Final Draft
City of Salinas
Sanitary Sewer Master Plan Update

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Final Draft Sanitary Sewer
Master Plan Update
April 2023

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Submitted by:

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CERTIFICATION

In accordance with the provisions of Section 6735 of the Business and Professions Code of the State of California, this report was prepared by or under the direction of the following Civil Engineer, licensed in the State of California:

ENGINEER IN RESPONSIBLE CHARGE:

DRAFT FOR REVIEW

Kari Wagner, PE C66026 Expiration: 6/30/2024 **Date**

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LIST OF ACRONYMS

ABS	Acrylonitrile Butadiene Styrene
ADF	Average Daily Flow
AMBAG	Association of Monterey Bay Area Government
CASP	Central Area Specific Plan
CEQA	California Environmental Quality Act
cfs	Cubic feet per second
CIMIS	California Irrigation Management Information System
CIP	Capital Improvements Project
City	City of Salinas
CIWQS	California Integrated Water Quality System Project
County	Monterey County
d/D	Depth over Diameter
DOF	Department of Finance
du/ac	Dwelling Units per Acreage
EDE	Economic Development Element
E.I.T.	Engineer in Training
EIR	Environmental Impact Reports
ENR	Engineering New Record
ESRI	Environmental Systems Research Institute
FAR	Floor Area Ratio
FGA	Future Growth Area
FOG	Fats, Oils, and Grease
FPS	Feet per Second
FRM	Fluid Resource Management
Ft	Feet
Ft/Sec	Feet per Second
GIS	Geographic Information System
GISP	Geographic Information System Professional
gpapd	Gallons per acre per day
GPD	Gallons Per Day
GPM	Gallons Per Minute
HDPE	High Density Polyethylene
I/I	Infiltration and Inflow
IWCCS	Industrial Waste Water Collection and Conveyance System
LAFCO	Monterey County Local Area Formation Commission
LF	Linear Feet
MACP	Manhole Assessment and Certification Program
MDDWF	Maximum Day Dry Weather Flow
MGD	Million Gallons Per Day
min	Minute
MRWPCA	Monterey Regional Water Pollution Control Agency
M1W	Monterey One Water
NA	Not Applicable
NAD	North American Datum
NASSCO	National Association of Sewer Service Companies

NAVD	North American Vertical Datum
ND	Negative Declarations
O&M	Operations and Maintenance
PACP	Pipeline Assessment and Certification Program
P.E.	Professional Engineer
P.L.S.	Professional Land Surveyor
PF	Peaking Factor
PHDWF	Peak Hour Dry Weather Flow
PHWWF	Peak Hour Wet Weather Flow
PVC	Polyvinyl Chloride
RDII	Rainfall-Dependent Infiltration and Inflow
RDWWTP	Regional Domestic Wastewater Treatment Plant
SAPS	Salinas Area Pump Station
S.F.	Square Foot
SCADA	Supervisory Control and Data Acquisition
SSMPU	Salinas Sanitary Sewer Master Plan Update
SSO	Sanitary Sewer Overflow
US^3	USCubed
VCP	Vitrified Clay Pipe
VFD	Variable Frequency Drive
WASP	West Area Specific Plan
w/	With

CHAPTER 1
INTRODUCTION

This report presents the Sanitary Sewer Master Plan Update (SSMPU) for the City of Salinas (City). Preparation of the SSMPU will assist the City of Salinas in prioritizing both existing and future collection system needs through repair, rehabilitation, replacement, or new facilities.

ENVIRONMENTAL REVIEW

In accordance with Title 14, California Code of Regulations, Chapter 3, Article 18 (Statutory Exemptions), this SSMPU is considered a planning study and therefore adoption of this document is exempt from the requirements to prepare Environmental Impact Reports (EIR) or Negative Declarations (ND). However, on a project-specific basis, the California Environmental Quality Act (CEQA) must be satisfied for any major capital improvement projects described in this report that will be implemented by the City in the future, through the preparation of an appropriate EIR or ND.

AUTHORIZATION AND SCOPE OF WORK

In March 2021, the City authorized Wallace Group to prepare a comprehensive Sanitary Sewer Master Plan Update. The scope of work is as follows:

Task 1. Document Review and Data Collection

We will review the existing 2011 Sanitary Sewer System Master Plan and City documents, including but not limited to the Sanitary Sewer Management Plan (SSMP), the Sewer Rate Study, the Salinas General Plan, and the Economic Development Element. Data collection will include review of the City's sanitary sewer records, future development plans, CCTV inspection videos, and maintenance records.

Task 2. Field Effort & GIS Update

Task 2.1 Survey Sanitary Sewer Manholes

Wallace Group, in conjunction with Fluid Resource Wallace Group will survey the rim elevations of each sewer manhole to be modeled (based on 1,025 manholes) and dip the manhole to obtain the invert elevation (invert in and invert out) of the flow lines. Wallace Group will also take pictures of each of the manholes, which would then be included in the GIS database. Based on photos and visual observation from ground surface, we will ascertain pipe material.

Task 2.2 Lift Station Assessment

Wallace Group, in conjunction with Fluid Resource Management (FRM), will conduct evaluations of the City's eleven lift stations. FRM will provide a Cal-OSHA confined space entry permit, and perform such confined space entry to evaluate the wet well for visible signs of corrosion and "wear and tear", and will make recommendations if a structural investigation of the wet well is warranted based on observation. We will evaluate the condition of piping and internal components, document the size of the wet well/pumping station, approximate depth and size of inverts, perform a pump draw down test and determine approximate flow from each pump, perform full load amperage and Meg-ohm readings on each motor, verify automation of controls, evaluate the electrical system for possible deficiencies/code violations, document the pumps and motors make/model

number, pull and inspect the pumps for signs of wear and tear including inspecting pump seals and fittings, electrical components for code violations, evaluate the pump seals, fittings, and overall condition, and perform a pump test to determine approximate flow, and measure amperage/power draws to check for signs of pump motor concerns. We will evaluate the system's ability to meet existing and future demands based on the pumping capacity and will provide the City with lift station upgrade recommendations.

Task 2.3 In-Line Flow Monitoring

Wallace Group will develop a flow monitoring program (FMP) in support of calibrating the hydraulic model of the sanitary sewer system. The flow data will evaluate average flow rates and representative diurnal flow patterns throughout the City including in/out of all pump stations, and to assist in the review/identification of average flow rates for residential (single and multi-family), commercial, hotel/motel, and apartment land uses. As part of the FMP, we will work with US3 to review site conditions of the potential monitoring sites, assuring they are hydraulically suitable for accurate flow monitoring measurements. The FMP is based on an assumed total number of 16 monitoring stations, with a total duration of 60 calendar days at each location. It is envisioned the winter monitoring will extend 45 calendar days, and the dry weather monitoring will extend 15 calendar days.

Task 2.4 Update GIS Database

Based on data collected, Wallace Group will update the City's GIS database. Wallace Group will also utilize data collected to incorporate any new developments and upgraded sewer mains that are not already included in the GIS database.

Task 3. Wastewater Flow Characteristics and Projections

We will develop unit flow factors in order to better project wastewater flows from future developments and calibrate the sewer model using existing wastewater flows. These unit factors will be developed for development types including residential, multi-family, commercial, industrial, hotels and other factors. We will request from Cal Water, water meter records/bills that will be used to evaluate usage from the various types of developments. Using actual water use data will provide the most accurate projection of wastewater generation unit factors, especially for residential and hotel units. Water demand data will be evaluated for a minimum of 12 months in order to assess indoor water demands (which generate wastewater flows) versus outdoor water demands (which do not generate wastewater flows). We will also use population and density information from the City's General Plan, Specific Plans, and other planning documents provided by the City, to project future build-out (15-year planning horizon) population and wastewater flows. We will compile all the information reviewed and gathered under Tasks 1, 2, and 3 and prepare a Preliminary Findings Memorandum stating our findings.

Task 4. Develop and Calibrate Sewer Model

We will utilize survey data collected in Task 1 and 2, and the updated GIS database for use in the Innovyze sewer modeling program (InfoSWMM). We will model the collection system under dry and wet weather conditions for the existing and future loadings. We typically will only model the trunk sewer mains (typically 10-inch and larger), with some exceptions. Using flow data collected in the Field Investigations, we will model simulations for dry and wet weather flow conditions for existing and future (build-out) development scenarios. We will use the model results to identify locations in the wastewater system that have hydraulic capacity constraints under existing and future flow conditions, peak dry weather and wet weather flow conditions, based on the criteria developed for the 2011 report. Based on the flow monitoring data obtained, we will provide the City with general observations

of tributary areas exhibiting signs of I/I. Based on this observation, we will recommend areas for further I/I investigation.

Task 5. Develop Capital Improvement Program

Using data collected during Field Investigations, and the modeling efforts of Task 4, we will develop a Sanitary Sewer Capital Improvement Program (CIP) recommending short-term (5-year) and long-term (15-year) improvements necessary to maintain a desired level of service for the City's sanitary sewer assets such as mainlines, manholes, and pump stations. We will also provide one additional Program focused on Development induced improvement recommendations. These upgrades are required to be completed when development occurs, which the timing may not be known.

Task 6. Develop Capital Improvement Program

Wallace Group will team with DTA to complete a Sanitary Sewer Development Impact Fee Nexus Study. This Task will not start until after the completion of Task 7. This Study will be completed under separate cover.

Task 7. Draft and Final Sanitary Sewer Master Plan Update

Upon completion of Tasks 1-5, we will submit five (5) printed copies and 1 digital copy in pdf format of a draft Sanitary Sewer Master Plan report to the City for review and comment.

Upon receiving written comments from the City for the draft Sanitary Sewer Master Plan report and discussion at the City Council, Wallace Group will prepare the Final Sanitary Sewer Master Plan Update.

ACKNOWLEDGEMENTS

The City of Salinas Sanitary Sewer Master Plan Update (SSMPU) is prepared by Wallace Group on behalf of the City of Salinas. Wallace Group gratefully acknowledges the City of Salinas, Monterey One Water, Utility System Science & Software (US3), and Fluid Resource Management (FRM) for their efforts, involvement, and assistance in preparing the City of Salinas SSMPU.

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CHAPTER 2
LAND USE AND POPULATION

This Chapter presents the land use and existing and future population forecasts for the City's SSMPU study area. The purpose of establishing the existing population and land use is to better understand the existing wastewater flow characteristics throughout the City's collection system, which provides a framework to forecast the wastewater flows that may be contributed in the future by vacant or under-utilized land. All figures are located at the end of this chapter.

INTRODUCTION

The City of Salinas is the largest city in Monterey County and serves as the County seat. The City has a long heritage as the financial and industrial center of Monterey County. US Route 101 bisects the City, while California State Route 68 heads west to Monterey and California State Route 183 runs northwest to Castroville. The City was incorporated in 1874 and is known as the "Salad Bowl of the World" for its large agricultural industry.

Existing Wastewater Service Area

The City's current wastewater service boundary incorporates approximately 12,455 acres. Sewer facilities within the existing service area are owned and operated by the City. Bolsa Knolls is a rural neighborhood just outside of City limits. There is a small portion of Bolsa Knolls near Rogge Road that is also served by the City through a special assessment district. The remaining area of Bolsa Knolls is planned for future connection to the City's collection system.

Study Area

One major purpose of this SSMPU is to evaluate the impacts that potential developments and future growth areas will have on the sewer collection system. The sphere of influence is defined as the territory outside the city limits which the Monterey County Local Area Formation Commission (LAFCO) recognizes as the appropriate and probable future jurisdictional boundary and service area of the City. Figure 2-1 displays City limits, the existing service area, and the SSMPU Study Area.

The study area for this SSMPU includes this sphere of influence, including the following areas:

- Future Growth Areas (FGA) include the North Boronda FGA, East FGA, Southeast FGA, and West Boronda FGA
- Target Areas, as identified by City's Economic Development Element (EDE)
- County Boronda Area is currently tied to the City's collection system, however, the sewer facilities are owned and operated by Monterey County
- Bolsa Knolls is an area in the County planned for future connection to the City's collection system
- Salinas Ag-Industrial Center

LAND USE

The following sections discuss the existing and future land uses within the study area. The existing land uses are based on the City's GIS database and General Plan Land Use Map.

Land Use: Existing Wastewater Service Area

The City is comprised of 12,455 acres of land, zoned for residential, commercial, industrial, agricultural, and public facilities. Table 2-1 summarizes the different land uses in the City's boundary and includes the special assessment district in Bolsa Knolls since it is part of the City's existing service area. Land use data shown on Figure 2-2 is a combination of GIS data provided by the City and the General Plan Land Use Map.

TABLE 2-1 CITY EXISTING LAND USE

	NUMBER OF PARCELS	AREA (ACRES)	% OF SERVICE AREA
LOW DENSITY RESIDENTIAL	18,253	3,003	24.1%
MEDIUM DENSITY RESIDENTIAL	6,906	929	7.5%
HIGH DENSITY RESIDENTIAL	2,007	635	5.1%
MOBILE HOME	9	116	0.9%
COMMERCIAL	1,397	1,297	10.4%
INDUSTRIAL	306	814	6.5%
HOTEL	34	34	0.3%
SCHOOL	59	752	6.0%
PUBLIC/SEMI-PUBLIC	232	1,294	10.4%
OPEN SPACE	4	31	0.2%
AGRICULTURE	51	3,261	26.2%
VACANT	324	289	2.3%
TOTAL	29,482	12,455	100%

As discussed, the County Boronda Area flows into the City's collection system. Table 2-2 breaks down the land use for the County Boronda Area, also shown on Figure 2-2.

