencies. The purpose of the 2021 master plan is to perform a condition assessment on the collection system and evaluate the hydraulic performance of the system under current and projected future conditions. The 2021 master plan identifies hydraulic capacity deficiencies and pipes in poor condition. The 2021 draft master plan includes a list of potential projects to improve the City's sewer system, but does not propose or approve their implementation. If they are carried forward, they may require individual CEQA coverage.

Water Master Plan

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 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. The purpose of the 2021 Water Master Plan is to evaluate the existing system infrastructure and incorporate impacts of short-term and long-term planned growth under the Milpitas GP to develop a comprehensive plan for implementation of the City's Water System CIP. The 2021 Water Master Plan includes a list of potential projects to improve the City's water system, but does not propose or approve their implementation. If they are carried forward, they may require individual CEQA coverage.

2.4 References

De Novo Planning Group, 2021. *City of Milpitas General Plan 2040*. March 2021.

De Novo Planning Group, 2020. *City of Milpitas Draft Environmental Impact Report*. November 2020.

HydroScience, 2021. *City of Milpitas Sewer Master Plan 2021*. January, 2021.

Schaaf & Wheeler, 2021. *City of Milpitas Storm Drain Master Plan 2021*. August 20, 2021

West Yost, 2021. *City of Milpitas Water Master Plan 2021*. March 2, 2021.

3.0 Environmental Setting, Impacts, and Mitigation Measures

This chapter describes any relevant changes that have occurred in the existing environmental conditions within and near the Planning area as well as environmental impacts associated with the Plans, compared to the evaluations presented in the Milpitas GP EIR. Impacts are addressed below to all resource areas in accordance to Appendix G of the CEQA Checklist, and as organized in the Milpitas GP EIR.

3.1 Aesthetics

The Plans are located within the Milpitas GP planning area. The setting of the Milpitas GP area was described in the Milpitas GP EIR, and for the purposes of aesthetics analysis the setting has not changed. While the Milpitas Planning Area contains numerous areas and viewsheds with relatively high scenic value, there are no officially designated scenic vista points in the planning area. There are no officially designated scenic highways located in the vicinity of Milpitas. Significant visual resources include Mission Hills, Monument Peak, and Mount Diablo. The primary sources of daytime glare are generally sunlight reflecting from structures and other reflective surfaces and windows. The primary sources of nighttime lighting are generally from exterior building lights, street lights, and vehicle headlights.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to aesthetic and visual resources:

- Less-than-significant impacts related to the scenic vista and scenic resources.
- Less-than-significant impacts to non-urbanized areas.
- Less-than-significant impacts related to the creation of new sources of nighttime lighting and daytime glare

Discussion

The Milpitas GP EIR concluded that with implementation of the policies and actions contained in the Milpitas GP, new non-residential development located in and around existing urbanized areas would be developed to be visually compatible with nearby open space resources, and these policies and actions would further ensure that new development is designed in a way that enhances the visual quality of the community, compliments the visual character of the city, and that adverse effects on public views are minimized. No new designated scenic vistas or scenic resources have been identified in the Plans vicinity since adoption of the Milpitas GP EIR. The Plans would be implemented consistent with the policies and actions contained in the Milpitas GP. The Milpitas GP EIR consulted that no adopted State scenic highways are located within the Milpitas GP area, and no scenic highways provide views of the area. No new adopted scenic highways have been identified in the Plans' vicinity since adoption of the Milpitas GP EIR. The Plans do not include development beyond that described in the Milpitas GP, and as noted, no new scenic vistas and resources have been identified since the approval of the Milpitas GP. Therefore, potential impacts on scenic vistas and scenic resources that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

The Milpitas GP EIR determined that the City is mapped and designated as an urbanized area. Policies in the Milpitas GP are intended to complement and further the intent of the City's provisions regulating scenic quality

and resources.¹ Any development occurring under the Milpitas GP would be subject to compliance with these guidelines. The Milpitas GP EIR concluded that with compliance of the guidelines, as well as implementation of policies and actions contained in the Milpitas GP, the Milpitas GP would not substantially degrade the existing visual character or quality of public views of the Milpitas GP area. The Plans do not propose actions that are beyond that described in the Milpitas GP or that could require non-compliance with the policies and guidelines in the Milpitas GP. Therefore, potential impacts related to conflicts with applicable zoning and other regulations governing scenic quality that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

The Milpitas GP EIR concluded that the Milpitas GP would increase the amount of daytime glare in existing urbanized areas, and increased nighttime lighting could reduce visibility of the night sky; generally detracting from the quality of life in Milpitas. Future development under the Milpitas GP would be required to be consistent with the Milpitas GP policies, as well as lighting and design requirements in the Milpitas Municipal Code, which would ensure that new development projects utilize appropriate building materials that do not result in significant increases in unusual glare. The Plans do not include structures or activities that would require lighting or glare beyond that described in the Milpitas GP or that could require non-compliance with the policies in the Milpitas GP and design requirements in the Milpitas Municipal Code. Therefore, potential impacts related to new sources of nighttime lighting and daytime glare that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

Conclusion

The impacts to scenic and visual resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.2 Agricultural and Forestry Resources

There are no lands within the Plans' area that are designated for agricultural use on the existing or proposed Milpitas GP Land Use Map. There are no agricultural lands identified by the California Department of Conservation's Farmland Mapping and Monitoring Program within the Milpitas GP area. There are no lands within the Milpitas GP area that are currently under a Williamson Act contract, or forest lands or timber lands.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to agricultural and forestry resources:

- Less-than-significant impacts to existing zoning for agricultural use, Williamson Act contracts, loss of forest land, and conversion of farmlands.

Discussion

The state and local land use and zoning designations with respect to agricultural and forest resources have not changed for the Plans' site and surroundings, and agricultural or forest use of the site has not commenced since

¹ Zoning and other regulations governing scenic quality applicable to the City of Milpitas include the Design Guidelines and Plan Review Checklist and the City of Milpitas Master Streetscape Master Plan, and Measures I, J, and K.

adoption of the Milpitas GP EIR. Thus, there has not been a substantial change in the circumstances involving agricultural and forest resources at the site or surrounding areas. The Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts on agricultural and forestry resources that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

Conclusion

The impacts to agricultural and forestry resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.3 Air Quality

The Planning Area is located within the San Francisco Bay Area Air Basin (SFBAAB). The Bay Area Air Quality Management District (BAAQMD) attains and maintains air quality conditions in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The air quality setting relevant to the Plans' site, including applicable regulations and air quality conditions, has not appreciably changed since the certification of the Milpitas GP EIR.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to air quality:

- Less-than-significant impacts for the potential to conflict with or obstruct implementation of the applicable air quality plan or result in a cumulatively considerable net increase of criteria pollutant;
- Less-than-significant impacts for the potential to expose sensitive receptors to substantial pollutant concentrations, and
- Less-than-significant impacts for the potential to result in other emissions (such as those leading to odors adversely affecting a substantial number of people).

Discussion

The Milpitas GP EIR concluded that the Milpitas GP would be consistent with the 2017 Clean Air Plan and all future development projects would be subject to the Milpitas GP's policies, goals, and actions. The Milpitas GP would further the fundamental goals of BAAQMD in reducing emissions of criteria air pollutant and would increase opportunities for transit ridership. Exposure to toxic air contaminants (TAC) and PM_{2.5}² concentrations within the City would be minimized with the implementation of policies and actions to under the Milpitas GP. Individual projects subject to the Milpitas GP are required to have environmental assessments to determine health impacts from construction and operation and implement mitigation measures to reduce exposure. The Milpitas GP does not propose any land use that could be a potential source of objectionable odors. Future sewer, water and storm drainage improvements under the Plans would have to comply with the air quality management plans (AQMP), state implementation plan (SIP), California Air Resources Board (CARB), and BAAQMD regulations, as well as, Title 24 energy efficiency regulations, and the Milpitas GP policies and actions to minimize impacts.

² PM_{2.5} is particulate matter 2.5 micrometers or less in diameter (known as fine particulate matter).

Because the Plans do not include utility development beyond the general types and scope that are described in the Milpitas GP, the Plans would not result in new or increased impacts from that disclosed in the Milpitas GP EIR. Therefore, potential impacts to air quality resources that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

Conclusion

The impacts to air quality with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.4 Biological Resources

The biological resources setting relevant to the Plans' site has not appreciably changed since the adoption of the Milpitas GP EIR. This includes applicable regulations and the existing condition of sensitive biological resources, such as wetlands, natural communities, and habitats that support special-status plant and wildlife species.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts on biological resources:

- Less-than-significant impacts related to sensitive natural communities, protected wetlands, species identified by California Fish and Wildlife and U.S. Fish Wildlife Service, local policies, and provisions approved by local, regional, or state habitat conservation plans, and wildlife movement corridors.

Discussion

The Milpitas GP concluded that while subsequent development under the Milpitas GP could result in direct loss of habitat areas associated with special status animal species, the Milpitas GP includes numerous policies and actions intended to avoid and reduce impacts to special status species. In addition to policies detailed in the Milpitas GP, special status species also receive protection from federal endangered species act (FESA), California endangered species act (CESA), and various other biological resource protection laws.

The Milpitas GP EIR itself does not approve physical changes to the environment. However, subsequent approved projects that are consistent with the buildout of the Milpitas GP could have indirect changes on the physical environment. The Milpitas GP outlines minimization measures future projects will be required to comply with to protect riparian habitat, other sensitive natural communities and the numerous federally and state protected wetlands and other jurisdictional waters found at the Plans' site. Additionally, subsequent approved projects would be required to comply with relevant Federal, State, and local regulations. Section 404 of the Clean Water Act (CWA), for example, requires any project to obtain a permit that authorizes the disturbance to a wetland or water of the U.S. The regulatory process through section 404 of the CWA ensures no "net loss" of wetlands or jurisdictional waters.

The Milpitas GP EIR concluded that because the Milpitas GP will not result in any physical changes to the environment, adoption of the Milpitas GP will not result in direct impacts to the environment. Subsequent individual projects could impact movement corridors; however, each project would require a detailed and site-specific review of the site to determine the presence or absence of movement corridors on the project site. Federal and State laws implemented through the project approval and permit process require measures to reduce, avoid, or compensate

for impacts to these resources. Future projects will be required to comply with the Santa Clara Valley Habitat Conservation Plan as not to conflict with existing provisions of adopted local, regional, or state conservation plans.

The Plans would not exacerbate or result in new impacts to the Plans' site. Because the Plans do not include development beyond that described in the Milpitas GP, the Plans would not result in new or increased impacts from that disclosed in the GP EIR. Therefore, potential impacts to biological resources that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

Conclusion

The impacts to biological resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.5 Cultural Resources and Tribal Cultural Resources

The cultural resources and tribal cultural resources setting relevant to the Plans' site has not appreciably changed since the adoption of the Milpitas GP EIR. Thirty-three cultural resources are listed in the Northwest Information Center (NWIC) database as previously recorded within the Milpitas GP area. These resources consist of historic buildings and railroads, prehistoric villages, prehistoric artifacts, and refuse deposits. In addition, twenty-five buildings are listed on the Santa Clara County Historic Property Data File Directory. Twenty-three of these buildings are also included on the list of resources on file with the NWIC.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to cultural resources and tribal cultural resources:

- Less-than-significant impacts related to a substantial adverse change in the significance of a historical and archaeological resource.
- Less-than-significant impact related to the disturbance of and human remains.
- Less-than-significant impacts related to substantial adverse changes in the significance of a tribal cultural resource.

Discussion

The Milpitas GP EIR does not propose any action that would result in adverse changes to cultural resources, however future development could affect historical resources and archaeological resources under the Milpitas GP. As future development and infrastructure projects are considered, each project will be evaluated for compliance with the Milpitas GP and applicable local and state regulations. The General Plan includes policies and actions that would reduce impacts to cultural, historical, and archaeological resources, as well as policies and actions for the conservation of cultural, historical, and archaeological resources. In addition, in the event of a resource discovery, the Milpitas GP requires all ground disturbing activity and construction to halt until a qualified expert is able to analyze the project site and determine appropriate mitigation. The Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts on historical and archaeological resources that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

The Milpitas GP requires that discovered human remains are treated in compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98. The Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts to human remains that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

The Milpitas GP also requires tribal consultation with tribes that may be impacted by development. The Plans would be required to follow development requirements, including compliance with local policies, ordinances, and applicable permitting procedures related to protection of tribal cultural resources. The Plans do not propose actions that could require non-compliance with the regulations. Therefore, potential impacts to tribal cultural resources that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

Conclusion

The impacts to cultural resources and tribal cultural resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.6 Geology

The geology and soils setting relevant to the Plans' site, including applicable regulations and geologic conditions, has not appreciably changed since the certification of the Milpitas GP EIR. Seismic hazard zones are currently mapped in Milpitas and include areas mapped for liquefaction and earthquake induced landslide hazards. The most prominent areas of the City susceptible to liquefaction are located along Coyote Creek. Soils and geologic conditions in the Plans' area have the potential for landslides, lateral spreading, subsidence, liquefaction, or collapse. The National Resource Conservation Service (NRCS) collected erosion data for the City and concluded that the susceptibility of soil to sheet fill and erosion by water was moderately low, with a moderate potential for soil erosion.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to geology:

- Less-than-significant impacts related to the potential to expose people or structures to potential adverse effects from earthquake faults, seismic shaking, seismic-induced ground failures, unstable geologic units, soils or expansive soils, or the potential to destroy paleontological resources.

Discussion

The nature, scale, and timing of the Plans have not changed in a manner that would exacerbate existing geologic and seismic hazards at the Plans' site. Ground disturbance associated with the Plans would be limited to shallow surface fill and soils in areas that are already developed.

There are faults within the Plans' area which could cause considerable seismic shaking. The Plans are required to comply with provisions of the California Building Standards Commission (CBSC), policies in the Milpitas GP associated with seismic events, and State and City codes where applicable, as well as complete a design level

geotechnical investigation. With the implementation of these provisions, policies and codes, potential impacts associated with ground instability, expansive soils, and exposing people and structures to adverse effects would be reduced. The Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts associated with geologic conditions that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

Because the majority of the city limits contains existing urban uses, the erosion potential is considered to be low. Limited development could occur within the Milpitas hillside areas. As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the CBSC, Milpitas GP, Zoning Ordinance, and other regulations. The Plans do not include development beyond that described in the Milpitas GP, and does not propose actions that could require non-compliance with the regulations. Therefore, potential impacts on geologic resources that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

The Milpitas GP EIR determined that construction within the city limits allowed by the Milpitas GP would not require the use of septic tanks or alternative wastewater disposal systems; limited use of septic tanks may be required within hillside areas outside the City limits. Implementation of the Sewer System Management Plan and the potential CIP under the Milpitas GP ensure adequate system capacity.

Ground disturbance associated with the Plans would be limited to shallow surface fill and soils in areas that are already developed. Although there could be fossils of potential scientific significance and other unique geologic features that remain undiscovered or are not recorded, implementation of the Milpitas GP policies and actions would ensure steps would be taken to minimize impacts to paleontological resources in the event that they are discovered. The Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts to paleontological resources that would be associated with the modified Plans would be the same as those identified in the certified EIR for the approved Milpitas GP.

Implementation of the Plans would not result in new or increased impacts from that disclosed in the GP EIR because the Plans does not include development beyond that described in the Milpitas GP. Therefore, potential impacts associated with septic tanks or alternative wastewater disposal systems that would be associated with the modified Plans would be the same as the those identified in the certified EIR for the approved Milpitas GP.

Conclusion

The impacts to geologic resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.7 Greenhouse Gases, Climate Change, and Energy

The greenhouse gases (GHG), climate change, and energy setting relevant to the Plans' site, including applicable regulations, has not appreciably changed since the certification of the Milpitas GP EIR.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to greenhouse gases and energy:

- Less-than-significant impacts related to the potential to generate GHG emissions that could have a significant impact on the environment;
- Less-than-significant impacts related to the potential to conflict with adopted plans, policies, or regulations adopted for the purpose of reducing GHG emissions; and,
- Less-than-significant impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, or conflicting with or obstruct state to local plans for renewable energy or energy efficiency.

Discussion

The Milpitas GP EIR concluded that implementation of the Milpitas GP would result in an increase in overall GHG emissions but they would be minimized through implementation of the City's Climate Action Plan (CAP). Short term and long term emissions would result from future development projects. Implementation of the Milpitas GP is expected to increase the population of Milpitas, thus increase emissions from vehicles, indirect use of electricity for water usage, and solid waste. Land use modifications and policies identified in the Milpitas GP minimize per capital vehicle miles traveled and per service vehicle miles traveled. The City's CAP would minimize emissions community-wide and streamline review of future development projects. The CAP requires the City to achieve GHG reduction target for 2030 and 2050. The Milpitas GP is consistent with the City's CAP, which has been established to satisfy GHG reduction requirements. The Milpitas GP would not conflict with adopted plans, policies, or applicable regulations related to GHG reductions, because the Milpitas GP includes comprehensive policy approaches. In addition, the Milpitas GP would not conflict with the implementation of regional transportation related GHG targets outlined in Association of Bay Area Governments (ABAG's) Plan Bay Area 2040 because the land use modifications contained in the Milpitas GP, and the corresponding reduction in vehicle miles traveled result in lower emissions than those forecasted in the Plan Bay Area 2040. Implementation of the Plans would result in the same impacts as the approved Milpitas GP EIR because the Plans does not include development beyond that described in the Milpitas GP, and does not propose any actions that would conflict with the CAP. Therefore, potential impacts associated with greenhouse gases, climate change, and energy that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Buildout of the Milpitas GP would use energy resources for the operation of buildings, for on-road vehicle trips, and from off-road construction activities. Each of these activities would require the use of energy resources. Developers of individual projects within the Milpitas GP area would be responsible for conserving energy, to the extent feasible, and would rely heavily on reducing per capita energy consumption to achieve this goal, including through Statewide and local measures. Additionally, energy-saving regulations, including the latest State Title 24 building energy efficiency standards ("part 6"), would be applicable to the projects developed under the Milpitas GP. Buildout of the Milpitas GP would be consistent with applicable federal, state, and regional regulations regulating energy usage. Buildout of the Milpitas GP would not be expected cause an inefficient, wasteful, or unnecessary use of energy resources nor conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Implementation of the Plans would result in the same impacts as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP, or proposed actions that would obstruct plans for renewable energy or energy efficiency. Therefore, potential

impacts related to energy resources that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts associated with greenhouse gases, climate change and energy with implementation of the Plans would be the same as those analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.8 Hazards and Hazardous Materials

The hazards and hazardous materials setting relevant to the Plans' site, including applicable regulations, has not appreciably changed since the certification of the Milpitas GP EIR. The state and local land use plans, policies, and regulations applicable have not materially changed since adoption of the Milpitas GP EIR. Hazardous materials are monitored by BAAQMD, Regional Water Quality Control Board (RWQCB), Department of Toxic Substances (DTSC) and Certified Unified Program Agencies (CUPA). The Milpitas GP area does not contain airports and therefore does not include actions that would impact air hazards or safety.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to hazards and hazardous materials:

- Less-than-significant impact for the potential to create a significant hazard to the public or the environment through the routine use or accidently release of hazardous materials, emit hazardous emissions, have projects located on a site included on a list of hazardous materials compiled by Government Code, be located within an airport land use plan, or have the potential to interfere with an adopted emergency response or evacuation plan.

Discussion

Individual projects approved under the Milpitas GP would be required to comply with federal and state Regulations, the Municipal Code, and policies and actions in the Milpitas GP that ensure potential hazards and hazardous materials are identified and projects that are in areas where exposure to hazards or hazardous materials could occur can be mitigated. Future projects that establish business that would emit, or handle hazardous materials would be handled in accordance to federal, state and county requirements. Compliance with federal and state regulations would reduce hazardous conditions on future project sites. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP, or proposed actions that would obstruct plans and regulations for handling hazardous materials. Therefore, potential impacts related to hazardous materials and resources that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

The Milpitas GP may result in increased population in Milpitas. Milpitas is a partner of the Santa Clara County Operation Areas and the Santa Clara County Emergency Management Organization, which provide mutual aid to Milpitas. The City's emergency operation plan (EOP) addresses its emergency planning and response. The Milpitas GP includes goals to enhance safety and ensure emergency procedures are regularly reviewed and up to date. Implementation of the Plans would not result in new or increased impacts from that disclosed in the GP EIR because the Plans do not include development beyond that described in the Milpitas GP, nor would it conflict

with the provisions in the City's EOP. Therefore, potential impacts to emergency access that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts to hazardous resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.9 Hydrology and Water Quality

The hydrology and water quality setting relevant to the Plans' site, including applicable regulations, has not appreciably changed since the certification of the Milpitas GP EIR. The City is not at significant risk from a dam failure and Santa Clara Water Valley District (Valley Water) Dam Safety Program ensures operation of its 10 major dams in the county. The Milpitas GP area contains manmade lakes with shallow surface areas that would not create devastating seiches. The City is also not a tsunami hazard areas and would not be subject to substantial impacts from seiches.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to hydrology and water quality:

- Less-than-significant impacts related to violation water quality standards or degrading water quality, depletion of groundwater supplies, altering existing drainage, and releasing pollutants.

Discussion

The Milpitas GP EIR concluded that compliance with Federal, State, and local codes would reduce potential impacts to hydrology and water quality. Existing regulatory requirements that manage water quality include requirements to obtain approval from the RWQCB, obtain National Pollutant Discharge Elimination System (NPDES) permits, develop stormwater pollution prevention plans (SWPPP) and water quality management plans (WQMPs), and implementing best management practices. The Milpitas GP includes policies and actions to enhance stormwater quality, infiltration, and review development projects to identify potential impacts to hydrology and water quality, including stormwater quality and infiltration. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not propose actions that would be in non-compliance with existing regulatory requirements. Therefore, potential impacts related to water quality and stormwater infiltration that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Buildout and implementation of the Milpitas GP would not significantly add to the volume of impervious surfaces in the Milpitas GP area when compared to the overall size of the regional basin recharge area. Though no mitigation is required, the Milpitas GP includes policies to support the use of permeable surfaces with recycled water for non-potable use and coordination with local water districts. The Milpitas GP is consistent with the Groundwater Management Plan. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans does not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to stormwater runoff and groundwater recharge that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

The Valley Water is responsible for regional flood control planning within the County. The Milpitas GP includes policies to reduce flooding and stormwater pollution from new development and enhance natural storm drain features. Implementation of the Plans would not result in new or increased impacts from that disclosed in the GP EIR because the Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts on hydrology and water quality resources that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts to hydrology and water quality resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.10 Land Use Planning and Population/Housing

The state and local land use plans, policies, and regulations applicable at land use and planning, and population and housing have not materially changed since adoption of the Milpitas GP EIR.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to land use planning and population/housing:

- Less-than-significant impacts related to physically dividing an established community, inducing substantial unplanned population growth in the area, and displacing substantial number of existing people or housing.

Discussion

The Milpitas GP EIR determined that the land uses allowed under the proposed Milpitas GP provide opportunities for cohesive new growth at in-fill locations within existing urbanized areas of the city, and would not create physical division within the community. New development and redevelopment projects would be designed to complement the character of the existing community and neighborhoods and provide connectivity between existing development and new development. The Milpitas GP includes policies to ensure that future development is compatible with adjacent communities and land issues. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP, or propose actions that would conflict with land use policies. Therefore, potential impacts related to physically dividing an established community that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

The Milpitas GP EIR determined that the Milpitas GP would not conflict with continued application of State land use plans, policies, and regulations adopted to avoid or mitigate environmental effects. Subsequent development and infrastructure projects would be required to be consistent with all applicable policies, standards, and regulations, including those land use plans, policies, and regulations adopted to mitigate environmental effects by the City as well as those adopted by agencies with jurisdiction over components of future development projects. The Milpitas GP includes policies to ensure that the Milpitas GP does not conflict with any and use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP, or propose actions that would conflict with policies for avoiding or mitigating an environmental effect. Therefore, potential impacts related to conflicting with any land use plan, policy, or

regulation adopted for the purpose of avoiding or mitigating an environmental effect that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

The Milpitas GP EIR concluded that with implementation of Milpitas GP policies and actions intended to guide growth to appropriate areas and provide services necessary to accommodate growth, the land uses allowed under the proposed General Plan, the infrastructure anticipated to accommodate proposed land uses, and the goal and policy framework would not induce growth that would exceed adopted thresholds, beyond those disclosed and analyzed throughout the Milpitas GP EIR. The majority of developed land in the Milpitas GP area is comprised of residential uses, which are not anticipated to undergo significant land use changes under the proposed Milpitas GP. The Milpitas GP Land Use Map was developed to preserve existing neighborhoods throughout the City. Additionally, the Land Use Element includes policies and actions aimed at preserving housing options, and providing attainable housing opportunities for all residents. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans does not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to growth that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts to land use planning/population/ housing with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.11 Mineral Resources

The mineral resources setting relevant to the Plans site, including applicable regulations, has not appreciably changed since the certification of the Milpitas GP EIR. The Milpitas GP area contains four areas identified by the State Geologist as containing Regionally Significant Construction Aggregate Resources. These areas, located in the foothills outside City limits, are part of the South San Francisco Bay Production-Consumption Region and contain sandstone deposits. All of the areas are being currently quarried.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to mineral resources:

- Less-than-significant impacts related to loss of availability mineral or locally- important mineral resources.

Discussion

The Milpitas GP EIR determined that proposed new urban uses available for development are within the City limits and would not be developed within an identified regional mineral resource area or mining operation and therefore would not preclude mineral extraction within existing mineral resources area. Access to mineral resource areas would be considered on a project specific basis. Implementation of the proposed Milpitas GP would not result in the loss of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan, as the proposed Milpitas GP don't not re-designate any new lands for urban development within the hillside areas. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to mineral resources that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts to mineral resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.12 Noise

The noise setting relevant to the Plans' site, including applicable regulations, has not appreciably changed since the certification of the Milpitas GP EIR. Noise exposure in the City is associated with traffic and railroad operation, as well as stationary sources (i.e., parking lots, loading docks, parks, schools, and other commercial/retail use noise sources). One notable fixed noise source in Milpitas is the Milpitas Materials Company concrete plant.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to noise:

- Significant-and-unavoidable impact related to exposure to significant traffic noise sources.
- Less-than-significant impact due to excessive railroad noise sources.
- Less-than-significant impact due to excessive stationary noise sources.
- Less-than-significant impact due to increased construction noise sources.
- Less-than-significant impact due to construction vibration or exposure to ground borne vibration.

Discussion

Buildout of the Milpitas GP may result in an exceedance of the City's transportation noise standards. Policies are included in the Milpitas GP to minimize exposure to excessive noise, including noise associated with traffic; however, even with implementation of the Milpitas GP policies, increased traffic noise under full buildout would exceed applicable noise exposure criteria. The Milpitas GP EIR concluded that this impact is significant and unavoidable. Implementation of the Plans would essentially be the same as under the approved Milpitas GP because the Plans would not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to traffic noise that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Development under the Milpitas GP would not be expected to exceed noise levels associated with railroad operations that would be in excess of the City's standards. The Milpitas GP does allow for extension of railroad noise contours for railroad lines. Future development along these lines could be exposed to elevated railroad noise levels. The Milpitas GP includes policies to minimize exposure to excessive noise and support noise-compatible land uses in the vicinity of railroad noise sources. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP, or propose actions that would conflict with the applicable Milpitas GP policies. Therefore, potential impacts related to railroad noise that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

The Milpitas GP EIR found that the Milpitas GP could result in future non-transportation development of land use that would generate noise in excess of the City's noise standards. The Milpitas GP includes measures for

noise from stationary sources such as air conditioning/heating systems, car washes, daycare facilities, and recreational uses. These policies require commercial studies for commercial and industrial development and project-specific mitigation in noise attenuation. The policies comply with the City's noise standards and would reduce potential exposure to excessive noise from future development. Construction noises from development would also be subject to policies in the Milpitas GP that reduce construction noise. Noise from construction would be temporary and not ongoing. Demolition and excavation of project sites could cause excess noise; however, the Milpitas GP also has measures to ensure administrative controls and notify neighbors of scheduled construction activities. The Plans would have the same impacts related to noise as those identified in certified EIR for the approved Milpitas GP because the Plans do not include development beyond that described in the Milpitas GP, nor would it conflict with policies to address noise exceedances. Therefore, potential impacts associated with exposure to noise in excess of City's standards that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

The Milpitas GP EIR found that the construction activities facilitated by implementation of the Milpitas GP may result in vibrational noise. The Milpitas GP includes policies and actions for administrative controls during construction to ensure perceptual vibrational impact be kept to a minimum, such as notifying neighbors of scheduled construction activities and scheduling construction with the highest perceptible vibration during hours with the least potential to affect nearby business. The Milpitas GP EIR found that development of the Milpitas GP could expose persons to excessive ground borne vibration from railroad trains. The Milpitas GP requires development projects to undergo project-specific environmental review and address potential impacts associated with ground borne vibration and the railroad. Policies require development within 100 feet of rails to ensure vibration experienced by residents would not exceed Federal Transit Administration (FTA) guidelines. The Plans would have the same impacts related to vibration as those identified in certified EIR for the approved Milpitas GP because the Plans does not include development beyond that described in the Milpitas GP, nor would it conflict with policies to address ground borne vibration. Therefore, potential impacts associated with construction vibration and ground borne vibration that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The noise and vibration impacts with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.13 Public Services and Recreation

The public services and recreation setting relevant to the Plans' site, including applicable regulations, has not appreciably changed since the certification of the Milpitas GP EIR. The Milpitas Fire Department is responsible for fire suppression, emergency medical services, rescue services, 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. The Milpitas Police Department provides law enforcement services for the City. Parks, trails, and recreational facilities in the City are managed by the Recreation and Community Services Department and maintained by the Public Works Department. The City has 38 parks and a total of approximately 177.8 park acres. In addition, 183 acres of open space owned by the City are publicly accessible. The Milpitas Public Library is the only public library located in the City. The City also has a community center, a senior center and a sports center.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to public services and recreation:

- Less-than-significant impacts related to adverse physical impacts on the environment associated with the need for new government facilities, and physical impacts associated with deterioration of parks and recreation facilities.

Discussion

The Milpitas GP EIR concluded that new facilities will be needed to serve growth contemplated in the Milpitas GP. The Milpitas GP includes a range of policies and actions to ensure that public services adequately accommodate growth, maintain community services and facilities, and that new development funds its fair share of services. Any new parks or recreational facilities that may be constructed in the future would be primarily provided on sites with land use designations that allow such uses and the environmental impacts of constructing and operating the parks and recreational facilities would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the Milpitas GP. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to public services and recreation that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts to public services with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.14 Transportation

The transportation setting relevant to the Plans' site has not appreciably changed since the certification of the Milpitas GP EIR. The City adopted a vehicles miles traveled (VMT) policy in May 2021.³

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to transportation facilities:

- Less-than-significant impacts related to 1) potential to conflict with programs, plans, ordinances, or policies, addressing the circulation system; 2) potential to substantially increase hazards due to geometric design features; and 3) potential to result in inadequate emergency access.
- Potentially significant impact relating to conflicting with or being inconsistent with CEQA Guidelines section 15064.3.

Discussion

The Milpitas GP contains a number of minimization measures that focus on multimodal transportation in Milpitas and support a variety of transportation plans and the Plans. Policies included minimize the negative impacts improvements on mode of transportation may have on another. Implementation of the Plans would be the same as

³ <https://www.ci.milpitas.ca.gov/wp-content/uploads/2021/06/Final-VMT-Policy-with-Reso-and-Heat-Maps-1.pdf>

the approved Milpitas GP EIR because the Plans do not propose any actions that would conflict with policies addressing the circulation system. Therefore, potential impacts related to multimodal transportation that would be associated with the Plans as modified in the Plans would be the same as the approved Milpitas GP. The Milpitas GP EIR determined that because the City has not adopted a standard of significance for evaluating VMT at the time the Milpitas GP EIR was prepared, guidance provided by the California Governors' Office of Planning and Research (OPR) in the *Technical Advisory on Evaluating Transportation Impacts* in CEQA, 2018, was used. Average residential VMT per capita was below the threshold of significance identified in the technical advisory. Average employee VMT per employee was found to be above the threshold of significance. The Milpitas GP includes a number of goals, policies, and actions to reduce VMT. Future projects would be required to complete their own VMT analyses based on VMT policies and thresholds. Because these impacts cannot be guaranteed to be less than significant, the Milpitas GP EIR concluded that this impact is significant and unavoidable. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the newly adopted City VMT guidance is generally consistent with OPR's guidance, and would not change the conclusions of the Milpitas GP EIR, and the Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to VMT that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

At such time as the facilities presented in the Milpitas GP are implemented, they would be required to meet applicable City, federal, and state design standards. The Milpitas GP also includes policies to emphasize consideration of the needs of all transportation users, including safety as well as comfort, which may exceed minimum design requirements. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to design hazards that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

The Milpitas GP would include modifications to the existing transportation network which would potentially affect emergency access response times. Future development under the Milpitas GP would be subject to the City's Design and Construction Standards, which includes requirements for emergency access, and would be reviewed by public safety officials as part of the City's project entitlement process. The Milpitas GP also includes policies to focus on the need to consider safety needs as part of planning and implementing transportation improvements. Implementation of the Plans would be the same as the approved Milpitas GP EIR because the Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to emergency access that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts to transportation resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Significant and Unavoidable])**

3.15 Utilities and Services Systems

The utilities and services systems setting relevant to the Plans' site, including applicable regulations, has not appreciably changed since the certification of the Milpitas GP EIR.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to utilities and service systems:

- Less-than-significant impacts related to the potential to result in sufficient water supplies available to serve the City and reasonable foreseeable future development.
- Less-than-significant impacts relate to the construction of new water, wastewater, and storm drainage treatment facilities or expansion of existing facilities.
- Less-than-significant impacts for complying with federal, state, and local solid waste management regulations.

Discussion

Implementation of the Milpitas GP would allow population growth, which would increase the demand for additional water supplies. When comparing potable water demand to the supply available, the Milpitas GP EIR determined that the City would have ample water supply to serve buildout of the Milpitas GP. The Milpitas GP includes plans and policies to ensure adequate and cleans sources of potable water. The projected 2040 waters supplies are sufficient to support demand that would be generated from population increase in Milpitas. Wastewater generation associated with the Milpitas GP would not exceed projected wastewater generation volumes in the 2016 City Sewer System Management Plan and the 2020 urban water management plan (UWMP). Though the individual projects may result in increased areas of impervious surfaces throughout Milpitas, resulting in demand for stormwater drainage, conveyance, and retention infrastructure, the Milpitas GP includes policies and actions to ensure adequate infrastructure is available for stormwater conveyance, and to minimize potential adverse impacts. The Milpitas GP does not result in a need for new or and expansion of existing water, wastewater, or storm water drainage facilities, however future projects will have to be in conformance with the Milpitas GP, Municipal Code and applicable regulations. The City's buildout of the Milpitas GP is within the permitted capacity of the Newby Island landfill nearby, thus the Milpitas GP would not generate waste in excess of the capacity of local infrastructure. Future projects within the Milpitas GP area would be required to comply with applicable state and local requirements including those pertaining to solid waste, construction waste diversion, and recycling. While there is adequate permitted landfill capacity to accommodate future growth, the proposed Milpitas GP includes actions to further reduce the project's impact on solid waste services. Implementation of the Plans would not result in new or increased impacts from that disclosed in the GP EIR because the Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts on utilities and service systems that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts to utilities and service system resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

3.16 Wildfire

The wildfire setting relevant to the Plans' site, including applicable regulations, has not appreciably changed since the certification of the Milpitas GP EIR. The City or the general vicinity is not categorized as a Very High Fire Hazard Severity Zone by CalFire. Areas east of the City within the sphere of influence are designated as High Fire Hazard Severity Zone by Calfire.

Findings of Certified EIR

The Milpitas GP EIR identified the following impacts related to wildfire:

- Less-than-significant impact related to impairing adopted emergency response plans, exacerbating wildfire risks, requiring installation of associate infrastructure, and exposing people or structures to significant risks.

Discussion

The Milpitas GP includes policies to ensure that the City maintains adequate emergency access as well as staffing, training, station locations, emergency response. Important new critical facilities would also be located to ensure resiliency and functionality in the event of a natural disaster. Implementation of the Plans would not result in new or increased impacts from that disclosed in the GP EIR because the Plans do not include development beyond that described in the Milpitas GP, nor would it conflict with the provisions in the City's EOP. Therefore, potential impacts related to impairing an adopted emergency response plan or emergency evacuation plan that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

As indicated in the Milpitas GP EIR, the Plans' site is not within a Very High Fire Hazard Severity Zone. Nothing in the Milpitas GP will substantially alter the slope, prevailing winds, or other factors that would increase exposure to Milpitas residents, employees or visitors to increased pollutant concentrations from wildfire or result in the uncontrollable spread of a wildfire. Development of such infrastructure may increase wildfire risks in

the affected areas. The Milpitas GP includes policies and actions related to minimizing wildfire risk.

Development allowed under the Milpitas GP would be required to comply with the applicable provisions of the California Building Code (CBC), and CA Fire Code (CFC). Implementation of the Plans would not result in new or increased impacts from that disclosed in the GP EIR because the Plans do not include development beyond that described in the Milpitas GP. Therefore, potential impacts related to wildfire risk plan would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

The Milpitas GP would allow development and improvement projects that would involve some land clearing, grading, and other ground-disturbing activities that could temporarily increase soil erosion rates during and shortly after project construction. The topography in the urban portions of the Milpitas GP area is considered relatively flat and would generally not be subject to debris flows. portions of the sphere of influence may be exposed to potential risks associated with landslides, debris flows, and flooding in the weeks, months following the fire as a result in changes to the vegetative cover of the land and the rain absorption capacity of the soil. The Milpitas GP includes policies and actions related to minimizing exposure of people or structures to significant risks. Each subsequent development project or improvement project would be evaluated for conformance with the CBC, Zoning Ordinance, and other regulations, and will require an approved SWPPP that includes best management practices for grading and preservation of topsoil. Implementation of the Plans would not result in

new or increased impacts from that disclosed in the GP EIR because the Plans do not include development beyond that described in the Milpitas GP, nor would it conflict with regulations for managing risks. Therefore, potential impacts related to significant risks that would be associated with the modified Plans would be the same as those identified in certified EIR for the approved Milpitas GP.

Conclusion

The impacts to wildfire resources with implementation of the Plans would be the same as that analyzed in the Milpitas GP EIR. No new or more significant impacts beyond those identified in the certified Milpitas GP EIR would result. **(Same Impact as Previously Approved Project [Less than Significant])**

4.0 Conclusions and Recommendations

As discussed in the Introduction section, the CEQA Guidelines (Sections 15162 and 15164) require that a lead agency prepare an addendum to a previously Certified EIR if some changes or additions to the environmental evaluation of a project are necessary, but none of the following occurs:

1. There are no substantial changes in the project which require major revisions to 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. There are no substantial changes with respect to the circumstances under which the project is undertaken which require major revisions to the previous EIR due to involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. No 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, which 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; The project will result in impacts substantially more adverse than those disclosed in the EIR; 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.

CEQA Guidelines section 15164 requires that an addendum include a brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162. CEQA Guidelines Section 15162 pertaining to subsequent EIRs indicates that:

- (a) When an EIR has been certified or a negative declaration adopted 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 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.
- (b) If changes to a project or its circumstances occur or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent EIR if required under subdivision (a). Otherwise the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum, or no further documentation.
- (c) Once a project has been approved, the lead agency's role in project approval is completed, unless further discretionary approval on that project is required. Information appearing after an approval does not require reopening of that approval. If after the project is approved, any of the conditions described in subdivision (a) occurs, a subsequent EIR or negative declaration shall only be prepared by the public agency which grants the next discretionary approval for the project, if any. In this situation no other responsible agency shall grant an approval for the project until the subsequent EIR has been certified or subsequent negative declaration adopted.
- (d) A subsequent EIR or subsequent negative declaration shall be given the same notice and public review as required under Section 15087 or Section 15072. A subsequent EIR or negative declaration shall state where the previous document is available and can be reviewed.

Environmental review of the Plans, along with environmental review prepared for the Certified Milpitas GP EIR have led the City to conclude that the Plans would not result in any new impacts not previously disclosed in the Certified EIR; nor would it result in a substantial increase in the magnitude of any significant environmental impact previously identified. For these reasons, an addendum to the Certified EIR would be sufficient to meet the requirements of CEQA Section 15164 and that an addendum need not be circulated for public review but can be included in or attached to the final EIR. This Addendum also serves as documentation that the proposed Plan changes do not trigger any of the conditions in CEQA Guidelines Section 15162; therefore, a subsequent EIR is not required.

RESOLUTION NO. _____**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS,
ADOPTING THE WATER MASTER PLAN**

WHEREAS, the City of Milpitas (“City”) owns and operates the water utility system contained within the City limits; and

WHEREAS, the purpose of a Water Master Plan 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); and

WHEREAS, 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); and

WHEREAS, the City is continuing to experience significant growth and has adopted a 2040 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; and

WHEREAS, 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; and

WHEREAS, 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, and

WHEREAS, 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; and

WHEREAS, the objective of the update to the City’s Water Master Plan is to review and make recommendations on how the current water system can be upgraded within the City to best suit the water system management needs of the City in the future; and

WHEREAS, staff completed an environmental review of the update to the City’s Water Master Plan in accordance with CEQA, and recommends that the City Council determine this project is consistent with the program of activities identified in the City’s 2040 General Plan Final Environmental Impact Report (State Clearinghouse Number 2020070348) certified by the City Council in March 2021; and

WHEREAS, The City Council received the draft Water Master Plan on May 18, 2021.

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. The City Council hereby approves the 2021 Water Master Plan.

PASSED AND ADOPTED this _____ day of _____, 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Suzanne Guzzetta, Interim City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney

RESOLUTION NO. _____**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS,
ADOPTING THE SEWER MASTER PLAN**

WHEREAS, the City of Milpitas (“City”) owns and operates the sewer utility system contained within the City limits; and

WHEREAS, 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, and

WHEREAS, the purpose of a Sewer Master Plan 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 Sewer System Capital Improvement Program (CIP); and

WHEREAS, the City’s last Sewer Master Plan was completed in 2002, with a revision completed in 2004 and an update in 2009; and

WHEREAS, the City is continuing to experience significant growth and has adopted a 2040 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; and

WHEREAS, the objective of the update to the City’s Sewer Master Plan was to evaluate the hydraulic performance of the sewer 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; and

WHEREAS, staff completed an environmental review of the update to the City’s Sewer Master Plan in accordance with CEQA, and recommends that the City Council determine this project is consistent with the program of activities identified in the City’s 2040 General Plan Final Environmental Impact Report (State Clearinghouse Number 2020070348) certified by the City Council in March 2021, and

WHEREAS, The City Council received the draft Sewer Master Plan on May 18, 2021.

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. The City Council hereby approves the 2021 Sewer Master Plan.

PASSED AND ADOPTED this _____ day of _____, 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Suzanne Guzzetta, Interim City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney

RESOLUTION NO. _____**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS,
ADOPTING THE STORM MASTER PLAN**

WHEREAS, the City of Milpitas (“City”) owns and operates the storm system contained within the City limits;
and

WHEREAS, the purpose of a Storm Master Plan 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 Storm System Capital Improvement Program (CIP); and

WHEREAS, the City’s first comprehensive storm master plan was completed in 2001 and updated in 2013; and

WHEREAS, the City is continuing to experience significant growth and has adopted a 2040 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; and

WHEREAS, the objective of the update to the City’s Storm Master Plan was to update 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; and

WHEREAS, the update to the City’s Storm Master Plan provides an updated CIP 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); and

WHEREAS, staff completed an environmental review of the update to the City’s Storm Master Plan in accordance with CEQA, and recommends that the City Council determine this project is consistent with the program of activities identified in the City’s 2040 General Plan Final Environmental Impact Report (State Clearinghouse Number 2020070348) certified by the City Council in March 2021, and

WHEREAS, the City Council received the draft Storm Master Plan on November 2, 2021.

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. The City Council hereby approves the 2021 Storm Master Plan.

PASSED AND ADOPTED this _____ day of _____, 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Suzanne Guzzetta, Interim City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney

RESOLUTION NO. _____

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS ADOPTING
AN ADDENDUM TO THE ENVIRONMENTAL IMPACT REPORT FOR THE
MILPITAS GENERAL PLAN UPDATE (SCH# 2020070348) IN ACCORDANCE WITH
THE REQUIREMENTS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT**

WHEREAS, on March 9, 2021, the City Council of the City of Milpitas (“City Council”), by Resolution No. 9047, certified the General Plan Final Environmental Impact Report (“EIR”) and adopted the new Milpitas City General Plan; and

WHEREAS, the proposed amendments to the General Plan are comprised of changes made since the certification of the General Plan EIR as a result of the Milpitas Utility Master Plans (“Plans”) and analyzes any change in environmental effects associated with those changes; and

WHEREAS, the Plans would not result in any new significant impacts not previously disclosed in the circulated EIR; nor would it result in a substantial increase in the magnitude of any significant environmental impact previously identified; and

WHEREAS, pursuant to CEQA Guidelines section 15164, an addendum is appropriate in order to explain why no changes or additions to the General Plan EIR are necessary and why none of the conditions described in CEQA Guidelines section 15162 calling for preparation of a subsequent EIR have occurred; and

WHEREAS, an addendum need not be circulated for public review under CEQA Guidelines Section 15164, but can be included in or attached to the final certified EIR; and

WHEREAS, the City must consider the addendum with the certified EIR prior to making a decision on the Milpitas Utility Master Plans; and

WHEREAS, the Milpitas Utility Master Plans’ changes do not trigger any of the conditions in CEQA Guidelines Section 15162; therefore, a subsequent EIR is not required.; and

WHEREAS, the Addendum is included as an attachment to the agenda report; and

NOW, THEREFORE, the City Council of the City of Milpitas hereby finds, determines, and resolves as follows:

1. The City Council has considered the full record before it, which may include but is not limited to such things as the staff report, testimony by staff and the public, and other materials and evidence submitted or provided to it. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.
2. The City of Milpitas is the lead agency under CEQA for preparing the Addendum, and is the entity with final decision-making authority, as defined in Section 15356 of the CEQA Guidelines, with regard to approval of the Amendments.
3. The Addendum was prepared in accordance with all legal requirements, including CEQA Guidelines section 15164.

4. Based on substantial evidence in the record, the Amendments are within the scope of the previously certified General Plan EIR. The mitigation measures and Statement of Overriding Considerations associated with certification of the General Plan EIR address the environmental effects of the Amendments. Accordingly, with the approval of the Amendments, all applicable mitigation measures and the Statement of Overriding Considerations are hereby reconfirmed and readopted.
5. The City Council has reviewed and considered the Addendum, the General Plan EIR itself and other information in the entire record and has considered the information contained therein, including the written and oral comments received, prior to acting upon or approving the Amendments.
6. Based on substantial evidence in the record, the proposed Amendments are within the scope of the previously certified General Plan EIR for the purposes of CEQA.
7. Based on the analysis incorporated into the Addendum, none of the conditions described in Public Resources Code §15162 or Section 15163 of the CEQA Guidelines calling for preparation of a subsequent or supplemental EIR or negative declaration have occurred.
8. The Addendum shall be included and attached to the General Plan EIR.
9. This Resolutions shall be effective immediately upon adoption by the City Council.

PASSED AND ADOPTED this _____ day of _____ 2022, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Suzanne Guzzetta, Interim City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Conduct a Public Hearing and Introduce an Ordinance Amending Sections of Chapter 10, Title XI of the Milpitas Municipal Code Relating to Non-Residential Building Heights (Staff Contact: Ned Thomas, Planning Director, 408-586-3273)
Category:	Public Hearings-Community Development
Meeting Date:	8/9/2022
	<u>Recommendation:</u> (1) Conduct a public hearing and move to close the hearing following comments; (2) City Attorney shall read aloud title of the Ordinance; (3) Move to waive the first reading beyond the title and introduce an Ordinance amending sections of Chapter 10 of Title XI of the Milpitas Municipal Code relating to Non-Residential Building Heights and determine that the Municipal Code amendment is exempt from environmental review under the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines Section 15183 (Projects Consistent with a General Plan) and 15061(b)(3) (Common Sense Exemption).

BACKGROUND:

The proposed ordinance provides greater clarity and guidance regarding standards for maximum height for non-residential buildings in three of the city's commercial zones: General Commercial (C2), Highway Services (HS) and Town Center (TC). The Zoning Ordinance does not currently state the maximum allowable height for buildings in these zones – the Commercial Zone Development Standards table (Table XI-10-5.03-1) shows the maximum height for primary buildings in these zones as "None."

In practice, the height of proposed new buildings or modifications to existing buildings in these zones is reviewed and determined through the Site Development Permit process; however, the lack of specific standards for building height creates uncertainty not only for project applicants, but also for property owners and residents in the vicinity of proposed development sites. It could also put the Planning Commission in a difficult and complicated position if an applicant were to propose a very tall building that was significantly out of scale with its surroundings and not consistent with the context of the surrounding area, because the Zoning Ordinance does not currently provide clear guidance as to how an appropriate building height should be determined or what factors should be considered as part of this decision.

To rectify these circumstances, Planning staff proposes to add a specific maximum height (by right) of 35 feet or three stories for primary buildings in the General Commercial, Highway Services, and Town Center zones as standards in the Commercial Zone Development Standards table. For properties in these zones that are located within 100 feet of the boundary of a Single Family Residential (R1) or One and Two-Family Residential (R2) zone, the building height would be limited to 30 feet or two stories, consistent with the maximum height in those residential zones.

In addition, staff proposes to allow additional building height through discretionary review in the Industrial Park (MP), General Commercial (C2), and Town Center (TC) – up to 75 feet or six stories – with a Conditional Use Permit (CUP) (note: this provision would not apply to properties located within 100 feet of the boundary of a low-density residential zone (R1 or R2)). The Zoning Ordinance currently allows additional height beyond three stories or 35 feet, with no maximum height specified, in the MP and TC districts with approval of a CUP. The proposed ordinance would add C2 to the zones where additional height may be conditionally permitted and set the 75-foot/six-story maximum). Specific new findings that would apply to a CUP requesting building height in excess of the by-right standard are also included in the proposed amendments.

The Planning Commission considered the proposed ordinance for Zoning Code Amendments at its meeting June 8, 2022. Following public comment, the Planning Commission requested that staff make minor changes

to the Zoning Code Amendments to further limit non-residential building heights within 100 feet of the boundary of a low-density residential zone (R1 or R2) to two stories or 30 feet, and then unanimously adopted Resolution 22-006 (Attachment B) recommending that the City Council adopt the proposed Ordinance (with the suggested changes).

On June 14, 2022, the City Council held a discussion about the draft zoning amendments relating to non-residential building heights. Members of the Council supported the Planning Commission's recommendations and directed staff to revise the draft zoning amendments accordingly, and to bring forth the proposed Ordinance to the City Council for formal action and adoption.

Changes to Draft Ordinance Based on Council Direction

During the discussion on the draft ordinance at the June 14, 2022, City Council meeting, members of the Council requested that Planning staff incorporate changes to the proposed zoning amendments to add a maximum primary building height of 30 feet or two stories for properties in the C2, HS, and TC zones that are located within 100 feet of the boundary of a R1 or R2 zone. Council further directed staff to include a provision in the draft ordinance stating that properties in the C2 and TC zones that are within 100 feet of the boundary of an R1 or R2 zone are not eligible to request a discretionary increase in building height through a CUP. These changes are reflected in the current version of the draft ordinance.

Overview of Draft Ordinance (Reviewed and Accepted on June 14, 2022)

The proposed ordinance includes amendments to the following sections of the Zoning Code (Title XI, Chapter 10 of the Milpitas Municipal Code):

Commercial Zone General Development Standards (XI-10-5.03): The Commercial Zone Development Standards table (Table XI-10-5.03-1) would be amended to add a maximum height of 35 feet or three stories for primary buildings in the General Commercial (C2), Highway Services (HS), and Town Center (TC) zones (except for properties within 100 feet of an R1 or R2 residential zone, where the maximum building height would be 30 feet or two stories). The maximum primary building height in the Neighborhood Commercial (C1) zone is also proposed to be changed from 35 feet or 2.5 stories to 35 feet or three stories, for consistency with the standards for other commercial zones.

Footnote number 1 to the development standards table would apply to both the C2 and TC zones, and the existing footnote text would be amended to reference the provisions in the Commercial Zone Special Development Standards and Conditional Use Permit sections of the Zoning Code that allow for additional primary building height subject to a CUP.

Commercial Zone Special Development Standards (XI-10-5.04): A new Subsection (D) would be added and would include language outlining guidance on criteria the Planning Commission should consider when reviewing a request for additional building height pursuant to a CUP. The proposed criteria focus on site-specific conditions and design elements such as the width of the right-of-way of the principal street; the proximity of the subject site to low-or medium-density residential districts R1, R2, and R3; building setbacks as they relate to the proposed building height beyond 35 feet; and upper story building setbacks. These criteria are intended to provide clear and objective direction about the factors that should inform a decision about a CUP application for additional building height.

Conditional Use Permits and Minor Conditional Use Permits (XI-10-57.04): As noted above, Table XI-10-57.04-1 in the Conditional Use Permits section of the Zoning Code currently includes a provision allowing for consideration of additional building height beyond 35 feet or three stories in the MP and TC zoning districts. The proposed ordinance would make the provision also applicable in the C2 zone and would amend it to add a maximum building height standard of 75 feet or six stories with a CUP (except that the provision for a discretionary increase in building height with a CUP would not apply to properties within 100 feet of an R1 or R2 residential zone).

A note would also be added to the table referencing the criteria discussed above (in Subsection XI-10-5.04) that apply to requests for a CUP for excess building height and the specific findings for approval for this type of which appear below in Table XI-10-57.04-2 in this subsection. The findings would be amended to eliminate

existing language related to “exceptional architecture and aesthetic merit,” which is highly subjective, and to add new, more subjective findings related to the proposed building’s compatibility with the surrounding area. The proposed new findings would consider factors such as the design, location, size, and bulk of the proposed building; the transition in scale between the proposed building and structures in adjacent residential districts; and shadow impacts of the proposed building on adjacent parcels, public sidewalks, and public open spaces.

Definitions (XI-10-2.03): As part of the proposed zoning amendments for non-residential building heights, a minor amendment is included to the definition of the term “Floor Area Ratio” (FAR). The language allowing for increased FAR with approval of a Use Permit would be deleted. The purpose of this proposed change is twofold: first, to eliminate potential conflicts and confusion that may arise if a project applicant were to file a request for additional height and additional FAR (which are related but different); and second, because such a provision for a discretionary increase to the maximum allowed FAR would be more appropriately located as part of development standards elsewhere in the Zoning Code, rather than as part of the definition of the term FAR.

Through the process of preparing these proposed zoning amendments, staff has discussed the issue of discretionary increases to maximum FAR, and whether and how the City’s Zoning Code should address them. Typically when a jurisdiction allows for a discretionary increase in allowable FAR, it is used as an incentive, so the City receives something in return from the project (e.g. affordable housing, public open space, or other public amenities, etc.). Staff determined that for the sake of simplicity, for now the provision for increased FAR should be eliminated from the Zoning Code, and the issue should be revisited in more detail as part of the forthcoming comprehensive zoning update.

Policy Alternative:

Alternative: Do not adopt the ordinance amending regulations for non-residential building heights in Title XI, Chapter 10 of the Municipal Code. There would continue to be no stated maximum height for primary buildings in the C2, HS, and TC zones. When a development application is submitted, any building height could theoretically be proposed, and Planning staff would review and make a determination about appropriate building height as part of the Site Development Permit review process.

Pros: Continuation of status quo (no new regulations for the City or developers to follow; maximum flexibility in interpreting development standards for commercial building height).

Cons: Lack of clarity and predictability for Planning staff and developers; lack of clear criteria or findings on which the Planning Commission may base a decision about building height.

Reason not recommended: It is to the City’s advantage to have clear and specific standards and review procedures pertaining to building height in commercial areas. Because the Zoning Code does not currently provide clear guidance as to how to determine what building height would be appropriate for a specific context, there is a risk that an applicant could propose an excessively tall building that would be significantly out of scale with its surroundings, and that may create negative impacts on adjacent properties related to shadows and solar access, views, and/or general neighborhood character and compatibility. In such a case, Planning staff and the Planning Commission may not have a strong and defensible foundation on which to base a decision requiring the applicant to reduce the building height.

Fiscal Impact:

The proposed zoning ordinance amendments will establish a maximum height for buildings in three of the city’s commercial zones: General Commercial (C2), Highway Services (HS) and Town Center (TC). This change in development regulations will have no fiscal impact on the City.

California Environmental Quality Act:

The proposed text amendments to the Milpitas Municipal Code are exempt from environmental review under the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines Sections 15183 (Projects Consistent with a General Plan) and Section 15061(b)(3) (Common Sense Exemption).

The proposed ordinance would result in the adoption of new development standards for building height as

as review criteria and findings for approval for discretionary increases in building height. It would provide City staff and the Planning Commission with specific tools to use to ensure that the scale and design of new development is compatible with surrounding areas and does not create adverse effects on other properties. These regulations would help to promote good development that fits well with its surroundings and relates well to other buildings in the area and public spaces in terms of size and design. Therefore, it can be seen with certainty that there is no possibility that the ordinance in question would have a significant effect on the environment; accordingly, the ordinance is exempt from CEQA review.

Recommendations:

- 1) Conduct a public hearing and move to close the hearing following comments.
- 2) City Attorney shall read aloud title of the Ordinance.
- 3) Move to waive the first reading beyond the title and introduce an Ordinance amending sections of Chapter 10 of Title XI (Zoning) of the Milpitas Municipal Code relating to Non-Residential Building Heights and determine that the Municipal Code amendment is exempt from California Environmental Quality Act pursuant to CEQA Guidelines Sections 15183 (Projects Consistent with a General Plan) and 15061(b)(3) (Common Sense Exemption).

Attachments:

1. Draft Ordinance
2. Planning Commission Resolution No. 22-006

PLEASE NOTE:

This copy of Ordinance No. XX.XXX is a “redlined” version for your convenience. Text additions are designated by an underline and text deletions are designated with a strikethrough.

REGULAR

NUMBER: XX.XXX

TITLE: AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF MILPITAS AMENDING SECTIONS OF CHAPTER 10 OF TITLE XI OF THE MILPITAS MUNICIPAL CODE TO MODIFY AND ADD REGULATIONS RELATING TO MAXIMUM HEIGHTS FOR NON-RESIDENTIAL BUILDINGS IN CERTAIN COMMERCIAL ZONES, AND MAKING FINDINGS OF CEQA EXEMPTION

HISTORY: This Ordinance was introduced (first reading) by the City Council at its meeting of _____, upon motion by _____ and was adopted (second reading) by the City Council at its meeting of _____, upon motion by _____. The Ordinance was duly passed and ordered published in accordance with law by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Wendy Wood, City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney

RECITALS AND FINDINGS:

WHEREAS, the City of Milpitas, California (the “City”) is a municipal corporation, duly organized under the constitution and laws of the State of California; and

WHEREAS, California Government Code Section 65800 et seq. authorizes the adoption and administration of zoning laws, ordinances, rules and regulations by cities as a means of implementing the General Plan; and

WHEREAS, clear and specific zoning regulations, including development standards and findings for project approval, are important elements in a municipal government’s process of encouraging and approving high-quality development projects that are compatible with surrounding areas; and

WHEREAS, the City’s Zoning Ordinance, Chapter 10 of Title XI of the Milpitas Municipal Code, does not currently include standards for the maximum height of primary buildings in the General Commercial (C2), Highway Services (HS), or Town Center (TC) zoning districts; and

WHEREAS, the City wishes to enact appropriate regulations applying to the maximum height of primary buildings in the C2, HS, and TC zones, and further to conditionally allow additional building height in the C2 and TC zones, when such buildings are appropriately located and well designed to avoid negative impacts on surrounding properties and public spaces; and

WHEREAS, the City has prepared a Zoning Amendment (“Amendment”) to the City’s Municipal Code, including Section 2.03 (“Definitions”), Section 5.03 (“Commercial Zone General Development Standards”), Section 5.04 (“Commercial Zone Special Development Standards”), and Section 57.04 (“Conditional Use Permits and Minor Conditional Use Permits”), of Title XI, Chapter 10–Zoning; and

WHEREAS, on June 8, 2022, the Planning Commission for the City of Milpitas held a lawfully noticed public hearing to solicit public comment and consider the proposed Amendment, take public testimony, and make a recommendation to the City Council on the project; and

WHEREAS, on June 14, 2022, the City Council of the City of Milpitas held a study session to consider the proposed Amendment and to provide comments and direction to Planning Department staff; and

WHEREAS, this ordinance is exempt from the California Environmental Quality Act, Public Resources Code Section 21000, *et seq.* (“CEQA”), each as a separate and independent basis, pursuant to CEQA Guidelines Section 15183 (projects consistent with the General Plan) and Section 15061(b)(3) (no possibility of significant environmental effect).

NOW, THEREFORE, the City Council of the City of Milpitas does ordain as follows:

SECTION 1. RECORD AND BASIS FOR ACTION

The City Council has duly considered the full record before it, which may include but is not limited to such things as the City staff report, testimony by staff and the public, and other materials and evidence submitted or provided to the City Council. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.

SECTION 2. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Based on its review of the entire record, including the staff report, public comments and testimony presented to the Planning Commission and City Council, and the facts outlined below, the City Council hereby finds and determines that this ordinance is categorically exempt from the California Environmental Quality Act (“CEQA”) under CEQA Guidelines, § 15061(b)(3), also known as the “common sense exemption”, which exempts from CEQA any project where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment. A “significant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project. This ordinance would enact new building height regulations for non-residential development in the General Commercial (C2), Highway Services (HS), and Town Center (TC) zoning districts. Since there are currently no maximum building heights specified in the development standards for these zones, the ordinance would create and apply new standards that are more specific and robust than those that currently govern new development. In addition, new regulations are proposed that would apply in circumstances where a project applicant proposes a greater building height than the 35 feet or three stories that is allowed by right in the C2 and TC zones. These draft standards would encourage good design and improve project compatibility with surrounding areas, thereby eliminating or mitigating potential negative effects. Therefore, it can be seen with certainty that there is no possibility that this Ordinance would have a significant effect on the environment; accordingly, this Ordinance is exempt from CEQA review.

Moreover, the City Council hereby finds that the introduction and adoption of this Ordinance is categorically exempt from CEQA pursuant to CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning). Section 15183 of the CEQA Guidelines provides that projects that are consistent with a Community Plan, General Plan or Zoning for which an EIR has been certified “shall not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site.” These proposed zoning amendments serve to implement policies and guidelines in the Community Design Element of the Milpitas General Plan because they would add development standards, design criteria, and findings for approval for non-residential buildings to ensure that any proposed building that is taller than the maximum height allowed by right is designed to fit in well with existing neighborhood context and to minimize impacts on surrounding properties. Therefore, the proposed Amendment is consistent with the General Plan. Therefore, the proposed Amendment is consistent with the General Plan and is exempt from CEQA pursuant to Section 15183 of the CEQA Guidelines.

Accordingly, this Ordinance is exempt from CEQA review pursuant to Sections 15061(b)(3) and 15183 of the CEQA Guidelines, each as a separate and independent basis.

SECTION 3. GENERAL PLAN CONSISTENCY

The Community Design Element of the City’s General Plan includes policies and guidelines that require development projects to (1) incorporate context-sensitive design approaches, respecting and responding to the scale and character of adjacent land uses as well as surrounding neighborhoods; and to (2) reinforce desirable design elements of the surrounding area, such as scale and setback patterns. This zoning Amendment would set maximum by-right height for primary buildings in three commercial zoning districts, where no maximum height standards are currently stated. The proposed zoning changes provide specific and detailed guidance about how a request for additional conditionally permitted height should be evaluated and what factors should form the basis of a decision on such a request. Moreover, the Amendment includes well-crafted language for findings for approval of conditional requests for additional building height, which would serve to ensure that contextual factors (e.g. neighborhood scale and width of primary street right-of-way) and project-specific design factors (such as building setbacks and upper story building stepbacks) are considered as part of development projects involving taller buildings in commercial areas. In this way, the proposed Amendment would serve to implement several policies of the General Plan.

SECTION 4. AMENDMENT OF MILPITAS MUNICIPAL CODE TITLE XI, CHAPTER 10, SECTION 2

Title XI, Chapter 10, Section 2 (Definitions), Subsection XI-10-2.02 (General Definitions) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-2.03 Definitions

"**Floor Area Ratio (FAR)**" is defined for nonresidential Zoning Districts as the maximum permitted ratio of gross floor area to site area and is calculated as follows:

FAR =
$$\frac{\text{Total of Gross Floor Area for All Structures on Site}}{\text{Site Area}}$$

~~Increases above the maximum permitted FAR for any district can be allowed with approval of a Use Permit by the Planning Commission. This can be considered when the applicant can demonstrate that the proposed development will (1) generate low peak hour traffic; (2) will not create a dominating visual prominence. Examples of such uses include wholesaling, distribution and hospitals. In each case where an increase in the maximum permitted FAR has been allowed, all other development standards for the site must be met.~~

SECTION 5. AMENDMENT OF MILPITAS MUNICIPAL CODE TITLE XI, CHAPTER 10, SECTION 5

Title XI, Chapter 10, Section 5 (Commercial Zones and Standards), Subsection XI-10-5.03 (Commercial Zone General Development Standards) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-5.03 Commercial Zone General Development Standards

The following minimum requirements shall be observed, except where increased for conditional uses. The minimum requirement shall be one of the following for the district classification as designated on the zoning map.

**Table XI-10-5.03-1
Commercial Zone Development Standards**

Standard	CO	C1	C2	HS	TC
Lot Area, minimum	None	None	10,000 s.f.	Fronting major street (4 or more lanes): 1.5 ac. Fronting all other streets (two lanes): 20,000 s.f.	None.
Lot Width, minimum	None	None	100 ft.	Fronting major street: 250 ft. Fronting all other streets: 125 ft.	None

Front Yard Setback, minimum	10 ft.	20 ft.	0 ft.	Major street: 50 ft. All other streets: 0 ft.	20 ft. 35 ft. along E. Calaveras Blvd.	Item # 17.
Side Yard Setback (Interior), minimum	10 ft.	0 ft. 15 ft. when abutting R District	0 ft. 15 ft. when abutting R District	0 ft. 15 ft. when abutting R District	0 ft. 15 ft. when abutting R District	
Street Side Yard Setback, minimum	10 ft.	0 ft.	0 ft.	0 ft.	20 ft. 35 ft. along E. Calaveras Blvd.	
Rear Yard Setback, minimum	10 ft. When abutting residential, not less than R District required setback	0 ft. 15 ft. when abutting R District	0 ft. 15 ft. when abutting R District	0 ft. 15 ft. when abutting R District	0 ft. 15 ft. when abutting R District	
Building Height, maximum						
Primary building	35 ft. or 3 stories	35 ft. or 2.53 stories	None 35 ft. or 3 stories^{1,2}	None 35 feet or 3 stories²	None ¹ 35 feet or 3 stories^{1,2}	
Accessory building	25 ft. or 2 stories	25 ft. or 2 stories				
Parking	Refer to Section 53, Off Street Parking, of this Chapter.					
Lot Coverage	None	None	None	None	None	
Floor Area Ratio	0.50	0.35	0.50	0.50	0.85	
Landscaping	None	None	None	25% of front yard setback	All required setback areas and the ends of each parking aisle ²³	

¹ Refer to Subsections [XI-10-5.04\(D\)](#) and [XI-10-57.04\(C\)\(1\)](#), ~~Applicability~~, of this Chapter for additional requirements.

² [For properties that are located within 100 feet of the boundary of a Single Family Residential \(R1\) or One and Two-Family Residential \(R2\) zone, the maximum height of a primary building shall be limited to 30 feet or two stories.](#)

²³ The Planning Commission shall determine the size of the planters through site and architectural review.

XI-10-5.04 Commercial Zone Special Development Standards

A. All Zones.

1. Areas for Collecting and Loading Recyclable Materials. There shall be provided areas for collecting materials in accordance with Subsection 54.12, Areas for collecting and loading recyclable materials, of this Chapter.
2. All outdoor storage areas of such things as trash and materials shall be within a completely enclosed building or behind a visually obscure solid wall or tight board fence a minimum six (6) feet in height and shall not be located within any front or street side yard setback area.
3. Such uses, operations or products shall not be objectionable due to odor, dust, smoke, noise, vibration or other similar causes.

B. TC Zone.

1. Setbacks for Residential Projects. Except for the Calaveras Boulevard setback, all other setbacks shall be determined through a Site Development Permit.

C. Neighborhood Commercial (C1) Zone. Thrift stores shall comply with each of the following standards:

1. Signage prohibiting dumping of merchandise during non-business hours shall be installed in conspicuous locations to the satisfaction of the Planning Director indicating penalties and fines for such activity. Signage shall include daytime collection hours for donated goods.
2. A designated area inside the building shall be established for the receipt, sorting and processing of goods. Donated goods shall be accepted only inside the building and during regular business hours; no donated goods shall be left outside. Loading and unloading must take place in a designated area that shall be cleared, cleaned and maintained before closing of business each day.
3. The storefront windows shall be permanently maintained as displays of merchandise in a professional and attractive manner (i.e., unsightly clothing racks and displays shall not be placed adjacent to the windows).
4. Any goods or materials left outside of the store overnight shall be removed immediately upon the thrift store opening the next business day.
5. Outdoor storage or display of donated goods or merchandise shall not be permitted.
6. The subject property shall be maintained free of trash, debris, any all other goods at all times.
7. Thrift stores shall not be located closer than one thousand (1000) feet from another thrift store.