TABLE 2-2. COUNTY BORONDA AREA EXISTING LAND USE

	Number of Parcels	Area (Acres)
COMMERCIAL	35	63
LOW DENSITY RESIDENTIAL	358	111
HOTEL	2	7
OPEN SPACE	1	1
SCHOOL	1	6
PUBLIC/SEMI-PUBLIC	7	4
TOTAL	404	192

Study Area: Future Land Use

One major purpose of the SSMPU is to forecast the wastewater flows that will be contributed by growth areas in the future, both within and outside City limits. Both the City's General Plan and Economic Development Element (EDE) were used as the sources to evaluate future land use and development capacity. The EDE is the most recent document, dated September 2017, and is the eighth element of the 2002 City's General Plan. The EDE provides amendments to the City's General Plan that reflects the goals, policies, and actions outlined in the EDE. Table LU-3 of the Proposed General Plan Amendments (attached in Appendix A) was used to project future dwelling units and non-residential building capacities for the City's focused growth areas and future growth areas. Additional development capacities, known as Target Areas, are identified in Table LU-ED-1 (attached in Appendix A). Although most of these Target Areas fall outside the City boundary, they are included in the SSMPU study area. Focused Growth Areas, Future Growth Areas, and Target Areas are shown on Figure 2-3.

The development capacities found in the General Plan and the EDE provide the most conservative projections for City buildout in the Year 2045. However, it is important to note that these numbers are based on planning projections and preliminary locations around the City. As future developments enter final engineering and design, it is recommended that the City re-evaluate the sewer model based on more accurate flow projections, engineering plans, and sewer main tie-in locations.

Focused Growth Areas

The General Plan identifies (5) Focused Growth Areas to accommodate new developments. The Focused Growth Areas are:

- Laurel Drive at North Main Street
- North Main Street/Soledad Street
- East Alisal Street/East Market Street
- Abbott Street
- South Main Street

According to the General Plan, these areas of existing developments would "benefit from redevelopment or revitalization, change of land uses, and/or the incorporation of mixed-use residential uses." Wastewater flows for these focused growth areas will be modeled based on the future land use designation; however, the impact to the City's collection system is likely marginal since most focused growth areas already contribute existing wastewater flows. Additional modeling may be necessary in the event more intensification of use, such as a hotel, is incorporated. These Focused Growth Areas and the future land uses per the City's General Plan are shown on Figure 2-4.

Bolsa Knolls Septic Conversion

As discussed, a small portion of the Bolsa Knolls area is currently served by the City through a special assessment district. The remaining Bolsa Knolls area is on septic tanks. As part of the future analysis for this SSMPU, this remaining Bolsa Knolls area is included in the hydraulic model as a future connection to the City's collection system.

Future Growth Areas

Four (4) Future Growth areas (FGA) were identified in the City's General Plans as areas outside the City limits where new growth will occur on land that is currently used for agricultural production. The Future Growth Areas are:

- North Boronda FGA
- East FGA
- Southeast FGA
- West Boronda FGA

The Future Growth Areas and future land uses associated per the City's General Plan are shown on Figure 2-5. In 2008, the North Boronda FGA was annexed into the City. Prior to development, Future Growth Areas are subject to the adoption of Specific Plans by the City Council. The North Boronda FGA was split into three (3) Specific Plans: West Area, Central Area, and East Area, shown on Figure 2-6. In December 2019, the West Area Specific Plan (WASP) was approved by City Council, and in 2020, the Draft Central Area Specific Plan (CASP) was made public for review. Table 2-3 summarizes the development capacities identified in the WASP and CASP. The East Area Specific Plan has not been made public and is not included in Table 2-3. These Plans specify the ultimate distribution, location, and intensity of land uses. Unsewered areas such as open space and parks are not included in this table as they do not contribute wastewater base flow.

TABLE 2-3 SPECIFIC PLAN DEVELOPMENT CAPACITY

	WEST AREA		CENTRAL AREA	
	DWELLING UNITS	NON-RESIDENTIAL (SF)	DWELLING UNITS	NON-RESIDENTIAL (SF)
LOW DENSITY RESIDENTIAL	1,361	–	1,367	–
MEDIUM DENSITY RESIDENTIAL	1,803	–	1,359	–
HIGH DENSITY RESIDENTIAL	1,085	–	1,185	–
COMMERCIAL/ MIXED USE	91	571,500	–	489,700
TOTAL	4,340	571,500	3,911	489,700

Salinas Ag-Industrial Center

The Salinas Ag-Industrial Center, within City limits, is a 257-acre area planned for agricultural-related businesses. Ruggeri-Jensen-Azar and Associates prepared the Sanitary Sewer System Analysis Report & Calculations for the Salinas-Ag Industrial Center, dated November 2021. The proposed sewer system will connect to the City's existing system at Abbott Street, Burton Avenue, and Dayton Street. Projected square footage of these industrial buildings is based on the average floor area ratio (FAR) of 0.3 for general industrial land uses, as identified in Table LU-3 of the City's General Plan.

Target Areas

With the adoption of the EDE, the City amended the General Plan to include Economic Opportunity Target Areas to provide additional land capacity for new economic development. Five of the six Target Areas are currently outside of the City's Sphere of Influence but have been included in the SSMPU study area to account for future wastewater flows. The sixth target area, Target Area V, shown on Figure 2-3, is within Carr Lake, inside City limits. Table LU-ED-1 (attached in Appendix A) summarizes the land use and building capacities for these Target Areas.

Table 2-4 summarizes the total projected dwelling units and projected non-residential area, as shown in Table LU-3 of the proposed General Plan amendments. These numbers include the units identified in the CASP and WASP. The land uses and development capacities for the Target Areas are also shown on Table 2-4. Inaccurate totals for Focused Growth Area acres, Future Growth Area acres, and Future Growth Area projected non-residential square feet were corrected on Table LU-3 in Appendix A. The City's General Plan land use areas in GIS were used to allocate projected dwelling units and non-residential areas to the Focused Growth Area and Future Growth Areas. The GIS areas did not match the projected areas, so a multiplier was used to scale the GIS areas to match each designated land use shown in Table 2-4.

TABLE 2-4. FUTURE DEVELOPMENT CAPACITY

	ACRES				PROJECTED DWELLING UNITS		PROJECTED NON-RESIDENTIAL (SF)			
LAND USE	FOCUSED GROWTH AREA	FUTURE GROWTH AREA	TARGET AREAS	SALINAS AG-INDUSTRIAL CENTER	FOCUSED GROWTH AREA	FUTURE GROWTH AREA	FOCUSED GROWTH AREA	FUTURE GROWTH AREA	TARGET AREAS	SALINAS AG-INDUSTRIAL CENTER
OPEN SPACE	4	696	--	--	0	0	5,000	420,000	--	--
LOW DENSITY RESIDENTIAL	9	1,042	--	--	57	6,771	0	0	--	--
MEDIUM DENSITY RESIDENTIAL	43	515	--	--	507	6,052	0	0	--	--
HIGH DENSITY RESIDENTIAL	9	160	--	--	153	2,680	0	0	--	--
COMMERCIAL	148	183	201	--	0	9	4,361,000	208,000	2,193,478	--
MIXED USE	212	120	--	--	989	360	10,891,000	2,613,000	--	--
INDUSTRIAL	73	995	218	257	0	0	950,000	10,773,000	3,073,158	3,361,743
PUBLIC/ SEMI-PUBLIC	58	247	--	--	0	0	636,000	2,799,000	--	--
TOTAL	556	3,958	419	257	1,706	15,872	16,843,000	16,813,000	5,266,636	3,361,743

POPULATION

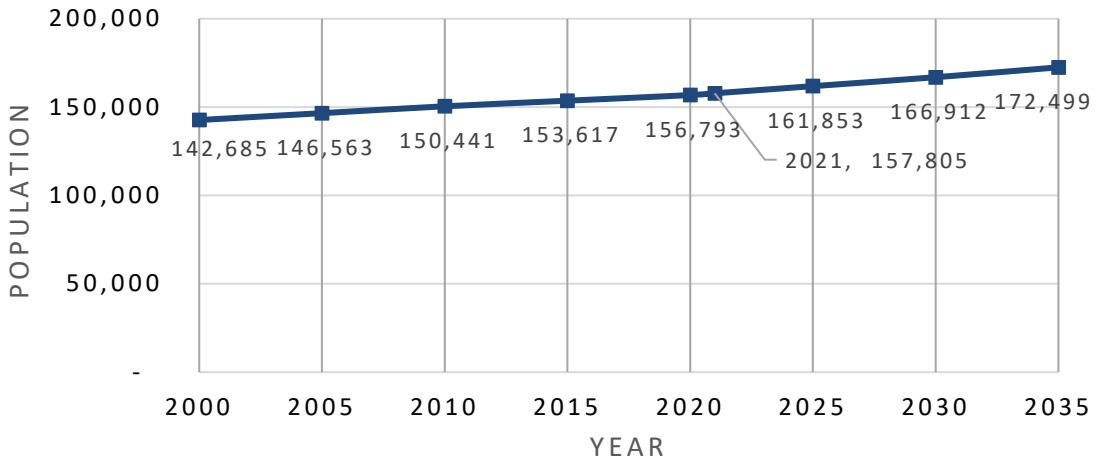
Population for the SSCSMP is comprised of the City population within the study area. Three sources of information were utilized to determine existing and future population for the study area:

1. 2015 City of Salinas Housing Element
2. 2020 Census
3. Association of Monterey Bay Area Governments (AMBAG) Final 2020 Regional Growth Forecast Memorandum

Existing Population

The City's existing population and historic population growth are important factors to understand past trends and project future wastewater flows. Figure 2-7 shows the City's population growth forecast as shown in the City's Housing Element, with a projected 2021 population of 157,805.

FIGURE 2-7: CITY POPULATION GROWTH



According to the 2020 Census, the total population for the City of Salinas is 163,542. For the purposes of this SSMPU, **163,542 persons** will be used for the current 2021 population.

Population Densities

The following Table 3 summarizes the average number of residential units per land use according to the 2014 Economic Development Element.

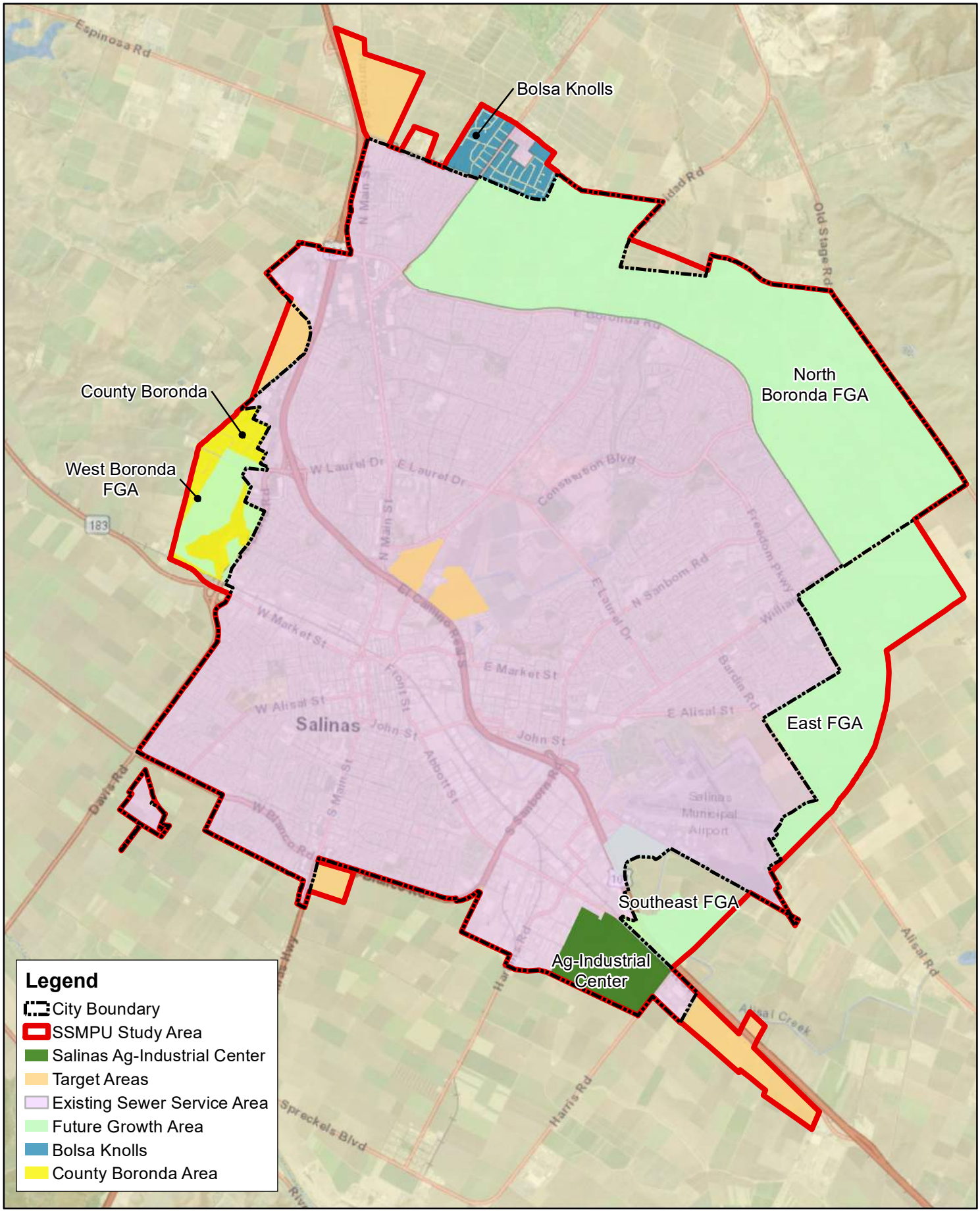
Table 2-5. RESIDENTIAL DENSITIES

	UNITS/ACRE
LOW DENSITY RESIDENTIAL	6.5
MEDIUM DENSITY RESIDENTIAL	11.75
HIGH DENSITY RESIDENTIAL	16.75

Future Population

In August 2019, AMBAG staff met with City staff to review the forecasts for future growth. Information collected from this meeting was presented to the AMBAG Board of Directors in the Final 2020 Regional Growth Forecast Memorandum. Based on the findings, 175,358 persons is projected to be the City's future population in the Year 2040.

According to the City's General Plan, the buildout population projected beyond 2035 for the City is 213,063 persons. This is based on the General Plan's Development Capacity table which considers projected populations for the City's focused growth and future growth areas. As part of the City's 2017 Economic Development Element, amendments to the General Plan were proposed; however, the projected buildout population remained the same. For the purposes of this SSMPU, **213,063 persons** will be used for the City's buildout population.



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1 inch = 5,000 feet

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FIGURE 2-1
EXISTING SEWER SERVICE AREA

NOTES:
ESRI BASEMAP.
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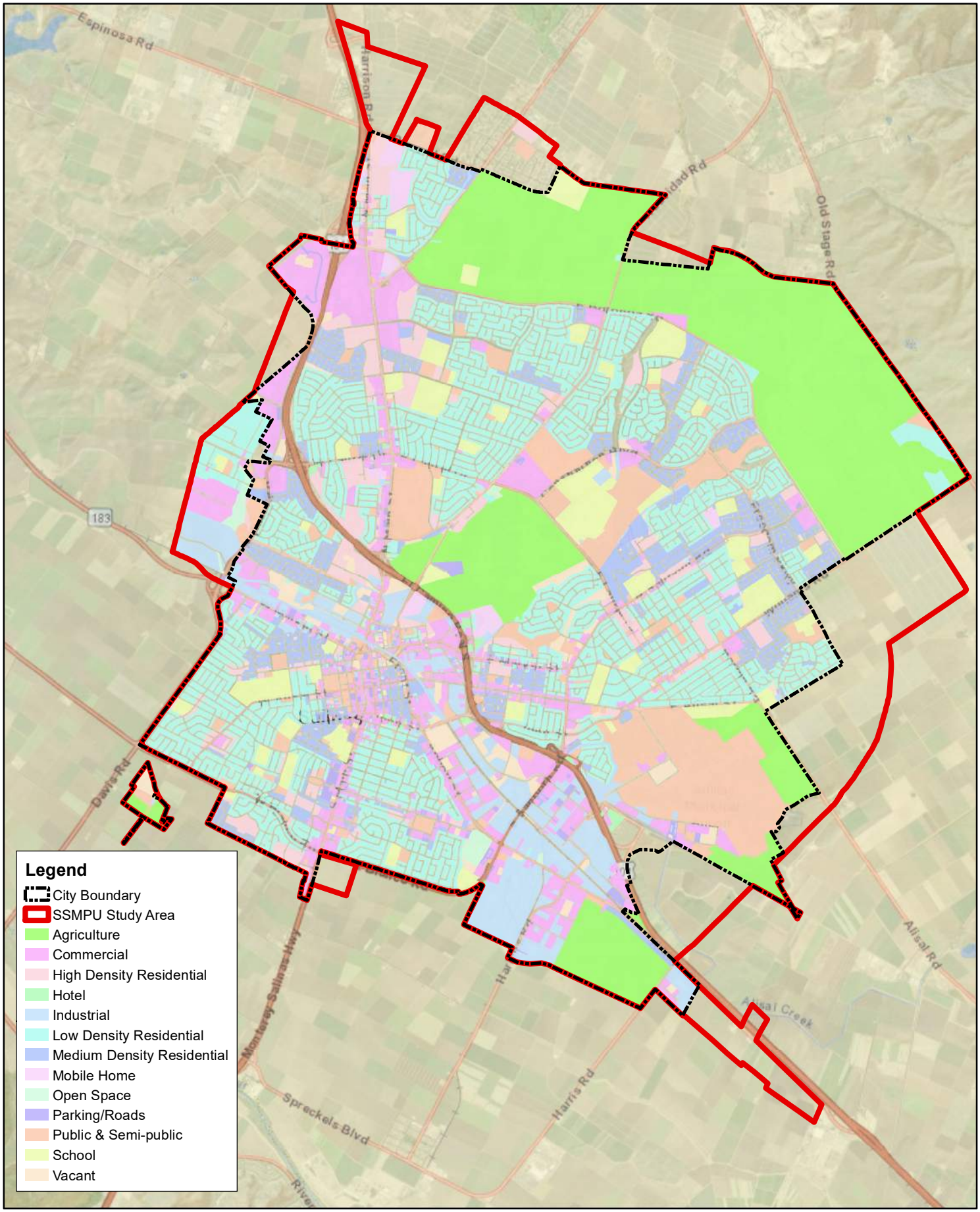

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FIGURE 2-2
EXISTING SERVICE AREA
LAND USE

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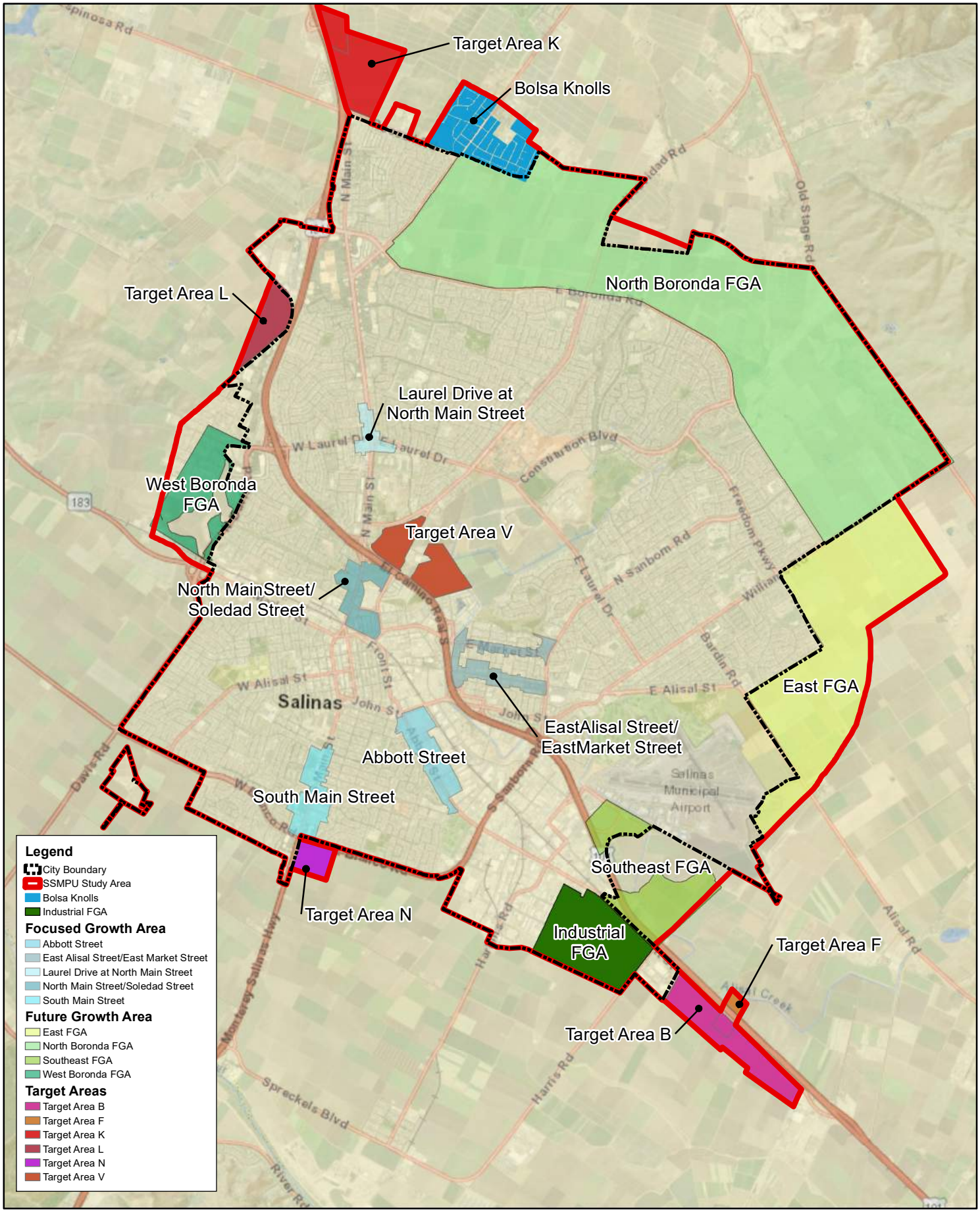

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FIGURE 2-3
CITY GROWTH AREAS

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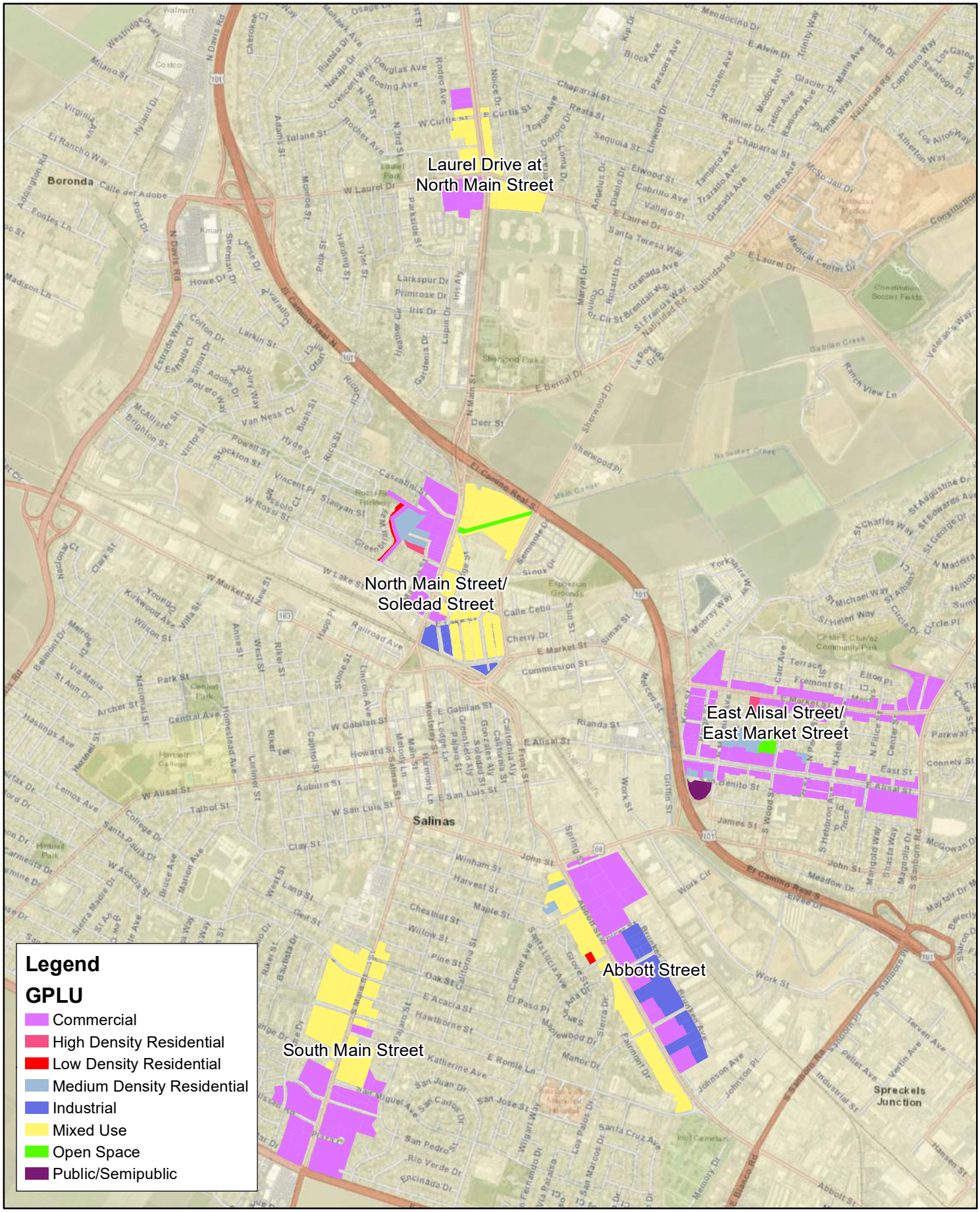

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FIGURE 2-4
FOCUSED GROWTH AREAS
LAND USE

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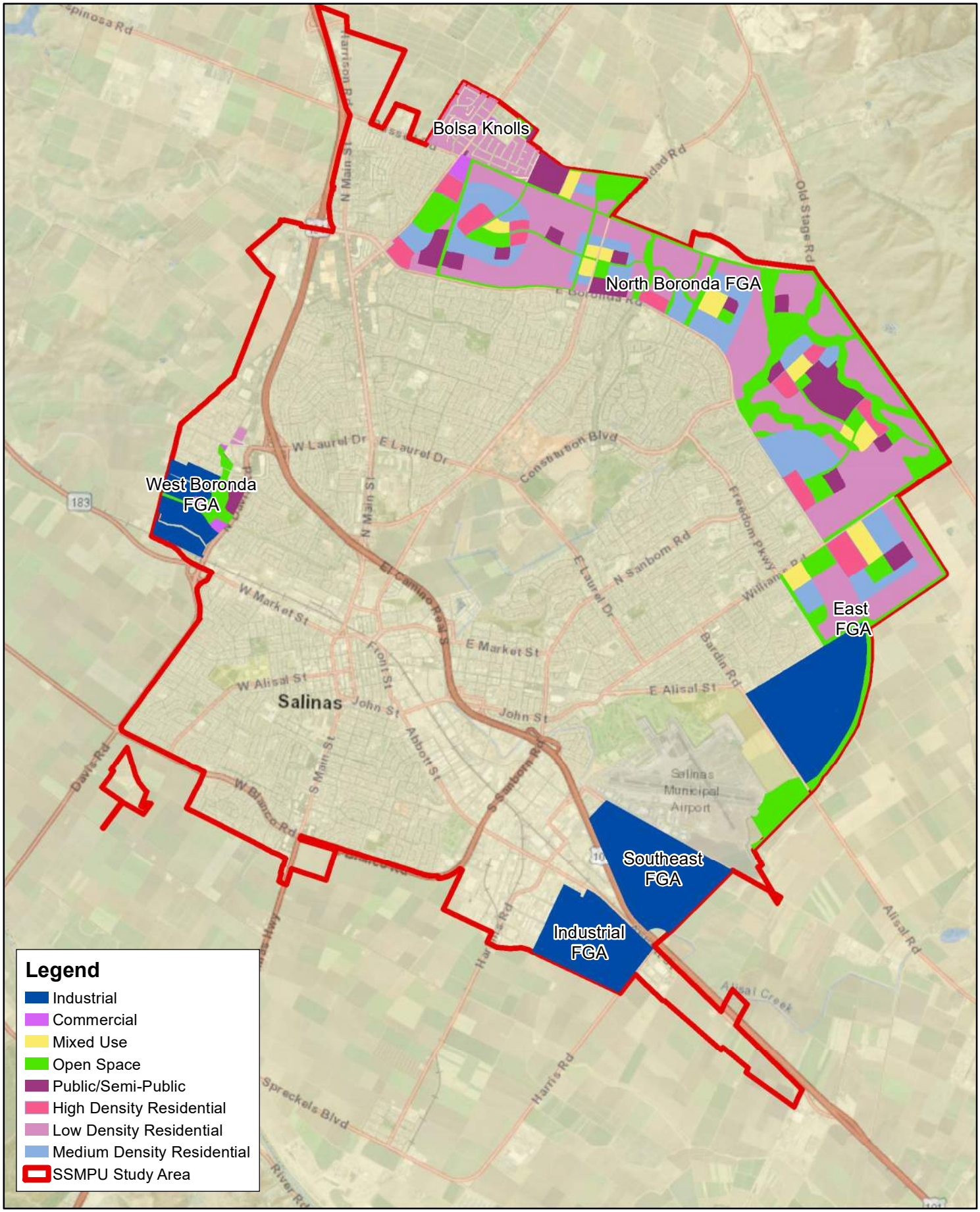