D. General Commercial (C2) and Town Center (TC) Zones.

1. In deciding whether to grant a request for additional building height through the Conditional Use Permit process pursuant to Section XI-10-57.04(C)(1), the Planning Commission shall consider site conditions, design elements, and other factors including but not limited to (a) width of right-of-way of principal street; (b) proximity of the site to low- or medium-density residential districts (R1, R2, and R3); (c) building setbacks in relation to proposed building height in excess of 35 feet; and (d) upper story setbacks.

Title XI, Chapter 10, Section 57 (Applications), Subsection XI-57.04 (Conditional Use Permits and Minor Conditional Use Permits) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-57.04 Conditional Use Permits and Minor Conditional Use Permits

A. Purpose and Intent.

1. The purpose and intent of the Conditional Use Permit process is to provide a review of land uses which would not otherwise be permitted as a matter of right in a zoning district because of their nature, have an impact on the surrounding environment and for the determination of whether or not the proposed use is appropriate for its proposed location.

The Conditional Use Permit process is intended to encourage uses to be located in a manner that is:

- a. Consistent with the City's zones;
 - b. Sensitive to community and neighborhood identity; and
 - c. Minimizes impacts to adjacent uses, including traffic flow; circulation; safety for vehicular and pedestrian traffic; imposition of noises, odors and health and safety hazards upon nearby residential area; provision of adequate light, air and reasonable access; securing safety from fire and other dangers; prevent overcrowding of land; facilitating adequate provision for transportation and in general, to promote the public health, safety, peace, morals, comfort and welfare; prevention of neighborhood deterioration and blight; the objectives of zoning and planning in the community and the effect upon the City's general welfare of this proposed use in relation to surrounding uses and the community. Review of a use may require the consideration of site plan issues related to the use, as well.
2. It is the purpose of the Minor Conditional Use Permit process to provide for the streamlined review of uses that may have an impact on the surrounding environment and require discretionary review, but due to their nature, scale or location, do not require discretionary consideration by the full Planning Commission. Either the Zoning Administrator or Planning staff has the authority to review Minor Conditional Use Permits. The Minor Conditional Use Permit process has as its purpose the same goals for uses described for the Conditional Use Permit process above.

B. Authority.

1. Conditional Use Permits. The Planning Commission has the authority to approve Conditional Use Permits, subject to concurrent review and appeal provisions of Section XI-10-64, Development Review Process, of this Chapter.
2. Minor Conditional Use Permits. Minor Conditional Use Permits may be approved either by the Zoning Administrator or administratively by Planning staff.
 - a. Review by the Zoning Administrator. The Zoning Administrator has the authority to approve Minor Conditional Use Permits for those uses listed in the use tables of the Zoning Ordinance. Such approvals shall be subject to the concurrent review and appeal provisions of Section XI-10-64, Development Review Process, of this Chapter.
 - b. Review by Planning staff. Planning staff has the authority to administratively approve Minor Conditional Use Permits for those uses listed in the use tables of the Zoning Ordinance. Such approvals shall be subject to concurrent review and appeal provisions of Section XI-10-64, Development Review Process, of this Chapter. Planning staff-level issued Minor Conditional Use Permits shall not require a public hearing or notice.

C. Applicability.

1. Conditional Use Permits. Conditional Use Permits are required as indicated by the use tables in Residential, Mixed Use, Commercial, Industrial, Institutional, Park and Open Space, and other land use districts of this Chapter. Conditional Use Permits are also required for the following requests:

Table XI-10-57.04-1

Use/Modifications	As provided for in:	Notes
Height		
Height. For buildings that exceed three stories or 35 feet, up to a maximum of six stories or 75 feet , within the MP, C2 , and TC districts.	Table XI-10-7.03-1, Industrial Zone Development Standards and Table XI-10-5.03-1 Commercial Zone Development Standards	See Table XI-10-57.04-2 and Section XI-10-5.04(D)(1) See footnote 1
Height. For buildings that exceed six stories or 85 feet within the -OO overlay district up to a maximum of eight stories or 115 feet in height.	Section XI-10-12.02, Gateway Office (-OO) Overlay District	
Height. Permit in R2 and R3 districts, schools, hospitals, sanitariums, institutions, churches and other similar uses allowed under the use regulations of this Chapter, to be erected to a height not exceeding six stories or 75 feet, provided, that the front and side yard requirements for such buildings in the "R3" District are complied with.		
Non-conforming		
Nonconforming buildings and structures	Section XI-10-56.02(C), Additions to, enlargements and moving of nonconforming buildings and structures	See footnote 12
Nonconforming uses, change of use	Section XI-10-56.03, Nonconforming use of buildings and structures	
Parking		
Parking location	Section XI-10-53.13(A), Location of Parking	
Tandem parking	Section XI-10-53.07(D), Tandem Parking Spaces and Section XI-10-53.13(B), Parking Space Size	
Parking Structures	Section XI-10-53(H)(4), Parking Structures	
Temporary Uses and Structures		
Temporary buildings and structures	Section XI-10-13.11(H), Temporary Uses and Structures.	
Other		
Certain industrial uses within commercial districts	Table XI-10-5.02-1, Commercial Zone Uses.	

Exceptions to performance standards	See the zoning districts use standards in XI-10-05, Residential Zones, XI-10-06, Mixed Use Zones, and XI-10-07, Industrial Zones.	Item # 17.
Lot width reduction		
Wireless telecommunications facilities	Section XI-10-13.09, Wireless Telecommunications Facilities, of this Chapter, for specific standards and exempted facilities.	

¹ [Properties that are located within 100 feet of the boundary of a Single Family Residential \(R1\) or One and Two-Family Residential \(R2\) zone shall not be eligible for a request for a Conditional Use Permit to allow height exceeding the maximum standard for primary buildings as shown in Table XI-10-5.03-1 – Commercial Zone Development Standards.](#)

⁴² In addition, the cumulative floor area included in all such additions or enlargements since the adoption of Ord. No. 38.760 (September 17, 2002) shall not exceed thirty (30%) percent of the floor area contained in said building or structure. Floor area, for the purposes of this Subsection, shall include all habitable space associated with a residential use and shall mean gross floor area associated with any non-residential use. These criteria are established so as not to prolong the life of the original building or structure.

- a. Other Uses. The Planning Commission may, after a public hearing, permit the following uses in districts from which they are prohibited by this Chapter where such uses are deemed essential or desirable to the public convenience or welfare and are in harmony with the various elements or objectives of the General Plan.

However, any of the following uses which are marked with an asterisk shall not be allowed in the designated Hillside Combining District.

- i. Helicopter pads for medical evacuation purposes.
 - ii. Development of natural resources (excluding the drilling for or producing of oil, gas or other hydrocarbon substances) together with the necessary buildings, apparatus, or appurtenances incident thereto.
 - iii. Library or museum, public.
 - iv. Park, playground, or recreational or community center.
 - v. Public utility and public service use or structure.
 - vi. Radio or television transmitter.
 - vii. Reverse vending machines or mobile recycling units except where the lot is being used for residential purposes.
2. Minor Conditional Use Permits. Minor Conditional Use Permits are required as indicated by the use tables in Residential, Mixed Use, Commercial, Industrial, Institutional, Park and Open Space, and other land use districts of this Chapter.

D. Submittal Requirements. Refer to the most recent submittal requirements required by the Planning Division.

E. Review Procedures.

1. Conditional Use Permits.
 - a. The Planning Commission shall hold a public hearing on said application upon such notice as is required in Section XI-10-64, Development Review Process, of this Chapter.
 - b. After the conclusion of the hearing, the Planning Commission may approve the application, approve it subject to such conditions as the Planning Commission may impose, or disapprove the application.

- i. The Planning Commission may impose such conditions as it deems necessary to the best interests of the surrounding property, of the neighborhood, and as it deems in conformity with the requirements of the General Plan.
2. Minor Conditional Use Permits.
- a. Review by Planning Commission Subcommittee. The Planning Commission Subcommittee shall consider a Minor Conditional Use Permit application when authorized to do so under the use tables of the Zoning Ordinance and hold a public hearing on application upon such notice as is required in Section XI-10-64, Development Review Process, of this Chapter.
 - i. After the conclusion of the hearing, the Planning Commission Subcommittee may approve the application, approve it subject to such conditions as the Planning Commission Subcommittee may impose, or disapprove the application.
 - a) The Planning Commission Subcommittee may impose such conditions as it deems necessary to protect the best interests of the surrounding property, of the neighborhood, and as it deems in conformity with the requirements of the General Plan.
 - b) If the Planning Commission Subcommittee members disagree on a decision for a project, then the project will be placed on the agenda for Planning Commission review, with no additional fees required.
 - b. Review by Planning staff. The Planning Division shall administratively consider a Minor Conditional Use Permit when authorized to do so under the use tables of the Zoning Ordinance. Planning staff shall investigate as necessary to determine whether or not the proposed project conforms or may be conditioned to conform fully to the intent of this Chapter. No public hearing or notice shall be required for an administrative level Minor Conditional Use Permit.

If the project does not comply, a notice of correction shall be prepared and returned to the applicant. If the applicant resubmits for review and the project still does not comply with the required regulations or is not in accordance with the approved conditions of approval, the Planning Division shall deny the application.

F. Required Findings for Conditional Use Permits and Minor Conditional Use Permits.

- 1. General Findings. Approval may be granted by the appropriate decision-making body, of a Conditional Use Permit or Minor Conditional Use Permit application in accordance with this Chapter if all of the following findings are made, based on the evidence in the public record:
 - a. The proposed use, at the proposed location will not be detrimental or injurious to property or improvements in the vicinity nor to the public health, safety, and general welfare;
 - b. The proposed use is consistent with the Milpitas General Plan; and
 - c. The proposed use is consistent with the Milpitas Zoning Ordinance.

In the case of a project located within a Specific Plan, the following additional finding shall be made:

- d. The proposed use is consistent with the Specific Plan.
- 2. Specific Findings. In addition to the general findings required in Subsection (F)(1), above, specific findings shall be made prior to the approval of an application for a Conditional Use Permit for the following requests:

Table XI-10-57.04-2

Use/Modification	Specific Findings
------------------	-------------------

Height	
Height. For buildings that exceed three (3) stories or thirty-five (35) feet within the MP, C2, and TC districts.	The project exhibits exceptional architecture and aesthetic merit to warrant the excess height. <u>1. The design, location, size, and bulk of the proposed building is compatible with the existing and allowed future land uses in the vicinity.</u> <u>2. The building's design provides an appropriate transition in scale to structures in adjacent residential districts.</u> <u>3. The building's design minimizes shadows on public sidewalks, public open spaces, and solar facilities on adjacent parcels through setbacks at upper levels or other design elements.</u>
Height. For buildings that exceed six (6) stories or eight-five (85) feet within the -OO overlay district up to a maximum of eight (8) stories or one hundred fifteen (115) feet in height.	The project exhibits exceptional architecture and aesthetic merit to warrant the excess height.
Other	
Certain Industrial Uses within Commercial Districts	The site is within close proximity to industrial uses or districts and is suitable for the type and intensity of use that is proposed.

- G. Consideration of Conditional Use Permit or Minor Conditional Use Permit Pending Zoning Amendment. Upon the close of a public hearing before the Planning Commission on the question of a Zoning Amendment to change property from one zone to another, and upon favorable report thereon by the Commission, the Commission may consider such matters and regulations as are set forth in Subsection XI-10-57.04, Conditional Use Permits and Minor Conditional Use Permits, of this Chapter.

The Commission may conditionally impose such requirements and regulations upon the subject property and use as the Commission is authorized to impose by Subsection XI-10-57.04, Conditional Use Permits and Minor Conditional Use Permits, of this Chapter, and may conditionally approve Conditional Use Permits; said requirements and regulations shall be imposed and said approval shall be granted upon the express condition that said property shall be rezoned in accordance with the specific recommendation of the Planning Commission relating to zoning and shall not take effect unless and until said property is rezoned in accordance with specific recommendation of the Planning Commission and until the Ordinance amending this Chapter in accordance with the specific recommendation of the Planning Commission shall take effect.

- H. Appeals. An appeal of the action on a Conditional Use Permit or Minor Conditional Use Permit shall be reviewed in accordance with Section XI-10-64, Development Review Process, of this Chapter.
- I. Modifications Requested by the Applicant. Projects shall be developed in conformity with project approvals. If the applicant wishes to modify the project, as approved, the applicant shall submit revised plans and any other applicable information to the City for review by the Planning Division. The Planning Division staff shall make one of the following determinations regarding the request:
1. Insignificant Modifications. If the Planning Division determines that the modifications are minor, the modifications may be approved administratively.

2. Significant Modifications With or Without Public Impact or Concern. If the Planning determines that the modifications are significant enough to warrant discretionary review and have the potential for public impact or concern, then the modifications shall be referred to the final decision-making authority for the original project in the case of non-staff level issued permits, or to the Planning Commission in the case of staff-level issued Minor Conditional Use Permits. If the original application for a project required a public hearing, then the final decision-making authority's review of modifications shall require a public hearing, in accordance with Section XI-10-64, Development Review Process, of this Chapter.
- J. Modifications, Suspensions and/or Revocations Initiated by the City. Refer to Section XI-10-63.06, Revocation, Suspension, Modification, of this Chapter.
- K. Approval Runs with the Land. The approval of a Conditional Use Permit or Minor Conditional Use Permit shall run with the land, and shall continue to be valid upon a change of ownership of the site to which it applies, unless the decision-making authority places limits on the effective time of the approval.

SECTION 7. SEVERABILITY

The provisions of this Ordinance are separable, and the invalidity of any phrase, clause, provision, or part has no effect on the validity of the remainder.

SECTION 8. EFFECTIVE DATE AND POSTING

In accordance with Section 36937 of the Government Code of the State of California, this Ordinance takes effect 30 days from the date of its passage. The City Council hereby directs the City Clerk to cause this Ordinance or a summary thereof to be published in accordance with Section 36933 of the Government Code of the State of California.

RESOLUTION NO. 22-006**A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MILPITAS
RECOMMENDING THAT THE CITY COUNCIL APPROVE ZONING TEXT
AMENDMENT ZA22-0002 AMENDING SECTIONS OF CHAPTER 10 - ZONING OF
THE MILPITAS MUNICIPAL CODE RELATING TO MAXIMUM HEIGHTS FOR
NON-RESIDENTIAL BUILDINGS IN CERTAIN COMMERCIAL ZONES; AND
DETERMINING THE ORDINANCE TO BE EXEMPT FROM ENVIRONMENTAL
REVIEW PURSUANT TO CEQA GUIDELINES SECTIONS 15061(B)(3) AND 15183**

WHEREAS, the City of Milpitas, California (the “City”) is a municipal corporation, duly organized under the constitution and laws of the State of California; and

WHEREAS, California Government Code Section 65800 et seq. authorizes the adoption and administration of zoning laws, ordinances, rules, and regulations by cities as a means of implementing the General Plan; and

WHEREAS, clear and specific zoning regulations, including development standards and findings for project approval, are important elements in a municipal government’s process of encouraging and approving high-quality development projects that are compatible with surrounding areas; and

WHEREAS, the City’s Zoning Ordinance, Chapter 10 of Title XI of the Milpitas Municipal Code, does not currently include standards for the maximum height of primary buildings in the C2 General Commercial, HS Highway Services, or TC Town Center Zoning Districts; and

WHEREAS, the City wishes to enact appropriate regulations applying to the maximum height of primary buildings in the C2, HS, and TC zones, and further to conditionally allow additional building height in the C2 and TC zones, when such buildings are appropriately located and well designed to avoid negative impacts on surrounding properties and public spaces; and

WHEREAS, the City has prepared a Zoning Amendment (“Amendment”) to the City’s Municipal Code, including Section 2.03 (“Definitions”), Section 5.03 (“Commercial Zone General Development Standards”), Section 5.04 (“Commercial Zone Special Development Standards”), and Section 57.04 (“Conditional Use Permits and Minor Conditional Use Permits”), of Title XI, Chapter 10–Zoning; and

WHEREAS, the Planning Commission makes and accepts as its own the findings set forth in this resolution; and

WHEREAS, the Planning Commission is an advisory body to the City Council; and

WHEREAS, the Planning Commission hereby finds and determines that the project is exempt from further CEQA review pursuant to CEQA Guidelines section 15061(b)(3) (common sense exemption); and

WHEREAS, as a separate and independent basis, the Planning Commission hereby finds and determines that the project is exempt from further CEQA review pursuant to CEQA Guidelines section 15183 (projects consistent with a Community Plan, General Plan or Zoning); and

WHEREAS, on June 8, 2022, the Planning Commission held a duly noticed public hearing on the subject application, at which all those in attendance were given the opportunity to speak on the Zoning Text Amendment; and

WHEREAS, the Planning Commission has considered all the written and oral testimony presented at the public hearing in making its decision; and

NOW THEREFORE, the Planning Commission of the City of Milpitas hereby finds, determines, and resolves as follows:

SECTION 1. Recitals

The Planning Commission has duly considered the full record before it, which may include but is not limited to such things as the City staff report, testimony by staff and the public, and other materials and evidence submitted or provided to the Planning Commission. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.

SECTION 2. CEQA Finding

The Planning Commission finds, under CEQA Guidelines, Section 15061(b)(3), that this Ordinance is exempt from further environmental review because it is the adoption of an ordinance amending zoning regulations but would not permit any particular project. Therefore, it can be seen with certainty that there is no possibility that the Ordinance in question may have a significant effect on the environment; accordingly, the Ordinance is not subject to review under CEQA. As a separate and independent basis, the Project is also exempt from further environmental review pursuant to CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan or Zoning).

SECTION 3. Findings for Zoning Amendment (Milpitas Municipal Code, Subsection XI-10-57.02(G)(3))

The Planning Commission makes the following findings based on the evidence in the public record in support of Zoning Text Amendment No. ZA22-0002:

- 1. The proposed amendment is consistent with the General Plan.*

The proposed zoning amendments are consistent with the Milpitas General Plan. Specifically, they would serve to implement several policies in the Community Design Element that relate to good design, context-sensitive development, and compatibility of new development with surrounding areas. The amendments set maximum by-right height for primary buildings in three commercial zoning districts, where no maximum height standards are currently stated. They provide specific and detailed guidance about how a

request for additional conditionally permitted height should be evaluated and what factors should form the basis of a decision on such a request. Moreover, the amendments include well-crafted language for findings for approval of conditional requests for additional building height, which would serve to ensure that contextual factors (e.g. neighborhood scale and width of primary street right-of-way) and project-specific design factors (such as building setbacks and upper story building step-backs) are considered as part of development projects involving taller buildings in commercial areas, as demonstrated in Table 1.

Table 1: General Plan Consistency

Policy	Conformance
<i>Community Design Element Policy CD 1-1(B):</i> Require development projects to...incorporate a context-sensitive design approach that considers the scale and existing and desired character of adjacent uses and the surrounding neighborhood or district.	The proposed zoning amendments would allow additional building height in some commercial zones (C2 and TC) subject to a CUP – up to 35 feet or three stories more than what is currently permitted by right. It is very important to ensure that proposed development projects involving taller buildings are designed to respect and fit well with the existing area context and to maximize compatibility with surrounding buildings, streets, and open spaces. These zoning amendments are drafted to include specific and detailed guidance about how a request for additional building height should be considered. The criteria and findings for review and approval focus on context sensitivity (e.g. transitions to nearby lower-density residential areas, size, and scale of proposed buildings in relation to surrounding streets and buildings) and design treatments that minimize or avoid shadows or other negative impacts on surrounding properties.

Policy	Conformance
<i>Community Design Element Policy CD 2-2:</i> Continue to develop and implement design standards and guidelines for residential, non-residential, and infrastructure development...to provide design and site planning approaches....and site planning criteria that will add design excellence, visual quality and interest to the community.	The proposed amendments would add design standards for non-residential development to the Zoning Code, allowing for additional discretionary building height (where appropriate). These draft standards emphasize good design for taller buildings and would encourage buildings that are well-designed in relationship to their surroundings, which would enhance the visual quality of the built environment.
<i>Community Design Element Policy CD 3-3:</i> Ensure that new development and redevelopment reinforces desirable elements of its neighborhood, district, or center, including architectural style, scale, and setback patterns.	The proposed amendments, including development standards, design criteria for taller buildings, and findings for approval for discretionary additional building height, are intended to promote compatible building scale and encourage new development that fits well with the surrounding neighborhood or district.
<i>Community Design Element Policy CD 5-1:</i> Design new development to reflect the character of the predominant existing character of the same type in the surrounding area through the regulation of lot size, street frontage, height, building scale, siting/setbacks, and building orientation.	While the proposed amendments would conditionally allow for greater building heights than are currently allowed by right in certain commercial zoning districts, the underlying goal and purpose of the draft changes is to address building height and scale as they relate to and affect the character of the surrounding area. By tying approval of a request for discretionary additional building height to consideration of site-specific conditions such as street frontage, setbacks, and the scale and height of adjacent structures, the proposed amendments seek to maintain and protect the character of existing non-residential areas as well as that of adjacent residential areas.

2. *The proposed amendment will not adversely affect the public health, safety and welfare.*

The proposed zoning amendments are intended to promote the public interest by ensuring that proposed taller commercial buildings have minimal or no negative impacts on adjacent neighborhoods and commercial districts in terms of scale, bulk, shadows, etc. Requiring proposed new buildings with height exceeding the maximum allowed by right (35 feet or three stories) to respond well to the context of surrounding development, and to incorporate design solutions that help them fit in well with adjacent areas, will not result in adverse effects on public health, safety, or welfare.

SECTION 4: Planning Commission Action

The Planning Commission of the City of Milpitas hereby adopts Resolution No. 22-006 recommending that the City Council adopt Zoning Text Amendment ZA22-0002 based on the above Findings. The Planning Commission also recommended that the City Council consider adding a provision to the proposed text amendments to limit the height of buildings located within 100 feet of a lower-density residential neighborhood to two stories or 30 feet, which is consistent with the maximum permitted height of buildings in the City's lower-density residential zoning districts (R1 and R2). In addition, the Planning Commission recommended that discretionary approval of additional building height in the C2, HS and TC zones (i.e., with approval of a CUP) should not apply within 100 feet of any boundary with a R1 or R2 residential zone.

PASSED AND ADOPTED at a regular meeting of the Planning Commission of the City of Milpitas on June 8, 2022.

DocuSigned by:

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Bill Chuan, Planning Commission Chair

Resolution No. 22-006**Page 6**

Item # 17.

TO WIT:

I HEREBY CERTIFY that the following resolution was duly adopted at a regular meeting of the Planning Commission of the City of Milpitas on June 8, 2022, and carried by the following roll call vote:

COMMISSIONER	AYES	NOES	ABSENT	ABSTAIN
Mercedes Albana			✓	
Dipak Awasthi	✓			
Bill Chuan	✓			
Larry Ciardella	✓			
Alexander Galang	✓			
Sonia Medina-Ashby			✓	
Zeya Moshin	✓			



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Conduct a Public Hearing and Introduce an Ordinance Amending Sections of Chapter 10, Title XI (Zoning) and sections of Chapter 213, Title V (Noise Abatement) of the Milpitas Municipal Code Relating to Outdoor Music in Bars and Restaurants and Review and Permitting Requirements for Special Events (Staff Contact: Ned Thomas, Planning Director, 408-586-3273)
Category:	Public Hearings-Community Development
Meeting Date:	8/9/2022
	<u>Recommendations:</u> (1) Conduct a public hearing and move to close the hearing following comments. (2) City Attorney shall read aloud title of the Ordinance. (3) Move to waive the first reading beyond the title and introduce an Ordinance amending sections of Chapter 10 of Title XI (Zoning) and Chapter 213 of Title V (Noise Abatement) of the Milpitas Municipal Code relating to Outdoor Music in Bars and Restaurants and Review and Permitting Requirements for Special Events and determine that the Municipal Code amendment is exempt from California Environmental Quality Act pursuant to CEQA Guidelines Sections 15183 (Projects Consistent with a General Plan) and 15061(b)(3) (Common Sense Exemption).

Background:

The purpose of the proposed ordinance is to allow outdoor music as an accessory use to restaurants and bars in most commercial and mixed-use zones throughout the city. In addition, the ordinance includes various minor revisions to the Special Events and Activities section of the Zoning Ordinance, related to amplified music and other amplified sound as well as types of special events and review/permitting requirements for each.

City Councilmembers directed staff to streamline and simplify rules and procedures for hosting live and recorded music at restaurants and bars. Allowing these businesses to offer music for the entertainment of customers on patios, decks, or other outdoor spaces without the need for a permit from the Planning Department will not only help to support restaurants and bars, but also it will support local musicians in Milpitas. In addition, it will promote an atmosphere of cultural vitality in the city.

This series of amendments to the Milpitas Municipal Code (MMC) includes the addition of a new definition for “outdoor music” in the Zoning Ordinance (MMC Title XI, Chapter 10) and changes to the use tables for commercial and mixed-use zones to allow music (both indoor and outdoor) as an accessory use to restaurants and bars that are principal permitted or approved conditional uses, subject to certain standards. Those standards, which include allowed hours for outdoor music as well as noise level limits and standards to restrict noise impacts for properties in residential zones are articulated through amendments to the Noise Abatement Ordinance (MMC Title V, Chapter 213).

The zoning amendments related to Special Events and Activities (MMC Title XI, Chapter 10, Section 15)

focus mainly on creating a new category of “Minor Events,” with the category currently referred to in the code as “Minor” proposed to be renamed as “Regular Events.” The new category of Minor Events is intended to apply to small, simple events that do not warrant the level of review and permit fee cost that are currently required. The new “Minor Events” category corresponds to a new, lower Special Event Permit fee category that was added as part of the City’s FY 2022-23 Master Fee Schedule. Other refinements are also proposed to the thresholds for the three categories of special events defined in the Zoning Ordinance (Minor, Regular, and Major), and a new definition is included for the term “amplified sound,” related to the zoning amendments for outdoor music.

Overview of Draft Ordinance:

The proposed ordinance includes amendments to the following sections of the Zoning Ordinance (Title XI, Chapter 10 of the Milpitas Municipal Code) and the Noise Abatement Ordinance (Title V, Chapter 213):

Definitions (XI-10-2.02)

The term “Outdoor Music” would be added to the General Definitions section of the Zoning Ordinance. The definition would encompass both acoustic and amplified music, including individual musicians, bands, and disc jockeys (DJs) performing in outdoor spaces such as patios or decks. It would also refer to recorded background music played outdoors by businesses such as restaurants, bars, and retail stores.

Commercial Zone Use Regulations (XI-10-5.02) and Mixed Use Zone Use Regulations (XI-10-6.02)

At present, live entertainment and dancing at restaurants are not permitted in the Administrative and Professional Office (CO) Zone or the Neighborhood Commercial (C1) Zone and are conditionally permitted in the General Commercial (C2), Highway Services (HS), Town Center (TC), and all Mixed Use (MXD, MXD2, and MXD3) Zones. The current requirement for a restaurant to obtain a conditional use permit (CUP) in order to host live music is expensive and time-consuming. The Zoning Ordinance does not specifically address live entertainment at bars and nightclubs; however, these uses require a CUP in most zones (other than those where they are prohibited) and thus any proposed live entertainment would be reviewed as part of the CUP review process.

The City recognizes the value of facilitating the process for restaurants to offer live music in terms of quality of life and access to entertainment for the Milpitas community. To this end, Planning staff proposes to amend the zoning regulations for music as an accessory use to restaurants and bars so that both indoor and outdoor music, whether live or recorded, would be permitted without further City review. For restaurants that are a permitted use in a particular zoning district, indoor and outdoor music would also be permitted by right; for restaurants and bars that have an approved CUP as required per zoning regulations, indoor and outdoor music would be permitted without the need to amend their CUP. These changes would apply in the C1, C2, TC, MXD, MXD2, and MXD3 Zones (no changes are proposed to current requirements for indoor/outdoor music in the CO Zone (not permitted) or the HS Zone (conditionally permitted)).

Per the proposed regulations, other forms of live entertainment at restaurants (e.g. stand-up comedy, theatrical shows, karaoke) as well as social dancing would continue to follow existing regulations and permit requirements. Other live entertainment and dancing at bars and nightclubs would continue to be subject to review through the CUP process that is required for all such uses citywide.

Commercial Zone Special Development Standards (XI-10-5.04) and Mixed Use Zone Special Development Standards (XI-10-5.04)

The Special Development Standards sections of the Zoning Ordinance for commercial and mixed-use zones would be amended to add standards that apply specifically to outdoor music at restaurants and bars. Outdoor music would be permitted between 9:00 am and 11:00 pm, and a noise level limit of 70 to 90

decibels¹ (dB) would be established. Larger outdoor music events that are open to the general public (as opposed to music events offered for customers of a single establishment) would continue to require a Special Event Permit.

In addition, the standards would state that recorded background music may be played outdoors on public sidewalks and in other public areas (such as plazas). The intent of this change is to allow businesses to play recorded music for customers' enjoyment on sidewalks and other public areas, as long as it complies with other standards in the Zoning and Noise Abatement Ordinances.

Special Events and Activities (XI-10-15)

The current zoning regulations for Special Events define two types of events, Minor and Major, with different review procedures and permit fees for each. Existing criteria and thresholds that correspond to Minor Events include: four consecutive days or less, with or without amplified sound, and 1,000 people or less in attendance. Block parties on residential streets are also specified as Minor Events. Major Events are currently defined as those lasting more than four consecutive days, with or without amplified sound and street closures, or events having more than 1,000 attendees.

In response to recent incidents in which small community events in parks and other public places were required under the City's Special Event regulations to apply for a Minor Event permit, which had a fee of \$945 per the Master Fee Schedule (Fiscal Year 2021-22), staff proposes creating a new category for smaller special events. Under the proposed zoning amendments, the new category would be called "Minor Events," and the existing Minor Events category would be renamed as "Regular Events." This new classification for Minor Events would apply to single-day events with fewer than 250 participants and no street closures or amplified sound. The permit fee for Minor Events per the updated Master Fee Schedule for FY 2022-23 is \$253. For context, the permit fee for Regular Events will be \$986, and the permit fee for Major Events will be \$6,157.

The category proposed to be called "Regular Events" would include those meeting one or more of the following thresholds: Between one and four days in duration, with 250 to 1,000 participants, and with or without amplified sound. Residential block parties would be considered Regular Events. Major events would be defined by any of the following thresholds: Between four and seven days, with more than 1,000 participants, with or without amplified sound, and requiring street closures (other than residential block parties).

In addition, in connection with the draft zoning regulations for outdoor music that would require a Special Event permit for larger, public music events, the proposed amendments to the Special Events section include a revised, more specific definition for "amplified sound." The new language would define this term as "the use of any loudspeaker, public address system, amplifier, or any other device which electronically or mechanically increases the volume of the human voice, music, or any other sound."

Noise Abatement (V-213):

The Noise Abatement chapter of the Milpitas Municipal Code currently includes a section regarding "disturbing noise" in residential zones. A "disturbing noise" is defined as "any sound or vibration caused by sound which occurs with such intensity, frequency, or in such manner as to disturb the peace and quiet of a person of normal sensitivity residing in that area." MMC Section V-213-2.03 provides specific examples of different types of disturbing noises. The City's current regulations set forth a noise level limit in all residential zones of 65 decibels (dB) measured from the property line of the noise source. The noise limit serves to maintain a quiet atmosphere in the city's residential areas and restrict louder noise sources that may disturb people while in their homes.

¹ For reference, the noise level for a typical classical music concert is 70-90 dB, and rock concerts in outdoor venues typically range between 90-100 dB. Sources: www.earpros.com/blog/how-loud-are-concerts and www.decibelpro.app/blog/how-loud-is-a-rock-concert.

The proposed amendments would update the Noise Abatement Ordinance to include new rules and standards for outdoor music in restaurants and bars in commercial and mixed-use zones, as allowed per the zoning changes discussed above. Outdoor music played or performed in compliance with the new standards in the Noise Abatement Ordinance would be specifically excluded from the definition of “disturbing noise.”

A new subsection (V-213-3(b)) would be added, stating the same operational standards that are included in the Special Development Standards sections for commercial and mixed use zones in the Zoning Ordinance: permitted hours for outdoor music at restaurants and bars are 9:00 am to 11:00 pm, and the noise level limit is 70-90 dB (measured from any property line on the parcel where music takes place). For consistency with other standards in the Noise Abatement Ordinance regarding noise levels in residential zones, the proposed new standards would require outdoor music at a restaurant or bar within 100 feet of a parcel in a lower-density, single-family residential zone (R1 or R2) to maintain a noise level limit of 65 dB as measured at the property line of the parcel with the noise source. Thus, while outdoor music at restaurants and bars would generally be handled as an exception to the “disturbing noise” regulations that apply to residential zones and different hours would apply, the new noise standards for outdoor music at restaurants and bars would also incorporate protections for single-family residential areas (R1 and R2 zones) in order to maintain the same standard for noise levels as currently applies.

This subsection would also stipulate that for residential uses in the mixed-use zones (MXD, MXD2, and MXD3), ambient noise from outdoor music permitted as an accessory use to a restaurant or bar is not subject to the general noise restrictions pertaining to residential uses. The reason for this provision is that residences in higher-density mixed use areas are understood to be part of an active urban environment where noise levels are expected to be higher than in single-family residential areas.

Policy Alternative:

Alternative: Do not adopt the ordinance adding and amending regulations for outdoor music and special events in Title V, Chapter 213 and Title XI, Chapter 10 of the Municipal Code. Live music at restaurants and bars would continue to be prohibited in the Neighborhood Commercial (C1) zone and would continue to be conditionally permitted in the C2, TC, MXD, MXD2, and MXD3 zones. Business owners of bars and restaurants wanting to offer live music indoors or outdoors would be required to apply for a Conditional Use Permit (or amend an existing approved Conditional Use Permit). The FY22-23 permit fee for a new CUP is \$15,739 and the fee to amend an existing CUP is \$7,870. For special events, small and simple events would continue to require a permit with a corresponding fee of \$986.

Pros: The City would retain a relatively high level of discretion and scrutiny over live music performed indoors and outdoors at restaurants and bars. A higher level of City review and discretion would also be retained for small and simple special events. The City would continue to collect relatively high permit fees for applications for live music at bars/restaurants and small special events.

Cons: Small business owners of restaurants and bars in Milpitas wishing to offer live music, and community members proposing to organize small and simple events in City parks and other public areas, would continue to face substantial administrative burdens and high permit fees (which may be cost prohibitive in many cases) in order to obtain the necessary City approvals for these activities.

Reason not recommended: If the proposed ordinance is not adopted, the City would miss an opportunity to reduce the cost and the burden of time and effort for business owners and citizens to organize and host musical entertainment and small community gatherings. These types of activities support a lively and vibrant community, help small businesses to thrive, and improve the quality of life for Milpitas residents.