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FIGURE 2-5
FUTURE GROWTH AREAS
LAND USE

NOTES:
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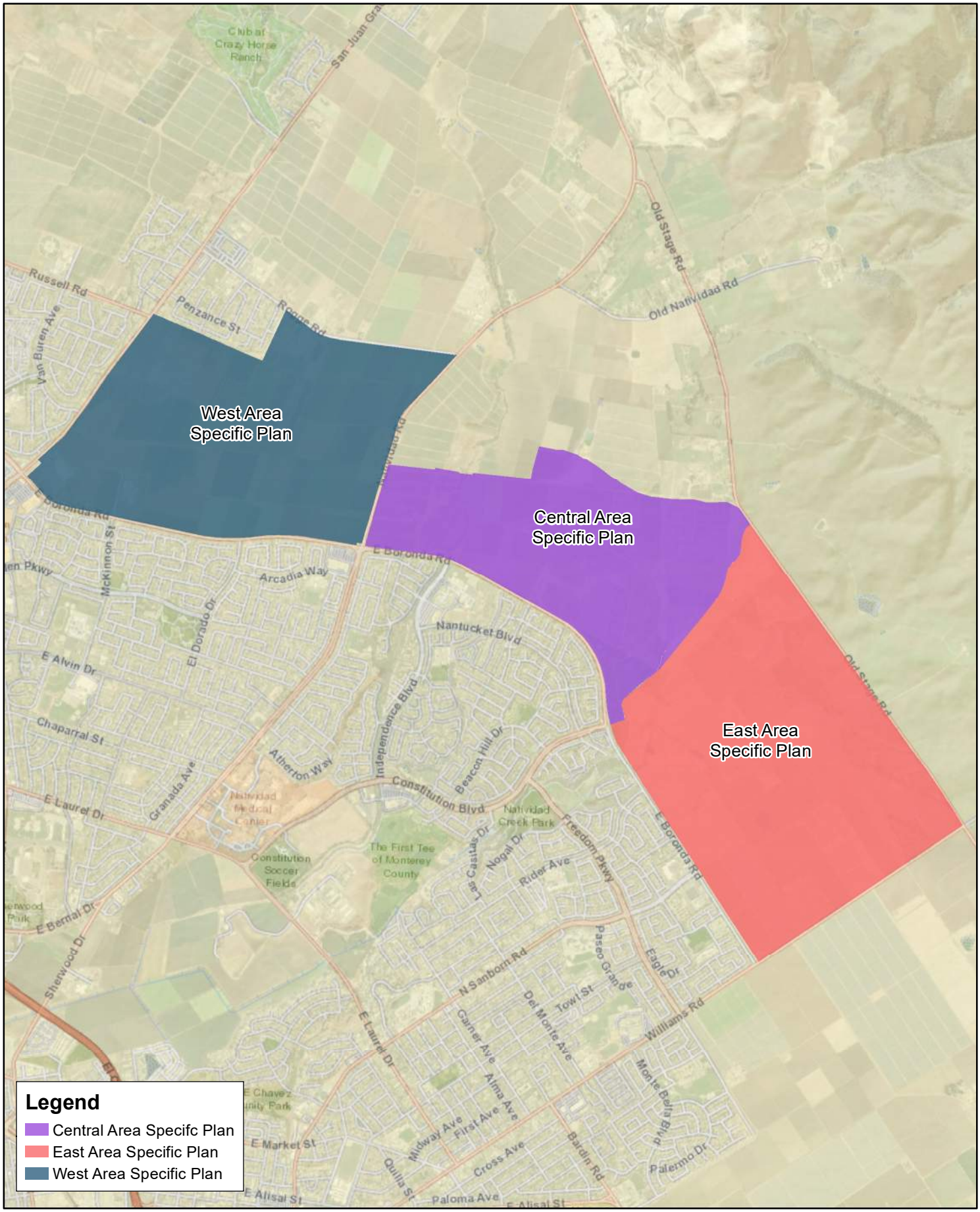

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FIGURE 2-6
NORTH BORONDA
FGA SPECIFIC PLANS

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CHAPTER 3
COLLECTION SYSTEM OVERVIEW

This Chapter provides an overview of the existing domestic wastewater collection system for the City. All figures are located at the end of this chapter.

COLLECTION SYSTEM OVERVIEW

The City operates two sewer collection systems, the municipal collection system, which collects wastewater from residential, commercial, institutional, and industrial users throughout the City; and the Industrial Wastewater Collection and Conveyance System (IWCCS), which collects wastewater from industrial users located mostly within the southeastern portion of the City. This report is for the municipal sewer collection system and does not consider the industrial system.

The City's municipal sewer collection system is comprised of approximately 292 miles of gravity pipes, which vary in diameter from 6-inch to 54-inches, ten (10) City-owned lift stations, one (1) City-maintained lift station, and two (2) miles of force mains. According to the California Integrated Water Quality System Project (CIWQS), 70% of the City's collection system was constructed before 1980, with 41% of the system constructed between 1960-1979. The remaining 30% of the system was constructed from 1980 to present.

The sewer collection system conveys the City's wastewater to the Salinas Area Pump Station (SAPS) located at the southwest corner of the City near Blanco Road and Davis Road. SAPS is owned and operated by Monterey One Water (M1W), formerly Monterey Regional Water Pollution Control Agency (MRWPCA).

Gravity Sewer Mains

Table 3-1 breaks down the City's gravity sewer inventory. According to the City's GIS database, 9.6% of the sewer collection system has an unknown diameter. Most of these unknown diameters are at upstream portions of the primary collection system and are assumed to be of smaller diameter (likely 6- or 8-inch) that will not significantly affect the sewer modeling of the main trunk lines. Figure 3-1 displays the City's gravity sewers by diameter.

Most of the existing collection system buried piping material is Vitrified Clay Pipe (VCP). Although Polyvinyl Chloride (PVC) pipe would have likely been installed with newer construction from 1980 to present. Hydraulic modeling of the sewer lines assumes that the pipe material is VCP unless the pipe material was visually verified by the survey work performed for this SSMPU.

TABLE 3-1. GRAVITY SEWER INVENTORY BY DIAMETER

DIAMETER (IN)	LENGTH (MILES)	% OF SEWER SYSTEM
UNKNOWN	27.5	9.6%
6-INCH	61.3	21.4%
8-INCH	124.0	43.2%
10-INCH	19.9	6.9%
12-INCH	14.2	5.0%
15-INCH	10.1	3.5%
18-INCH	9.2	3.2%
21-INCH	4.4	1.5%
24-INCH	3.8	1.3%
27-INCH	2.6	0.9%
30-INCH	2.6	0.9%
33-INCH	1.2	0.4%
36-INCH	0.5	0.2%
42-INCH	1.8	0.6%
48-INCH	1.2	0.4%
54-INCH	2.4	0.9%
TOTAL	286.7	100%

Manholes

Based on the City's GIS database, the existing wastewater collection system contains 3,462 sewer manholes. There are both concrete and brick manholes throughout the collection system. It is estimated that approximately 5-10% of the manholes are brick manholes, which no longer meets City standards. Brick manholes can be a source of infiltration of water and sand and can potentially fail if bricks are offset. Additionally, the City's collection system contains 1,403 flushing inlets/cleanouts. These can often limit access for operation and maintenance (O&M) staff to inspect and clean the sewer mains.

It is recommended to complete annual manhole inspections as part of the CCTV program to identify manholes in poor condition and replace or rehabilitate as required. This may include concrete manholes that have severe hydrogen sulfide corrosion, brick manholes that are cause of significant infiltration or are failing, and broken flushing inlets. As on-going improvements to extend the life of the sewer collection system are made, it is recommended that all brick manholes be either replaced with new manholes, or at minimum install a coating or lining. Flushing inlets should be replaced with 8-inch inspection ports or new manholes. These are low-priority upgrades, but should be considered as an on-going operations and maintenance project to continue improving operations and reducing infiltration of sand and water and potential for failures. Figure 3-2 shows the locations of brick manholes and corroded manholes (74 total) identified by field survey and all the City's flushing inlets.

Lift Stations

The City owns and operates ten (10) lift stations located throughout the collection system. The City also maintains the Vista Nueva Lift Station under an assessment district. Recently, tenants at Harris Place Industrial Park have requested that the City assume operations and maintenance of the privately-owned Harris Lift Station. The City is currently preparing a study to determine the feasibility of operating this lift station under separate cover and therefore, Harris Lift Station is not included in this report. Chapter 5 provides a detailed description of the lift stations and recommended improvements. The following is a list of the 11 City owned and/or operated lift stations:

- Airport (Moffett)
- Carpenter Hall
- De La Torre
- Harkins Road
- Lake Street
- Las Casitas
- Mill Lake
- Santa Rita
- Spicer
- TP2
- Vista Nueva

All lift station force mains tie into the City's gravity system for conveyance to SAPS. City staff conducts regular maintenance of the City's lift stations. In 2018, staff initiated a Supervisory Control and Data Acquisition (SCADA) program to monitor all lift stations. This SCADA program tracks flows and motor run times and offers an alarm system that calls staff directly if there are any operational issues at the lift stations.

In addition to the City-owned and operated lift stations, the City also receives wastewater flows from ten (10) private lift stations located throughout the City. These lift stations service commercial complexes and industrial facilities that discharge directly into the City's gravity system. The locations of these lift stations are listed below:

- Oregon and Sanborn Street
- 11 Harris Place
- 1121 Alamo Way
- 115 San Juan Grade Road
- 150 Sherwood Drive
- Natividad Hospital
- 58 Natividad Road
- Northridge Mall
- Salinas Adult School
- Sherwood Hall

All City-owned, County-owned, and private lift stations are shown on Figure 3-3.

Salinas Area Pump Station (SAPS)

As stated above, wastewater collected in the City's municipal sewer system flows to the Salinas Area Pump Station (SAPS), operated by Monterey One Water (M1W). SAPS feeds into a 36-inch forcemain from Salinas to the regional wastewater treatment plant operated by M1W near the City of Marina. Here the wastewater is treated and then used for beneficial re-use or discharged to the ocean via a 60-inch diameter outfall. SAPS is shown in the southwestern corner of the City on Figure 3-3.

Inverted Siphons

The City has four (4) known inverted siphon locations within the sewer collection system. These inverted siphons are used to carry wastewater flows under creeks and highways. Inverted siphons often present hydraulic issues and require periodic flushing during low flows. The known inverted siphon locations are shown on Figure 3-3 and are modeled according to record drawings provided by the City.

Industrial Wastewater Diversion

As stated above, the City owns and operates a separate collection system which receives only industrial wastewater that flows to the City owned Industrial Wastewater Treatment Facility (IWTF). Although the industrial wastewater collection system is not part of this SSMPU, it is important to note that a concrete shunt structure allows the diversion of produce wash water and winter stormwater discharges from this industrial wastewater conveyance system to enter the City's wastewater collection system at the SAPS location, just upstream of the flow totalizer. M1W monitors and operates this industrial wastewater diversion and has provided the daily diversion flows from May 5, 2016 to June 30, 2018. Since the SAPS location is the most downstream point in the City's collection system, these diverted flows do not affect the City's collection system and are not considered in the sewer model.

Reclamation Ditch Diversion

This diversion structure was recently constructed and brought on-line in 2018. It is located in the existing Reclamation Ditch near the intersection of Davis Road and West Market Street/Highway 183 in Salinas. According to the State Water Resources Control Board Permit 21377, this project allows for up to 6 cubic feet per second (cfs) by direct diversion from the Reclamation Ditch and pumped into the City's collection system. M1W owns and operates this reclamation ditch diversion. These reclamation ditch diversion flows were considered in the hydraulic model since they feed into the main 54-inch trunk line that conveys flow along Davis Road to SAPS.

HIGH PRIORITY AREAS

According to the City's 2019 Sanitary Sewer Collection System Annual Performance Report, City staff perform high-priority and routine line cleaning, manhole inspections, and lift station inspections each business day. In 2019, wastewater staff cleaned 116 miles of pipe, which is an increase of 93 miles from the year before. In the same year, approximately 48,075 linear feet of CCTV inspections were performed to identify damages or causes of blockages in City sewer lines. The City has not provided an inspection report for these videos; therefore, the results of this inspection are not included in this SSMPU.

City Manhole Monitors

The City installed fifty-six (56) manhole monitors at locations with either historical surcharging or sanitary sewer overflow (SSO) issues. In 2021, staff responded to eighteen (18) manhole monitoring alarms indicating sewer surcharging. This avoided potential SSOs from the sewer system and helped the Wastewater Division meet its goal of having five or less overflows on the City main line per year. Over the last few years, the City has met this goal with the following SSOs per year: four (4) in 2018, two (2) in 2019, two (2) in 2020, and five (5) in 2021. Table 3-2 summarizes the location of all the monitors and Figure 3-4 shows high priority sewer mains as identified by the City and past locations of SSO manholes.

TABLE 3-2. MANHOLE MONITORING LOCATIONS

MH-ID	LOCATION	MH-ID	LOCATION
M5-020	JOHN ST. & GRIFFIN ST.	J8-004	1002 DEL MONTE AVE.
M5-009	500 JOHN ST.	J7-041	1035 ATLANTIC ST.
M5-012	599 JAMES ST.	K8-024	1116 CORTEZ ST.
M5-013	105 NORTH WOOD ST.	H4-015	1020 E. LAUREL DR.
L5-033	481 E. MARKET ST.	L8-028	183 DENNIS AVE.
L5-020	127 CARR AVE.	L8-031	176 AFTON RD.
L6-016	700 ELTON PLACE	N7-014	1340 MERCER WAY
M3-050	500 LINCOLN AVE.	G8-011	1166 ROCKHAVEN CT.
M3-036	602 RIKER ST.	J9-014	1044 BISON WAY
L3-020	210 CAPITOL ST.	I5-036	77 SAINT FRANCIS WAY
L3-013	142 W MARKET ST.	L3-029	26 STONE ST.
L2-014	33 VILLA ST.	G6-018	744 SAUCITO AVE
K4-052	177 SHERWOOD DR.	N6-013	9 MAYFAIR DR.
I4-029	1149 SHERWOOD DR.	D4-028	18588 NORTHRIDGE DR.
G4-029	223 N FIRST ST.	D5-001	18807 LENNY ST.
I3-056	119 SHERMAN DR.	M8-016	200 TAMPA ST.
G3-028	447 COMANCHE WAY	M7-016	15 PALOMA AVE.
G4-034	1502 WHEELER DR.	O3-011	321 WOODSIDE DR.
G4-023	44 JULIA AVE.	G6-009	1538 MARIN AVE.
G5-012	55 KIP DR.	I4-001	939 HEATHER CIRCLE
F4-015	472 REGENCY CIRCLE	N2-020	432 WOODSIDE DR.
D4-064	13278 JACKSON ST.	K4-023	146 LAKE ST.
D4-001	13170 LOUISE ST	H3-043	805 W LAUREL DR.
D4-030	18601 COOLIDGE	H6-014	1515 LOS ALTOS WAY
H7-075	1619 MARSHFIELD CT.	H3-043	805 W LAUREL DR.
I8-039	1205 NOGAL DR.	L6-036	30 CENTER ST.

2017 Mark Thomas CCTV Evaluation

In 2017, Mark Thomas Engineering performed a CCTV sanitary sewer analysis of approximately 5,300 linear feet, or approximately 0.3%, of sanitary sewer mains and twenty-three (23) manhole structures in the southeast corner of the City. The report used the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) and Manhole Assessment and Certification Program (MACP). The condition of the pipes and manholes were graded based upon observed structural and operations and maintenance defects. Table 3-3 below summarizes this grading system used and Figure 3-5 displays the CCTV analysis findings with notes about each manhole and pipe condition. All recommended pipe and manhole repairs from this CCTV evaluation are listed and prioritized as existing CIPs and discussed further in Ch. 7 of this SSMPU. The full evaluation report can be found in Appendix B of this SSMPU.

TABLE 3-3. PACP AND MACP GRADING TABLE

GRADE	GRADE DESCRIPTION	STRUCTURAL AND O&M DEFINITION	GENERAL DETERIORATION DEFINITION
5	Immediate Action	Defects requiring immediate attention	Failed or will likely fail within the next 5 years
4	Poor	Sever defects that will become Grade 5 defects within the foreseeable future	Probably fail in 5-10 years
3	Fair	Moderate defects that will continue to deteriorate	May fail in 10-20 years
2	Good	Defects that have not begun to deteriorate	Unlikely to fail for at least 20 years
1	Excellent	Minor defects	Unlikely in the foreseeable future

O&M Repairs

The City has a list of known operations and maintenance (O&M) problem areas throughout the City. The nature of the problem areas ranges from pipe sags/joints and pipe damage to manhole repairs to hydrogen sulfide corrosion and fats, oils, and grease (FOG) build-up. Table 3-4 summarizes these City identified locations and groups repair projects together based on priority, repair type, and location. All City identified repairs are listed and prioritized as existing CIPs and discussed further in Ch. 7 of this SSMPU. All repair projects are detailed in the City's Sewer Repair Atlas Map in Appendix C.

Additionally, the City should prioritize their CCTV program to inspect the entire collection system every five years. This would mean the City should complete an average of 58 miles per year, a significant increase from the 14.7 miles inspected in 2021 and 8.1 miles inspected in 2020. Table 3-5 assumes the cost of cleaning and CCTV based on similar work performed in Monterey County. In order to account for a 3% inflation rate each year, Table 3-6 summarizes the cost per year that should be budgeted by the City. This ongoing CCTV program is included as an existing CIP in Ch. 7 of this SSMPU.

TABLE 3-4. O&M REPAIRS

COMBINED O&M PROJECT	CITY LOCATION	ATLAS ID
ACACIA, BAUTISTA, WOODSIDE REPAIRS	ACACIA CIRCLE NORTH WOODSIDE DR. BAUTISTA DR. WEST ACACIA ST.	N3
COMANCHE, POLK, AND NORTH FIRST REPAIRS	COMANCHE WAY POLK ST. NORTH 1ST ST.	G3, I3, H4
DEL MONTE AND MAE REPAIRS	726 MAE AVE. AND C ST. DEL MONTE AVE. MAE AVE.	K8
DONNER WAY REPAIR	DONNER WAY	G6
E LAUREL AND WILLIAMS REPAIRS	E. LAUREL DR. WILLIAMS RD.	K7, L7
EAST MARKET AND UPSTREAM OF LAKE STREET REPAIRS	YORKSHIRE WAY LONGBOW WAY SUN ST. E MARKET ST. N MADEIRA AVE.	K5
HOOVER ST REPAIR	1885 HOOVER ST.	C5
JOHNSON PLACE REPAIRS	JOHNSON PLACE (FIRE STATION #3)	O5
KATHERINE AVE. & PAJARO ST. REPAIRS	KATHERINE AVE. PAJARO ST.	O4
KING STREET REPAIRS	KING ST.	L5
LOUISE AND VAN BUREN STREET REPAIRS	LENNY ST. AND LOUISE ST. VAN BUREN AVE.	D4
MALARIN ST AND WILGART WAY REPAIRS	WILGART WAY WORK ST AND BRUNKEN AVE. LOS PALOS DR. AND FAIRMONT DR.	O4, N5
N MAIN ST HWY 101 UNDERPASS BUNKER REPAIR	N. MAIN ST. UNDERPASS BUNKER HWY 101	J4
RIKER STREET REPAIR	555 RIKER STREET	M3
ROMIE LANE REPAIRS & RECONFIGURATION ANALYSIS	ROMIE LANE BETWEEN LOS PALOS AND PAJARO	O4
SAN MIGUEL AVE REPAIR	PAJARO ST./SAN MIGUEL AVE.	O4
SHERWOOD DR REPAIRS	SHERWOOD DR.	K4

COMBINED O&M PROJECT	CITY LOCATION	ATLAS ID
UPPER CARR LAKE REPAIRS	LAUREL DR. BIKE TRAIL	J6
WEST MARKET AT DAVIS OVERCROSSING	W. MARKET ST. AND DAVIS OVERCROSSING	K2
WEST MARKET STREET REPAIRS	10 VILLA ST. W. MARKET ST. NEAR MARKET CAPITOL ST. TO 10 CAPITOL ST. CAPITOL ST.	L3
WOOD STREET RECONFIGURATION ANALYSIS	WOOD ST.	L5

TABLE 3-5. CCTV COSTS

DIAMETER (IN)	LENGTH (FT)	CLEANING & CCTV COST ($/LF)	TOTAL COST
6-12 INCHES	1,303,314	$5.00	$6,516,570
15-27 INCHES	158,931	$10.00	$1,589,310
30-54 INCHES	51,498	$13.00	$669,475
TOTAL	1,513,776		$8,775,355

TABLE 3-6. ANNUAL CCTV PROGRAM

YEAR	BUDGET[1]
YEAR 1	$1,769,000
YEAR 2	$1,822,000
YEAR 3	$1,877,000
YEAR 4	$1,933,000
YEAR 5	$1,991,000
TOTAL	$9,392,000

[1]The annual budget includes a 3% escalation rate per year.

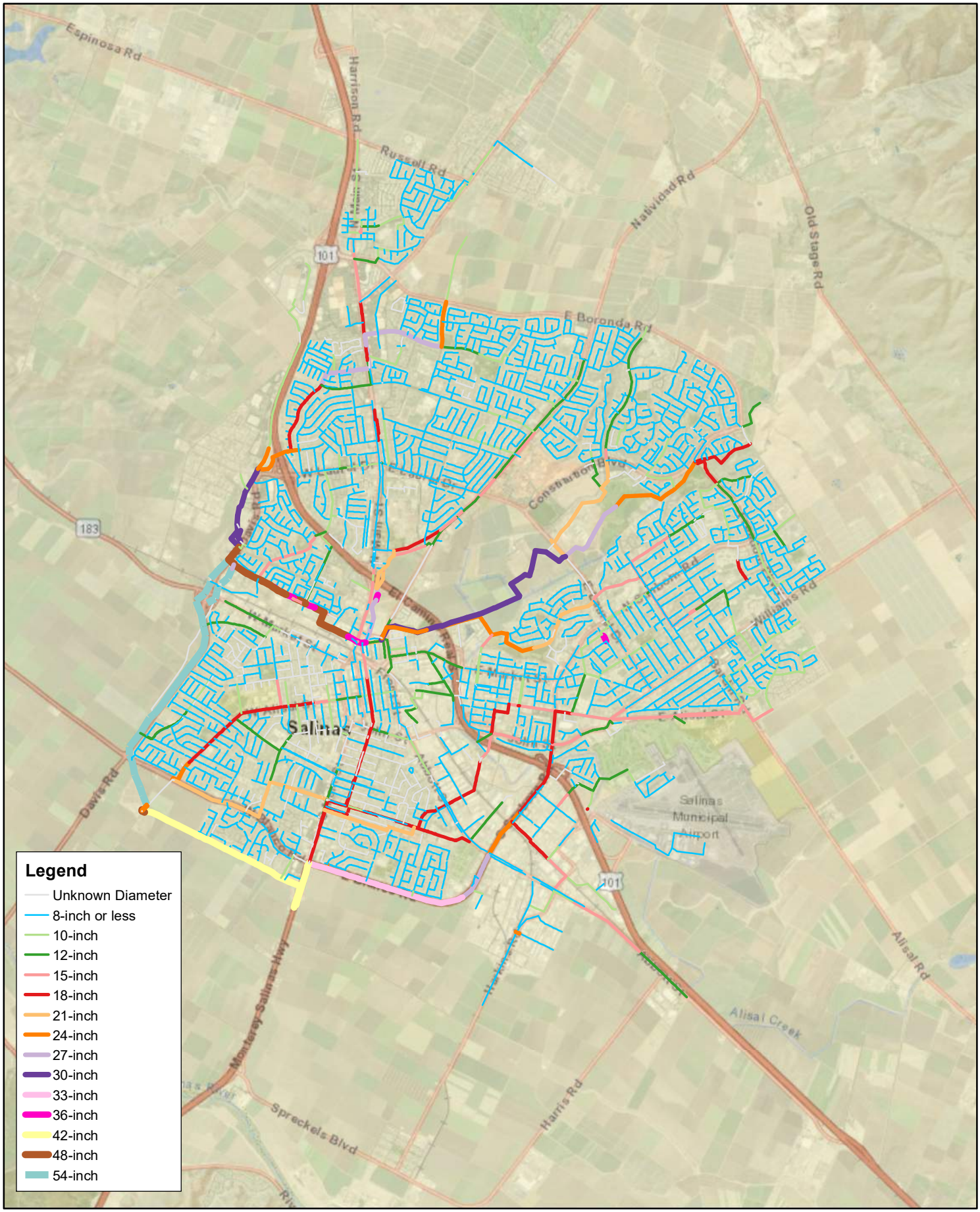

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FIGURE 3-1
EXISTING PIPE DIAMETER