Fiscal Impact:

Amending the Zoning Ordinance to allow outdoor music may increase restaurant and bar revenues and therefore increase sales tax revenue that the City receives from these businesses. The amount of increase

is unknown. Amending the Zoning Ordinance to establish three categories of special events (i.e., minor, regular, and major events) helps to align with the City master fee schedule and enhance the City's cost recovery.

California Environmental Quality Act:

The proposed text amendments to the Milpitas Municipal Code are exempt from environmental review under the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines Sections 15183 (Projects Consistent with a General Plan) and Section 15061(b)(3) (Common Sense Exemption).

The proposed ordinance would create new regulations related to outdoor music at restaurants and bars as well as new regulations for the review and permitting of small special events. The outdoor music regulations include provisions to maintain appropriate sound levels, thereby avoiding environmental impacts relating to noise. None of the proposed amendments would directly or indirectly result in physical changes to the environment. Therefore, it can be seen with certainty that there is no possibility that the ordinance in question would have a significant effect on the environment; accordingly, the ordinance is exempt from CEQA review.

Recommendations:

- 1) Conduct a public hearing and move to close the hearing following comments.
- 2) City Attorney shall read aloud title of the Ordinance.
- 3) Move to waive the first reading beyond the title and introduce an Ordinance amending sections of Chapter 10 of Title XI (Zoning) and Chapter 213 of Title V (Noise Abatement) of the Milpitas Municipal Code relating to Outdoor Music in Bars and Restaurants and Review and Permitting Requirements for Special Events and determine that the Municipal Code amendment is exempt from California Environmental Quality Act pursuant to CEQA Guidelines Section 15061(b)(3).

Attachments:

- A) Draft Ordinance
- B) Planning Commission Resolution No. 22-007

PLEASE NOTE:

This copy of Ordinance No. XX.XXX is a “redlined” version for your convenience. Text additions are designated by an underline and text deletions are designated with a strikethrough.

REGULAR

NUMBER: XX.XXX

TITLE: AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF MILPITAS AMENDING SECTIONS OF CHAPTER 10 OF TITLE XI AND CHAPTER 213 OF TITLE V OF THE MILPITAS MUNICIPAL CODE TO MODIFY AND ADD REGULATIONS RELATING TO OUTDOOR MUSIC IN BARS AND RESTAURANTS AND REVIEW AND PERMITTING REQUIREMENTS FOR SPECIAL EVENTS, AND MAKING FINDINGS OF CEQA EXEMPTION

HISTORY: This Ordinance was introduced (first reading) by the City Council at its meeting of _____, upon motion by _____ and was adopted (second reading) by the City Council at its meeting of _____, upon motion by _____. The Ordinance was duly passed and ordered published in accordance with law by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

APPROVED:

Wendy Wood, City Clerk

Rich Tran, Mayor

APPROVED AS TO FORM:

Michael Mutalipassi, City Attorney

RECITALS AND FINDINGS:

WHEREAS, the City of Milpitas, California (the “City”) is a municipal corporation, duly organized under the constitution and laws of the State of California; and

WHEREAS, California Government Code Section 65800 et seq. authorizes the adoption and administration of zoning laws, ordinances, rules and regulations by cities as a means of implementing the General Plan; and

WHEREAS, the City wishes to encourage and allow outdoor live and recorded music at restaurants and bars as a way to encourage a vibrant city, provide accessible arts and entertainment for Milpitas residents and visitors, and support local business and musicians; and

WHEREAS, clear and specific land use and noise regulations, including operational standards such as noise level limits, permitted hours, and protections against disturbing noise for residential neighborhoods are important elements in a municipal government’s process of allowing and encouraging outdoor music; and

WHEREAS, the City wishes to simplify and facilitate the process of approving small special events of limited scale that do not create negative impacts on surrounding areas; and

WHEREAS, the City wishes to reduce the cost of obtaining a Special Event Permit for applicants proposing to hold small and simple special events of limited scale; and

WHEREAS, the City’s Zoning Ordinance, Chapter 10 of Title XI of the Milpitas Municipal Code, currently includes land use regulations for the location and approval procedures for special events generally as well as for live entertainment associated with restaurants and bars in commercial and mixed-use zoning districts; and

WHEREAS, the City’s Noise Abatement Ordinance, Chapter 213 of Title V of the Milpitas Municipal Code, currently includes requirements and standards for noise levels in residential zones that serve to protect these areas from disturbing noise and maintain peaceful, favorable living environments; and

WHEREAS, the City has prepared a Zoning Amendment (“Amendment”) to the City’s Municipal Code, including Section 2.03 (“Definitions”), Section 5.02 (“Commercial Use Regulations”), Section 5.04 (“Commercial Zone Special Development Standards”), Section 6.02 (“Mixed Use Regulations”), Section 6.06 (“Mixed Use Special Development Standards”), and Section 15 (“Special Events and Activities”) of Title XI, Chapter 10–Zoning; and including Section 213-2 (“Definitions”) and Section 213-3 (“Unlawful to Create or Permit Disturbing Noise”) of Title V, Chapter 213–Noise Abatement; and

WHEREAS, on June 22, 2022, the Planning Commission of the City of Milpitas held a lawfully noticed public hearing to solicit public comment and consider the proposed Amendment, take public testimony, and make a recommendation to the City Council on the project; and

WHEREAS, this ordinance is exempt from the California Environmental Quality Act, Public Resources Code Section 21000, *et seq.* (“CEQA”), each as a separate and independent basis, pursuant to CEQA Guidelines Section 15183 (projects consistent with the General Plan) and Section 15061(b)(3) (no possibility of significant environmental effect).

NOW, THEREFORE, the City Council of the City of Milpitas does ordain as follows:

SECTION 1. RECORD AND BASIS FOR ACTION

The City Council has duly considered the full record before it, which may include but is not limited to such things as the City staff report, testimony by staff and the public, and other materials and evidence submitted or provided to the City Council. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.

SECTION 2. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Based on its review of the entire record, including the staff report, public comments and testimony presented to the Planning Commission and City Council, and the facts outlined below, the City Council hereby finds and determines that this ordinance is categorically exempt from the California Environmental Quality Act (“CEQA”) under CEQA Guidelines, § 15061(b)(3), also known as the “common sense exemption”, which exempts from CEQA any project where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment. A “significant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project. This ordinance would create new regulations related to outdoor music at restaurants and bars as well as new regulations for the review and permitting of small special events. The outdoor music regulations include provisions to maintain appropriate sound levels, thereby avoiding environmental impacts relating to noise. None of the proposed amendments would directly or indirectly result in physical changes to the environment. Therefore, it can be seen with certainty that there is no possibility that this Ordinance would have a significant effect on the environment; accordingly, this Ordinance is exempt from CEQA review.

Moreover, the City Council hereby finds that the introduction and adoption of this Ordinance is categorically exempt from CEQA pursuant to CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning). Section 15183 of the CEQA Guidelines provides that projects that are consistent with a Community Plan, General Plan or Zoning for which an EIR has been certified “shall not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site.” These proposed zoning amendments serve to implement several goals and policies in the Economic Development, Noise, Utilities and Community Services, and Parks, Recreation & Open Space Elements by supporting and encouraging small live music events at food and beverage businesses throughout the city while also establishing rules and standards that would limit hours and noise levels to protect residential areas from disturbing noise. In this way, the amendment would strike a positive balance between supporting arts, entertainment and economic development and preserving the quiet enjoyment of residential areas in Milpitas. Therefore, the proposed Amendment is consistent with the General Plan. Therefore, the proposed Amendment is consistent with the General Plan and is exempt from CEQA pursuant to Section 15183 of the CEQA Guidelines.

Accordingly, this Ordinance is exempt from CEQA review pursuant to Sections 15061(b)(3) and 15183 of the CEQA Guidelines, each as a separate and independent basis.

SECTION 3. GENERAL PLAN CONSISTENCY

The Economic Development, Noise, Utilities and Community Services, and Parks, Recreation & Open Space Elements of the City’s General Plan include several policies and actions related to supporting small business in Milpitas, encouraging a vibrant arts and cultural scene, making arts and entertainment events accessible to everyone in the community, and maintaining clear standards to restrict noise levels and protect residential areas from disturbing noise. The proposed municipal code amendments would serve to implement these General Plan policies and actions because they would strike a positive balance between supporting arts, entertainment and economic development and preserving the quiet enjoyment of residential areas in Milpitas.

SECTION 4. AMENDMENT OF MILPITAS MUNICIPAL CODE TITLE V, CHAPTER 213, SECTIONS 2 AND 3

Item # 18.

Title V, Chapter 213 (Noise Abatement), Section 2 (Definitions) of the Milpitas Municipal Code is hereby amended to read as follows:

V-213-2 – Definitions

2.04 "Disturbing Noise" as used herein in this Chapter means any sound or vibration caused by sound which occurs with such intensity, frequency or in such a manner as to disturb the peace and quiet of reasonable person of normal sensitivity residing in that area. It shall include, but not be limited to noise from the following sounds (this enumeration not being exclusive but only illustrative):

- (1) The use, operation, playing of any radio, television, musical instrument or instruments, phonograph, stereo, loud speaker, sound amplifier or other device for the production or reproduction of sound with louder volume than is necessary for hearing for any person or persons who are in the room, vehicle or chamber in which such machine or device is operated and who are voluntary listeners thereto. Outdoor music played or performed in compliance with Subsection V-213-3(b) shall not be construed as disturbing noise.
- (2) The sounding of any horn or signal device or siren except as a danger warning.
- (3) The operation of any machinery or tool.
- (4) The continuous or recurrent acceleration of a motor vehicle or other engine while stationary ("revving" the engine).
- (5) Yelling, shouting, hooting, whistling, singing, or similar types of noise.

Title V, Chapter 213 (Noise Abatement), Section 3 (Unlawful to Create or Permit Disturbing Noise) of the Milpitas Municipal Code is hereby amended to read as follows:

V-213-3 – Unlawful to Create or Permit Disturbing Noise

(a) Residential Zone Regulations.

3.01 Except as permitted in Section V-213-3(b), it shall be unlawful for any person in any district zoned for residential use (under the provisions of Chapter 10, Title XI of the Milpitas Municipal Code) to make, continue, maintain, permit or cause to be made, continued, maintained, or permitted any Disturbing Noise that increases the noise exposure level by three dB over the local ambient noise level measured from the property line of the noise source, or more than 65 dB measured from the property line of the noise source, whichever is more restrictive.

3.02 Except as permitted in Section V-213-3(b), it shall be unlawful for any person who owns, possesses, or controls any real property in any district zoned for residential use (under the provisions of Chapter 10, Title XI of the Milpitas Municipal Code) to make, continue, maintain, permit or cause to be made, continued, maintained or permitted any Disturbing Noise that increases the noise exposure level by three dB over the local ambient noise level measured from the property line of the noise source, or more than 65 dB measured from the property line of the noise source, whichever is more restrictive.

3.03 Notwithstanding any other provision of this Chapter and in addition thereto, it is unlawful for any person or any person who owns, possesses, or controls real property in any district zoned for residential use (under provisions of Chapter 10, Title XI of the Milpitas Municipal Code) to make, continue, maintain, permit, or cause to be made, continued, maintained or permitted any Disturbing Noise. It shall be prima facie violation of this Section if any Disturbing Noise is audible during the hours

of 10:00 p.m. to 7:00 a.m. from a distance of 50 feet from the property line of the noise source or distance of 100 feet from any nonstationary noise source. It shall also be prima facie violation of this Section if any Disturbing Noise is audible during the hours of 7:01 a.m. to 9:59 p.m. from a distance of 100 feet from the property line of the noise source or any nonstationary noise source.

3.04 The above prohibition against making, continuing, maintaining or permitting any Disturbing Noise in any district zoned for residential use shall not apply to the authorized collection of solid waste, recyclables, and/or yard trimmings by an authorized collector beginning at 6:00 a.m.

(b) Outdoor Music Regulations for Commercial and Mixed Use Zones.

3.05 Outdoor music shall be permitted on real property in the C1, C2, TC, MXD, MXD2, and MXD3 zoning districts (per Chapter 10, Title XI of the Milpitas Municipal Code) as an accessory use to a restaurant or bar that is a principal permitted use or approved conditional use. Outdoor music shall be permitted between the hours of 9:00 a.m. and 11:00 p.m.

3.06 Except as provided below in Subsection V-213-3(b) 3.06(1), noise levels for outdoor music as an accessory use shall not exceed 70-90 dB measured from the property line of the parcel on which the outdoor music occurs. See also Table XI-10-5.02-1 – Commercial Zone Uses in Title XI, Chapter 10, Section 5.02 and Table XI-10-6.02-1 – Mixed Use Zone Uses in Title XI, Chapter 10, Section 6.02.

- (1) For any parcel in a C1, C2, TC, MXD, MXD2, or MXD3 zoning district that is located within 100 feet of a parcel in a R1 or R2 zoning district, noise levels for outdoor music as an accessory use shall not exceed 65 dB measured from the property line of the parcel on which the outdoor music occurs.
- (2) For residential uses in the MXD, MXD2, and MXD3 zoning districts, it is recognized that ambient noise from outdoor music that is permitted as an accessory use to a restaurant or bar is a normal condition inherent to a mixed-use, urban living environment; therefore accessory outdoor music at a restaurant or bar shall not be subject to the noise restrictions in Section V-213-3(a) 3.01 and 3.02 in the case of residential uses in the MXD, MXD2, and MXD3 zones.

(b)(c) Site Construction Regulations.

~~3.0507~~ No person shall engage or permit others to engage in construction of any building or related road or walkway, pool or landscape improvement or in the construction operations related thereto, including, delivery of construction materials, supplies, or improvements on or to a construction site except within the hours of 7:00 a.m. to 7:00 p.m. on weekdays and weekends. No construction work shall be conducted or performed on the holidays indicated in Section V-213-2-2.05 of this Chapter.

~~3.0608~~ Exemption from Off-Site Construction Regulations. Exempt from the Off-Site Construction Regulations of this article are as follows:

- (1) Emergency construction and repair that is necessary for protection of life and property,
- (2) Operation preempted from local regulation by state law, such as construction of public school buildings,
- (3) Furnishing utility-type service including construction and maintenance of utility facilities,
- (4) Any work on an existing single-family or duplex (two-family) dwelling undertaken by the property owner,
- (5) Operation to construct and maintain facilities within the public right-of-way as deemed necessary by the Public Works Director, and
- (6) Any other circumstances where the City Manager deems that an exemption would be appropriate.

SECTION 5. AMENDMENT OF MILPITAS MUNICIPAL CODE TITLE XI, CHAPTER 10, SECTION 2

Item # 18.

Title XI, Chapter 10, Section 2 (Definitions), Subsection XI-10-2.02 (General Definitions) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-2.03 Definitions

"Outdoor Music" means live music, both acoustic and amplified, including live individual musicians, bands, and disc jockeys (DJs), but not including karaoke, that takes place on a patio or other outdoor space. Outdoor music as defined and regulated in this Chapter shall also include recorded background music played outdoors at a public establishment such as a restaurant, bar, retail store, or other business.

SECTION 6. AMENDMENT OF MILPITAS MUNICIPAL CODE TITLE XI, CHAPTER 10, SECTION 5

Title XI, Chapter 10, Section 5 (Commercial Zones and Standards), Subsection XI-10-5.02 (Commercial Use Regulations) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-5.02 Commercial Use Regulations

- A. Permitted and Conditionally Permitted Uses.
1. Primary uses. The uses identified in Table 5.02-1, Commercial Zone Uses, shall be the primary uses allowed to occur on a property. All uses except for those noted shall be conducted within enclosed structures. The primary uses identified in Table 5.02-1 shall be permitted or conditionally permitted, as indicated:

P	Where the symbol "P" appears, the use shall be permitted.
MCS	Where the symbol "MCS" appears the use shall be permitted subject to the issuance of a Minor Conditional Use Permit by staff, in accordance with Subsection 57.04, Conditional Use Permits and Minor Conditional Use Permits, of this chapter.
P/C	Where the symbol "P/C" appears the use may be permitted if certain criteria is met or otherwise a Conditional Use Permit shall be required, in accordance with Section XI-10-57.04, Conditional Use Permits, of this Chapter.
C	Where the symbol "C" appears, the use shall be permitted subject to the issuance of a Conditional Use Permit, in accordance with Subsection 57.04, Conditional Use Permits and Minor Conditional Use Permits, of this Chapter.
MC	Where the symbol "MC" appears, the use shall be permitted subject to the issuance of a Minor Conditional Use Permit, in accordance with Subsection 57.04, Conditional Use Permits and Minor Conditional Use Permits, of this chapter.
O	Where the symbol "O" appears, the use is subject to an alternative review process described in a subsequent footnote.

- B. Prohibited Uses. The following uses are prohibited:
1. Uses where the symbol "NP" appears within Table 5.02-1.
2. Uses that have been excluded from Table 5.02-1, unless they are found by the City to be similar to permitted or conditionally permitted uses in accordance with C below.

3. Any residential uses in the Town Center Zone shall strictly be prohibited provided residential uses constructed on or before February 17, 2015 or any project securing an approved tentative map or site development permit for construction of residential uses on or before February 17, 2015 shall be exempt from this prohibition and Milpitas Zoning Code Section 56, Nonconforming Buildings and Uses.

- C. Other Uses. Any other uses may be considered by the Planning Commission that are similar in accordance with the procedure prescribed in Subsection 10-54.02, Other Uses Permitted by Commission, of this Chapter.

**Table XI-10-5.02-1
Commercial Zone Uses**

Use	CO	C1	C2	HS	TC
1. Commercial Uses					
Alcoholic beverage sales	C ⁶	C	C	NP	C
Art/photography studio or gallery	NP	P	P	P	P
Bookstore	NP	P	P	P	P
Commercial services ¹	P	P	P	NP	P
Funeral home or mortician	NP	NP	C	C	NP
Furniture sales	NP	P	P	P	P
Grocery store (supermarkets)					
Within 1,000 ft. of residential zone	NP	C	C	C	C
Not within 1,000 ft. of residential zone	NP	P	P	P	P
Head/smoke/tobacco shop	NP	C	C	NP	C
Home improvement (hardware, blinds, interior decorating, etc.)	NP	P	P	C	P
Not fully enclosed operation	NP	C	C	C	C
Household appliance store ⁷	NP	NP	P	P	NP
Small appliance repair	NP	NP	MCS	P	NP
Large appliance repair	NP	NP	NP	P	NP
Janitorial services	NP	NP	P	P	NP
Newsstand					
Indoor	P	P	P	NP	P
Outdoor	C	C	C	NP	C
Nursery (flower or plant)					
Indoor	NP	NP	P ²	P	P
Outdoor	NP	NP	C	P	NP
Office supply sales (stationery, equipment)	P	P	P	P	P
Paint and wallpaper stores	NP	NP	P	P	P
Pawnshops	NP	NP	C	NP	NP
Pet stores	NP	NP	P	P	P
Printing (newspaper, publishing)	NP	NP	P	P	P
Rentals (medical supplies, costumes, party equipment, office equipment)	NP	NP	P	P	P
Retail stores, general merchandise	NP	P	P	NP	P
Tanning salon	NP	NP	P	NP	P
Thrift store ³	NP	C	P	P	P
2. Entertainment and Recreation					
Adult business ⁴	NP	NP	NP	P	NP

Bowling alley	NP	NP	P	P	P	Item # 18.
Commercial athletic facilities						
Indoor	NP	C	P	P	P	
Outdoor	NP	NP	NP	C	NP	
Motion picture theater (See 7 below)						
Recreation or entertainment facility	NP	C	C	C	C	
Shooting range, indoor	NP	NP	NP	C	NP	
3. Health and Veterinarian Uses						
Animal grooming (no boarding)	NP	P	P	P	P	
Hospital	C	NP	C	C	C	
Kennel	NP	NP	C	NP	NP	
Massage establishment ¹⁵	NP	NP	MC	MC	MC	
Massage establishment, accessory ¹⁵	NP	NP	MCS	MCS	MCS	
Medical and dental office	P	P	P	NP	P	
Medical and dental clinic	P	C	C	NP	P	
Medical support laboratories	P	C	C	C	C	
Optician and optometrist shop	P	P	P	NP	P	
Pharmacy or drug store	NP	P	P	P	P	
Sauna and steam bath	NP	NP	NP	P	NP	
Veterinary clinic	NP	NP	P	P	P	
4. Industrial Uses⁵						
Assembly from pre-processed materials	NP	NP	C	NP	NP	
Commercial fueling facility	NP	NP	NP	C	NP	
Commercial laboratory	NP	NP	C	P	NP	
Contractor's yards and offices	NP	NP	C	C	NP	
Disinfection and extermination business	NP	NP	C	P	NP	
Dry cleaning plant	NP	NP	NP	P	NP	
Food storage locker	NP	NP	NP	P	NP	
Landscape contractor	NP	NP	C	P	NP	
Lumberyards	NP	NP	C	C	NP	
Mini-storage complex	NP	NP	C	C	NP	
Plumbing, metalworking, glassworking or woodworking	NP	NP	C	C	NP	
Research & development	NP	NP	C	NP	NP	
Sign sales and fabrication (Electric and neon sign, sign painting)	NP	NP	C	P	NP	
Warehousing and wholesale	NP	NP	C	NP	NP	
5. Lodging						
Hotel and motel	NP	NP	C	C	C	
6. Professional Offices, Financial Institutions and Related Uses						
Automatic teller machines (freestanding) ⁶	NP	P	P	P	P	
Financial institutions (banks, savings and loans, etc.)	P	P	P	P	P	
General offices (administrative and business services, real estate, travel agencies, etc.)	P	P	P	P	P	
7. Public, Quasi-Public and Assembly Uses						
Auction hall	NP	NP	C	C	C	
Child care						

Child care center	C	C	C	C	C	Item # 18.
Day care school	C	C	C	C	C	
Large family child care home	NP	NP	NP	NP	C	
Small family child care home	NP	NP	NP	NP	C	
Places of assembly	C	C	C	C	C	
Cultural center	NP	NP	C	C	C	
Educational institutions						
Schools, private (elementary, middle, high)	NP	NP	C	NP	C	
Trade and vocational school	C	NP	P	P	C	
Farmer's market (not including flea market)	NP	C	C	C	C	
Instruction						
Group ⁸	MCS	MCS	MCS	MCS	MCS	
Private	P	P	P	P	P	
Motion picture theater						
Indoor	NP	C	C	C	C	
Outdoor	NP	NP	NP	C	NP	
Parking facility, storage garage	NP	P	P	C	C	
Public utilities	C	C	C	C	C	
Transportation facility (taxi, limousine, etc.)	NP	NP	C	C	C	
8. Restaurants or Food Service						
Banquet hall	NP	NP	C	C	C	
Bar or nightclub	NP	NP	C ¹⁷	C	C ¹⁷	
Catering establishment	C	NP	P	P	P	
Restaurants	C ⁷	P	P	P	P	
<u>With music (indoor/outdoor)</u>	<u>NP</u>	<u>P ¹⁷</u>	<u>P ¹⁷</u>	<u>C</u>	<u>P ¹⁷</u>	
With <u>other</u> live entertainment/dancing ¹⁸	NP	NP	C	C	C	
With drive-in or drive-through	NP	C	C	C	C	
With ancillary on-premise beer & wine with no separate bar	NP	MC	PMC	MC	MC	
Mobile Food Vending (individual vehicle) ¹⁶	P	P	P	P	P	
Mobile Food Park ¹⁶	MC	MC	MC	MC	MC	
Commissary	MC	P	P	P	MC	
9. Residential Uses						
Caretaker (in conjunction with contractor's yard or mini-storage complex)	NP	NP	C	C	NP	
Emergency shelters ⁹	NP	NP	NP	P/C	NP	
Single-room occupancy residences ¹⁰	NP	NP	NP	C	NP	
10. Vehicle Related Uses						
Auto repair (tire, oil change, smog check, etc.)	NP	NP	C	C	NP	
Auto sales and rental, outdoor (new and used cars, RV and truck)	NP	NP	C	C	NP	
Auto broker (wholesale, no vehicles on site)	MCS	MCS	MCS	MCS	MCS	
Car wash	NP	NP	C	C	NP	
Service stations (with or without repair or retail) ¹¹	C	C	C	C	C	
Drive through uses (restaurants, pharmacies, etc.)	NP	C	C	C	C	
11. Unclassified Uses						

Accessory structures ¹²	P	P	P	P	P	Item # 18.
Model home complex ¹³	NP	NP	NP	NP	P	
Mortuary or crematory	NP	NP	NP	C	NP	
Radio or television station	NP	NP	C	P	NP	
Temporary seasonal sales ¹⁴	NP	P	P	P	P	

- ¹ Refer to the definition for "Commercial Services" in Section 2, Definitions, of this Chapter.
- ² Provided that all incidental equipment and supplies, including fertilizer and empty cans, are kept within a building.
- ³ Refer to XI-10-5.04, Commercial Zone Special Development Standards, of this Chapter.
- ⁴ In accordance with the Title III, Chapter 4, Adult Business Ordinance, and Subsection 13.04, Adult Businesses, of this Chapter.
- ⁵ For conditionally permitted uses, refer to Subsection 57.04(C) (9), Certain Industrial Uses within Commercial Districts, of this Chapter.
- ⁶ Refer to Subsection 57.03, Site Development Permits and Minor Site Development Permits, of this Chapter.
- ⁷ When intended to serve the occupants and patrons of the permitted use (office, etc.) and conducted and entered from within the building and provided there is no exterior display of advertising.
- ⁸ Refer to Subsection 5.02-1, Commercial Zone Special Uses, of this Section.
- ⁹ Refer to XI-10-13.14, Special Uses, Emergency Shelters, of this Chapter.
- ¹⁰ Refer to XI-10-13.13, Special Uses, Single Room Occupancy Residences, of this Chapter.
- ¹¹ Refer to Subsection XI-10-6.02-2, Special Uses, of this Chapter, for standards. Service stations shall follow the "General development policy: Gasoline service stations, and automotive service centers" adopted by the City Council on December 19, 1995.
- ¹² Not including warehouses on the same site as the permitted use.
- ¹³ No tract sign shall be permitted within 600 feet of a Santa Clara County Expressway.
- ¹⁴ Refer to Section 13.11, Temporary Uses and Structures, of this Chapter.
- ¹⁵ Massage establishments are subject to Title III, Chapter 6 of the Milpitas Municipal Code and Subsection XI-10-13.16 of this title. Refer to Subsection XI-10-13.16, of this Title, for special provisions for massage establishments.
- ¹⁶ Refer to Subsection XI-10-13.18, Mobile Food Vending, of this Chapter.
- ¹⁷ [Indoor or outdoor music is permitted as an accessory use on the same parcel in conjunction with a restaurant or bar that is a principal permitted use or approved conditional use in the C1, C2, and TC zones. See also Subsection XI-10-5.04\(E\) for additional regulations.](#)
- ¹⁸ [Examples of "other live entertainment" include, but are not limited to, stand-up comedy, theatrical shows, magic shows, and karaoke.](#)

Title XI, Chapter 10, Section 5 (Commercial Zones and Standards), Subsection XI-10-5.04 (Commercial Zone Special Development Standards) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-5.04 Commercial Zone Special Development Standards

A. All Zones.

1. Areas for Collecting and Loading Recyclable Materials. There shall be provided areas for collecting materials in accordance with Subsection 54.12, Areas for collecting and loading recyclable materials, of this Chapter.
2. All outdoor storage areas of such things as trash and materials shall be within a completely enclosed building or behind a visually obscure solid wall or tight board fence a minimum six (6) feet in height and shall not be located within any front or street side yard setback area.
3. Such uses, operations or products shall not be objectionable due to odor, dust, smoke, noise, vibration or other similar causes.

B. TC Zone.

1. Setbacks for Residential Projects. Except for the Calaveras Boulevard setback, all other setbacks shall be determined through a Site Development Permit.

- C. Neighborhood Commercial (C1) Zone. Thrift stores shall comply with each of the following standards:
1. Signage prohibiting dumping of merchandise during non-business hours shall be installed in conspicuous locations to the satisfaction of the Planning Director indicating penalties and fines for such activity. Signage shall include daytime collection hours for donated goods.
 2. A designated area inside the building shall be established for the receipt, sorting and processing of goods. Donated goods shall be accepted only inside the building and during regular business hours; no donated goods shall be left outside. Loading and unloading must take place in a designated area that shall be cleared, cleaned and maintained before closing of business each day.
 3. The storefront windows shall be permanently maintained as displays of merchandise in a professional and attractive manner (i.e., unsightly clothing racks and displays shall not be placed adjacent to the windows).
 4. Any goods or materials left outside of the store overnight shall be removed immediately upon the thrift store opening the next business day.
 5. Outdoor storage or display of donated goods or merchandise shall not be permitted.
 6. The subject property shall be maintained free of trash, debris, any all other goods at all times.
 7. Thrift stores shall not be located closer than one thousand (1000) feet from another thrift store.
- D. General Commercial (C2) and Town Center (TC) Zones.
1. In deciding whether to grant a request for additional building height through the Conditional Use Permit process pursuant to Section XI-10-57.04(C)(1), the Planning Commission shall consider site conditions, design elements, and other factors including but not limited to (a) width of right-of-way of principal street; (b) proximity of the site to low- or medium-density residential districts (R1, R2, and R3); (c) building setbacks in relation to proposed building height in excess of 35 feet; and (d) upper story setbacks. *[This section to be adopted at the same Council meeting on the same date. Language included here to maintain the correct section numbering].*

E. Outdoor Music

1. Outdoor music as an accessory use in conjunction with a restaurant or bar in the C1, C2, or TC zone shall be permitted for the entertainment and enjoyment of customers at the restaurant or bar during regular operating hours. Outdoor music as an accessory use shall be limited to the hours of 9:00 am to 11:00 pm.
2. Recorded background music may be permitted outdoors on public sidewalks and in other public areas subject to the standards of this Chapter and Title V – Public Health, Safety and Welfare, Chapter 213 – Noise Abatement.
3. Noise levels for outdoor music, when permitted as an accessory use to a restaurant or bar, shall not exceed a maximum range of 70 to 90 decibels (dB). See also Title V – Public Health, Safety and Welfare, Subsections V-213-2 and V-213-3, for additional regulations.
4. Larger outdoor music events, both live and recorded music, which are intended for the entertainment and enjoyment of the general public shall require a Special Event Permit pursuant to Section 15, Special Events and Activities, of this Chapter.

SECTION 7. AMENDMENT OF MILPITAS MUNICIPAL CODE TITLE XI, CHAPTER 10, SECTION 6

XI-10-6.02 Mixed Use Regulations

A. Permitted and Conditionally Permitted Uses.

1. Primary uses. The uses identified in Table 6.02-1, Mixed Use Zone Uses, shall be the primary uses allowed to occur on a property. All uses except for those noted shall be conducted within enclosed structures. The primary uses identified in Table 6.02-1 shall be permitted or conditionally permitted, as indicated:

P	Where the symbol "P" appears, the use shall be permitted.
MCS	Where the symbol "MCS" appears, the use shall be permitted subject to the issuance of a Minor Conditional Use Permit by staff, in accordance with Section 57.04, Conditional Use Permits and Minor Conditional Use Permits, of this chapter.
P/C	Where the symbol "P/C" appears the use may be permitted if certain criteria is met or otherwise a Conditional Use Permit shall be required, in accordance with Section XI-10-57.04, Conditional Use Permits, of this Chapter.
C	Where the symbol "C" appears, the use shall be permitted subject to the issuance of a Conditional Use Permit, in accordance with Section 57.04, Conditional Use Permits and Minor Conditional Use Permits, of this chapter.
MC	Where the symbol "MC" appears, the use shall be permitted subject to the issuance of a Minor Conditional Use Permit, in accordance with Section 57.04, Conditional Use Permits and Minor Conditional Use Permits, of this chapter.
O	Where the symbol "O" appears, the use is subject to an alternative review process described in a subsequent footnote.

2. Accessory Uses.

- a. Massage Services. Massage services may be allowed as an accessory use to any permitted or conditionally permitted medical office, medical clinic, chiropractor practice, acupuncture practice, physical therapist, fitness and athletic facility, health care facility (such as hospitals, nursing homes and sanitariums), and accredited school, college, and university. Massage services, limited to massage of the head, neck, shoulders, hands and feet may be allowed as an accessory use to any permitted or conditionally permitted beauty salon, barbershop, and healing art practices. This section shall not exempt any person or business from complying with all the provisions of Title III, Chapter 6.

B. Prohibited Uses. The following uses are prohibited:

1. Uses where the symbol "NP" appears within Table 6.02-1.
2. The following uses are not permitted in any mixed use zone:
 - a. Adult Businesses as defined in Subsection 13.04, Adult Businesses, of this Chapter.
 - b. Disinfecting and extermination business.
 - c. Ground level residential in the Ground Level Commercial Area as shown on the Midtown Specific Plan Land Use Map, Figure 3.1 and Zoning Map.
 - d. Outdoor storage of vehicles.
 - e. Private self-storage facilities
 - f. Single family detached dwellings

- g. Two family dwelling units
 - h. Drive through uses (restaurants, pharmacies, etc.)
- C. Other Uses. Any other uses may be considered by the Planning Commission that are similar in accordance with the procedure, prescribed in Subsection 10-54.02, Other Uses Permitted by Commission, of this Chapter.