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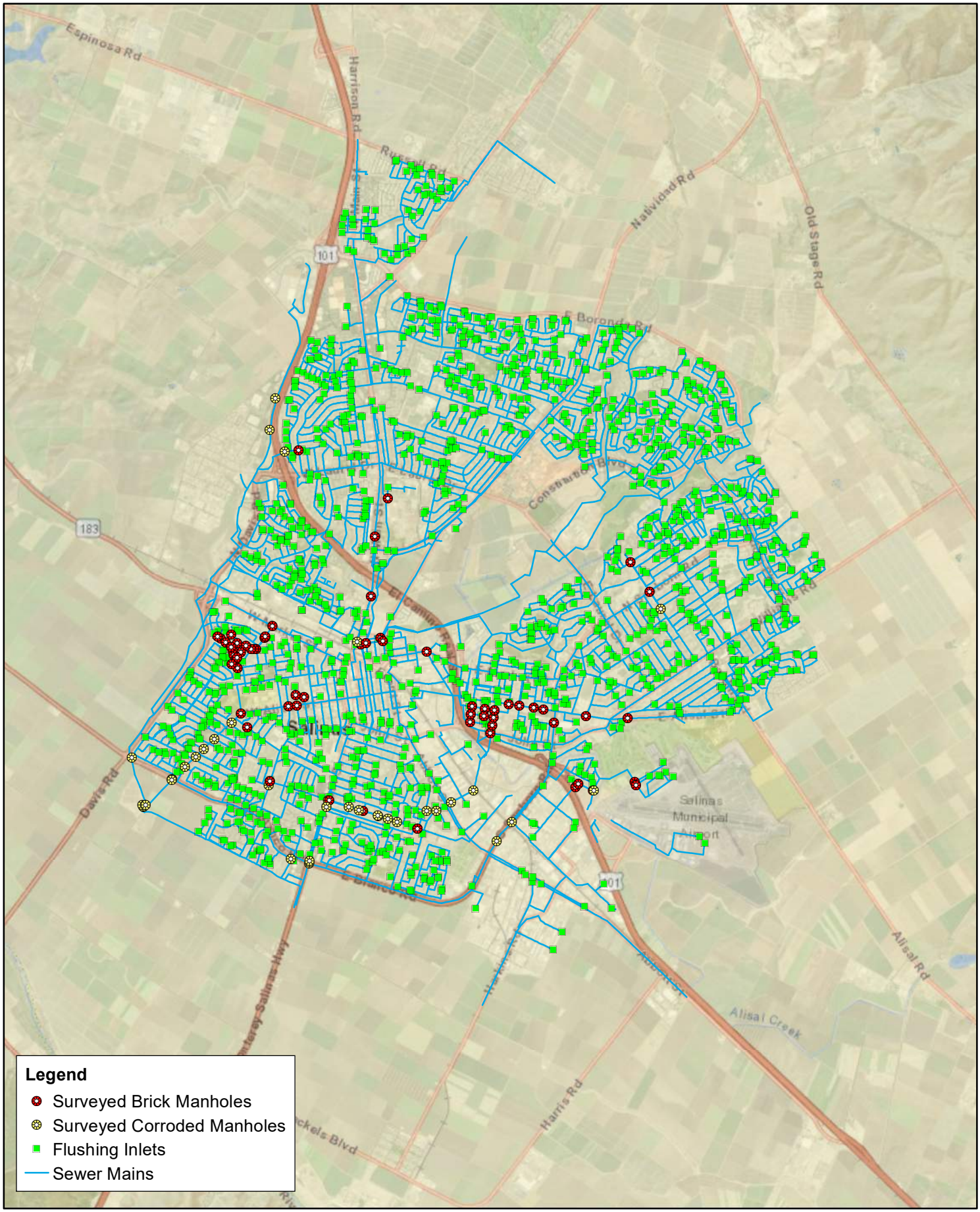

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FIGURE 3-2
LOW PRIORITY REPLACEMENTS

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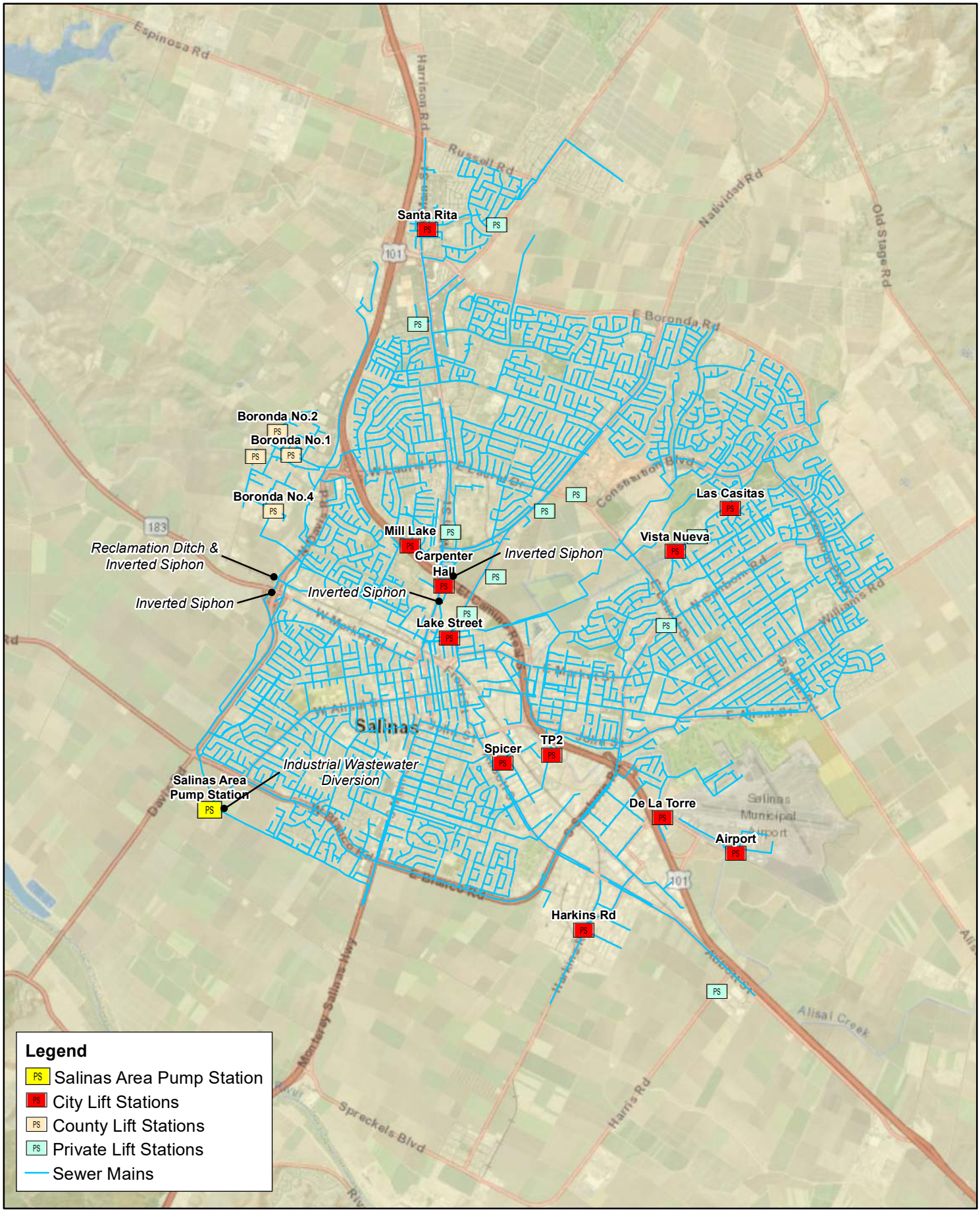

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FIGURE 3-3
LIFT STATIONS & SIPHONS

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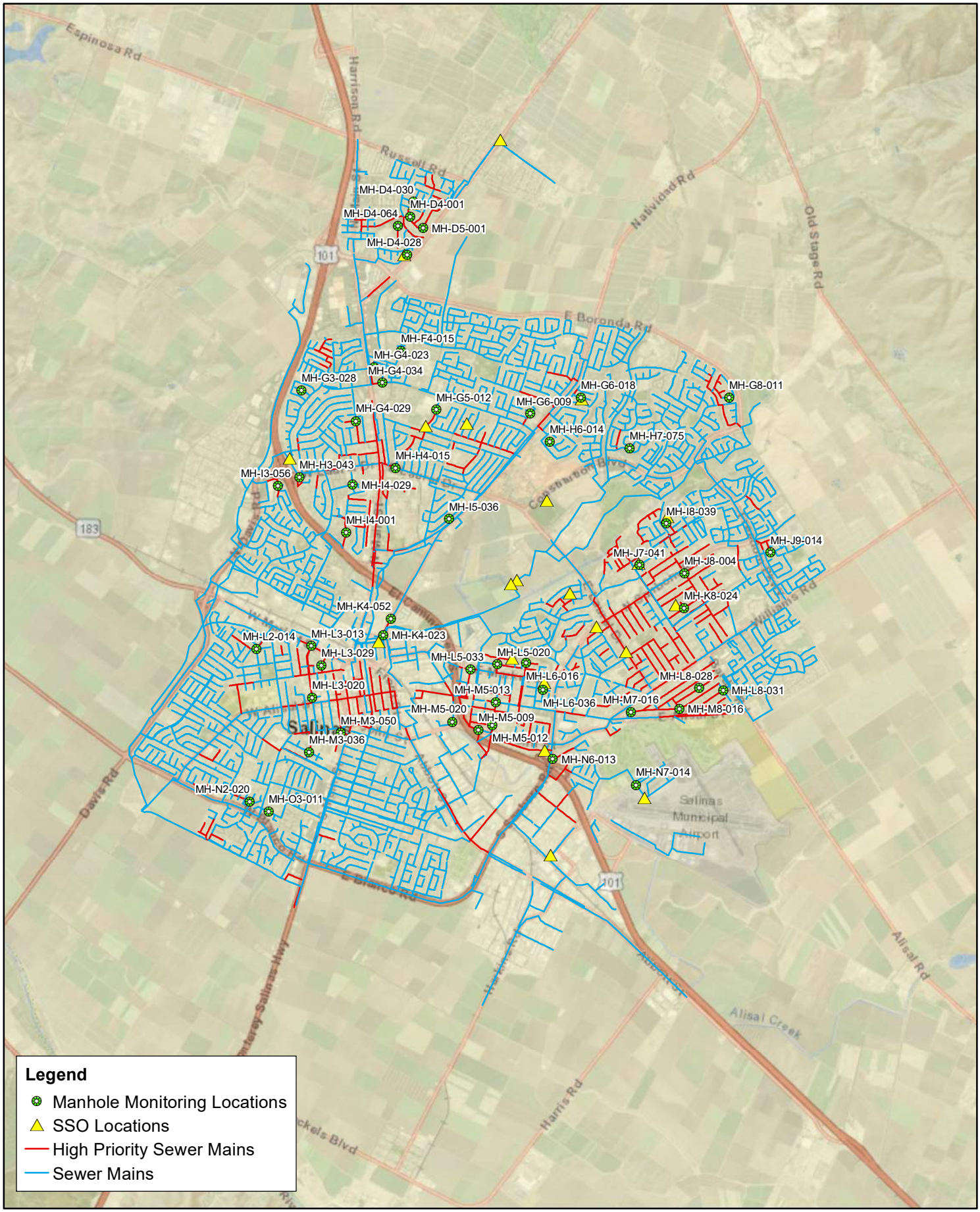

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FIGURE 3-4
CITY MANHOLE MONITORING LOCATIONS

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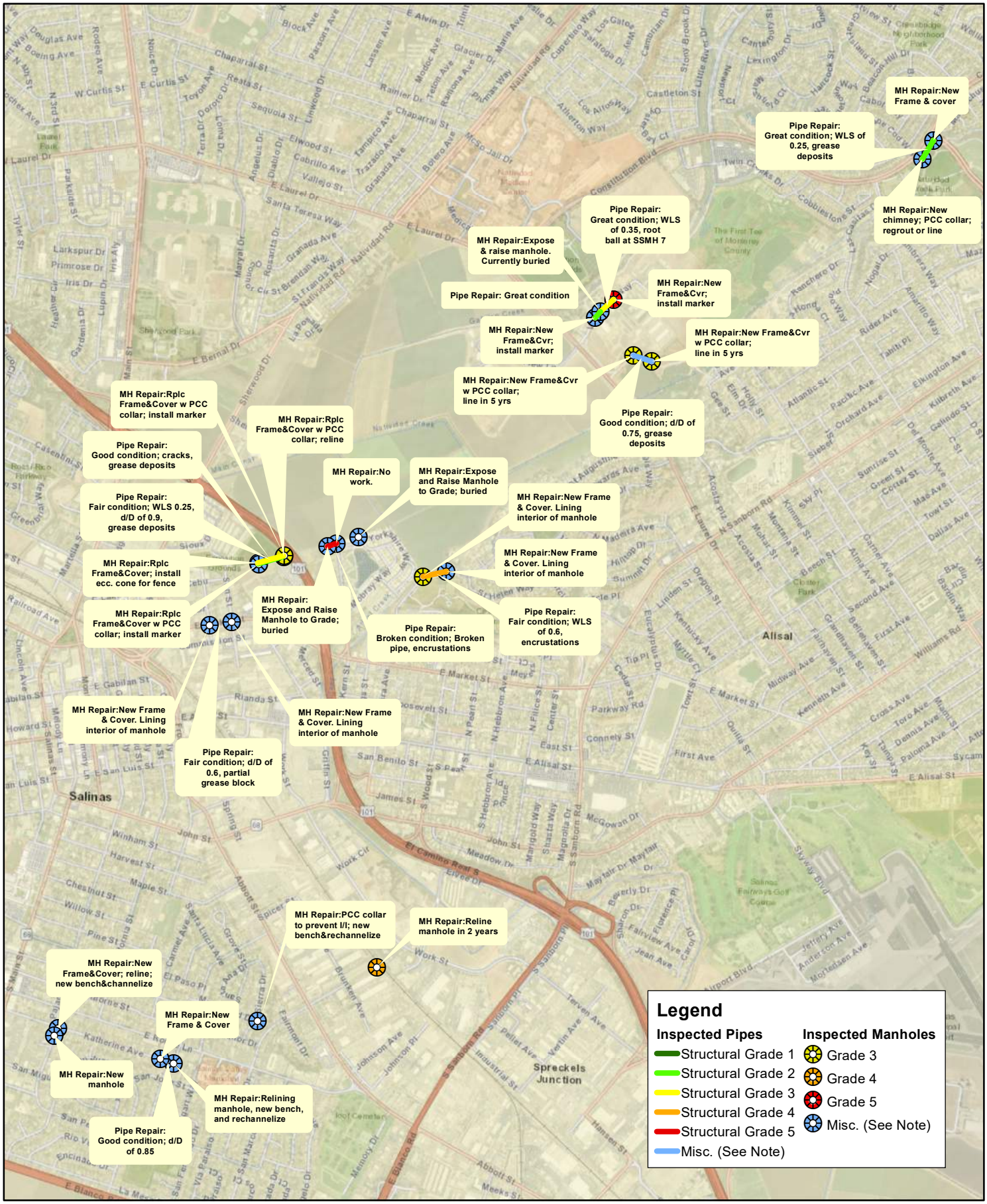

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FIGURE 3-5
MARK THOMAS CCTV FINDINGS

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CHAPTER 4
WASTEWATER FLOWS

This Chapter presents the results of the sewer flow monitoring and the development of the wastewater flow characteristics used for the analysis of the collection system for the City. All figures are located at the end of this chapter.

INTRODUCTION

Wastewater flows were evaluated from three sources described in the following sections:

- Temporary flow meters installed in the City's sewer system
- Wastewater flow records provided by Monterey One Water
- Water use records provided by the City's water purveyors: California Water Service and Alco Water Service

WASTEWATER FLOW MONITORING

To develop a better understanding of the existing wastewater flows, in-line flow monitoring was conducted at eighteen (18) different locations on main trunk lines throughout the City. Temporary sewer flow monitoring locations were selected based upon downstream locations for sewersheds of similar land uses that could be calibrated for the proposed sewer model development. The locations of the flow meters and their corresponding tributary areas are depicted on Figure 4-1.

Flow meter locations 1-15 were installed by USCubed (US^3) on March 5-6, 2021. For redundancy in calculating the total flow of the system, meter locations 16-18 just upstream of SAPS were installed by US^3 on March 30, 2021. These three additional monitoring locations were selected after anomalies were discovered in the SAPS flow data. All meters were removed April 20-21, 2021. Locations 1-15 were monitored for a total of 45 days and locations 16-18 were monitored for a total of 21 days. After review of locations 16 and 17, it was discovered that the 54-inch line conveying most of the western portion of the City's flow was not monitored due to inaccurate GIS data; therefore, these flow monitoring results were not used as a check against the SAPS total flow data.

Flow Meters

FLO-DAR® flow meters were used for the wastewater flow monitoring. These flow meters are mounted to the manhole wall, above the flow where they should not encounter any potential debris or grease that would affect readings. A digital Doppler radar is used to measure the velocity and direction of flow every 15 minutes. Additionally, the flow level is measured by ultrasonic pulse echo and recorded as well.

Since sewer flow monitoring does not continuously record flow, it is unable to record transient events of very short duration, in this case of less than 15 minutes. The flow monitoring does, however, provide an estimate of the amount of wastewater generated by various sewersheds during the monitoring event. This provides useful information about the diurnal sewer flow patterns for each sewershed and can also potentially show the impacts of inflow and infiltration. The following provides a summary of the benefits and the potential problem with sewer flow monitoring:

Benefits

- Provides hourly and daily wastewater flow averages for various sewersheds within the community. This can be used to help differentiate between the amount of wastewater flow coming from residential versus commercial development.

- Evaluates diurnal trends within the community, which will help estimate the peaking factors that are required to size the collection system and evaluate the remaining capacity within the existing collection system

- May help evaluate the potential impacts of inflow and infiltration if the monitoring event spans both dry weather and wet weather events.

Potential Drawback

- The flow meters read every 15 minutes, providing only an average of the flow over the 15-minute period. The averages are then totaled for the day to get total daily flows. There are possibilities that the flow meter could miss higher peaks that may come through the collection system between readings.

Flow Monitoring Summary

The goal of flow monitoring is to record wastewater flows and establish diurnal trends that will be used to calibrate the sewer model. The following Table 4-1 provides a summary of the results from each of the flow monitoring stations.

TABLE 4-1. FLOW MONITORING SUMMARY

LOCATION	PRIMARY LAND USE	AVERAGE DAILY FLOW (GPD)	MONITORING NOTES
1 SUCRE	Residential-65% Commercial-15%	534,842	Three lines entering from the east, west, and south. Downstream 15-inch line was monitored.
2 HARDEN	Residential-70% Commercial-22%	190,354	Three lines entering from the east, north, and south. Downstream 32-inch line was monitored.
3 LAUREL	Residential-60% School-25%	198,404	Two lines entering from the east and north. Downstream 8-inch line was monitored.
4 CONSTITUTION	Residential-73% Public/Semi-Public-15%	414,180	No laterals. Upstream 24-inch line was monitored. Levels and velocities began dropping to zero during 4/8-4/13 of the study. No issue was found with the equipment, but those days were not included in the Average Daily Flow total.
5 RANCH VIEW	Residential-42% School-40%	386,611	No laterals. Upstream 21-inch line was monitored. US3 notes levels and velocities began dropping to zero during the last three days of the study. No issue was found with the equipment, but those days were not included in the Average Daily Flow total.
6 ALISAL	Residential-74% School-40%	291,616	Two lines entering from the northeast and southwest. Downstream 15-inch line was monitored.
7 EUCALYPTUS	Residential-71% School-14%	777,840	Two lines entering from the east and north. Downstream 18-inch line was monitored.
8 DAVIS	Residential-52% Commerical-29%	1,715,731	Two lines entering from the north and west. Downstream 24-inch line was monitored.

TABLE 4-1. FLOW MONITORING SUMMARY (CONT.)

LOCATION	PRIMARY LAND USE	AVERAGE DAILY FLOW (GPD)	MONITORING NOTES
9 EL RANCHO	Residential-89% Hotel-8%	46,255	No laterals. Upstream 8-inch line was monitored.
10 MADISON	Commercial-57% Residential-33%	291,616	Two lines entering from the east and one line from the west. Downstream 10-inch line was monitored.
11 CHEROKEE	Residential-67% Commercial-19%	1,881,437	Two lines entering from the north and west. Downstream 18-inch line was monitored.
12 LAKE ST 24	Residential-70% Public/Semi-Public -10%	583,734	No laterals. Upstream 24-inch line was monitored. US3 notes this site had sediment in the line and program parameters were used to reduce issues due to the poor hydraulics.
13 LAKE ST 30	Residential-55% Commercial-21%	1,884,712	No laterals. Upstream 30-inch line was monitored. US3 notes levels and velocities dropped to zero somewhere between 3-8am almost every day during the study.
14 BRIDGE	Residential-58% Public/Semi-Public-19%	1,717,329	No laterals. Upstream 36-inch line was monitored. US3 notes this site has sediment in the line and program parameters were used to reduce issues due to the poor hydraulics.
15 SANBORN	Residential-33% Commercial-29%	1,428,913	Two lines entering from the north and west. Downstream 24-inch line was monitored.
16 & 17 HITCHCOCK	Residential- 48% Commercial-18%	1,364,436	No laterals. Downstream 24-inch line was monitored. US3 notes that program parameters were used at Site 17 to reduce issues due to the poor hydraulics.
18 HITCHCOCK	Residential-40% Industrial-26%	1,892,455	No laterals. Downstream 36-inch line was monitored. US3 notes program parameters were used to reduce issues due to the poor hydraulics.

SALINAS AREA PUMP STATION AVERAGE DAILY FLOWS

Monterey One Water provided total daily flows at SAPS from January 20, 2015 to June 30, 2018 for historical use. They also provided January through May 2021 to compare total flows during the same time period as the flow monitoring. Flows in the latter half of 2018 through 2020 were not provided due to several anomalies such as large jumps and dips that are not typical to total sewer flows, thus the data was unreliable. M1W reports that anomalies may be due to the flow meter needing calibration, cleaning, or repairs.

Table 4-2 presents the average daily flow for the years 2015-2017. These values represent domestic wastewater in the City's system. Industrial wastewater flows that were diverted to SAPS during these years were subtracted from the total metered wastewater flow at SAPS to determine the actual flows from the domestic sewer collection system.

TABLE 4-2. SAPS DOMESTIC WASTEWATER FLOWS

YEAR	AVERAGE DAILY FLOW (MGD)
2015	11.32
2016	10.12
2017	9.94
AVERAGE	10.46

It should be noted that the City's 2011 Sanitary Sewer Master Plan notes an average daily flow of 12.5 MGD from 2002-2007. Although the population has increased since this time, the decrease in sewer flows can be attributed to significant water conservation efforts that occurred during the statewide drought water conservation mandates which included more water efficient water fixtures installed subsequent to 2007.

To further this point, a draft of the *West Area Specific Plan* states that conservation effort decreased M1W Plant flows from 21 MGD in 2014 to 16 MGD in 2016. Of the 16 MGD, the City of Salinas contributed 12 MGD. This number is the total flow from SAPS to M1W Regional Treatment Plant, including the industrial wastewater diversion flow. The average daily flow for 2016 in Table 4-2 subtracts this metered industrial wastewater diversion, which is approximately 2.7 MG for the months of May-October, to provide total domestic flows entering the SAPS.

WATER USE DATA

Wastewater flows were also calibrated by comparing the estimated wastewater flows to water use records. Water use records for the year 2020 were provided by the City's water purveyors: California Water Service and Alco Water Service. In order to compare water use records to wastewater flow, it is important to identify outdoor versus indoor water use that would contribute flow to the wastewater system. Known irrigation accounts were identified and removed from the data provided in order to estimate indoor water use. The 2011 Sanitary Sewer Master Plan estimates sewer flows as 85% of the lowest monthly average water consumption or as 75% of the annual average water consumption. Table 4-3 provides a summary of sewer flows using these ratios.

TABLE 4-3. WATER USE

	WATER USE (MGD)	RETURN TO SEWER RATIO	DOMESTIC WASTEWATER (MGD)
MARCH 2020 (LOWEST MONTH)	11.95	0.85	10.16
2020 ANNUAL AVERAGE	15.58	0.75	11.69

EXISTING WASTEWATER FLOWS

After analyzing the average daily sewer flows via flow monitoring results, the 2015-2017 SAPS influent flow data, and the City's domestic water use records, for the purposes of this report and model calibration, the average daily flow for the City of Salinas is 10,460,000 gallons. Based on the calculated average daily flow for various sewersheds and land uses, the wastewater flow factors for various existing land uses within the City were developed and are presented in Table 4-4.

TABLE 4-4. EXISTING FLOW FACTORS

	QUANTITY	UNIT	FLOW FACTOR (GPD/UNIT)	EXISTING AVERAGE FLOW (GPD)
RESIDENTIAL	159,143	Persons	54.5	8,673,200
MOBILE HOME	4,399	Persons	30	131,900
HOTEL	649	Rooms	19.5	12,600
COMMERCIAL	16,289,742	SF	0.08	1,221,700
INDUSTRIAL	7,087,044	SF	0.04	248,000
SCHOOL	38,365	Students	4.5	172,600
EXISTING AVERAGE DAILY FLOWS				**10,460,000**

The quantity of persons is based on the existing population of 163,542. The number of students was based on the City's GIS data, and the number of hotel rooms was based on the hotels within the existing service area. In order to compare hotel flows to flow monitoring that was performed during the COVID-19 California Stay Home Order, it was assumed that hotels were operating at half capacity. The City provided a dataset of the building footprints within the City, which was used to quantify the total area for both commercial and industrial facilities.

Table 4-5 summarizes the estimated flows for the sewersheds. These flows are estimates based on the wastewater flow factors shown in Table 4-4. Table 4-5 also summarizes the percent difference of the estimated flows to the flow monitoring average values. Population densities per household and number of units per acre were classified into three categories (low, average, and high) based on 2020 Census Tract data. Certain areas of the City have higher population densities per household than other areas of the City, as shown as a heatmap on Figure 4-2. Classifying the population densities into three categories allowed the flow projections for each sewershed to more accurately match what was measured during flow monitoring. Table 4-6 summarizes the breakdown of population and housing unit densities and the sewersheds where these densities were applied.

TABLE 4-6. EXISTING FLOW FACTORS

	LOW	AVERAGE	HIGH
LOW DENSITY	4.5 UNITS/ACRE	6.5 UNITS/ACRE	8.0 UNITS/ACRE
AVERAGE DENSITY	8.0 UNITS/ACRE	11.75 UNITS/ACRE	15 UNITS/ACRE
HIGH DENSITY	15 UNITS/ACRE	16.75 UNITS/ACRE	24 UNITS/ACRE
HOUSEHOLD SIZE	2.7 PERSONS/HOUSEHOLD	3.2 PERSONS/HOUSEHOLD	5.8 PERSONS/HOUSEHOLD
SEWERSHEDS	1, 2, 3, 4, 9, & 18	5, 7, 8, 10, 14, 15, 16, & 17	6, 11, 12, 13, & 14

For sewersheds that saw higher flow monitoring values than what was predicted, it is likely representative of groundwater infiltration or minimal amounts of rainfall dependent inflow or infiltration. Since the rainfall event during the flow monitoring period was not significant, it is likely that these higher values can be attributed to groundwater infiltration. Based on the City's observation, this is likely in Sewershed 12 & 13 since it is known that Carr Lake experiences inflow and infiltration. Sewersheds 14 and 15 may be seeing infiltration from upstream inverted siphons and crossings at the reclamation ditch.

Before review of the flow monitoring results, it was assumed that Sewershed 11 was upstream of Sewershed 8 based on the City's GIS data; however, the flow monitoring data was much higher than what was estimated for Sewershed 8. The survey data confirmed that flows from Sewershed 11, and upstream Sewersheds 1 and 2, are conveyed into the 24-inch line on Davis Road just upstream of the flow monitoring location 8. Therefore, the flows from Sewershed 8 include upstream Sewersheds 1, 2, and 11.

Sewersheds 16 & 17 were combined based on the two 24-inch parallel lines conveying flow through the agricultural fields south of Blanco Road and into SAPS. Additionally, Sewersheds 12 & 13 were combined since they are both upstream of Lake Street Lift Station.