**Table XI-10-6.02-1
Mixed Use Zone Uses**

Use	MXD	MXD2		MXD3
		Ground Level (Facing Retail street)	Upper Floor	
1. Commercial Uses				
Alcohol beverage sales	C	C	C	C
Commercial services ¹	MCS	MCS	MCS	MCS
Grocery stores (supermarkets)	C	C	C	C
Pawnshops ²	C	C	C	C
Pet shops	C	NP	NP	NP
Retail stores, general merchandise ³	MCS	MCS	MCS	MCS
Tanning salons	P	P	P	P
Thrift shops (used merchandise)				
Retail	P	P	P	P
With collections	C	C	C	C
2. Entertainment and Recreation				
Commercial athletic facilities	P	P	P	P
Motion picture theater (see 6 below)				
Recreation or entertainment facility	C	C	C	C
3. Health and Veterinarian Uses				
Animal grooming (no boarding)	P	P	NP	P
Hospitals or sanitariums ⁴	C	C	C	C
Massage establishment ¹⁷¹⁸	MC	MC	MC	MC
Massage establishment, accessory ¹⁷¹⁸	MCS	MCS	MCS	MCS
Medical or dental offices and clinics	P	NP	P	P
Medical support laboratories	P	P	P	P
Optician and optometrist shop	P	P	P	P
Pharmacy or drug store	P	P	P	P
Veterinarian clinic	P	P	P	P
4. Lodging				
Bed and breakfast	P	P	NP	NP
Boarding houses (3 or more persons)	C	C	C	C
Group dwellings	C	C	C	C
Hotels	C	P	P	P
Motels	C	C	C	C
5. Professional Offices, Financial Institutions and Related Uses ⁴				
Financial institutions (banks, savings and loans, etc.)	MCS	NP	MCS	P
Offices ³	MCS	NP	MCS	P
6. Public/Quasi Public and Assembly Uses				

Child care				
Child care center	C	P	C	P
Day care school	C	C	C	
Large family child care home	P	P	C	P
Small family child care home	P	P	P	P
Instruction				
Group ⁴³¹⁴	P	NP	NP	NP
Private	P	P	P	P
Park, playground or community center ⁵	O	O	O	O
Places of assembly ⁴	C	C	C	C
Public utilities	C	C	C	C
Schools, private (elementary, middle and high) ⁴	C	C	C	C
Theaters (Indoor)	C	C	C	C
Trade and vocational schools ⁴	C	C	C	C
Transportation facilities ²	C	C	C	C
7. Residential Uses				
Multi-family housing ⁷	P	NP	P	P
Transitional and supportive housing ⁷	P	NP	P	P
Accessory Dwelling Unit ⁴⁹²⁰	P	NP	P	P
8. Restaurants or Food Service				
Bar or nightclub	C ¹⁰	C ¹⁰	C	C ¹⁰
Brewery/Eateries ¹⁰	MCS	MCS	NP	MCS
Catering establishments	C	C	C	C
Restaurants ²	P/C	P/C	NP P/C	P/C
<u>With music (indoor/outdoor)</u>	<u>P¹⁰</u>	<u>P¹⁰</u>	<u>P¹⁰</u>	<u>P¹⁰</u>
With <u>other live entertainment</u> /dancing ¹¹ and entertainment	C	C	C	C
With ancillary on-premise beer & wine with no separate bar	P	P	P	P
Mobile Food Vending (individual vehicle) ²⁰²¹	P	P	NP	P
Mobile Food Park ²⁰²¹	MC	NP	NP	MC
Commissary	MC	NP	NP	MC
9. Unclassified Uses				
Artisan Studios & Live-work units, woodworking or glassworking, plumbing or metalworking and sign shops ²	MCS	MCS	MCS	MCS
Lobbies and entries for upper floor uses	P	P	NP	P
Model home complex ⁴¹¹²	P	P	P	P
Mixed use developments ⁴²¹³	P	P	P	P
Planned Unit Development ⁴³¹⁴	P	P	P	P
Temporary seasonal sales ⁴⁴¹⁵	P	P	P	P
Short-Term Rentals ⁴⁸¹⁹	P	NP	P	P
10. Vehicle-Related Repair, Sales and Services				
Auto sales and rental ⁴⁵¹⁶	C	C	C	C
Auto broker (wholesale, no vehicles on site) ²	MCS	MCS	MCS	MCS
Vehicle service uses ⁴⁶¹⁷	C	NP	NP	C

- ¹ Refer to Subsection XI-10-6.02-1(B), Performance standards for certain uses, of this Chapter, for standards.
- ² Refer to Subsection XI-10-6.02-1, Special Uses, of this Chapter, for standards.
- ³ Refer to Subsection XI-10-6.02-1(B) Performance standards for certain uses, of this Chapter.
- ⁴ Refer to Subsection XI-10-6.02-2, Quasi-Public Uses, of this Chapter, for standards.
- ⁵ For parks, playgrounds or community center owned and operated by a government agency or a nonprofit community organization.
- ⁶ Refer to XI-10-13.14, Special Uses, Emergency Shelters, of this Chapter.
- ⁷ Ground level residential is prohibited in the Ground Level Commercial Area as shown on the Midtown Specific Plan Land Use Map, Figure 3.1.
- ⁸ Refer to XI-10-13.13, Special Uses, Single Room Occupancy Residences, of this Chapter.
- ⁹ Uses serving upper-floor residential uses, such as common gathering space, lobby, and resident services, may be allowed as ground floor uses where residential uses would otherwise not be permitted.
- ¹⁰ ~~Reserved.~~ Indoor or outdoor music is permitted as an accessory use on the same parcel in conjunction with a restaurant or bar that is a principal permitted use or approved conditional use in the MXD, MXD2, and MXD3 zones. See also Subsection XI-10-6.06(B) for additional regulations.
- ¹¹ Examples of “other live entertainment” include, but are not limited to, stand-up comedy, theatrical shows, magic shows, and karaoke.
- ¹² ¹³ Refer to Subsection XI-10-13.11I, Model Home Complexes and Sales Offices, of this Chapter for temporary tract offices.
- ¹²⁻¹³ Which include only permitted uses.
- ¹³ ¹⁴ Refer to Section XI-10-54.07, Planned Unit Developments, of this Chapter, for standards.
- ¹⁴ ¹⁵ Refer to Section XI-10-13.11(D), Temporary Seasonal Sales, of this Chapter.
- ¹⁵ ¹⁶ New and used auto, recreational vehicle and boat sales, excluding commercial vehicles, trucks, buses, vans, and farm equipment, with accessory repairs and services, only allowed if fully enclosed within a building. Bicycle and auto rental agency, excluding commercial vehicles, trucks, buses, vans, boats and RV rentals, only if fully enclosed within a building.
- ¹⁶ ¹⁷ Refer to Subsection XI-10-6.02-2, Special Uses, of this Chapter, for standards. Service stations shall follow the “General development policy: Gasoline service stations, and automotive service centers” adopted by the City Council on December 19, 1995.
- ¹⁷ ¹⁸ Massage establishments are subject to Title III, Chapter 6 of the Milpitas Municipal Code and Subsection XI-10-13.16 of this title. Refer to Subsection XI-10-13.16, of this Title, for special provisions for massage establishments.
- ¹⁸ ¹⁹ Only allowed within a dwelling unit, subject to the requirements of Subsection XI-10-13.17, Short-Term Rentals, of this Chapter.
- ¹⁹ ²⁰ Only allowed within multi-family dwellings, subject to the requirements of Subsection XI-10-13.08, Accessory Dwelling Units, of this Chapter.
- ²⁰ ²¹ Refer to Subsection XI-10-13.18, Mobile Food Vending, of this Chapter.

6.02-1 Mixed Use Zone Special Uses

- A. Special Uses within all MXD zones. Certain uses noted in Table 6.02-1, Mixed Use Zone Uses may be allowed through the approval of a Conditional Use Permit and Minor Conditional Use Permits, in accordance with Subsection 57.04, Conditional Use Permits, of this Chapter, if they are not located within one thousand (1,000) feet of another same use listed below. This distance shall be measured from the property line of the parcel where such use is located.
 1. Auto service uses, including but not limited to: gasoline service stations, car washes, tire shops, towing without vehicle storage and auto repair shops of all kinds, radiators, paint, body, glass, brakes, upholstery, and other similar types.
 2. Local transportation service facilities (e.g. taxi, parcel service, ambulance, armored car, and van storage) without outdoor storage of vehicles.
 3. Pawnshops.
- B. Performance Standards for Certain Uses. For uses requiring approval of a Minor Conditional Use Permit by staff, in accordance with Section XI-10-57.04, Conditional Use Permits and Minor Conditional Use Permits, of this Chapter, the following performance standards below shall be met.
 1. Auto Brokers. Auto Brokers may be permitted by right if the following standards are met:

- a. Local Sales and Use Tax. In order to assist the City of Milpitas in its efforts to receive distribution of the local tax on materials associated with the project, the California Sales and Use Tax (the "Local Tax") shall be allocated to the project site, to the extent reasonably possible. Evidence of tax allocation or cause as to why such allocation cannot be made shall be submitted at the time of business license submittal.
2. Auto Service Uses. Auto Service uses shall comply with the following standards:
 - a. All operations shall be conducted completely within an enclosed building.
 - b. Entrances to the service bays shall not be open to the street but shall be designed to face the rear or interior side property line.
3. Artisans, Plumbing, Metalworking, Sign Shops and Woodworking or glass working shops. These uses shall comply with the following standards:
 - a. All operations shall be conducted completely within an enclosed building.
 - b. There shall be no dust, fume, or odor either emitted from the premise.
 - c. The operations shall not create excessive vibrations.
 - d. The operations shall be consistent with the City's noise standards.
 - e. Plumbing, metalworking, sign shops, woodworking or glass working shops shall not be closer than 1,000 feet of another same use measured from the property line.
4. Commercial Services uses shall comply with the following:
 - a. When located within the MXD zone:
 - i. Located in the area designated for ground floor retail and are less than or equal to ten thousand (10,000) square feet in gross floor area;
 - ii. Located in the areas not designated for ground floor retail and are less than or equal to fifty thousand (50,000) square feet in gross floor area.
 - b. When located within the MXD2 and MXD3 zones they are less than or equal to fifty thousand (50,000) square feet in gross floor area;
 - c. They are not open past 10:00 p.m.;
 - d. They are not specifically noted in Table 6.02-1, Mixed Use Zone Uses, of this chapter, requiring Conditional Use Permit approval or listed as a prohibited use;
 - e. They are not listed as a prohibited use in Section 10-6.02 (B), Prohibited Uses, of this Chapter.

If items a through c above are not met, then approval of a Conditional Use Permit is required in accordance with Subsection 57.04, Conditional Use Permits and Minor Conditional Use Permits, of this Chapter.

5. Group Instruction uses shall comply with the following standards:
 - a. No loitering shall be permitted before or after any classes or sessions.
6. Restaurants may be permitted provided:
 - ~~a. They provide no dancing or live entertainment;~~
 - ~~b.~~ They have only ancillary on-premise consumption of beer and wine associated with food sales;
 - ~~c.~~ They have no separate bar area;
 - ~~d.~~ When located within the MXD2 and MXD3 zones they are located on the ground floor facing a public street designated as a retail mixed use street; and

ed. They conform to the performance standards listed in this subsection (f) below.

If items (a) through (~~dc~~) above are not met, then approval of a Conditional Use Permit is required in accordance with Section 57, of this Chapter.

Fe. Restaurant Performance Standards. Restaurants shall comply with the following performance standards:

- i. Seating shall not exceed that which the amount of parking allocated for the restaurant space would allow. A sign measuring at least one (1) foot by one (1) foot, with a lettering height of at least three (3) inches, shall be placed in a conspicuous location near the restaurant front entrance stating the maximum total seating allowed. Outdoor seating is allowed if it has been approved as part of the facility's Minor Site Development Permit or Site Development Permit and is operated in conformance with any conditions of that approval.
 - ii. The restaurant shall comply with the City Council's Guidelines for Recycling Enclosures (Resolution No. 6296).
 - iii. The restaurant shall incorporate measures to reduce odors to acceptable levels, including, but not limited to, installation of a scrubber, carbon filter or similar equipment, on the roof vent to control odors.
 - iv. All the facility's floor drains, trash compactors and indoor mat and equipment washing areas shall be drained to the sanitary sewer.
 - v. Where applicable, the restaurant shall maintain an active account with a tallow hauling company.
 - vi. The restaurant shall prepare and implement a program assigning restaurant staff responsibility for complying with the following guidelines which shall be adhered to while the restaurant is in operation:
 - 1) Wash all containers and equipment in the kitchen areas so that wash water may drain into the sanitary sewer.
 - 2) Keep garbage dumpsters clean inside and out; replace very dirty dumpsters with new, clean ones.
 - 3) Double bag waste to prevent leaking.
 - 4) Place, do not drop or throw, waste-filled bags, to prevent leaking.
 - 5) Keep the ground under and around the garbage dumpsters swept.
 - 6) Sprinkle the ground lightly after sweeping with a mixture of water and a little bleach.
 - 7) Hold training sessions to instruct employees on the proper procedures in the handling and disposal of food items; the general maintenance and use of the compactor and any other procedures that would assist the business in complying with all State and local health and sanitation standards. A record of such training must be kept to prove compliance with this requirement.
 - 8) Post signs (in English and multi-lingual) inside the premises for all employees identifying procedures for food delivery and garbage disposal.
 - 9) All garbage bins shall be stored in the garbage enclosure except for the twelve (12) hours immediately before and after garbage collection.
7. Retail and Offices shall comply with the following:
- a. When located within the MXD zone:
 - i. Located in the area designated for ground floor retail and are less than or equal to ten thousand (10,000) square feet in gross floor area;

- ii. Located in the areas not designated for ground floor retail and are less than or equal to fifty thousand (50,000) square feet in gross floor area.
- b. When located within the MXD2 and MXD3 zones they are less than or equal to fifty thousand (50,000) square feet in gross floor area;
- c. They are not open past 10:00 p.m.;
- d. They are not specifically noted in Table 6.02-1, Mixed Use Zone Uses, of this Chapter, requiring Conditional Use Permit approval or listed as a prohibited use; and
- e. They are not listed as a prohibited use in Section 10-6.02 (B), Prohibited Uses, of this Chapter.

If items a through c above are not met, then approval of a Conditional Use Permit is required in accordance with Section 57, Conditional Use Permits and Minor Conditional Use Permits, of this Chapter.

Title XI, Chapter 10, Section 6 (Mixed Use Zones and Standards), Subsection XI-10-6.06 (Special Development Standards) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-6.06 Special Development Standards

A. Utilities.

1. Utilities shall be placed in underground or subsurface conduits.
2. All mechanical equipment, ground transformers and meters shall be located and screened to minimize visual impacts.
3. Rooftop mechanical equipment shall be concealed from street level views through roof designs that area architecturally integrated with the building, such as equipment wells and parapets.
4. Public utility distribution meters, vaults and similar installations shall be consolidated in a single area whenever possible and located away from highly visible areas such as street corners and public open spaces.
5. Backflow preventors shall be located within landscaped setback areas and painted black or dark green to minimize visual impact. Where no landscaped setback areas exist the backflow preventors shall be incorporated into the front of the building to minimize visual obtrusiveness.
6. Refuse and recycling containers shall not be visible from a public or private street. Such containers shall be stored either within the parking facility of the building or within a vehicular accessway with screening designed to meet the requirements of this section.
7. Trash enclosure walls shall incorporate building materials and colors that match the architecture of the building, and be well landscaped.
8. All telecommunications antennas shall be building I or roof mounted and screened appropriately.
9. On Main Street only telecommunication facilities that are disguised to appear as a part of the building architecture (i.e. “stealth” antennas) may be used.

B. Outdoor music

1. Outdoor music as an accessory use in conjunction with a restaurant or bar in the MXD, MXD2, or MXD3 zones shall be permitted for the entertainment and enjoyment of customers at the restaurant or bar during regular operating hours. Outdoor music as an accessory use shall be limited to the hours of 9:00 am to 11:00 pm.

2. Recorded background music may be permitted outdoors on public sidewalks and other areas subject to the standards of this Chapter and Title V – Public Health, Safety and Welfare, Chapter 213 – Noise Abatement.
3. Noise levels for outdoor music, when permitted as an accessory use to a restaurant or bar, shall not exceed a maximum range of 70 to 90 decibels (dB). See also Title V – Public Health, Safety and Welfare, Subsections V-213-2 and V-213-3, for additional regulations.
4. Larger outdoor music events, both live and recorded music, which are intended for the entertainment and enjoyment of the general public shall not be considered accessory uses and shall require a Special Event Permit pursuant to Section 15, Special Events and Activities, of this Chapter.

SECTION 8. AMENDMENT OF MILPITAS MUNICIPAL CODE TITLE XI, CHAPTER 10, SECTION 15

Title XI, Chapter 10, Section 15 (Special Events and Activities), Subsection XI-10-15.03 (Review Requirement) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-15.03 Review Requirement

Special Events shall require review and approval in accordance with Table XI-10-15.03-1, below.

**Table XI-10-15.03-1
Review Requirements for Special Events**

Threshold for review	Planning Director or Designee	Zoning Administrator
<u>Minor Events</u> <u>Fewer than 250 participants or attendees</u> <u>Takes place on a single day</u> <u>No street closures or amplified sound</u>	<u>X</u>	
Minor <u>Regular Events</u> <u>Between 250 and 1,000 participants or attendees</u> <u>Between one and four consecutive days (including set up and tear down).</u> Any Special Event w<u>With or without amplified sound that does not exceed four consecutive days (including set up and tear down).</u> <u>Block parties on a residential street.¹</u>	X	
Major Events <u>More than 1,000 participants or attendees anticipated</u> <u>Between four and seven consecutive days (including set up and tear down).²</u> Any Special Event that exceeds four consecutive days (including set up and tear down); up to seven days w<u>With or without amplified sound</u> and/or Requires <u>street closures (other than block parties on a residential street) or any event that anticipates crowds exceeding 1,000 people.²</u>	X	
Multiple Reviews <u>Recurring Events</u>	X	X

- Recurring Special Events (up to four events per calendar year): Applicant may request a one-time review and issuance of a Special Event Permit for events which occur up to four times per calendar year for a permissible duration of four consecutive days for each recurring event.³ Multi-YearAnnual Events: Applicant may request a Special Event Permit good for up to three years for Special Events that will be held annually, for up to three consecutive years in the same location. Applicant must demonstrate that the same event location, layout, date and times are adhered to for each event.³		
Appeals or Revocations Hearing on a notice of decision to deny an application for Special Event Permit or to revoke or appeal a Special Event Permit.⁴		X

¹ See MMC V-100-13.05

² Permits for events exceeding seven days may be granted at the Planning Director's discretion.

³ Planning Director may recommend to Zoning Administrator for review and approval.

⁴ Appeals to the Zoning Administrator may only occur after denial or revocation by the Planning Director or designee.

Title XI, Chapter 10, Section 15 (Special Events and Activities), Subsection XI-10-15.04 (Definitions) of the Milpitas Municipal Code is hereby amended to read as follows:

XI-10-15.04 Definitions

The definitions set forth in this part shall govern the application and interpretation of this Section.

- "Amplified Sound" means the use of any loudspeaker, public address system, amplifier, or any other device which electronically or mechanically increases the volume of the human voice, music, or any other sound.~~any sound created by the use of sound amplification equipment and/or performance with electric or acoustic instruments associated with a special event.~~
- "Athletic Events" means a physical or endurance activity that includes but is not limited to races, runs, walkathons, bicycle tours and the like.
- "Block Party" means a party for all the residents of a block or neighborhood, typically held on a temporarily closed City street.
- "Business day" means any day except Saturday, Sunday and holidays observed by the City of Milpitas.
- "Business License" means a permit issued by the City of Milpitas that allows individuals, companies, or other entities to transact and conduct business within the City limits.
- "City Official" means an authorized officer of the City of Milpitas as appointed by the City Manager or City Council.
- "Director" means the Director or head of the department(s) designated to issue Special Event Permits, or such other person or persons designated by the Director to fulfill the responsibilities identified as the Director's responsibilities herein.

8. "Downtown" means the main business or commercial areas within the Midtown and Town Center Specific Plan districts and the Town Center Zoning District.
9. "First Amendment Event" means conduct, the sole or principal object of which is the expression, dissemination or communication by verbal, visual, literary, or auditory means of opinion, views or ideas. Expressive activity includes, but is not limited to, public oratory and distribution of literature.
10. "Indigent Natural Person" includes, but is not limited to, a person enrolled or participating in a federal or state government assistance program for low-income or indigent persons such as general assistance, CalWORKS, Medi-Cal, food stamps, Supplemental Security Income (SSI), Women, Infants and Children (WIC), U.S. Department of Housing and Urban Development (HUD) Section 8 rental housing subsidy, and other subsidized or public housing.
11. "Indoor/Outdoor Facility Rental Agreement" means a rental agreement issued by the Recreation Services Department to conduct a special event in a park.
12. "Mobile Food Vending Event" means an event where two or more mobile food vehicles gather in one location for a period of seven consecutive days or less.
13. "Outside Agency" means any local, state or federal regulatory agency responsible for administering permits to allow certain activities within their purview. Outside agencies includes but not limited to other City jurisdictions, Santa Clara Valley Water District (SCVWD), Santa Clara Valley Transportation Authority (VTA), California Department of Transportation (Caltrans), California Department of Alcoholic Beverage Control, Santa Clara County Department of Environmental Health and Santa Clara County Roads and Airports.
14. "Parade" means an organized group marching in procession on a street. Parades do not include races, runs or other athletic events.
15. "Park", for purposes of this Section, means all outdoor areas managed by the Recreation Services Department, which are identified as a City park by the City, made available for use by the public as a park for recreation or open space purposes, and over which the City has the right of use for such purposes. The term "park" does not include outdoor areas adjacent to community centers not otherwise located within a City park, or property owned by school districts even if the property is used by the City for recreational purposes.
16. "Paseo" means a mall designed and used for pedestrian passage between two or more parallel streets and which is owned or controlled by the City. The definition of "paseo" includes any adjacent sidewalks.
17. "Permittee" means a person, company, corporation or entity that is given a permit or permission to hold a Special Event.
18. "Permit Applicant" means a person, company, corporation or entity that applies for a permit.
19. "Plaza" means a public square or similar open area in the downtown which is owned or controlled by the City. The definition of "plaza" includes any adjacent sidewalks.
20. "Public Right-of-Way" means any street, alley, or similar parcel of land, which is deeded, dedicated, or otherwise permanently appropriated to the public for public use.
21. "Regulations" means the policies, rules and regulations mandated by the City which govern the Special Event Permit and use of City sidewalks, streets, plazas, paseos, and parks.
22. "Simple Assembly" means a gathering of persons at a park, plaza or paseo that does not include any of the following:
 - a) The placement or erection of equipment or temporary structures other than one portable table and two chairs; or

- b) Activities referenced in Section XI-10-15.04(23)(c) of this Code.
 - c) For purposes of illustration, a simple assembly can be a large gathering of 150 persons; no equipment or structures (other than a table and two chairs) are placed or erected; and the other activities (i.e., cooking, sale or public distribution of food and commercial merchandise) are not involved. Nothing herein prevents the use of handheld equipment, including a loudspeaker, and handheld signs at a simple assembly.
23. "Special Event" (Minor, Regular, or Major) means any indoor or outdoor event that consists of any combination of the following:
- a) A parade or assembly consisting of persons, animals, vehicles, or any combination thereof, which is ~~to~~ intended to assemble or travel in unison on any street and which does not comply with applicable traffic regulations, laws, or controls;
 - b) An organized assemblage of ~~150 or more~~ persons at a plaza, ~~or park, or 75 or more persons on a paseo, or any assemblage that exceeds the maximum capacity of the plaza, park or paseo facility~~ gathered for a common purpose under the direction or control of a person or organization; or
 - c) An activity or event on a public right-of-way, plaza, paseo, park or private property which involves:
 - i. The placement or erection of equipment or temporary structures other than one portable table and two chairs, including but not limited to a booth, tent, canopy, stage, barricade, fencing, generator, heating equipment, sound amplifier, vehicle or float;
 - ii. The use of live animals, fireworks, pyrotechnics, electrical power and/or cabling, or equipment or materials that can create a risk of damage to public or private property or injury to persons;
 - iii. Cooking or the sale, preparation for sale or commercial distribution of food or beverages;
 - iv. The sale of commercial merchandise.
 - d) An activity which involves blocking off a street or other use of a street which obstructs the normal traffic thereon.
 - e) Examples of Special Events include, but are not limited to, concerts, parades, carnivals, fairs, festivals, block parties, public dances, street fairs, community events, sporting or athletic events, parties, meals, mobile food vending events, celebrations and receptions.
 - f) For definitions of "Major," "Regular," or "Minor" Special Events, see Table XI-10-15.03-1: Review Requirements for Special Events.
24. "Special Event Permit" means a permit issued pursuant to this Section, which authorizes the holder to conduct a Special Event at a Special Event Venue in accordance with its terms and conditions. A Special Event Permit includes a Temporary Street Closure Permit, Temporary Assembly Permit, Business License, and any outside agency regulatory permits that may be required for the operations and activities for the aforementioned Special Event.
25. "Special Event Venue" means the outdoor area (i.e., private property, street, park, paseo, or plaza) for which a Special Event Permit has been issued.
26. "Street" means a public or private right-of-way used for vehicular traffic that is owned, controlled or maintained by the City. The definition of "street" includes the entire street right-of-way inclusive of any and all adjacent sidewalks.
27. "Temporary Street Closure Permit" means a permit issued by the Chief of Police of the Milpitas Police Department or designee to conduct a special event on a public street.
28. "Temporary Assembly Permit" means a permit that is issued by the City of Milpitas Fire Marshal for the temporary assembly of 50 or more people associated with a Special Event.

29. "Temporary Collection Service Agreement" means an agreement between the Permittee and a public service provider for the trash and recycling collection.
30. "Written Request" means written, typed or email correspondence submitted by the applicant to the Director or Designee. Text messages are not included.

SECTION 9. SEVERABILITY

The provisions of this Ordinance are separable, and the invalidity of any phrase, clause, provision, or part has no effect on the validity of the remainder.

SECTION 10. EFFECTIVE DATE AND POSTING

In accordance with Section 36937 of the Government Code of the State of California, this Ordinance takes effect 30 days from the date of its passage. The City Council hereby directs the City Clerk to cause this Ordinance or a summary thereof to be published in accordance with Section 36933 of the Government Code of the State of California.

RESOLUTION NO. 22-007

**A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MILPITAS
RECOMMENDING THAT THE CITY COUNCIL APPROVE ZONING TEXT
AMENDMENT ZA22-0003 AMENDING SECTIONS OF TITLE XI, CHAPTER 10 -
ZONING AND TITLE V, CHAPTER 213 – NOISE ABATEMENT OF THE MILPITAS
MUNICIPAL CODE RELATING TO OUTDOOR MUSIC AS AN ACCESSORY USE TO
RESTAURANTS AND BARS AND CATEGORIES AND PERMIT REQUIREMENTS
FOR SPECIAL EVENTS; AND DETERMINING THE ORDINANCE TO BE EXEMPT
FROM ENVIRONMENTAL REVIEW PURSUANT TO CEQA GUIDELINES SECTION
15061(B)(3)**

WHEREAS, the City of Milpitas, California (the “City”) is a municipal corporation, duly organized under the constitution and laws of the State of California; and

WHEREAS, California Government Code Section 65800 et seq. authorizes the adoption and administration of zoning laws, ordinances, rules, and regulations by cities as a means of implementing the General Plan; and

WHEREAS, the City wishes to encourage and allow outdoor live and recorded music at restaurants and bars as a way to encourage a vibrant city, provide accessible arts and entertainment for Milpitas residents and visitors, and support local business and musicians; and

WHEREAS, clear and specific land use and noise regulations, including operational standards such as noise level limits, permitted hours, and protections against disturbing noise for residential neighborhoods are important elements in a municipal government’s process of allowing and encouraging outdoor music; and

WHEREAS, the City wishes to simplify and facilitate the process of approving small special events of limited scale that do not create negative impacts on surrounding areas; and

WHEREAS, the City wishes to reduce the cost of obtaining a Special Event Permit for applicants proposing to hold small and simple special events of limited scale; and

WHEREAS, the City’s Zoning Ordinance, Chapter 10 of Title XI of the Milpitas Municipal Code, currently includes land use regulations for the location and approval procedures for special events generally as well as for live entertainment associated with restaurants and bars in commercial and mixed-use zoning districts; and

WHEREAS, the City’s Noise Abatement Ordinance, Chapter 213 of Title V of the Milpitas Municipal Code, currently includes requirements and standards for noise levels in residential zones that serve to protect these areas from disturbing noise and maintain peaceful, favorable living environments; and

WHEREAS, the City has prepared a Zoning Amendment (“Amendment”) to the City’s Municipal Code, including Section 2.03 (“Definitions”), Section 5.02 (“Commercial Use

Regulations”), Section 5.04 (“Commercial Zone Special Development Standards”), Section 6.02 (“Mixed Use Regulations”), Section 6.06 (“Mixed Use Special Development Standards”), and Section 15 (“Special Events and Activities”) of Title XI, Chapter 10–Zoning; and including Section 213-2 (“Definitions”) and Section 213-3 (“Unlawful to Create or Permit Disturbing Noise”) of Title V, Chapter 213–Noise Abatement; and

WHEREAS, the Planning Commission makes and accepts as its own the findings set forth in this resolution; and

WHEREAS, the Planning Commission is an advisory body to the City Council; and

WHEREAS, the Planning Commission hereby finds and determines that the project is exempt from further CEQA review pursuant to CEQA Guidelines section 15061(b)(3) (common sense exemption); and

WHEREAS, on June 22, 2022, the Planning Commission held a duly noticed public hearing on the subject application, at which all those in attendance were given the opportunity to speak on the Zoning Text Amendment; and

WHEREAS, the Planning Commission has considered all the written and oral testimony presented at the public hearing in making its decision; and

NOW THEREFORE, the Planning Commission of the City of Milpitas hereby finds, determines, and resolves as follows:

SECTION 1. Recitals

The Planning Commission has duly considered the full record before it, which may include but is not limited to such things as the City staff report, testimony by staff and the public, and other materials and evidence submitted or provided to the Planning Commission. Furthermore, the recitals set forth above are found to be true and correct and are incorporated herein by reference.

SECTION 2. CEQA Finding

The Planning Commission finds, under CEQA Guidelines, Section 15061(b)(3), that this Ordinance is exempt from further environmental review because it is the adoption of an ordinance amending zoning regulations but would not permit any particular project. Therefore, it can be seen with certainty that there is no possibility that the Ordinance in question may have a significant effect on the environment; accordingly, the Ordinance is not subject to review under CEQA.

SECTION 3. Findings for Zoning Amendment (Milpitas Municipal Code, Subsection XI-10-57.02(G)(3))

The Planning Commission makes the following findings based on the evidence in the public record in support of Zoning Text Amendment No. ZA22-0003:

1. *The proposed amendment is consistent with the General Plan.*

The proposed amendments are consistent with the Milpitas General Plan. Specifically, they would serve to implement several goals and policies in the Economic Development, Noise, Utilities and Community Services, and Parks, Recreation & Open Space Elements by supporting and encouraging small live music events at food and beverage businesses throughout the city while also establishing rules and standards that would limit hours and noise levels to protect residential areas from disturbing noise. In this way, the amendment would strike a positive balance between supporting arts, entertainment and economic development and preserving the quiet enjoyment of residential areas in Milpitas.

2. *The proposed amendment will not adversely affect the public health, safety and welfare.*

The proposed zoning and noise ordinance amendments for live music will promote the public interest and protect public health and welfare by limiting noise from outdoor music at restaurants and bars to reasonable noise levels (70-90 dB) and reasonable hours (no later than 11 pm). The amendments for special events will also promote the public interest by providing reasonable and easy-to-follow guidelines and procedures for small community events, making it easier for the City to approve small events that are compatible with community well-being and will not create negative community impacts.

SECTION 4: Planning Commission Action

The Planning Commission of the City of Milpitas hereby adopts Resolution No. 22-007 recommending that the City Council adopt Zoning Text Amendment ZA22-0003 based on the above Findings.

PASSED AND ADOPTED at a regular meeting of the Planning Commission of the City of Milpitas on June 22, 2022.

DocuSigned by:
Chair Bill Chuan Jun 22 2022
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Bill Chuan, Chair

Resolution No. 22-007**Page 4****Item # 18.****TO WIT:**

I HEREBY CERTIFY that the following resolution was duly adopted at a regular meeting of the Planning Commission of the City of Milpitas on June 22, 2022, and carried by the following roll call vote:

COMMISSIONER	AYES	NOES	ABSENT	ABSTAIN
Mercedes Albana	✓			
Dipak Awasthi	✓			
Bill Chuan	✓			
Larry Ciardella	✓			
Alexander Galang	✓			
Sonia Medina-Ashby	✓			
Zeya Mohsin			✓	



CITY OF MILPITAS AGENDA REPORT (AR)

Item Title:	Receive Progress Report on The Work Completed and Existing Conditions Analysis from Raimi and Associates and Staff on the Housing Opportunity Zones, Discuss Project Objectives and Priorities, and Provide Direction on Key Planning Concepts and Land Use Strategies (Staff Contact: Ned Thomas, Planning Director, 408-586-3273 and Jay Lee, Principal Planner, 408-586-3077)
Category:	Community Development
Meeting Date:	8/9/2022
	<u>Recommendation:</u> Receive progress report on the work completed and existing conditions analysis from Raimi and Associates and staff on the Housing Opportunity Zones, discuss Project objectives and priorities, and provide direction on key planning concepts and land use strategies.

Background:

Since 1969, California law has required all cities and counties to plan to meet housing goals for residents at all income levels. Every eight years, the California Department of Housing and Community Development (HCD) and the Association of Bay Area Governments (ABAG) distribute the Regional Housing Needs Allocation (RHNA) to each City and County in the Bay Area. The City is then required to perform a comprehensive update to the Housing Element, which is a chapter in the General Plan. The Housing Element identifies specific programs and policies that the City commits to implement to help realize the City's RHNA goals and respond to related needs.

In the 2019-20 Budget Act, Governor Newsom signed into law a \$250 million allocation for California regional and local jurisdictions to prioritize planning activities to accelerate state-wide housing production as part of a broader mandate to address the State's affordable housing shortage and to end homelessness. This allocation includes \$119 million for the Local Early Action Planning Grant (LEAP) for cities and counties. LEAP provides one-time grant funding for cities and counties to update planning documents and implement process and policy improvements to accelerate housing production. LEAP is a non-competitive grant program and a State strategy to help local governments meet their legal obligation to plan for housing for all residents, including low-income residents, as per the City's RHNA obligations.

On June 29, 2020, the City applied to HCD for grant funding through the LEAP Program to create Housing Opportunity Zones (HOZs) in areas of the City prioritized for housing by the City's General Plan. The HOZs will establish various incentives through an overlay zoning district to facilitate and streamline affordable housing production in the City's two Specific Plan areas, four Neighborhood Commercial Mixed Use (NCMU) areas, and the Town Center Zoning District. Incentives include a supplemental density bonus beyond the State Density Bonus, relaxed development standards, streamlined by-right permitting and environmental review, and financial incentives. On September 2, 2020, HCD informed staff that the City of Milpitas has been awarded \$300,000 in grant funds through the LEAP Program to establish HOZs.

On December 12, 2021, the City Council approved and authorized the City Manager to execute a professional services agreement with Raimi and Associates to prepare the HOZs in close coordination with related efforts underway including the Metro and Gateway Specific Plans, the Housing Element Update, and a separate Assessment of Fair Housing. Per the grant agreement, the HOZs must be completed by June 30, 2024.

Analysis:

As identified in the City's LEAP grant application and scope of work with Raimi and Associates, the key goals of the HOZs are to:

1. Streamline the permitting of housing development to meet the housing goals of the City;
2. Allow by-right approval of housing projects if they meet certain objective criteria;
3. Incentivize development of on-site affordable housing; and
4. Encourage different types of special needs housing, including senior living, housing for persons with disabilities, and workforce housing.

The work completed to date includes:

- **Best Practices Memo:** The memo provides an overview of example HOZs from other cities, especially as they relate to the creation of affordable housing units and housing for special needs populations. Three of the examples focus on affordable housing and one on senior housing. Each precedent study identifies strengths and weaknesses that can inform the consideration and development of new HOZs in Milpitas.
- **Planning Documents and Process Assessment:** The assessment memo reviews and summarizes existing planning documents and ordinances that impact the development of housing across the City and identifies strengths that can be enhanced and weaknesses that can be overcome through HOZs.
- **Existing Conditions Analysis:** The analysis of existing conditions examines each potential HOZ area and estimates the feasible development capacity based on Milpitas' current land use and zoning policies and regulations. Topics covered include the existing land use pattern, parcel size, pipeline projects, access to multimodal transportation options, site constraints, and opportunity sites. Staff will present the analysis in greater detail at a future study session with the City Council.
- **Stakeholder Meetings:** Raimi and Associates and City staff presented an overview of HOZs at the May 2022 Community Development Roundtable and subsequently conducted stakeholder interviews with non-profit and for-profit housing developers to better understand the constraints to building both mixed-income and 100 percent affordable housing projects.

Key findings from the background research and analysis and preliminary community outreach include:

- **Development Standards:** Development standards such as low maximum densities, high parking ratios, and high commercial requirements for mixed-use projects are constraints on development of affordable housing for both for-profit and non-profit housing developers. Adjusting these development standards would allow developers to prioritize affordable housing and spread the subsidized cost of the affordable units over a larger number of market rate units.
- **Permitting Process and Impact Fees:** Development fees are higher in Milpitas compared to other jurisdictions in Santa Clara County owing to high entitlement fees for single-family development and high impact fees for multi-family developments. A streamlined permitting process and reduced impact fees for housing projects in HOZs that meet objective standards would help reduce initial development costs and facilitate both mixed-income and 100 percent affordable housing projects.
- **Affirmatively Furthering Fair Housing (AFFH) Compliance:** HOZs can help a local jurisdiction address the potential issue of having a large concentration of affordable units in certain geographic areas (e.g., specific plan areas), which run counter to AFFH requirements in the Fair Housing Act. The Fair Housing Act requires cities to take meaningful actions to overcome patterns of segregation and foster inclusive communities. HOZs will help the City comply with this federal law by promoting a more equitable distribution of affordable housing throughout Milpitas.
- **General Plan Land Use Designations:** The 2040 General Plan aims to create vibrant commercial neighborhood centers through mixed-use development within the Town Center Zoning District and by establishing the Neighborhood Commercial Mixed-Use (NCMU) land use designation to incentivize the redevelopment of older commercial retail centers. Establishing HOZs for these areas will remove

current constraints on mixed-use development in these areas by modifying current policies and development requirements.

General Plan Implementation

The HOZs will be a critical implementation tool of the 2040 General Plan, which identifies several opportunity areas throughout the City for future housing development. These areas include the two Specific Plan areas (Metro Specific Plan and Gateway-Main St. Specific Plan), four NCMU areas, and the Town Center. The City is currently updating its two Specific Plans, and the HOZs will apply to these areas where much of the future housing development is expected to occur. However, the current policies and requirements of the NCMU and TWC land use designations need to be refined to facilitate and incentivize mixed-use redevelopment.

The NCMU land use designation establishes a ratio of one residential dwelling unit per 1,500 square feet of neighborhood-serving retail and commercial services for new mixed-use developments. While the purpose of this requirement is to incentivize the redevelopment of older strip retail centers into new mixed-use projects, redevelopment is unlikely to occur under the current policy framework. Based on the analysis completed for this HOZ project, the consultant team and staff now favor a clear allowable density range rather than a ratio between residential and nonresidential floor area.

For example, the TWC land use designation allows 40 residential dwelling units per acre for mixed-use developments but requires a high floor area ratio (FAR) of 0.35 for nonresidential uses. While the purpose of the nonresidential FAR requirement is to ensure that the Town Center retains its commercial activity over time, it presents a constraint to redevelopment. The current FAR of the Town Center north of Calaveras Boulevard is well below 0.35 and any redevelopment would require an additional 323,000 square feet of nonresidential floor area, which is highly unlikely in the current economic climate. The HOZs will build upon new General Plan policies for the NCMU and TWC areas by providing a more implementable strategy to achieve the overall goal of creating vibrant mixed-use neighborhoods in key areas throughout the City. The HOZs will adopt a place-based approach to facilitate mixed-use redevelopment of specific sites within these areas while allowing viable commercial centers to remain.

Housing Element Implementation

The HOZs will also be a critical implementation tool of the ongoing Housing Element Update, which must be updated every eight years identify adequate sites for new affordable housing to fulfill the City's RHNA. In the upcoming RHNA cycle (2023-2031), the City of Milpitas has been allocated 6,713 units, which is more than double the allocation from the previous cycle. Furthermore, 3,786 of the units must be affordable (i.e., below market rate) with 2,655 of those units at the low- or very-low-income affordability level, which the City has historically struggled to provide.

To address this challenge, the HOZs will focus on providing practical and effective incentives for developers to build affordable housing, especially at deeper affordability levels. The Housing Element Update will rely on the HOZs as a key program to implement its policies and help the City fulfill its housing goals and needs.

Next Steps

Following the City Council study session, the project team will continue to engage the public through additional stakeholder meetings with property owners, community workshops, and online surveys. The project team will also prepare a series of design studies to test the potential effects of the HOZs and develop several alternatives based on the feedback and direction received from the City Council.

Once the alternatives are established, the project team will return to the City Council for another study session to determine the preferred alternative. The project team will continue to meet with the City Council and Planning Commission as the Draft HOZs are developed to ensure that the project meets the needs of the City and community.

Fiscal Impact:

This is an informational item. As such, there is no fiscal impact.

California Environmental Quality Act:

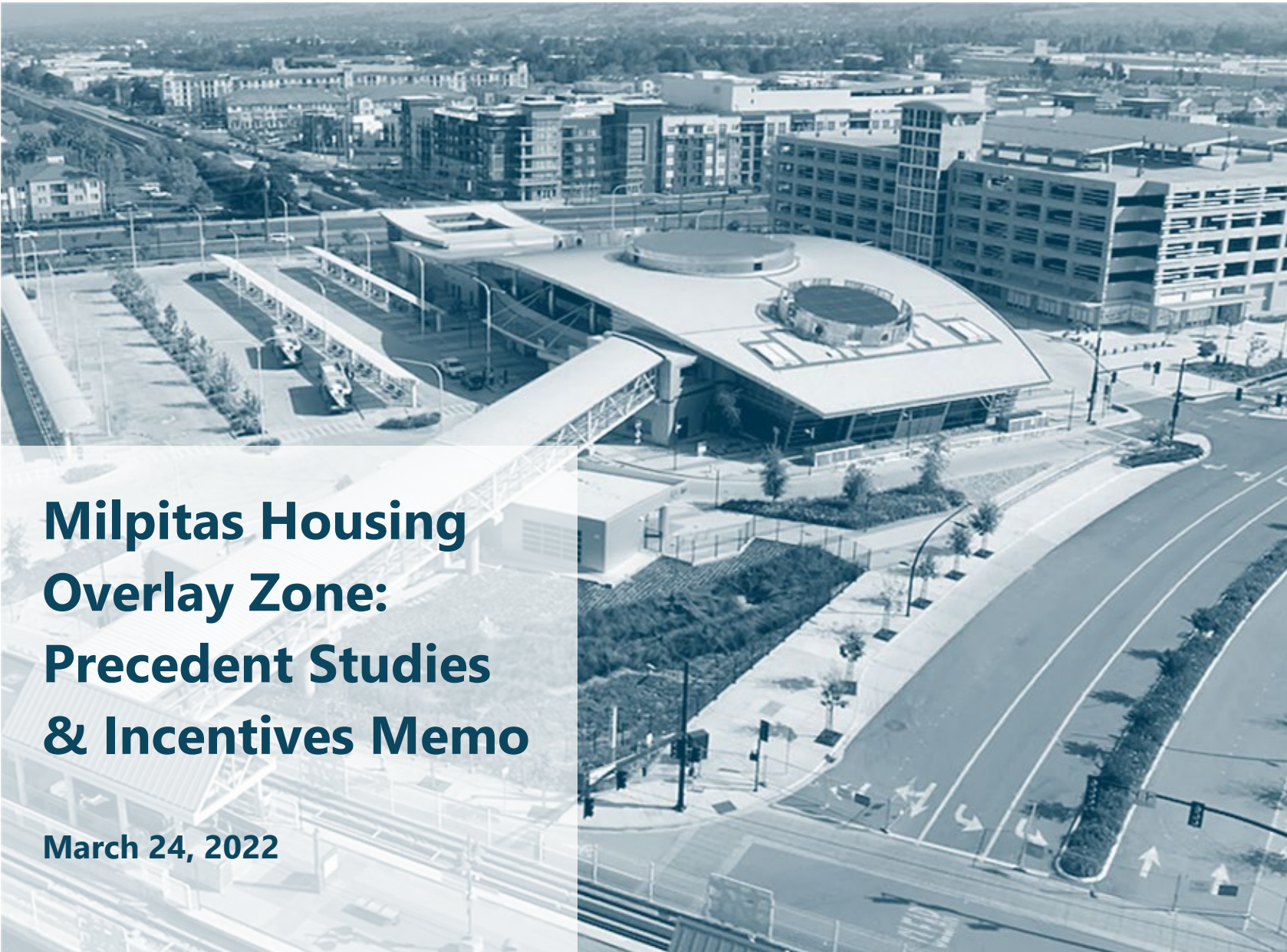
The additional development allowed through the HOZs will be consistent with the Housing Element sites inventory. Therefore, the required environmental review for the HOZs will be completed as part of the environmental review for the Housing Element Update.

Recommendation:

Receive progress report on the work completed and existing conditions analysis from Raimi and Associates and staff on the Housing Opportunity Zones, discuss Project objectives and priorities, and provide direction on key planning concepts and land use strategies.

Attachments:

1. Best Practices Memo
2. Planning Documents and Process Assessment



Milpitas Housing Overlay Zone: Precedent Studies & Incentives Memo

March 24, 2022

1. Introduction

This Precedent Studies & Provisions Memo is intended to provide an overview of example housing overlay zones from other cities, especially as they relate to the creation of affordable housing units and housing for special needs populations.

The memo provides a summary and analysis of four overlay zone frameworks (precedent studies), three focused on affordable housing and one on senior housing. Each precedent study identifies strengths and weaknesses that can inform the consideration and development of a new housing overlay in Milpitas. In addition to the development incentives and bonuses described in each precedent study, the Incentives Structures section of the memo describes the various development incentives and bonuses that could be included in a finalized housing overlay zone and how they interact with existing State housing development incentives. Some incentives can be tied to affordability or age requirements, depending on the population the overlay prioritizes.

2. Precedent Studies

As the City of Milpitas considers a potential new overlay zone designation to align with city-wide housing goals, several precedents have been established both locally in the Bay Area, and at the national scale. Since preserving and promoting affordable housing opportunities has been a priority shared by cities through California and beyond, jurisdictions have taken a number of different approaches to utilizing overlay zones as a regulatory mechanism for nesting standards related to the creation of new affordable units, income levels, construction and design standards, and several other topics. Overlay zones are not limited strictly to frameworks oriented around affordable housing but have also been adapted to address other planning challenges, such as provision of housing for senior residents or special needs populations.

This memo provides a summary and analysis of four overlay zone frameworks:

- Cambridge, MA. Affordable Housing Overlay (zoning)
- Berkeley, CA. Affordable Housing Overlay (Housing Element)
- Menlo Park, CA. Affordable Housing Overlay (zoning)
- Perris, CA. Senior Housing Overlay Zone (zoning)

Links to each precedent and their original language can be found in **6. Appendix**.

Comparative Matrix

The following table summarizes the regulatory language and framework of the four precedents. The information has been condensed in this memo.

Precedent Study	Applicability	Interactions with Underlying Zoning	Affordability Requirements	Deed-restriction or affordability agreement?	Incentives
100% Affordable Housing Overlay Cambridge, MA	- All zoning districts, except Open Space - Standards apply only to 100% affordable housing projects	Underlying zoning impacts density and height bonuses	- At least 80% of units for households with incomes 80% AMI or below - 50% of for-sale units should to households with incomes 80% AMI or below at initial occupancy	Continued affordability agreement	- No maximum FAR - Height bonus - No off-street parking minimums - Minimum of 30% open space to lot area ratio - Lower yard setbacks
100% Affordable Housing Overlay Zone Berkeley, CA (Proposed)	- R3, R4, MU-R, all C-prefixed districts - Potentially R-1, R-1A, R-2, R-2A - High fire risk area and historical landmarks are exempt - Projects must have 100% affordable units		Reserved for Extremely Low-, Very Low-, Low-, and Moderate-income households	Deed-restricted	- No maximum FAR - Density bonus - Height bonus

Affordable Housing Overlay (AHO) Menlo Park, CA	- Menlo Park El Camino Real and Downtown specific plan area; lots zoned R-4-S - Projects must have a mix of affordable and market rate units	Some Specific Plan development standards cannot be superseded by AHO standards	At least 25% of affordable units must be very low and/or extremely low-income, or at least 15% must be extremely low income	Continued affordability agreement (no less than 55 years)	- Density bonus - Height bonus - Parking space requirements per type of affordable unit - Common and/or private open space can be reduced by 50% - Setback reduced to 5' except when more is needed to accommodate increased density and when parcel is next to single-family residential - Possibility of waived processing fees
Senior Housing Overlay (SHO) Zone Perris, CA	- Can be combined with any residential or commercial zone district, and lots must be greater than 2 acres but not more than 75 acres	- Surrounding land uses must be compatible with the environment required by seniors - Level of affordability and percentage of affordable units are dependent on redevelopment area classification	- Minimum 1 household member must be age 55+ - Redevelopment area: at least 30% of units for low- and moderate-income households, at least 50% of the 30% for very low-income - Not redevelopment area: at least 3% of units for low- and moderate-income households, at least 40% of the 3% for very low-income households	Affordability in place for 30 years or how long the redevelopment area agreement specifies (whichever is longer)	- Density bonus (up to 50 units/acre) - Development fees waiver

A. Affordable Housing Overlay. Cambridge, MA

The City of Cambridge adopted the 100% Affordable Housing Zoning Overlay in October 2020. This overlay aims to help affordable housing developers build new, permanently affordable housing throughout the city, especially in areas where there are not enough affordable units, and areas where the current zoning makes it difficult to construct affordable housing projects. The standards and incentives of the overlay can only apply to projects where 100% of the units are affordable and available to households earning up to 100% of the Area Median income (AMI).

1. Development context

The Affordable Housing Overlay (AHO) developed from discussions between the City Council, Housing Committee, and Community Development Department (CDD) regarding how to address the housing crisis and was further mentioned during the “Envision Cambridge” citywide plan process from 2016-2019. CDD developed the overlay and gathered feedback from public hearings, community meetings, and open houses. The AHO was presented as a zoning amendment to the Planning Board and Ordinance Committee, and after several meetings and revisions, they recommended that the City Council adopt the AHO ordinance. The City Council adopted the ordinance on October 5, 2020. To date, approximately 350 new affordable units have been completed under the regulations, with the City currently reviewing projects that could result in additional 300 units.

2. Regulatory Framework

Cambridge’s AHO is an amended, new section in the City’s Zoning Ordinance. The ordinance contains income and affordability criteria, development and design regulations, and regulatory mechanisms for ensuring the continued affordability of an AHO project’s units.

3. Applicability/Area of Influence

The overlay zone applies to all zoning districts of Cambridge, except parcels zoned as Open Space. Regardless of the underlying zoning standards or density requirements, AHO projects can contain single-family, two-family, townhouse, or multi-family dwellings. Projects may also include active, non-residential uses on the ground floor, but only where the underlying zone or an additional overlay district already allow non-residential uses. An AHO project can feature the construction of a new building, or the retrofit of an existing building. The project is permitted “as-of-right” if the project meets all the standards within the overlay and the Design Guidelines established by the CDD.

4. Interaction with underlying zoning

The applicable development and design regulations of an AHO project are determined by the “District Dimensional Standards” of the underlying zoning district. The dimensional standards of the AHO apply in place of the District Dimensional Standards unless the AHO specifies otherwise. As previously stated, the AHO supersedes non-residential underlying zoning districts and allows for the development of housing in districts such as commercial or industrial. In addition, ground floor non-residential uses are allowed in new housing projects where the underlying zoning already allows such uses.

5. Development and Design Regulations

FAR. The floor area ratio (FAR) of an AHO project has no stated maximum or minimum.

- *Exception:* If the standards of the underlying zoning district specify a maximum FAR of less than 1.0, the AHO project cannot exceed an FAR of 2.0.

Lot Area. There is no minimum lot area per dwelling unit requirement for AHO projects.

Height. The height bonus for an AHO project is contingent on the underlying zoning district's allowable building heights.

Underlying zoning district allowable building height	Height Bonus	Exceptions
40 feet or less	Up to 45 feet (no more than 4 stories) if entirely residential; or	
	Up to 50 feet (4 stories above grade) if first floor has active, non-residential use	
Up to 50 feet	Up to 65 feet (no more than 6 stories) if entirely residential; or	• When AHO project is adjacent to a non-residential use, parts of the project within 35 feet of a zoning district that allows a maximum building height of 40' will be limited to the overlay provisions of that type of building (i.e., max build to 45' if residential, 50' if first floor is active non-residential) • When the AHO project parcel extends into that district, then the height limitation only extends 35' from the property line.
	Up to 70 feet (6 stories above grade) if first floor has active, non-residential use	
Greater than 50 feet	Up to 80 feet (no more than 7 stories)	• When AHO project is adjacent to a non-residential use, parts of the project within 35 feet of a district with zoning that allows a maximum building height of 40' will be limited to a maximum height of 60' (a minimum of 5 stories).

		When the AHO project parcel extends into that district, then the height limitation only extends 35' from the property line.
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Parking. AHO projects do not have an off-street parking minimum requirement. However, if a project does not provide off-street parking at a ratio of 0.4 spaces per dwelling unit, the developer must create a Transportation Demand Management program where they:

1. Offer a free annual membership to a bike share program, or a 50% discounted transit combined subway and bus pass for 6 months, to 2 individuals in each household upon their initial occupancy of a unit; and
2. Provide transit information to each household upon their initial occupancy of a unit or provide real-time transit service screen and information in the building lobby.

Open Space. The minimum percentage of open space to lot area of an AHO project is 30%, unless the standards of the underlying zoning district have a less restrictive requirement. This percentage can be lowered to a minimum of 15% if the AHO project includes the protection and preservation of an existing building that is in the State Register of Historic Places. The AHO contains additional guidelines for the placement and characteristics of an AHO project's open space.

Yard Setbacks.

Setback	Requirement	Exceptions
Front	Minimum setback of 15 feet	- The underlying zoning standards have a less restrictive requirement, - The project is on a corner lot (may be reduced to minimum of 10'), or - The developer chooses to reduce the setback to the average of the front yard setbacks of the four nearest pre-existing principal buildings that contain at least 2 stories above grade and directly front the same side of the street as the AHO project. - If there are different underlying zoning standards for residential and non-residential uses, the non-residential front yard setback requirement applies to an AHO project with an active non-residential ground floor.
Side	Minimum setback of 7.5 feet	Unless underlying zoning district's residential requirement is less restrictive.
Rear	Minimum rear setback of 20 feet	Unless the underlying zoning district's residential requirement is less restrictive.

Standards for Existing Buildings. Existing buildings used in an AHO project that do not match the development and design regulations can be altered, reconstructed, relocated, and/or enlarged to conform with the AHO regulations. Below are modification standards that are allowed "as-of-right."

- The addition of gross floor area within the interior of the existing building envelope that could violate FAR limitations set by the AHO
- An increase in the number of dwelling units within the existing building if the number of stories above grade is not greater than the existing number of stories above grade, or the existing height divided by 10 feet
- The relocation, enlargement, or addition of openings to the exterior of the building

- The addition of insulation to improve energy efficiency if the new exterior wall conforms to yard setback requirements, does not intrude more than 8 inches into the existing yard setback, or does not decrease the existing open space by more than 5%
- The addition of exterior features to meet accessibility requirements
- Alterations, additions, repair, reconstruction, or replacement of the existing building and pre-existing nonconforming features that do not violate the dimensional requirements set by the AHO

Building and Site Design Standards for New Development. The AHO contains design standards that apply to new construction and the additions to existing structures. Existing buildings that are a part of an AHO project do not have to follow these design standards if the alterations do not “create a condition that is in greater nonconformance with such standards than the existing condition.” The complete standards are available in **6. Appendix.**

5. Income and Affordability

An AHO Eligible Household has a gross household income upon initial occupancy of no more than 100% of AMI. Rental and for-sale AHO units are available for AHO Eligible Households, with a preference for Cambridge residents and former Cambridge residents who experienced a no-fault eviction in the last 12 months within Cambridge. This local preference can make projects ineligible from certain federal grants that can help finance the development of affordable housing.

Rental AHO dwelling units:

- The gross household income of the AHO Eligible Household at initial occupancy cannot be more than 100% AMI, but a household exceeding this limit after initial occupancy can continue to rent the unit (cannot exceed 120% AMI for more than one year).
- At least 80% of the units in an AHO project must be reserved for households with incomes no more than 80% AMI.
- Rent, utilities, and fees must be approved by the CDD and cannot be more than 30% of the gross household income of the unit occupants.
- The gross household income of an AHO Eligible Household will be verified annually, or at the times required by a CDD-approved housing subsidy program, to determine the household’s continued eligibility and rent.

Owner-occupied AHO dwelling units:

- The gross household income of the AHO Eligible Household at initial occupancy cannot be more than 100% AMI.
- At least 50% of the for-sale units in an AHO project must be reserved for households with incomes no more than 80% AMI.
- The initial sale price of a unit must be approved by the CDD, and the monthly housing payment cannot exceed 30% of the household’s monthly income.

6. Regulatory Mechanisms

Deed Restrictions. AHO units are “created and conveyed subject to recorded covenants approved by CDD” to guarantee the permanent availability of the dwelling units to AHO Eligible Households.

Application process and approval. Each AHO project must follow a review and community engagement process.

- The developer must schedule two design consultations with the Planning Board, who will determine if the project meets the regulations of the overlay.
- The developer must host at least two community meetings for the residents of the neighborhood surrounding the proposed project site. At the first meeting, the developer shares initial analysis and gathers feedback from the community before design begins. At the second meeting, the developer shares preliminary project designs and receives design feedback.

7. Strengths

- **AHO projects must contain 100% affordable units.** By requiring that all units of a project be reserved for household earning up to 80% and 100% of the AMI, the City commits to prioritizing low-income housing construction and ensuring that any additions to the housing stock utilizing the overlay’s incentives are affordable units.
- **Application and review process.** The review process includes mandatory community engagement procedures that allow community members to voice their opinions over changes occurring in their neighborhood. Additionally, the advisory design review process is straightforward and thoroughly explained in the AHO ordinance text.
- **Applicability of the overlay zone.** The AHO allows for the creation of affordable housing in zoning districts that have previously not allowed residential uses. In Milpitas, a housing overlay zone with similar regulations would allow areas of the city that are currently zoned and operate as commercial to accommodate new housing construction, without having to undergo a re-zoning process to amend the allowable uses in a commercial district. As an example, if all institutional-zoned parcels in Milpitas could accommodate housing, the City may be able to approve affordable housing projects for teachers and school staff much quicker, and without having to undergo the re-zoning process.

8. Weaknesses

- **100% AMI Standard.** Cambridge’s AMI is different from the AMI in Milpitas. Milpitas is located in Santa Clara, a county with high cost of living that can make 80% AMI unattainable for some Milpitas residents. In 2021, 80% AMI for a family of four was \$117,750 and 30% AMI (usually considered extremely low-income) was \$49,700. An overlay in Milpitas may need to use different affordability requirements that are more appropriate to the city’s context. Additionally, Cambridge requires the monitoring of income levels for rental and for-sale units. It may be difficult to enforce or monitor income requirements of certain units once they are sold.

- **Applicability of the overlay zone.** The AHO allows for the creation of affordable housing in all zoning districts, except Open Space. The overlay creates near-universal standards for parcels throughout the city, but each has different geographic contexts, transportation accessibility, and proximity to community services and amenities. Not all parcels in a city will be the best locations to place low-income housing and some may even contribute to the historic marginalization of low-income communities.
- **Affordable housing construction in Industrial Zoning Districts.** If AHO projects are constructed in areas with primarily industrial uses, these projects could contribute to the historical, unjust practice of placing low-income housing next to pollution-generating uses. Communities that have higher exposure rates to pollutants can lead to increased negative health impacts. Additionally, industrial zones may have underlying restrictive covenants related to the presence of hazardous waste and materials, which could prohibit the construction of housing. In Milpitas, there may be industrial districts that are more suitable for housing construction than others. A comprehensive study of industrial parcels would be needed to understand the socio-environmental effects of allowing low-income housing in these areas.
- **Modernization of older public housing.** For projects retrofitting existing buildings that already feature affordable housing, Cambridge's AHO standards lack anti-displacement measures to ensure future spaces for existing tenants. Consequently, the responsibility of ensuring housing security is left up to individual developers to voluntarily offer as a form of community benefits. For example, Jefferson Park Federal is a project that is replacing former federal public housing buildings with new fully, affordable housing units. The Cambridge Housing Authority has promised to ensure no permanent displacement of the buildings' original tenants and assisted in relocating the original tenants into other units while construction occurs. This assurance is not a product of a regulatory standard in the AHO, but a key value of the Authority when the project was initially being developed.

B. Affordable Housing Overlay. Berkeley, CA

1. Development context

In November 2021, the City Council of the City of Berkeley recommended the City Manager to consider a 100% Affordable Housing Overlay designation, and to integrate it into the ongoing Housing Element Update process. The implementation of the overlay would require the development of objective design standards, or form-based standards, and the development of an advisory Design Review process that will guide the design of qualifying affordable housing projects. Additionally, General Plan amendments would need to be created that allow 100% affordable housing projects, in order to remain consistent with existing densities described in the General Plan. As of March 2022 however, draft regulatory text has not yet been made publicly available, and the ongoing Housing Element work has not yet engaged fully with the topic of an overlay designation. The proposal that was presented to the City Council and City Manager has been released and contains goals, preliminary standards, and requirements that will be included in the final regulatory text.

2. Regulatory Framework

The overlay proposal includes preliminary requirements and standards for affordable housing projects that would utilize the overlay incentives.

3. Applicability/Area of Influence

The overlay would apply to parcels in the following zoning districts:

- Multiple-family Residential (R3)
- Multi-family Residential (R4)
- Mixed Use-Residential (MU-R)
- Commercial Districts (all C-prefixed districts)

The overlay could also apply to parcels in the following zoning districts, but would require further study to determine project feasibility:

- Single-family Residential (R-1)
- Limited Two-family Residential (R-1A)
- Restricted Two-family Residential (R-2)
- Restricted Multiple-family Residential (R-2A)

Parcels located in CalFire Very High Fire Hazard Severity Zones, City of Berkeley Fire Zones 2 and 3, or are designated City, State, and Federal Historical Landmarks, would be exempt from the overlay.

4. Development and Design Regulations

In R3, R4, MU-R, C-prefixed districts, the following standards and bonuses would apply:

- A local density bonus that reflects the provision of AB 1763 (in addition to any State density bonuses)
- No limits on FAR
- Up to 80% lot coverage

In R-1, R-1A, R-2, R-2A zones, the following standards and bonuses would apply:

- A local bonus inclusive of existing density bonuses
- No limits on FAR
- Up to 80% lot coverage

5. Regulatory Mechanisms

Deed Restrictions and Income Requirements. Units within qualifying 100% affordable housing projects would be deed-restricted for Low, Very Low, Extremely Low-, and Moderate-Income households.

Application process and approval. Projects that comply with the overlay’s design standards and income requirements would have ministerial approval. The advisory Design Review process would review if the project met the overlay’s guidelines. If the guidelines were not met, the Design board would provide suggested changes to the developer that would allow the project to meet the standards.

6. Strengths

- **Excluding parcels in fire hazard zones.** By not allowing affordable housing development in fire-risk areas, the City is decreasing the potential of low-income family displacement in the event of a wildfire.
- **Overlay as a part of the Housing Element.** The AHO proposal states that it will be a part of the state-mandated Housing Element, which describes the city’s plans to accommodate future housing growth. As a part of the Housing Element, it would better ensure that the overlay is implemented.

7. Weaknesses

- **Overlay language not yet finalized.** Berkeley’s AHO is still a proposal that will be incorporated into a different regulatory document, and it cannot be thoroughly compared to other overlay zones that have been adopted into zoning codes and ordinances.
- **100% Affordable Units.** Restricting the benefits of an Overlay to 100% affordable housing can be seen as a constraint. By limiting the pool of which types of projects can leverage the incentives can limit the overall production of affordable housing. In addition, constrained availability of public funds and the need for local municipalities to provide matching funds can be a limiting factor.

C. Affordable Housing Overlay. Menlo Park, CA

1. Development context

Menlo Park’s Affordable Housing Overlay (AHO) is meant to implement the goals of the Housing Element and encourage the development of affordable housing for low, very low, and extremely low-income households. The AHO was adopted by the City Council in June 2013 as a part of a settlement agreement (*Peninsula Interfaith Action, et al. v City of Menlo Park*) that also required the City to update its 1992 Housing Element. As of March 2022, the City’s 2023-2031 Housing Element Update is ongoing and has proposed updating the AHO to include a maximum density bonus of 100 dwelling units/acre for 100% affordable housing projects, extending the AHO coverage area, and modifying the fee waivers and development standards. These updates are not yet final, and the discussion presented below is based on the current, adopted overlay language.

2. Regulatory Framework

Menlo Park’s AHO contains income and affordability criteria, development and design regulations, and regulatory mechanisms for ensuring the continued affordability of an AHO project’s units.

3. Applicability/Area of Influence

The overlay applies to parcels within the Menlo Park El Camino Real and Downtown Specific Plan area and those zoned as R-4-S (AHO) (high density residential, special – affordable housing overlay). Qualifying projects must have at least 5 units and accommodate a full range of income levels.

4. Interaction with underlying zoning

The overlay has been applied to specific parcels as a zoning classification (R-4-S AHO) and applies to the parcels identified in the El Camino Real and Downtown Specific Plan. The Specific Plan establishes development standards that can be paired with the standards of the AHO, and the AHO identifies the Specific Plan guidelines that cannot be substituted.

- *Exceptions:*
 - For parcels within the Specific Plan boundaries, the maximum FAR will be limited to the public benefit levels for the area the parcel is in. Each Specific Plan area has a different maximum FAR depending on the parcel's land use and location within the area.
 - El Camino Real North: 1.10, 1.50 FAR
 - El Camino Real South: 1.50, 1.75 FAR
 - Station: 1.75, 2.25 FAR
 - Downtown: 1.0, 2.25 FAR
 - Front and side setback facing a public right-of-way.
 - Building facade height.
 - Massing and modulation standards including major portions of a building facing a street should be parallel to the street, building breaks, building facade modulation, and building profile, and upper story facade length.

5. Development and Design Regulations

Density bonus.

- An AHO project that provides 21% low-income units is entitled to a 36.5% density bonus. With each additional percentage of low-income units above 21% (or the percentage used for low-income units when there is a mix of low and very low-income units), project is entitled to an additional 1.5% density bonus up to a cumulative maximum bonus of 60%.
- An AHO project that provides 12% very low-income units is entitled to a 37.5% density bonus. With each additional percentage of very low-income units above 12% (or the percentage used for very low-income units when there is a mix of low and very low-income units), project is entitled to an additional 2.5% density bonus up to a cumulative maximum of 60%.

FAR. There is no stated maximum or minimum FAR. An AHO project can increase its floor area ratio “by an amount that corresponds to the increase in allowable density” determined by the density bonus guidelines.

- Projects can add an additional 5% or other increase that is “reasonably sufficient to make development of low and very low income multiple-bedroom units and family housing feasible.”

Coverage.

- “Any applicable maximum building coverage and/or allowable paving requirement shall be increased by 5% and the minimum open space requirement reduced by 10% from the underlying zoning designation.”

Height.

- An AHO project that can have up to a 45% AHO density bonus can have a maximum height of 4 stories (no more than 48’).
- An AHO project that can have an AHO density bonus greater than 45% and has at least 50% of its affordable units reserved for very low and extremely low-income households (or 25% of the affordable units reserved for extremely low-income households), can have a maximum of 5 stories (no more than 60’).

Parking. The parking requirements of the underlying zoning designation apply to AHO projects. The following guidelines only apply to the affordable units within a project:

Unit Type	Required Parking Space(s)
Studio	0.8
1-bedroom	1
2-bedroom or larger	1.5
Senior housing units	0.8 or less
<i>For projects within the Caltrain station area identified in the Specific Plan, each affordable unit can have a reduction of 0.2 parking spaces from the minimum listed here.</i>	

- AHO projects within the Specific Plan area can conform to the parking requirements listed in the AHO or adhere to the parking requirements of the specific plan, whichever is less.
- Parking spaces for affordable units do not need to be covered or located in a garage or carport.
- Provided long-term bicycle parking should not be more than 0.5 spaces per unit.
- Any requirement for electric vehicle parking or recharging stations can be reduced by 50% or project can provide an equivalent number of car sharing spaces.

Open Space. Common and private open space can be reduced by up to 50% from the underlying zoning requirements, in addition to reductions needed to “physically accommodate the increased density provided for” by the ordinance.

Setbacks. In addition to reductions needed to “physically accommodate the increased density provided for” by the ordinance, required setbacks can be reduced by 5 feet.

- *Exception:* When an AHO project parcel is next to a parcel zoned for single-family residential, the underlying zoning requirement still applies.

Design.

- AHO projects will be reviewed for compliance with adopted objective design standards, and projects within the Specific Plan area must follow the architectural control process described in the plan. No other review is required unless the developer requests a variance from the AHO requirements.
- Low and very low-income units must be built at the same time, and to the same quality standard, as market rate units. They must also be integrated into the project.
- The number of bedrooms in low and very low-income units must be consistent with the mix in market rate units.

6. Income and Affordability

To be eligible for bonuses and incentives, AHO projects with more than 5 but less than 100 units must have at a minimum: 21% of all units reserved for low-income households, or 12% of units reserved for very low-income households.

- If the project proposes to have both low and very low-income units, the minimum percentage of units shall be more than necessary to reach a 35% state density bonus.
- The below market rate units a project is required to include due to the City's Below Market Rate Housing Program cannot be counted to reach these AHO requirements.

To be eligible for the density bonuses and incentives, AHO projects with more than 100 units must have at a minimum: 21% of all units reserved for low-income households, or 12% of all units reserved for very low-income households.

- If the project proposes to have both low and very low-income units, the minimum percentage of units shall be more than necessary to reach *more than* a 35% state density bonus.
- The below market rate units a project is required to include due to the City's Below Market Rate Housing Program cannot be counted to reach these AHO requirements.

In addition to the aforementioned income criteria concerning low-income and very-low income households, the AHO also includes a secondary requirement, where:

- 25% of the affordable units must be reserved for very low and/or extremely low-income households, **or**
- 15% of the affordable units must be reserved for extremely low-income households

In practice, a 100-unit project would need to adhere to one of the following methods in order to qualify for the AHO bonuses:

- Method 1a: A minimum of 21 units reserved for low-income households (21% of all 100 units), where 6 of these units (25% of the 21 affordable units, rounded up) are reserved for very-low and/or extremely-low income households

- Method 1b: A minimum of 21 units reserved for low-income households, where 4 of these units (15% of 21 affordable units, rounded up) are reserved for extremely-low income households
- Method 2a: A minimum of 12 units (12% of all 100 units) reserved for very-low income households
- Method 2b: A minimum of 12 units reserved for very-low income households, where 2 of these units (15% of 12 affordable units, rounded up) are reserved for extremely-low income households

A key provision of the AHO is that the low or very low income percentage required to qualify for the AHO shall not include the below market rate units required to be provided by for-sale residential development project and commercial development projects pursuant to the city's below market rate housing program or Inclusionary Housing requirement.

7. Regulatory Mechanisms

Continued affordability.

- Project developers must create an agreement with the city to ensure the continued affordability of the affordable dwelling units for no less than 55 years.

Waivers.

- AHO projects with at least 50% of all project units reserved for low-income households (or 20% for very low-income households) are entitled to a fee waiver for all processing fees related to development applications.
- All AHO projects are entitled to a reduction in all other fees in an amount that corresponds to the increase in allowable density, though the waiving of certain fees is subject to discretionary review by the city council.

8. Strengths

- **Affordability requirements.** The AHO provides incentives to projects with 50% or less affordable units, an affordability percentage that can allow use of more private financing for these projects compared with 100% affordable housing projects.
- **Affordability agreement.** The overlay includes a 55-year continued affordability agreement, which allows the rental price of the unit to stay affordable and can lead to housing security for low-income families.
- **Fee waivers.** Fee waivers incentivize increases in the number of low (or very low) income units.
- **Design quality.** The AHO includes a condition that requires developer to construct affordable units to the same quality standard as market-rate units and for the affordable units to be integrated with the entire project building. This is an important aspect to include in the overlay that ensures that the lower and higher income units are fully integrated.

9. Weaknesses

- **Incentives.** Many of the development standard exceptions can be obtained by using the recently revised State Density Bonus Law provisions.
- **Parking requirements.** The reductions for parking could be higher, making the provision of additional affordable units more financially viable.

D. Senior Housing Overlay Zone. Perris, CA

The Senior Housing Overlay (SHO) Zone from the City of Perris is meant to encourage the development of senior housing in compatible neighborhoods and create more housing opportunities for very low- and moderate-income seniors.

1. Development context

The Senior Housing Overlay Zone was adopted by the City Council of Perris in 2013. Since then, [Perris Station](#) is an example project that made use of the SHO. The 84-unit senior housing project opened in 2015.

2. Regulatory Framework

Perris' SHO contains affordability requirements, density and parking incentives, and detailed building and site design guidelines.

3. Applicability/Area of Influence

The SHO Zone can be applied to a lot that is at least 2 acres, but not larger than 75 acres, in any residential or commercial district. The current and proposed surrounding land uses must be free from health and safety issues and be compatible with the environment required by seniors. SHO projects are allowed to have multifamily residential, attached single-family residential, and detached single-family residential units that can be rentals, condominiums, cooperative, or other fee-simple ownership units.

4. Interaction with underlying zoning

SHO projects can be on parcels in residential or commercial district. Projects must follow the standards of the underlying zone, except when the development and design regulations of the SHO say otherwise. Parts of the City are in a redevelopment area, and SHO projects within that area are subject to different SHO development and design regulations than those outside of the redevelopment area.

5. Development and Design Regulations

Density. The maximum allowable density of an SHO project is 50 dwelling units/acre. This incentive can override the underlying zone density requirements.

Parking. SHO projects must provide 1.15 parking spaces per dwelling unit.

Setback. The setback of the building along all street frontages must be half the length of the building wall but cannot be less than 20 feet.

Building and Site Design Standards. The SHO specifies development criteria that dictates the design of the building, site, accessibility features, circulation, landscaping, open space, and recreational facilities. It also lists security and maintenance considerations. For the full list of standards, refer to the original SHO language (link provided in **6. Appendix**)

6. Income and Affordability

Age requirement:

- At least one household member must be 55 years or older.

Projects within redevelopment area:

- At least 30% of the dwelling units will be reserved and affordable for low- and moderate-income households.
- At least 50% of the 30% mentioned above will be reserved and affordable for very low-income households.
- These dwelling units can be rental and/or for-sale units.
- The City may require more stringent income requirements if it has provided financial assistance to the development project.

Projects outside redevelopment area:

- At least 3% of the dwelling units will be reserved and affordable for low- and moderate-income households.
- At least 40% of the 3% mentioned above will be reserved and affordable for very low-income households.
- These dwelling units can be rental and/or for-sale units.

7. Regulatory Mechanisms

Deed Restrictions. The affordability restrictions must remain in place for 30 years or the time period specified by the land use controls of the redevelopment area, whichever is longer.

Waivers. The City can waive park development fees for qualified SHO projects.

Application process and approval.

- The Planning Commission will host a public hearing to consider the proposed project and determine whether to recommend approval or disapproval to the city council. They will recommend approval if the project meets the requirements of the SHO.
- The City Council will conduct a public hearing to determine whether the SHO should apply to the project. It must meet the following guidelines:
 - "The proposed project at its specific location is necessary and desirable to provide a facility that will contribute to the general well-being of seniors as well as the local neighborhood, community, and region.
 - The location of the project and the mix of uses is not detrimental to the health, safety, or welfare of its residents, employees, or those working or residing in the area.
 - The proposed project will provide a superior community that will support the unique needs and lifestyles of seniors.
 - That the granting of this permit will not adversely affect the public welfare and will be consistent with the city's general plan and any other relevant plans of any government agency."
- By granting an SHO project permit, the City Council reserves the right to modify the project plans or create conditions the project must meet to ensure public health, safety, and welfare and meet the objectives of the SHO Zone.

8. Strengths

- **Building and site design standards.** The Senior Housing Overlay includes detailed and specific design parameters developers must follow. With these guidelines, the City has clear expectations about the living environment senior housing developments should create and maintain.
- **Affordability agreement.** The overlay includes a 30-year continued affordability agreement, which allows the rental price of the unit to remain affordable.

9. Weaknesses

- **Affordability requirements.** The affordability requirements for projects outside of redevelopment areas of the city are very low and would not produce a substantial amount of affordable senior units or justify the benefits conferred to the project by the SHO. The affordability requirements for projects in redevelopment areas are even not very high given the objectives of this type of special zoning. Developers can see this low requirement as an incentive to prioritize housing construction in non-redevelopment areas, leaving other areas of the city without as much new senior housing. If the City's intention was to spur more senior housing in these other areas, this is unclear.
- **The project approval process is discretionary.** The project approval process is not as streamlined as other cities and it is discretionary to the City Council's interpretations of public health needs. In one way, the City has more oversight over what is built, but it could be seen as a disincentive by developers who would want to develop and construct projects on a faster timeline. Specific public health considerations could have been included in the building and site design standards section.

- **Limited applicability.** The minimum parcel size of 2 acres excludes the potential of projects on smaller sites. There are many examples of successful affordable or mixed-income senior housing projects with 50 units on one acre. The high minimum project size may be adequate in some areas but likely has the unintended consequence of excluding potential projects as infill in many older, more developed neighborhoods.

3. Incentives

It is important to note that Milpitas must also address a significant number of recently adopted state-level legislation and regulatory mechanisms pertaining specifically to affordable housing. Many of these laws establish a variety of incentives whose purpose is to encourage the construction of new housing, and in some instances have already resulted in significant revisions to local planning practices and regulatory language. Examples of relevant state law have been included throughout this section.

A. Streamlined Permitting Process

A streamlined, predictable permitting process can incentivize more developers to construct affordable housing. Many cities require a multistep discretionary review process to ensure a proposed project complies with the City's Zoning Code, and this approval process can extend the project timeline while adding more costs onto the developer. A clear permitting process can lower these initial development costs and expedite affordable housing projects. There are a variety of strategies municipalities can take to streamline their permitting process for affordable housing projects.

By-right/as-of-right approval

By-right (also known as "as-of-right," administrative review, ministerial review) development approval is granted to a project that has conformed to the zoning and building code requirements and qualifies for construction without having to go through a discretionary approval process. The project still needs to apply for permits but by qualifying for by-right development, the developer can cut down the time and money spent on having their proposed project approved. Some cities pair by-right approval with a design review.

For example, Cambridge's Affordable Housing Overlay "as-of-right" approval applies to projects that follow all the regulations and objective design standards of the overlay, go through a two-meeting advisory design review, and host two community engagement meetings. The expectations and requirements of the developer for these meetings are clearly listed in the Overlay ordinance.

In Menlo Park, Affordable Housing Overlay projects outside of the Downtown specific plan area only need a compliance review to determine the project's compliance with adopted objective design standards. Projects within the specific plan area must go through the architectural control process

described in the specific plan. If the developer requests a variance from adopted regulations and design standards, discretionary action will be required.

Milpitas could consider a streamlined permitting process specific to an overlay zone that is complementary and consistent with other existing regulations and state housing laws. Similar to the way that recent state legislation has already introduced mandated streamlined permitting processes related to specific types of development projects (among these, rooftop solar with AB 2188 in 2015 and streamlined residential review with SB 330 and changes to the Housing Accountability Act in 2019), the introduction of a new affordable housing overlay zone could provide a broader definition of projects eligible for a streamlined review.

B. Bonus Development

Density bonuses allow developers that prioritize affordable housing to construct more units to spread the subsidized cost of the affordable units over a larger number of market rate units. Accompanying height bonuses allow for the larger floor area to be accommodated on the site.

Additional Density/FAR Bonuses

Many cities build on the existing state density bonuses to further incentivize affordable housing development. A density bonus allows a project to have an increase in dwelling units per acre. A FAR bonus allows buildings to have an increase in the total floor area. To accommodate additional units allowed by density bonuses, some overlays have removed the maximum FAR limit for applicable projects. For example, Cambridge's overlay does not have a max FAR (unless the underlying zoning specifies a max 1.0 FAR, then applicable projects can have up to 2.0 FAR). Menlo Park also does not specify a max FAR, and notes that the FAR of projects can increase by the amount needed to accommodate increased density.

Beyond their inclusion in overlay zones however, Milpitas should first contend with prevailing state laws regarding density bonuses attributed to affordable housing. AB 1763 (2019) and AB 2345 (2020) constitute the most applicable and comprehensive examples, as they collectively establish several regulations that link ranges of density bonuses with affordability levels. AB 1763 more than doubles the density bonus for eligible projects where all units are affordable to low and very-low income level residents. AB 2345 accommodates density bonuses on a slide scale between 35% and 50%. The bonus is linked to several other conditions and criteria including income criteria, parking, and concessions for provision of senior housing.

For a new overlay zone to be meaningful, any provisions should be written to exceed the stated minimums, especially with regards to the required metrics for very low income- and low income-households; the bonuses in AB 2345 are currently triggered at 15% and 24% respectively.

Additional Height Allocation

Allowing additional building heights or stories in an overlay can incentivize developers to pursue a project because developers can meet “the economy of scale” needed to construct affordable housing. Increased height allowances can enable buildings to have additional uses on the ground floor, whether it be building amenities or community commercial uses. For example, Cambridge’s AHO increases allowable building heights from the underlying zoning’s requirements and allows an additional 5’ when the first floor has an active non-residential use.

Other overlays choose to link the new allowable building heights to the density bonus a project qualifies for and the number of affordable units it includes. In Menlo Park, a project with a 45% density bonus can have up to 4 stories (or 48’), while a project with a 45% density bonus and with 25% of the units reserved for extremely low-income households can have up to 5 stories (or 60’). Milpitas already has two precedents to consider when approaching additional height allocations. The High-Rise (-HR) Overlay District is an existing designation that can be combined with any zoning district along with infill projects located along freeways and expressways. While a new overlay zone oriented around affordable housing may be introduced, the City could first consider expanding the existing -HR designations onto new applicable parcels through a zoning map amendment, rather than nest such language into a new overlay regulation.

With the recent completion of the Milpitas BART station, AB 1763 (2019) also offers a unique perspective on regulating building height increases within an incentive structure. AB 1763 allows eligible 100% affordable housing developments built within a half-mile of a major transit stop an increase in building height by 3 additional stories or 33 feet. The bill allows this additional density to operate *atop* any other density bonuses. The result can be a substantial increase in total development potential, as seen in a recently approved housing development in nearby San Mateo where the application of AB 1763 allowed an initially proposed 164-unit, 5-story project to expand into a 225-unit, 7-story project. Although this stipulation may not apply city-wide, Milpitas could first consider the potential development capacity of parcels within a half-mile radius of the BART station, or other qualifying transit hubs, as an alternative to a new overlay zone.

Building & Site Design

Setback and off-street parking reductions can allow housing projects to increase their size and density, in turn creating more units. Setbacks create distance between a building and the property boundaries, and smaller setback minimum requirements mean that developers can use a greater area of the lot for the building.

Off-street parking requirements are usually met by constructing parking spaces underneath the building, on the ground floor, or in an adjoining parking lot. Reducing the required minimum parking spaces can allow for more development potential ((i.e., community amenities, green spaces, additional units) on a site as well as reduce development costs. With reduced or no minimum parking requirements, a developer can still choose to

provide more parking if needed. Additionally, removing parking minimums can incentivize building occupants to use alternative modes of transportation.

C. Fee Waivers

Development fees, permitting fees, and/or processing fees are typically required from developers when submitting a project proposal. Affordable housing overlays can be structured to waive certain fees for projects that reach specific affordability requirements. For example, Menlo Park waives processing fees for projects that have at least 50% of the units reserved for low-income households or 20% of the units reserved for very low-income households. The City of Perris' Senior Housing Overlay Zone waives the development fees for all projects that qualify under this overlay.

While Milpitas could waive some or all of the fees to incentivize housing projects, the City would need to evaluate how to fund the services that the fees are used to provide. Considerations may include waiving or reducing Planning Entitlement, Transit/Traffic Impact, or Parks fees, or revising the types of projects that are subject to these fees. In particular, the city should carefully assess whether qualifying multifamily projects within a newly proposed overlay zone would be subject to all typical fees – the prospect of a reduced set of mandatory fees could serve as an attractive incentive for developers.

D. Other Incentives

- **100% AHO vs not-100% AHO consideration.** Adopting a 100% Affordable Housing Overlay can incentivize non-profit and affordable housing developers to construct projects in Milpitas as it signals that the City is prioritizing the development of housing for its low-income residents, a demographic that struggles to find housing options that match their incomes. But having a mixed Affordable Housing Overlay allows other types of projects with different income mixes (and a broader variety of financing) to be constructed. Other types of possible incentives will be studied further after consultation with developers in Milpitas area to identify what would make it attractive to build more affordable housing.
- **Socio-economic benefits.** The creation of an affordable housing overlay zone can bring about socio-economic benefits for the city, and for the tenants and owners of affordable units. The Berkeley overlay proposal calls out how the intent of affordable housing overlays is not just to produce more housing, but to promote the more equitable distribution of affordable housing throughout a city. This is especially important in areas that have been shaped by class and racial segregation and where it persists to this day. When affordable housing is allowed to develop in high-opportunity neighborhoods, there are more opportunities than before for lower-income households to live and participate in those neighborhoods. More residents of a city can have the option to live in neighborhoods that typically have greater access to transit, education, and community amenities. Depending on the overlay's provisions, it can also incentivize a greater mix of incomes within individual buildings.

5. Conclusion

A housing overlay that is developed in Milpitas will have to consider the city's housing needs and environmental context to create an overlay that best suits the City's conditions and housing goals. There are a variety of incentives and strategies that an overlay can include to encourage the development of a particular type of housing, but it must be done in conjunction with existing state housing bonuses and incentives.

A few considerations for the city to consider in developing a AHO in Milpitas:

- The extent to which an AHO can build upon the SDBL and other recent State provisions for incentivizing housing production.
- The amount of financial incentives including fee waivers that the City can offer to prioritize the development of affordable housing.
- How to address the potential issue that the concentration of affordable units in certain geographic areas may run counter to AFFH requirements, especially if Housing Element sites are located with the overlay zone.

The precedent examples shall be helpful in informing the development of a Milpitas-specific overlay zone. Next steps include stakeholder interview and further analysis of target areas and applicable regulations.

6. Appendix

Overlay Zone Text and Resources

Cambridge, MA

- Regulatory text: <https://www.cambridgema.gov/-/media/Files/CDD/Housing/Overlay/adoptedahoordinance.pdf>
- Supporting Documentation:
 - https://www.cambridgema.gov/-/media/Files/CDD/Housing/Overlay/zngamend_aho_designguidelines_20200728v2.pdf
 - <http://rwinters.com/insideout/2018sept18/OverlayProposal2018Sept13.pdf>
 - <https://courbanize.com/projects/jeffersonparkfederal/information>
 - <https://www.wickedlocal.com/story/cambridge-chronicle-tab/2021/08/16/op-ed-cambridges-affordable-housing-overlay-already-producing-350-new-affordable-homes/8129618002/>

Berkeley, CA

- Regulatory text (DRAFT): <https://www.berkeleyside.org/wp-content/uploads/2021/11/2021-11-09-Item-09-Affordable-Housing-Overlay.pdf>

- Supporting Documentation:
 - <https://www.berkeleyside.org/2021/11/10/affordable-housing-berkeley>
 - <https://beyondchron.org/berkeley-s-next-big-step-a-100-affordable-housing-overlay/>
 - <https://www.dailycal.org/2021/11/11/berkeley-city-council-approves-affordable-housing-overlay-social-housing-measures/>

Menlo Park, CA

- Regulatory text: <https://www.codepublishing.com/CA/MenloPark/#!/MenloPark16/MenloPark1698.html>
- Supporting Documentation:
 - El Camino Real and Downtown Specific Plan: <https://www.menlopark.org/DocumentCenter/View/290/Specific-Plan---Complete?bidId=>
 - <https://beta.menlopark.org/files/sharedassets/public/community-development/documents/projects/housing-element-update/20220212-housing-element-update-community-meeting-presentation.pdf>
 - <https://covid19.sccgov.org/sites/g/files/exjcpb766/files/Documents/santa-clara-county-2021-area-median-income-ami-chart.pdf>

Perris, CA

- Regulatory text: https://library.municode.com/ca/perris/codes/code_of_ordinances?nodeId=COOR_TIT19ZO_CH19.86SEHOOVZOSH
- Supporting Documentation:
 - <https://ktgy.com/work/perris-station-senior-apartments/>

Other sources

- [https://www.planetizen.com/definition/right-development#:~:text=A%20by%20right%20approval%20\(also,construction%20without%20requiring%20discretionary%20approval](https://www.planetizen.com/definition/right-development#:~:text=A%20by%20right%20approval%20(also,construction%20without%20requiring%20discretionary%20approval)

TECHNICAL MEMO

City of Milpitas Planning Documents and Process Assessment

March, 2022



Submitted by Raimi + Associates

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1. Introduction

i. Overview

Several factors have made the goal of creating and preserving housing, especially affordable and special needs housing, a challenge in the City of Milpitas. Along with increasing land and construction costs, current plans and regulations can also severely limit where and how much new affordable housing can be built. Zoning laws may impose standards such as density limits and parking requirements or delays in the permitting process can become burdensome for some housing projects.

This memo reviews and summarizes some of the existing planning documents and ordinances that impact the development of housing and identifies strengths that can be enhanced and weaknesses that can be overcome through the Housing Overlay Zone project. The HOZ aims to address these challenges through relaxing requirements, providing incentives, and streamlining the permitting process to help the City's developers and housing partners access new opportunities and allow for balanced and equitable growth in the city. This memo will help develop recommendations guiding land use, developmental standards, and processes in the next phase of the Housing Overlay Zone project.

ii. Key Takeaways

- The General Plan goals and actions aim to create vibrant commercial neighborhood centers through placemaking strategies and mixed-use development that encourage social gatherings.
- While the current General Plan designations NCMU and TWC allow mixed use, low FAR limits and the bundling of residential development with the amount of commercial space developed considerably limits the scope of constructing mixed use projects.
- The revised density limits in the draft Metro Specific Plan have the potential to be further intensified based on the proposed height limits taking advantage of the State Density Bonus Law. The Zoning Ordinance would need to be amended after the adoption of the Metro Specific Plan.
- Density Bonus and other State laws provide for additional floor area, additional density, and a reduction in parking requirements. The HOZ may need to go significantly beyond state legislation to be effective on properties where state density bonus laws apply.
- The City's current Affordable Housing Ordinance requires a minimum of 15% of units to be affordable, pay an in-lieu fee, or dedicate land. The HOZ could further incentivize inclusionary units, or it will need to relate to projects exceeding the 15% required by the AHO.
- Development Process timelines for Milpitas are in line with surrounding communities and not seen as a significant burden to development.
- Development Fees are higher in Milpitas compared to other jurisdictions in Santa Clara County owing to high entitlement fees for single-family development and high impact fees for multi-family developments. The high impact fees are due to the Transit Area Development Impact fee (TADIF) for sites within the TASP area and high park in lieu fees for sites outside the TASP area.

2. Documents and Policies Reviewed

This memo summarizes relevant planning legislation and processes that regulate the development of housing and will inform the development of the Housing Overlay Zone. Specifically, the following regulatory planning and policy documents have been included in this memo.

Table 2-1 Overview of Plans and Policies Reviewed

Name of Plan/Policy	Adoption Date/Status	Relevance
Milpitas General Plan	Adopted 2021	Outlines city-wide land use goals and actions and provides land use designations including the mix of residential and commercial use.
Milpitas Metro Specific Plan	Public Draft 2021	Proposes redevelopment of industrial uses near the Great Mall area with increased intensities and mix of uses.
Midtown Specific Plan	Adopted March 2002 Updated 2010	Provides a new vision for approximately 1,000 acres with a focus on housing and employment. An update to the plan was initiated in 2021 and is not covered under this memo.
Zoning Code		Establishes zoning districts and defines the type of development, use, densities, height, and parking requirement for each district.
City Density Bonus Ordinance & State of California's Density Bonus Law	City's DBO last amended in 2008	Provides density bonuses on a sliding scale for different affordability criteria.
Affordable Housing Ordinance	July 2018 Amended 2022	Requires all developments with 10+ units to provide 15% affordable units.

3. Planning Review

i. Milpitas General Plan

The Milpitas General Plan, adopted in 2021, includes multiple high-density residential designations, two specific plan areas, and two mixed-use zones. For the HOZ project, this report will review the Town Center (TWC) and Neighborhood Commercial Mixed-Use (NCMU) designations in detail and highlight other potentially relevant designations.

General Plan Goals, Policies, and Actions.

The General Plan Goals, Policies, and Actions set out three main goals for the commercial centers included in the TWC and NCMU plan areas -the first is to support and maintain commercial centers that serve residential neighborhoods, the second is to focus on placemaking in any redevelopment of these commercial centers to create public gather places and opportunities for outdoor uses such as outdoor cafes and other amenities, and the third is to encourage mixed-use development including residential multi-family development to “encourage social interactions.” While these goals reflect the positive outcomes of potential redevelopment and reinvestment in underperforming and aging commercial centers, there are other goals and policies that may be contradictory or limit potential redevelopment. Specifically, the NCMU and TWC designations have requirements that significantly limit the feasibility of mixed-use projects. Generally, the Goals and Policies outline that in the NCMU zone, redevelopment results in “no net loss of viable commercial space.” This language is ambiguous and as the retail market continues to evolve, the viability and type of commercial spaces come into question. In other jurisdictions, a net loss in commercial space is often witnessed when single use shopping centers are redeveloped as mixed-use projects, with commercial FAR ranging between 10% to 25%.

The Actions in the General Plan give direct guidance on the creation of new zoning standards to support the NCMU designation and update the TC zone to reflect the guidance of the TWC designation. The actions also outline research and flexibility in standards to develop a citywide Retail Strategy and update the Zoning Ordinance to help ensure that commercial centers remain competitive and successful, as well as undertake strategic initiatives and flexible development standards for the adaptive re-use of aging centers. These actions allow more flexibility in the ability to meet the goals and policies for redevelopment of the mixed-use centers.

EXCERPT FROM GENERAL PLAN

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.*

LU 6-1 *Ensure new development in Neighborhood Commercial Mixed Use (NCMU) areas includes adequate commercial components to retain commercial uses as the dominant use type, and that the redevelopment of aging centers results in no net loss of viable commercial space. The City Council may consider opportunities to waive commercial requirements in mixed use areas for 100% affordable projects that increase the affordable housing stock within Milpitas for “very low income” and “low income” categories.*

LU 6-2 *As commercial centers are proposed for redevelopment, create a vibrant public realm through placemaking techniques like public gathering places, features and focal elements including outdoor cafes and other outdoor uses and amenities.*

LU 6-3 *Minimize the visual impact of large parking lots by locating them away from public streets and reclaim unneeded and underutilized paved areas that could be converted to neighborhood-enhancing features such as, gathering areas, pocket parks, or other community focused amenities.*

LU 6-4 *Maintain viable neighborhood-serving commercial uses throughout the City in order to serve surrounding neighborhoods and minimize vehicle miles traveled. Encourage a diverse mix of commercial uses including retail, service, office, entertainment, and assembly uses.*

LU 6-5 *Promote reinvestment in strip commercial and shopping centers and maintain, revitalize, and redevelop aging and underperforming centers.*

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.*

CD 9-3 *Encourage the incorporation of publicly accessible spaces, such as plazas and pocket parks, into new and existing commercial, multi-family, and mixed-use developments to encourage social interaction. The spaces should be appropriately scaled and programmed and compliment the characteristics of the district and/or neighborhood and the surrounding development.*

EXCERPT FROM GENERAL PLAN

Action LU-1a *Update the City's Zoning Map as appropriate to ensure consistency with the land use designations shown on Figure LU-1.*

Action LU-1b *Review the Zoning Ordinance and update as appropriate to reflect Land Use goals, policies, and implementation actions included in this Plan. Specific updates include but are not limited to: 1) Creation of specific new zoning standards to support the Neighborhood Commercial Mixed-Use (NCMU) and Neighborhood Commercial (NC) land use designations to ensure that NCMU and NC areas remain primarily neighborhood serving.*

Action LU-6a *Continue to review development applications to ensure land use compatibility as new development applications are brought forward. Where potential impacts are identified seek opportunities to reduce impacts through site planning and design techniques including but not limited to buffering of uses, clustering, or other planning tools as necessary to reduce potential impacts to sensitive receptors.*

Action LU-6b *Monitor emerging trends in retail and other commercial uses, regularly engage representatives of the business community and citizen leaders, and update the Zoning Ordinance to help ensure that commercial centers remain competitive and successful.*

Action ED-1i Develop, implement and update at least every 5 years, a citywide Retail Strategy, to reduce retail vacancies and strengthen the City's retail tax base.

Action ED-1j To encourage redevelopment of underperforming commercial corridors and retail centers (i.e. Serra Center, Main St.), maintain flexible zoning standards allowing both vertical and horizontal mixed uses.

Action ED-3a Encourage the renovation and/or redevelopment of existing outdated facilities that have strong linkages to transit and nearby retail and recreational amenities.

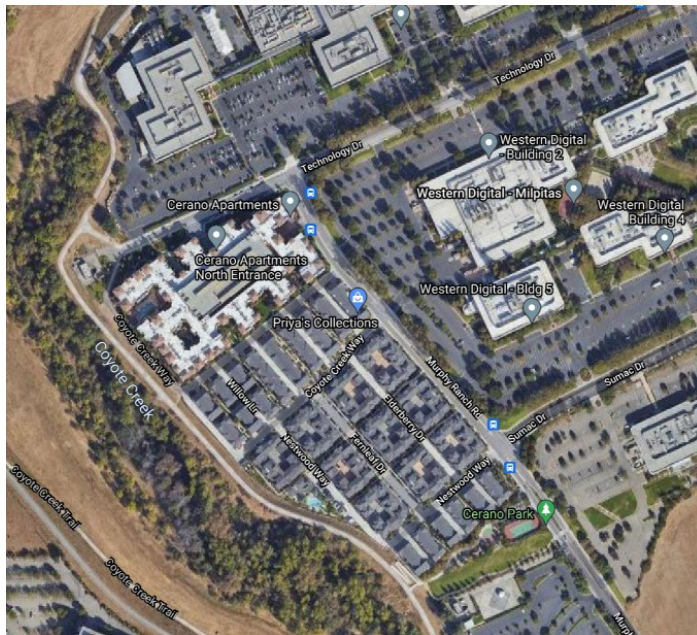
Action ED-3b Undertake strategic initiatives to attract private investment in well-located properties that are currently vacant and/or underutilized.

Action ED-3d Maintain flexible development standards to accommodate a wide range of commercial space needs and facilitate the adaptive reuse of older properties.

General Plan Designations

Residential Designations (LDR, MDR, HDR, VHDR). The residential GP designations are almost exclusively built at the upper end of the density for each designation. They are only relevant to the HOZ if other areas in Milpitas are rezoned to these designations through a Specific Plan or specific project. This seems to be a typical pattern in the City in multiple locations.

QUESTION: What is the history of non-residential properties being rezoned for housing? Should the HOZ look for these types of opportunities? Example: Cerano Apartments, Murphy Ranch Road (Previously zoned Light Industrial or Industrial Park, now zoned Urban Residential)



Neighborhood Commercial Mixed (NCMU). The NCMU designation is a new land use designation in the 2021 General Plan Update. The NCMU designation is located in four areas across the City and includes three different commercial and industrial zoning districts. The new designation allows for the development of housing on properties in the NCMU designation but includes strict limits on the amount of residential that is allowed in relation to the amount of commercial space provided. It is unlikely that a mixed-use project would be feasible if a new zoning district was created that instituted the residential to non-residential ratio requirements of the General Plan designation. The General Plan does not include a density for residential in the NCMU designation. Assuming 1,000 gross square feet per unit on average, the density of the NCMU designation would be 21 dwelling units per acre but would require 0.75 commercial to get to 21 dwelling units per acre. The General Plan does allow for discretionary approval for residential-only projects if the project is 100% affordable to the "low" and "very low" income categories.

"FLOOR AREA RATIO. Floor area ratio, referred to as FAR, is used to express the building intensity for nonresidential uses, such as commercial, industrial, community facilities, and the non-residential component of mixed-use projects. FAR refers to the ratio of the total floor area of a building or buildings on a site, excluding parking structures and outdoor storage areas, to the lot area of the site."

EXCERPT FROM GENERAL PLAN

NEIGHBORHOOD COMMERCIAL MIXED-USE (NCMU) (FAR UP TO 0.75, AND UP TO 1 UNIT PER 1,500 SQUARE FEET OF NONRESIDENTIAL DEVELOPMENT). The Neighborhood Commercial Mixed-Use (NCMU) designation is intended to accommodate a mix of commercial and residential uses with an emphasis on commercial activity as the primary use, and residential uses, hotel, and office development allowed on a limited basis. The NCMU designation encourages active neighborhood serving uses at the ground level, including grocery stores, specialty retail, restaurants, plazas, or walk-in personal services such as banks and salons at FARs up to 0.75. This designation also provides opportunities for vertical or horizontal mixed-use residential development to provide for area vibrancy and to encourage the redevelopment of aging commercial centers by allowing Multifamily dwelling units at a rate of 1 unit per 1,500 square feet of new or rehabilitated neighborhood-serving retail and commercial services. The City Council may consider the approval of residential-only projects in the NCMU land use designation, provided the project is 100% affordable to the "low" and "very low" income categories, in order to increase the stock of affordable housing in Milpitas. Projects with a residential component are subject to additional policy direction (Policy LU 6-1) to ensure that NCMU areas continue to primarily serve surrounding neighborhoods with commercial services.

If FAR limit does not apply to residential floor area:

Assuming 1,000 gross sf per unit. 1,000 sf residential for every 1,500 sf of commercial. 40% residential:60% commercial. 0.5 FAR residential: 0.75 FAR commercial = 21 dwelling units per acre

Town Center (TWC). The TWC designation updates the previous Town Center designation to allow for residential use to occur within a horizontal or vertical mixed-use project. Residential only projects are not permitted. The purpose for allowing residential is to "increase economic support to the commercial uses." This designation allows for up to 40 units per acre and requires a minimum of 0.35 FAR for non-residential uses. In our experience, we rarely see a 0.35 FAR in a vertical mixed-use project, the amount of parking needed typically makes this amount of commercial infeasible. A range of 0.10 to 0.20 FAR for commercial. Is more common vertical mixed-use or a mix of vertical and horizontal mixed-use projects. In addition to

the restrictive nature of the minimum commercial FAR requirement, the maximum density of 40 dwelling units per acre is not a typical density for vertical mixed-use projects. In a podium mid-rise building type, 40 dwelling units per acre can generally fit in typically 2 floors of residential, whereas a more typical mixed-use project includes 4 or 5 story residential floors. The above analysis is typical for single projects, the redevelopment of the large format shopping centers will require more analysis and site testing to understand the how the minimum commercial FAR and maximum density would play out in a more horizontally focused mixed-use project with structured or rooftop parking. If the zoning is set per the General Plan guidance, the HOZ may provide the opportunity to increase densities to a more typical building type while providing additional affordable housing above the AHO's 15% requirement. As part of this analysis, a more detailed economic analysis may be beneficial in the Existing Conditions phase of the project.

EXCERPT FROM GENERAL PLAN

TOWN CENTER (TWC) (UP TO 40 UNITS PER ACRE AND FAR UP TO 0.85). This designation provides for a variety of commercial, professional, civic, restaurants, hotels, residential, and entertainment uses. Projects may consist of a wholly non-residential development, or a mixed-use residential project that integrates residential and nonresidential uses vertically or horizontally. Residential-only projects are not permitted. Residential developments up to 40 units per acres may be permitted within the Town Center as part of a mixed-use development project to increase economic support to the commercial uses. Developers wanting to maximize the residential component of the parcel are required to provide a minimum FAR of 0.35 for the non-residential component. Sites developed with a mix of uses, or non-residential uses, must adhere to a FAR maximum of up to 0.85.

ii. Specific Plans

There are two specific plan areas in Milpitas. Both specific plan areas are currently undergoing an update. The Metro Specific Plan, formerly the Transit Area Specific Plan, has a Public Draft available for review. This document does not review content for the Midtown Specific Plan/Main Street Gateway Specific Plan since that update process has just started and new content is not yet available.

Milpitas Metro Specific Plan/Transit Area Specific Plan (2021 Admin Draft)

The Milpitas Metro Specific Plan (Metro plan) creates eight land use classifications and zoning districts that are specific to the Metro plan area. The Metro plan estimates an addition of 5,000 to 7,000 new residential units within its boundaries. The Metro plan does not have a specific affordable housing strategy that is different from city-wide inclusionary housing ordinance.

"The currently calculated draft capacity for additional residential units in Milpitas Metro is 5,000-7,000 total, with 2,000-4,000 units on the Great Mall site, and 3,000 units on other sites. When the Housing Element is developed, the City will determine which sites to include in the Housing Element."

Zoning Districts. Of the eight new zoning designations in the Metro Specific Plan, five districts allow residential development. The plan also identifies "Areas of Change" that include potential development

sites within the plan area since much of the land has been developed in the last 15 years under the TASP plan. Table 3-1 below is excerpted from the draft plan and shows preliminary densities and heights and associated zoning districts. The FAR's and densities are net, excluding required streets and open spaces. The plan also states that the HOZ may allow for increased housing densities in the plan area.

"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."

Many sites within the "Areas of Change" are located in the Great Mall site and designated Residential Retail High Density Mixed Use (RRMU) which allows for up to 85 units per acre on a residential only project or up to 2.5 FAR in mixed-use project with upper floor residential up to 85 feet in height. These numbers are in-line with the allowed FAR but a typical mid-rise residential only or mixed-use building with 5 residential floors could produce up to 120 to 140 dwelling units per acre. The difference between allowed density and estimated density per prototypical building type provides an opportunity for the HOZ to create an incentivized structure for additional density that is above what is allowed according to State Density Bonus law. Similarly, the housing densities in the MFH and VHD classifications are artificially low compared to the height limits. The URR classification's density of up to 120 units per acre is more in-line with a prototypical building type at 6 stories with associated affordable housing density bonuses.

Table 3-1 Metro Plan Residential Land Use Designations

Land Use Designation	Density (units per acre)	Maximum Height	Active Use Requirements	Zoning
Residential Retail High Density Mixed Use (RRMU)	Mixed Use ¹ : 1-2.5 FAR Residential Only: 40-85 units/ac	85 feet 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 Shopping Street.	Metro High Density Mixed Use (MXD2-Metro)
Boulevard Very High Density Mixed Use (BVMU)	Mixed Use ¹ : 2.5-5.0 FAR	275 feet 50 percent of base footprint above 85 feet and 25	Ground floor retail and active uses are required on 80 percent of the ground floor	Metro Very High Density Mixed Use

	Residential Only: 85-250 units/ac	percent of base footprint to a maximum height of 275 feet tall	facade along any Shopping Street.	(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	6 stories and 75 feet	N/A	Metro Urban Residential (R5-Metro)

¹ On Housing Element opportunity sites, upper story non-residential uses are prohibited.

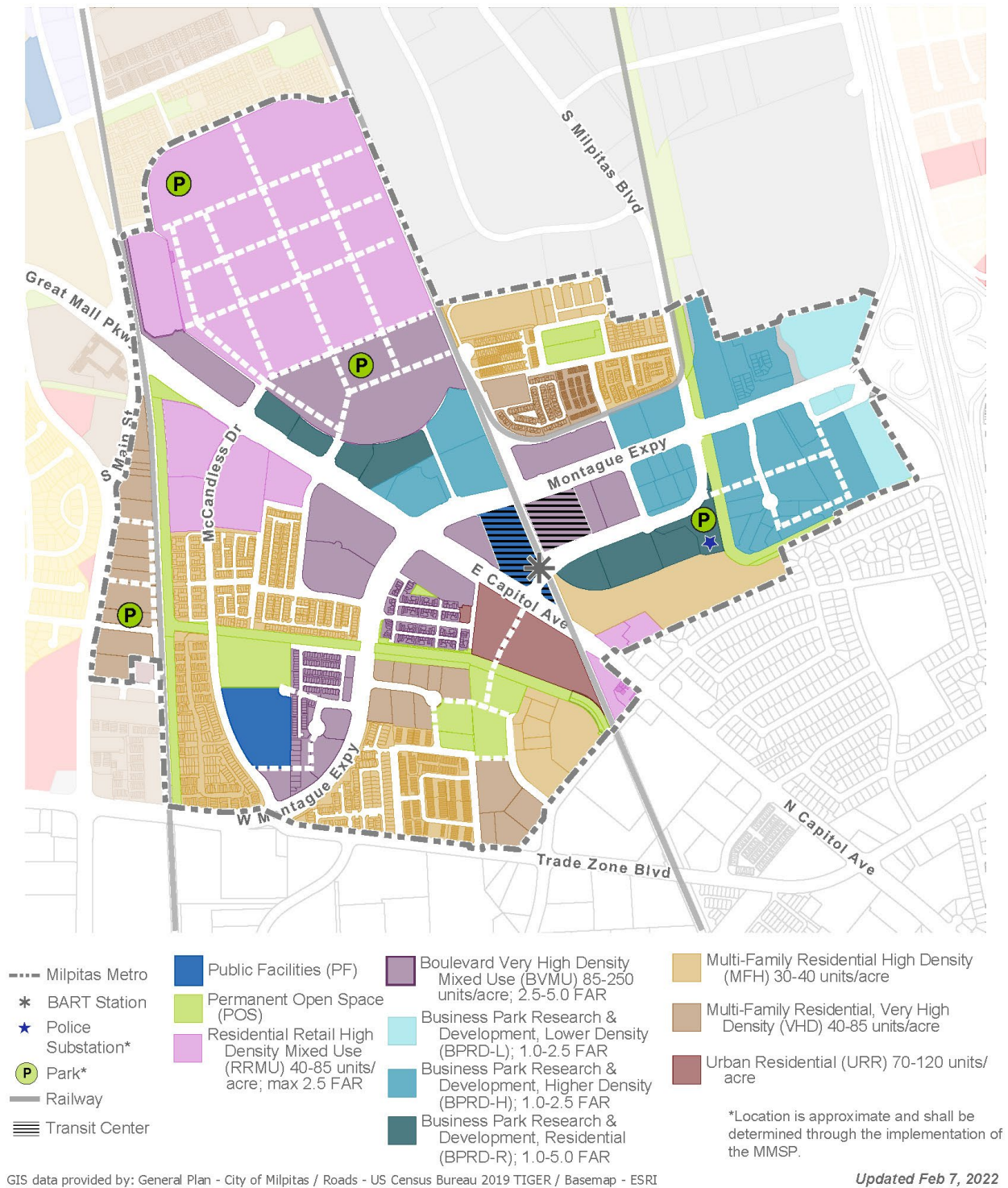
Parking. The Metro plan includes a significant reduction in parking requirements from the city-wide zoning code. The Metro plan introduces a maximum allowed parking ratio and a minimum number of spaces per unit without specifying number of bedrooms. In addition to the requirements in the table below, further reductions are possible conditionally.

Table 3-2 Metro Specific Plan Parking Requirement

Land Use	Minimum Requirement	Maximum Requirement
Residential/Lodging	0.5 spaces per unit	1.5 spaces per unit
Non-Residential	1 space per 1,000 sf	2 spaces per 1,000 sf

LAND USE

MILPITAS METRO



iii. Zoning/Municipal Code

Neighborhood Commercial Mixed-Use (NCMU)

The areas identified in the General Plan NCMU designation include three zoning districts (see table below). These zoning districts do not allow residential uses and have floor area and height limits that would be restrictive to developing residential and mixed-use residential projects. The zoning district will need to be updated within the HOZ process.

Town Center (TWC)

The TWC General Plan designation includes only one zoning district, TC (see table below). The maximum FAR in the zoning district is in line with the TWC designation at 0.85 FAR. The TC Zone does not allow residential uses, but three residential projects have been approved and built within the district. The zoning district will need to be updated during the HOZ process to allow for residential uses per the General Plan designation. As noted in the General Plan review, the maximum density of 40 dwelling units per acre may limit economic feasibility. The existing maximum building height of 35 feet would force projects into a horizontal mixed-use format. To achieve a vertical mixed-use product in the 40 dwelling units per acre density, a minimum of 4 stories and 50 feet of height would be needed. If through the HOZ or through the writing of new zoning greater densities were allowed, vertical mixed-use projects would be more feasible at 6 to 8 stories and up to 85 feet in height.

***EXCERPT FROM ZONING CODE** Town Center (TC) Zone. The purpose and intent of this zone is to provide for an area that supports a wide range of administrative, business, entertainment, dining, and cultural activities in the geographic center of the City to suit the varying lifestyles of residents and visitors alike. The area is easily accessible via the City's transportation network.*

Table 3-3 FAR and Height Requirement by Zoning District

Zone	Floor Area Ratio (FAR)	Building Height
Zoning Districts within NCMU		
Neighborhood Commercial (C1)	0.35 FAR	35 ft/ 2.5 stories
General Commercial (C2)	0.50 FAR	no building height maximum
Industrial Park (MP)	0.5 FAR	35 ft/3 stories
Zoning Districts within TWC		
Town Center (TC)	0.85 FAR	35 ft/3 stories or higher with conditional use permit

Parking

The following tables show minimum requirements for the different land uses in the zoning designations relevant to the HOZ. The zoning code does allow for shared parking through a conditional use permit.

Table 3-4 Parking Requirements for Mixed and Multi-family Zoning Districts

Mixed-Use + Multi-Family	Minimum Parking Spaces Required (parenthesis inclusive of guest parking)
<i>Studio</i>	<i>1 space per unit (1.15)</i>
<i>1 Bedroom</i>	<i>1.5 spaces per unit (1.75)</i>
<i>2-3 Bedroom</i>	<i>2 spaces per unit (2.15)</i>
<i>4 or more</i>	<i>3 spaces + 1 per additional bedroom (3.15)</i>
<i>Senior Housing</i>	<i>1 space per unit + 2 per manager's unit</i>
<i>Guest Parking</i>	<i>15% of the total required (structured)</i> <i>20% of the total required (private garages)</i>
<i>Bicycle Parking</i>	<i>5% of the total required (Residential + Commercial Uses)</i>
<i>Ground Floor Retail</i>	<i>1 per 250 sq. ft.</i>
<i>Office</i>	<i>If building is 1,000 sq. ft. or smaller: 1 per 250 sq. ft.; If building is larger than 1,000 sq. ft.: 3.3 per 1,000 sq. ft.</i>
<i>Other Uses</i>	<i>Refer to specific uses in table</i>

Table 3-5 Parking Requirements for Commercial Zoning Districts

Commercial Use (single-use)	Minimum Parking Spaces Required
<i>Commercial Services ¹ (floral shops, barber shops, dry cleaners, Laundromats, photocopy shops)</i>	<i>1 per 200 sq. ft.</i>
<i>General Retail and Convenience Stores</i>	<i>1 per 200 sq. ft.</i>
<i>Financial institutions (banks, savings and loans, etc.)</i>	<i>1 per 180 sq. ft.</i>
<i>Offices, administrative and business services</i>	<i>1 per 240 sq. ft.</i>
<i>Bars, Drinking Establishments</i>	<i>1 per 30 sq. ft.</i>
<i>Restaurants (Sit Down)</i>	<i>1 per 39 square feet of dining area.</i>
<i>Restaurants (Take Out)</i>	<i>1 per 2.5 seats (indoor/outdoor) plus 1 per 60 sq. ft. GFA for the ordering or take out area.</i>

Shared parking may be applied in the following situations:

1. In mixed-use developments, which include one or more businesses that are complementary, ancillary, or support other activities. A typical mix of uses includes, but is not limited to: residential, office, restaurants, retail, colleges, churches, cinemas, and special event situations if they can demonstrate that demand patterns vary among uses.
2. In shopping centers, when more than twenty percent (20%) of gross leasable area is occupied by dining and entertainment uses, (not including pad restaurants, unless they are located within 300 feet of the main shopping center building) shared parking may be applied.

Required Review. Shared parking proposals may be allowed with the approval of a Conditional Use Permit, in accordance with Subsection 57.04, Conditional Use Permits, of this Chapter.

iv. Density Bonus Ordinance

(Title XI-10-54.15 of the Zoning Code and Sections 65915 – 65918 of
Ca Government Code)

The City of Milpitas' Density Bonus Ordinance (DBO) was last amended in 2008. The State of California's Density Bonus Law (SDBL) explicitly supersedes any local ordinances and takes precedence when there is any conflict between the two, however, a city may provide additional density bonus over the minimum state requirement. The SDBL has been extensively amended over the last five years with multiple State laws. This report will primarily describe the SDBL and only the features of the DBO that are unique and not superseded by state law. The focus of this report is also primarily on aspects relevant to the goals of the HOZ.

Description of relevant City and State Density Bonus Regulations:

The State Density Bonus Law allows developers of projects with five or more dwelling units to obtain more favorable local development requirements in exchange for building or donating land for affordable or senior units. The SDBL (found in California Government Code Sections 65915 – 65918) provides incentives similar to what could be included in a Housing Overlay Zone to encourage the development of housing, including increase in project densities and reduction of parking or development standards depending on the amount of affordable housing or other specified community benefits (Nave, 2021).

Local jurisdictions are required to grant a density bonus and other incentives or concessions to housing projects which contain one of the following:

- At least 5% of the housing units restricted to very low-income residents.
- At least 10% of the housing units restricted to lower income residents.
- At least 10% of the housing units in a for-sale common interest development restricted to moderate income residents.
- 100% of the housing units (other than manager's units) restricted to very low, lower and moderate-income residents (with a maximum of 20% moderate).
- At least 10% of the housing units targeted for transitional foster youth, disabled veterans or homeless persons, with rents restricted at the very low-income level.
- The project donates at least one acre of land to the city for very low-income units, and the land has the appropriate general plan designation, zoning, permits and approvals, and access to public facilities needed for such housing.
- The project is a senior citizen housing development (no affordable units required).

The amount of the density bonus is set on a sliding scale, based upon the percentage of affordable units at each income level. Base density allowed is calculated based on either the zoning district or General Plan land use designation, whichever allows higher density. Affordable projects with as little as 5% Very Low income or 10% Low Income units are eligible for up to 50% increase in density. Projects which have all affordable units are eligible for an 80% increase in density.

In Milpitas, If the housing development meets criteria- at least 5% of the housing units restricted to very low-income residents or at least 10% of the housing units restricted to lower-income residents, the density bonus shall be an increase of 20% over the maximum allowable residential density under the general plan and zoning ordinance. If the housing development meets criterion- Ten percent (10%) of the total dwelling units in a condominium project restricted to moderate income, the density bonus shall be an increase of five (5%) percent over the maximum allowable residential density under the general plan and zoning ordinance.

Parking

Upon the developer's request, the city or county may not require more than the following parking ratios for a density bonus project (inclusive of parking for persons with disabilities):

- Studio or 1 Bedroom – 1 space
- 2 or 3 Bedroom – 1.5 spaces
- 4 Bedroom 2.5 spaces

Even lower parking ratios apply to affordable housing projects that are within specific proximity of transit services and facilities (although local jurisdictions can require higher parking ratios if supported by a parking study).

Concession and Waivers

In addition to the density bonus, the city or county is also required to provide one or more "incentives" or "concessions" to each project which qualifies for a density bonus. A concession or incentive is defined as reduction in site development standards or a modification of zoning code or architectural design requirements, such as a reduction in setback or minimum square footage requirements, or other regulatory incentives or concessions which actually result in identifiable and actual cost reductions. The number of required incentives or concessions is based on the percentage of affordable units in the project, with the larger the percentage of affordable units and the higher.

If any other city development standard would physically prevent the project from being built at the permitted density and with the granted concessions/incentives, the developer may propose to have those standards waived or reduced. The city is not permitted to apply any development standard which physically precludes the construction of the project at its permitted density and with the granted concessions/incentives other than those that would cause a problem for public health, safety, the environment, historical property, or would be contrary to law.

Bonus related to proximity to transit

Height or FAR limits in the local zoning are development standards for which waivers can be requested for a density bonus project. Eligible 100% affordable housing developments built within a half-mile of a major transit stop may increase building height by 3 additional stories or 33 feet over any prescribed zoning standard and have no other limit on density.

The SDBL also requires that cities and counties provide a “development bonus” to commercial developers who partner with affordable housing developers for the construction of affordable housing on the commercial project site, or offsite within the jurisdiction located near schools, employment and a major transit stop. Unlike the primary Density Bonus Law, there is no fixed amount of increased density available. Instead, the development bonus can be any mutually agreeable incentive, including up to a 20% increase in development intensity, floor area ratio, or height limits, up to a 20% reduction in parking requirements, or other exceptions (Meyers Nave, 2021).

Under new amendments effective in 2019, a local jurisdiction is also permitted under the SDBL to grant a floor area ratio bonus rather than a traditional density bonus to certain high density affordable housing projects adjacent to public transit. This option would need to be specifically adopted by the Milpitas City Council as an amendment to the City’s DBO since it is not automatically available. Eligible projects are also entitled to special parking ratios of one-tenth of a parking space per affordable unit and one-half space per market rate unit. To be eligible for the floor area ratio bonus, the project must restrict at least 20 percent of the units to very low-income tenants, must be located within a transit priority area or near a major transit stop, and must be in compliance with local height limits. (Meyers Nave, 2021).

Analysis of how these standards relate to HOZ goals

Milpitas has not had much affordable housing development of any type, so a variety of categories of incentives in the HOZ would be appropriate. The HOZ Existing Conditions Report, and the Housing Element are examining the inventory and pipeline of housing concurrently and the need for different types of housing. It is important to grant additional waivers from zoning standards to facilitate development that provides more affordability: One set of waivers in addition to the SDBL could apply to projects with 50% affordable housing, and a larger waiver could apply to 100% affordable projects. These waivers can exceed SDBL because the amount of affordable housing will exceed what is required in the State law.

In addition to amending the base commercial/mixed use zoning to have FAR density consistent with the NCMU and TWC, there is an opportunity for the HOZ to also consider an additional FAR bonus for residential projects with 50% or 100% Affordable units. This could include an amendment to Section XI-10-54.14 of the Zoning along with the creation of the HOZ section of the code.

v. Affordable Housing Ordinance

(Title XII-Chapter 1 of the Municipal Code – Housing Section)

The City of Milpitas' Affordable Housing Ordinance (AHO) came into effect in July 2018 and was recently amended in February 2022. The AHO sets out the minimum percentage of affordable dwelling units, compared to the SDBL and the HOZ provisions which are optional for developments providing much higher percentages of affordable housing onsite. The AHO requires all new residential projects with ten or more units to develop 15% of the total number of units as affordable units. This Report summarizes the most relevant provisions and identify issues that impact the HOZ goals and objectives.

Description of relevant AHO Regulations:

The required income levels for inclusionary units are very broad: rental developments may provide either very-low or low-income units, and ownership development may provide very-low-, low-, or moderate-income units.

The Ordinance provides incentives to developers to provide affordable housing units on site, however, a developer may satisfy the affordable housing requirement in other ways. All exceptions to the AHO requirement require City Council approval prior to the approval for development of the project.

- **Pay fees in lieu of creation of affordable units.** Ownership housing projects must request and secure approval from the City Council for paying fees in lieu of construction, whereas rental projects do not need special approval for this option. The affordable housing fees are adopted by City Council Resolution and adjusted annually for inflation. This section was updated after initial adoption to make it more likely for ownership projects to provide affordable units on site.
- **Construct affordable units off-site.** With the approval of the City Council, the developer may conditionally construct affordable units at another location within the city.
- **Dedicate land.** The City Council may conditionally permit an applicant to dedicate land to the City or a City-designated local non-profit housing developer in lieu of construction of some or all the required affordable units.
- **Transfer credit.** Affordable unit credits are issued for each additional affordable unit constructed over the required number. The applicant may then use the credits to satisfy the requirements for another project in the City.
- **Transfer equivalent square foot.** The applicant may choose to provide more units in an overall development; however, the gross square footage of the proposed affordable units cannot be less than the square footage of the required affordable units.

Table 3-6 Residential Projects Affordable Housing Fee

Building Permit Application Date	Ownership	Ownership	Ownership	Rental
	Single Family (Fee/Sq Ft)	Townhome (Fee/Sq Ft)	Condominium (Fee/Sq Ft)	Apartment (Fee/Sq Ft)
July 1, 2019 – June 30, 2020	\$33.00	\$33.00	\$33.00	\$33.00
July 1, 2020 – June 30, 2021	\$35.13	\$35.13	\$35.13	\$35.13
July 1, 2021 – June 30, 2022	\$37.11	\$37.11	\$37.11	\$37.11
Each Subsequent Fiscal Year	Adjusted by Rate Index per Affordable Housing Ordinance			

Non-Residential Affordable Housing Impact Fee

Any non-residential development in the City is subject to payment of a non-residential affordable housing impact fee. Some non-residential uses such as day care, nursery, school facilities, hospitals are exempt from this impact fee. Other uses not listed in the ordinance may be exempt if the City Council determines that the development will have a minimal impact upon the demand for affordable housing. The impact fee is calculated on a per square foot basis for net new gross floor area. Thus far, the pipeline non-residential projects have not reached the building permit approval stage, so no impact fee has been collected by the City. The non-residential requirement in the NCMU and TWC zone will lead to higher affordable housing impact fee for new projects in these zones.

Table 3-7 Non-Residential Projects Affordable Housing Impact Fee

Building Permit Application Date	Commercial (Office, Retail and Hotel) (Fee/Sq Ft)	Industrial (R&D, Manufacturing and Warehouse) (Fee/Sq Ft)
July 1, 2019 – June 30, 2020	\$4.00	\$1.00
July 1, 2020 – June 30, 2021	\$6.00	\$3.00

July 1, 2021 – June 30, 2022	\$8.00	\$4.00
Each Subsequent Fiscal Year	Adjusted by Rate Index per Affordable Housing Ordinance	

Incentives to Encourage On-Site Construction of Affordable Units

If an applicant provides affordable units in excess of 20 percent of the total number of units in the project the City provides the following incentives:

1. **Planning waivers:** Director of Planning shall grant up to two of the waivers listed below that help increase the feasibility of the construction of affordable units. The applicant will receive an additional two waivers from the list below for every additional 5 percent of affordable units provided above the 20 percent.

- Priority processing.
- Reduced setback requirements not to exceed 50 percent of the minimum required setback.
- Greater floor area ratio (FAR) not to exceed 50 percent of the maximum FAR for commercial space in mixed use zoning.
- Reduced landscaping requirements.
- Reduced interior or exterior amenities.
- A maximum 20 percent reduction in parking requirements.
- Height restriction waivers not to exceed 20 percent of the maximum zoning height limitations and in no event to exceed the general plan height limitations.

2. Fee deferral:

- **Development Processing Fees.** The City Manager may approve deferred payment of City processing fees applicable to the review and processing of the project. The terms and payment schedule of the deferred fees shall be subject to the approval of the City Manager.
- **Development Impact Fees.** The City Manager may authorize the deferred payment of development impact fees applicable to affordable units. Approval of this incentive requires demonstration by the Applicant that the deferral increases the project's feasibility. The applicant must provide appropriate security to ensure future payment of such fees.

Analysis of how these standards relate to HOZ goals

The AHO is a minimum requirement for projects with ten or more dwelling units, regardless of whether it is residential only or a mixed-use project. This ordinance is also applicable regardless of zoning district. If the income levels and number of affordable housing units meet the requirements for Density Bonus Law, the project would be eligible for the benefits under SDBL or any local density bonus.

vi. SB 35

California Senate Bill 35 (SB 35) is a state law (California Government Code Section 65400 and 65582.1) that streamlines the development review process for affordable housing projects in local jurisdictions that have not made adequate progress toward meeting their Very-Low- and Low-income Regional Housing Needs Allocations (RHNA). Projects in Milpitas with 50% affordable housing (as defined in the California Government Code) are eligible for SB 35 streamlining.

SB 35 requires jurisdictions to review applications within 60 days for developments with 150 or fewer units and within 90 days for developments with over 150 units to determine if the project qualifies for streamlined review. If the application is deemed eligible for streamlined review, the city must then review and approve the project within 90 days after application submittal.

Exemption from CEQA is one of the major benefits for projects using SB 35. However, If HOZ eligible projects are allowed to be approved by-right with no discretionary actions, this may eliminate the CEQA requirement for these regardless of SB 35 eligibility.

The City of Milpitas has not adopted any specific guidance regarding SB 35 projects. **Thus far, the City has only one project (112 below-market-rate, 100% affordable) in the pipeline that qualifies for SB 35 streamlined approval.** Other project details are discussed in the sections below.

Example SB 35 Project

Density Bonus

The City has only one project (112 below-market-rate, 100% affordable) in the pipeline that qualifies for SB 35 streamlined approval. The project site, located within the Transit Area Specific Plan (Milpitas Metro Plan) planning area and within one-half mile of high-quality public transit (Great Mall VTA light rail station), takes advantage of the State Density Bonus Law where there is no maximum density limit if the project is in close proximity to transit. The project is proposed at a density of 117 units per acre where the base density under the General Plan allows 41-60 units per acre. The project site is located in the R4-TOD Multi-family Very High-Density Residential Zoning District with a Transit-Oriented Development Overlay which allows 41-60 dwelling units per acre.

Parking

The proposed project includes no vehicular parking. Pursuant to Government Code Section 65913.4(e)(1)(A), the City is prohibited from imposing automobile parking standards on a project deemed eligible for streamlined review under SB 35 when it is located within ½-mile of public transit.

Concessions and Waivers

Per Density Bonus Law, the applicant requested the maximum four concessions allowed (modifications to Front Yard Setback, Side Yard Setback, Rear Yard Setback, and Residential Open Space) -- resulting in 'actual and identifiable cost reductions.' The applicant also requested two waivers (Private Open Space and On-Street Bicycle Parking) to enable the project to be built at the proposed density.

Development Fees

The project is required to pay the Transit Area Specific Plan Development Impact Fee (TADIF) set at \$44,009 per residential unit. Projects with more than 20 units are required to devote at least one half of one percent of the Building Development Cost towards the purchase and installation of public art at the project site. The project was not exempt from TADIF or the public art requirement.

4. Development Process Review

i. Project Review & Permitting

Standardized and transparent project review and streamlined permit processing are critical steps to assist the development of housing projects in the city. This section reviews the various steps in the project review process and analyzes estimated timelines for approvals to identify barriers or constraints to realize the housing goals stated in the General Plan and the Specific plans including the Housing Element. This review is based on information provided by City staff and the city website and will need to be corroborated and refined with discussions with housing developers. A summary of relevant issues and recommendations will be part of the HOZ Existing Conditions Analysis as well as the Constraints section of the Housing Element after stakeholder meetings with developers, both for-profit and not-for-profit.

Process

Project review in Milpitas is conducted in two phases: the first is the planning/zoning entitlement approval and second is the building permit approval. In the first phase, Planning staff and relevant City departments determine whether the project is consistent with the General Plan, Specific plans, the Zoning ordinance and other relevant regulatory requirements. 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 the City Council.

Following the approval of the appropriate planning entitlements, the building permit applications are reviewed by different City departments to check for consistency in the design and requirements for safety and improvements. The developers are expected to pay all the associated planning fees, impact fees and other fees in advance of building permit approval.

The different stages outlined for a developer in the City's Development Review handbook are as follows-

1. **Pre-application Meeting and Review.** The City offers a pre-application meeting and review session to facilitate the processing of development proposals. The pre-application process provides an opportunity for applicants to receive early feedback from City staff before project plans are finalized.
2. **Planning Review and Processing.** After the application is formally submitted, Planning staff and other City Department staff review the submitted materials within 30 days to make sure all necessary information is included. For large projects, meetings with the community and with decision-makers may be recommended to receive feedback for public hearings.
3. **Noticing and Decision Making.** Prior to issuing the approval, Planning staff prepares the required staff report, conditions of approval, and findings of approval. A public hearing is scheduled where the Planning staff present the project to the hearing body with a staff recommendation and answer any questions related to the project.

4. **Permitting.** The Building Safety and Housing Department issues building permits by reviewing construction plans to make sure the project complies with applicable State and local laws. During this stage, other City Departments and Outside Agencies may need to review the project as necessary. The applicant is required to pay all the associated fees during the building permit application submission.
5. **Construction.** After procuring all the necessary planning and building permit, the project moves into the construction and inspection phase with the Milpitas Building Safety and Housing Department to ensure that the construction is as per approval and that the building is safe for occupancy. The Certificate of Occupancy is awarded at the end of this phase.

Timelines

Delays due to permitting can lead to increased project costs which can serve as a constraint to housing production and affordability. Table 4-1 below shows the average processing times for different residential development applications and building permits from 2019. In Milpitas, provided the project is consistent with the City's Zoning Ordinance, General Plan, or any applicable Specific Plan, simple projects' planning application permit reviews are estimated to take about 1 month. For complex projects, without CEQA requirements, the planning permit review process can take up to 6 months and with CEQA can take more than 11 months. The Planning Commission and City Council have two regularly scheduled public meetings every month.

Table 4-1 Processing Times for Applications and Building Permits

Type of Development	Months (Planning Application)*	Months (Building Permit)*
ADU Ministerial (by-right)	0 to 1 month	1 to 6 months
Ministerial (by-right) Includes projects that comply with applicable building, zoning and development regulations.	0 to 1 month	1 to 6 months
Discretionary (Staff) Includes coastal development permits, neighborhood development permits, neighborhood use permits	0 to 1 month	2 to 12 months
Discretionary (Hearing Officer) Includes variances, certain site development permits, and certain conditional use permits	2 to 4 months	6 to 18 months
Discretionary (Planning Commission)	3 to 12 months	12 to 24 months

Includes certain conditional use permits, certain site development permits, and planned development permits		
Discretionary (Planning Commission and City Council)	3 to 12 months	12 to 24 months
Includes tentative maps, condominium conversion maps, easement vacations, public right-of-way vacations, rezoning, and land use plan amendments		
<i>*Based on City of Milpitas submission to Santa Clara County Collaborative</i>		

Milpitas's review and approval timelines are longer than average times taken by other jurisdictions in Santa Clara County. Streamlining the permitting and approval processes further can assist developers and property owners interested in developing housing in Milpitas. Issues and opportunities to improve timelines will be further explored in discussions with developers in the next phase of the project.

California's Housing Accountability Act (HAA) requires local governments to process and review, approve, or disapprove housing developments within very tight timeframes if an applicant requests this (Government Code section 65589.5)

In these cases, a city must review and notify an applicant within 30 days as to whether the application is complete. After completeness, the City must determine if a project is consistent with objective standards (specifically defined) that must be identified and set at the time of Pre-application or Completeness review. The City must provide written notice of inconsistency (if applicable) to the applicant within 30 days of application for projects with 150 or fewer units (60 days for more than that). Any discretionary hearings or internal review must be completed within these timeframes. Projects qualifying for HOZ incentives will almost always qualify under the HAA provisions for "Housing for Very Low, Low- or Moderate-Income Households" which is subject to further streamlining provisions. Based on preliminary data from other cities in Santa Clara County, these processing times do not provide any extraordinary constraint to development but can be further streamlined.

A project meeting the Very Low/Moderate standard may not be disapproved, rejected, or otherwise made infeasible unless extensive findings are made including that the project would "have a specific, adverse impact upon public health or safety and there is no feasible method to mitigate or avoid the impact..." unless the local government has met or exceeded its RHNA, or project denial or conditions are required to comply with specific state or federal law. Compared to these HAA standards, the City of Milpitas' development review times most recently documented would likely need to be accelerated for projects that meet the criteria. The averages shown in the table above are not outside of the range of time frames reported by other cities in Santa Clara County and are not high enough to constitute a significant constraint to the typical development.

ii. Fees

Local governments collect fees from new developments to cover administrative costs and to provide improved infrastructure to serve the residents of that development. These payments are required upfront during the plan review period, however, a deferral may be provided to a developer if they provide on-site affordable units as stated in the AHO.

Table 4-2 Different Fees associated with Residential Developments

Fee Type	Single Family	Multifamily Small (per unit)	Multifamily Large (per unit)
Entitlement Fees	\$17,359	\$3,671	\$367
Building Permit Fees	\$23,110	\$13,111	\$6,616
Engineering Fees	\$25,000	\$5,000	\$1,000
Fire Fees	\$1,120	\$568	\$353
Impact Fees (non TASP)	\$0	\$29,064	\$29,064
Other	\$10,600	\$3,468	\$3,264
TOTAL	\$77,797	\$54,882	\$40,664
Santa Clara County Average*	\$74,831	\$34,752	\$27,563

*Based on Draft Presentation from Santa Clara County Collaborative Meeting March 10, 2022

Compared to other cities in Santa Clara County, Milpitas has higher fees per unit for single and multi-family developments. Milpitas has the highest Entitlement Fees in the County for single family developments and high impact fees for multi-family developments. Impact Fees and other Developmental Fees are explored in detail in the following sections.

Impact Fees

The Calaveras Widening Traffic Impact Fee is collected to widen Calaveras Boulevard to mitigate the traffic impacts caused by new development in the area outside the TASP. Additionally, the Transit Area

Development Impact fee (TADIF) is collected to fund the planning and development of the transit area outlined in the TASP near the Great Mall to support the community with appropriate utilities, parks, services, and roadways. This fee compensates the City for costs of roads and a significant amount of infrastructure that normally would have been paid by developers for off-site improvements required in this area. The different impact fees applicable for residential projects are explained below.

Table 4-3 Different Impact Fees for Residential Developments

Impact Fees	Amount (as of June 2021)	
	In TASP	Not in TASP
Transit Area Development Impact fee (TADIF)	\$44,090 per unit	\$0
Calaveras Widening Traffic Impact Fee (5 or more units)	\$0	\$314 per unit
Public Art Fee	0.5% of construction cost	0.5% of construction cost
Park-in Lieu Fee	\$4,500	\$28,750
Total	~\$48,590	~\$29,064
Based on City of Milpitas submission to Santa Clara County Collaborative		

The average impact fee per unit for a multi-family project in Milpitas in the TASP area is \$48,500 which includes the TADIF which applies to a limited area for very specific required infrastructure. The typical impact fee per unit in other parts of the city would be \$29,064 for traffic impacts and parks. The Park-in Lieu Fee makes up 99% of impact fees outside of the TASP. A comparison of impact across different jurisdictions is shown in the table below.

Table 4-4 Comparison of Impact Fees for Multi-family and Single-family Developments

Unit Type	Milpitas	Santa Clara*	Mountain View*	Fremont**
Multi-family	\$29,064	\$10,750	\$34,000	\$22,331
Single family	\$0	\$54	\$71,347	\$35,334
* Based on Draft Presentation from Santa Clara County Collaborative Meeting March 10, 2022 ** (Turner Center for Housing Innovation, Residential Impact Fees in California, 2019) https://www.hcd.ca.gov/policy-research/plans-reports/docs/impact-fee-study.pdf				

Optional: Other and Development Taxes

Table 4-5 Additional Fees and Taxes for Residential Developments

Type of Dwelling	Amount (as of June 2021)	
	Single Family	Multi-Family
Storm Drain Fee	\$1,100 to \$6,469 based on lot size	\$16,771 per acre
Water Connection Fee	\$1,910	\$1,164
Sewer Connection Fee	\$1,908	\$1,406
Wastewater Treatment Plant	\$880	\$690
School Fee	\$4.08 per sf	
Based on City of Milpitas submission to Santa Clara County Collaborative		

5. References

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<https://www.ci.milpitas.ca.gov/pdfs/council/2022/020122/Attachments.pdf>

City of Milpitas Development Review Handbook https://www.ci.milpitas.ca.gov/wp-content/uploads/2022/01/DevReviewHandbook_FINAL_web_1-12.pdf

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Residential Impact Fees in California 2019, Turner Center https://turnercenter.berkeley.edu/wp-content/uploads/pdfs/Residential_Impact_Fees_in_California_August_2019.pdf

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