Table 4-5. Existing Average Daily Flows By Sewershed

Tributary Area	Low Density Residential Housing (acres)	Medium Density Residential Housing (acres)	High Density Residential Housing (acres)	Number of Mobile Home Units	Housing Units	Estimated Residential Population Density	Estimated Residential Population Density (Mobile Homes)	Estimated Residential Population	gpd	Estimated # of Hotel Rooms	gpd	Estimated # of Students	gpd	Commercial Facilities (minus schools & hotels) (sq. ft)	gpd	Industrial Facilities (sq. ft)	gpd	SubTotal Average Estimated Flow (gpd)	Average Flow Monitoring (gpd)	Individual Sites Percent Difference from Flow Monitoring	Combined Sites Percent Difference from Flow Monitoring
Site 01: Sucre	66	19	92	454	2,643	6,929	1,243	8,172	414,835	23	449	2,621	11,795	255,160	19,137	42,762	1,497	447,712	534,842	-16%	-16%
Site 02: Harden	136	20	17	0	1,002	2,667	0	2,667	145,299	0	0	550	2,475	515,409	38,656	0	0	186,430	190,354	-2%	-2%
Site 03: Laurel	134	0	26	0	973	2,591	0	2,591	141,180	0	0	3,097	13,937	155,585	11,669	770	27	166,812	198,404	-16%	-16%
Site 04: Constitution	193	139	16	0	2,133	5,679	0	5,679	309,448	0	0	2,586	11,637	148,599	11,145	570	20	332,250	414,180	-20%	-20%
Site 05: Ranch View	112	38	23	0	1,554	4,918	0	4,918	267,958	0	0	5,237	23,567	186,581	13,994	0	0	305,518	368,611	-17%	-17%
Site 06: Alisal	77	50	0	0	1,303	7,555	0	7,555	411,614	0	0	1,647	7,412	16,359	1,227	785	27	420,280	291,616	44%	44%
Site 07: Eucalyptus	269	23	45	0	2,759	8,731	0	8,731	475,735	0	0	2,863	12,884	386,979	29,023	8,507	298	517,939	486,224	7%	21%
Site 08 Davis	42	4	8	0	452	1,430	0	1,430	77,919	0	0	250	1,125	1,270,016	95,251	573	20	174,315	369,136	-53%	9%
Site 09: El Rancho	76	0	0	0	338	900	0	900	49,057	56	1,092	0	0	11,288	847	0	0	50,995	46,255	10%	10%
Site 10: Madison	35	0	0	0	226	714	0	714	38,930	0	0	0	0	323,801	24,285	0	0	63,215	67,699	-7%	-7%
Site 11: Cherokee	42	72	70	113	3,117	17,423	655	18,079	968,982	0	0	0	0	1,253,670	94,025	10,655	373	1,063,381	1,156,241	-8%	-10%
Site 12+13: Lake St 24 + Lake St 30	322	178	62	320	6,773	37,427	1,856	39,283	2,094,949	146	2,837	5,487	24,692	407,446	30,558	116,108	4,064	2,157,100	2,468,446	-13%	13%
Site 14: Bridge	401	31	30	0	4,162	24,140	0	24,140	1,315,270	0	0	3,265	14,693	670,740	50,306	11,116	389	1,380,657	1,518,925	-9%	-10%
Site 15: Sanborn	121	42	12	0	1,475	4,667	0	4,667	254,306	134	2,603	595	2,678	2,835,674	212,676	4,166,874	145,841	618,103	651,073	-5%	9%
Site 16 + Site 17: Hitchcock	372	145	54	0	5,007	15,846	0	15,846	863,389	138	2,691	6,731	30,290	3,910,339	293,275	887,713	31,070	1,220,714	1,364,436	-11%	-11%
Site 18: Hitchcock	220	54	57	0	2,211	5,885	0	5,885	320,639	14	273	1,190	5,355	1,344,877	100,866	1,237,867	43,325	470,458	463,542	1%	7%
Not Monitored	385	115	123	255	4,614	11,605	679	12,284	652,687	139	2,711	2,923	13,154	2,597,219	194,791	602,744	21,096	884,438	Not Monitored	N/A	N/A
System Total	3,003	930	635	1,142	44,153	159,109	4,433	163,542	8,802,197	649	12,656	39,042	175,689	16,289,742	1,221,731	7,087,044	248,047	10,460,000			

PEAKING FACTOR ANALYSIS

The following section defines some of the terminology commonly used to describe and analyze wastewater flows.

Average Daily Flow (ADF)

ADF is the average daily wastewater flow in a collection system. For this study, the ADF is based on the mean of the daily flows to the Salinas Area Pump Station (SAPS) for the years 2015-2017, as shown in Table 4-2. Based on this data, the ADF for the City is 10.46 MGD.

Maximum Day Dry Weather Flow (MDDWF)

MDDWF reflects the maximum day flow rate typically seen during the peak summer months. The City of Salinas peak flows in the summer are likely influenced due to the increase in population of farm workers in the area. According to the *Draft April 2018 Farmworker Housing Study and Action Plan for Salinas Valley and Pajaro Valley*, agricultural employment increases over an eight-month period of April through November. This same study found that approximately 20% of the total population for the Salinas and Pajaro Valleys are migrant, non-permanent residents. Assuming the City's population increases by 20% during these peak harvesting months would mean an increase of approximately 31,600 people. Using a flow factor of 54.5 gallons per person per day (see Table 4-4), wastewater flows would increase by approximately 1,722,200 GPD, for a total domestic average flow during these peak months of 12.2 MGD. The historical MDDWF recorded in the SAPS data provided was 13.9 MGD on April 24, 2015. This results in a multiplier to increase the ADF, or peaking factor, of 1.33.

The 2011 Sanitary Sewer Master plan also used historical SAPS data to calculate a dry weather peaking factor of 1.6, with the assumption that the peaking factor would approach 1.5 as flows increase in the future. For the purposes of this study, a peaking factor of 1.5 will be used to calculate MDDWF. This is also consistent with California Title 22 Drinking Water Regulations recommendation of using 1.5 as a multiplier to average daily water usage to calculate the maximum day demand. The MDDWF for the City is 15.69 MGD.

Peak Hour Dry Weather Flow (PHDWF)

An important design consideration for wastewater collection system facilities is the PHDWF. PHDWF is important to understand as it may govern the design of pump stations and sewer mains. Hourly measurements at SAPS were unavailable for this peak flow analysis; therefore, peak flow was estimated based on flow monitoring that was conducted March 5-6, 2021 to April 20-21, 2021. Since there was little to no rain during this time, the PHDWF would not include rainfall dependent inflow and infiltration flow contributions to the collection system. Figure 4-3 shows the relative residential and commercial hourly flows, or diurnal curves, for the collection system during the flow monitoring period described above. The diurnal curves in Figure 4-3 show the average dry weather peaking factor is 2.0 and 1.9 for collection systems serving residential and commercial areas, respectively. The PHDWF factor during max day, dry weather flow is equal to the diurnal peaking factor multiplied by the MDDWF factor, which equates to 3.0 for residential and 2.9 for commercial.

Peak Hour Wet Weather Flow (PHWWF)

PHWWF is the maximum flow rate that occurs in a single hour during wet weather, which is defined as a significant rain event. Similar to PHDWF, PHWWF can also govern the design of the sewage collection system as it may represent the maximum flow rate that the collection system must convey. PHWWF is calculated by multiplying the ADF by the diurnal peaking factor and adding the wet weather flow component typically found during flow monitoring conducted during one or more significant rainfall events. Since the flow monitoring conducted for this study did not occur during any significant rain events, the PHWWF cannot be accurately calculated. The following section summarizes the peak unit rainfall dependent infiltration and inflow (RDII) flow factors that were analyzed to approximate the peak wet weather flow for this study.

INFILTRATION AND INFLOW

Infiltration and Inflow (I/I) can cause significant issues in collection systems and wastewater treatment plants. The I/I of surface and ground water into a sewer system can result in peak flows that exceed dry weather flow conditions. For the purposes of this study, these terms are defined as follows:

Infiltration is the water entering a sewer system and service connections from groundwater, through such means as defective pipes, pipe joints, connections, or manhole walls. Infiltration does not include inflow and is relatively constant over a period of days, weeks, or even months as high groundwater conditions persist.

Inflow is the water discharged into a sewer system and service connections from such sources as roof drains, cellars, yard and area drains, foundation drains, cooling water discharges, drains from springs and swampy areas, manhole covers, cross connections from storm sewers, catch basins, storm water, surface water runoff, or drainage. Inflow does not include infiltration. Inflow occurs and may vary more rapidly than infiltration with rainfall conditions. Sewer collection flows rising and falling within minutes or hours of a severe storm events are typically associated to the occurrence of inflow.

In order to check for rainfall-dependent I/I (RDII) during the flow monitoring period, rain data was obtained through weather stations monitored by the California Irrigation Management Information System (CIMIS). CIMIS Station 116 Salinas North was identified as the closest rain gauge to the City. Over the entire duration of the flow monitoring performed for this study (48 days), a total of 1.17 inches were recorded in the first 14 days with a maximum of less than 0.3 inches per day at Station 116. This is considered to be less than the one-year recurrence interval storm event. Graphs of the daily flow at each monitoring location versus daily rain totals are also provided on Figures 4-4 to 4-21.

The rainfall recorded during the sewer flow monitoring does not provide enough information to determine wet weather peaking factors from the flow monitoring period. Therefore, historical rainfall events and the wet weather peaking factors from the City's 2011 Sanitary Sewer Master Plan were reviewed and summarized in the following sections.

Historical Rainfall Dependent Infiltration and Inflow

M1W provided instantaneous flow at SAPS for February 2017. Data for this month is valuable because a total of 2.15 inches fell over a 24-hour period on February 20, 2017 and several rainfall events occurred on the days prior, increasing the potential for infiltration into the sewer based on the rain saturating the ground. The instantaneous flow at SAPS showed a max reading of 31.5 MGD on February 20, 2017. Figure 4-22 graphs the instantaneous reading at SAPS for the wet weather day (February 20, 2017), the hourly precipitation on the wet weather day, and the instantaneous readings on February 27, a similar weekday with no rainfall events on or leading up to the day.

By comparing the maximum recorded flow at SAPS, 31.5 MGD, to the average daily flow of 10.46 MGD, a PHWWF peaking factor of 3.0 was determined for this storm event. Although this information confirms the City's collection system does experience RDII, it does not provide insight into where RDII is occurring because the monitoring location at SAPS is at the most downstream point of the collection system. Additionally, this data does not provide the extent to which RDII may be occurring because it is only one data point. Therefore, this study will also use the wet weather flow parameters described in the City's 2011 Sanitary Sewer Master Plan.

2011 Sanitary Sewer Master Plan RDII Peak Unit Flow Rates

The 2011 Sanitary Sewer Master Plan used the flow monitoring data and measured rainfall events occurring during January to February 2007 and 2008 to develop wet weather parameters for different sewersheds. As described above, the portion of the sewer flow attributed to each rainfall event was calculated as the measured sewer flow minus the dry weather base flow. With this data, linear regression equations were used to determine; (1) the percentage of storm volume that reaches the sewer collection system; (2) the RDII peak flow to RDII volume ratio; and (3) the runoff coefficient for RDII in each sewershed. These wet weather parameters were applied to the 5-year, 6-hour storm and 10-year, 6-hour storm to calculate peak RDII factors. Discussion of the methods used are available in Appendix B of the City's 2011 Sanitary Sewer Master Plan.

These three wet weather parameters were not verified since the sewer flow monitoring was not provided during the 2007-2008 monitoring period; however, the peak RDII unit flows from these parameters were correlated to the sewersheds in this study and used to determine the peak wet weather flow.

Table 4-7 provides the peak RDII unit flow rates and total flow estimates for the 10-year, 6-hour design storm. Sewersheds that were not part of the 2007 and 2008 metered data were assigned an RDII unit flow of 2,000 gpapd for the 10-year, 6-hour storm, based on the 2011 Sanitary Sewer Master Plan recommendations.

Since these values were developed in 2007-2008, it is still recommended that the City complete an in-depth I/I evaluation of the entire collection system. Unfortunately, it is difficult to determine the best time to complete this evaluation as most California counties, including Monterey County, are experiencing extreme drought conditions. The I/I evaluation would also include an update to the wet weather flow scenarios used in the hydraulic model and an evaluation of any additional CIPs. This recommended I/I evaluation is included as an existing CIP in Ch. 7 of this report and the timing of the project will be dependent on a significant wet weather year.

TABLE 4-7. PEAK WET WEATHER FLOW FOR 10-YEAR, 6-HOUR STORM

SEWERSHED	CONTRIBUTING SEWER AREA	PEAK RDII UNIT FLOW (GPAPD)	PEAK RDII FLOW (GPD)	PEAK WET WEATHER FLOW (GPD)
1	373	1,200	447,600	895,320
2	224	2,000	448,500	634,930
3	245	2,000	490,600	657,420
4	453	2,000	905,600	1,237,850
5	274	2,000	547,500	853,020
6	151	2,000	301,200	721,490
7	440	2,100	923,500	1,441,440
8	195	1,200	234,400	408,720
9	85	2,000	170,800	221,800
10	101	2,000	201,400	264,620
11	329	1,200	394,400	1,457,790
12&13	840	2,900	1,427,300	3,584,410
14	590	3,000	1,770,600	3,151,260
15	870	2,100	1,826,000	2,444,110
16&17	1,037	2,000	2,074,500	3,295,220
18	591	2,000	1,181,700	1,652,160
Not Monitored	975	2,000	1,949,500	2,833,940
TOTAL	7,773		15,295,100	25,755,500

FUTURE WASTEWATER FLOWS

Projection of wastewater flow is tied closely to population projections and anticipated development discussed in Chapter 2. Table 4-8 provides a summary of the future flows for each growth area. Although it is assumed that water conservation measures will be taken, such as low flow plumbing fixtures for future developments, the future flows are determined by using the existing flow factors identified in Table 4-4. The total additional future flow to the system is estimated to be 7.3 MGD.

Since there are large industrial areas projected for the City, a conservative value of 0.10 gallons/day/square feet is used to account for future industrial flows. This unit is based on historical water use data seen for high industrial users. Note, the industrial flows are for the domestic flows from industrial facilities, not industrial wastewater from industrial facilities, such as wash water. The industrial wastewater is anticipated to flow to the industrial wastewater treatment facility via the industrial sewer collection system.

As discussed in Chapter 2, Ruggeri-Jensen-Azar and Associates prepared the Sanitary Sewer System Analysis Report & Calculations for the planned Salinas-Ag Industrial Center. The sewer flow calculations for this analysis used the conservative value of 2,000 gpapd, identified in the City's 2011 Sanitary Sewer Master Plan for future industrial developments. Based on discussions with the City, the sewer flows modeled for the Salinas-Ag Industrial Center in this SSMPU are based on the above value of 0.10 gallons/day/building square feet.

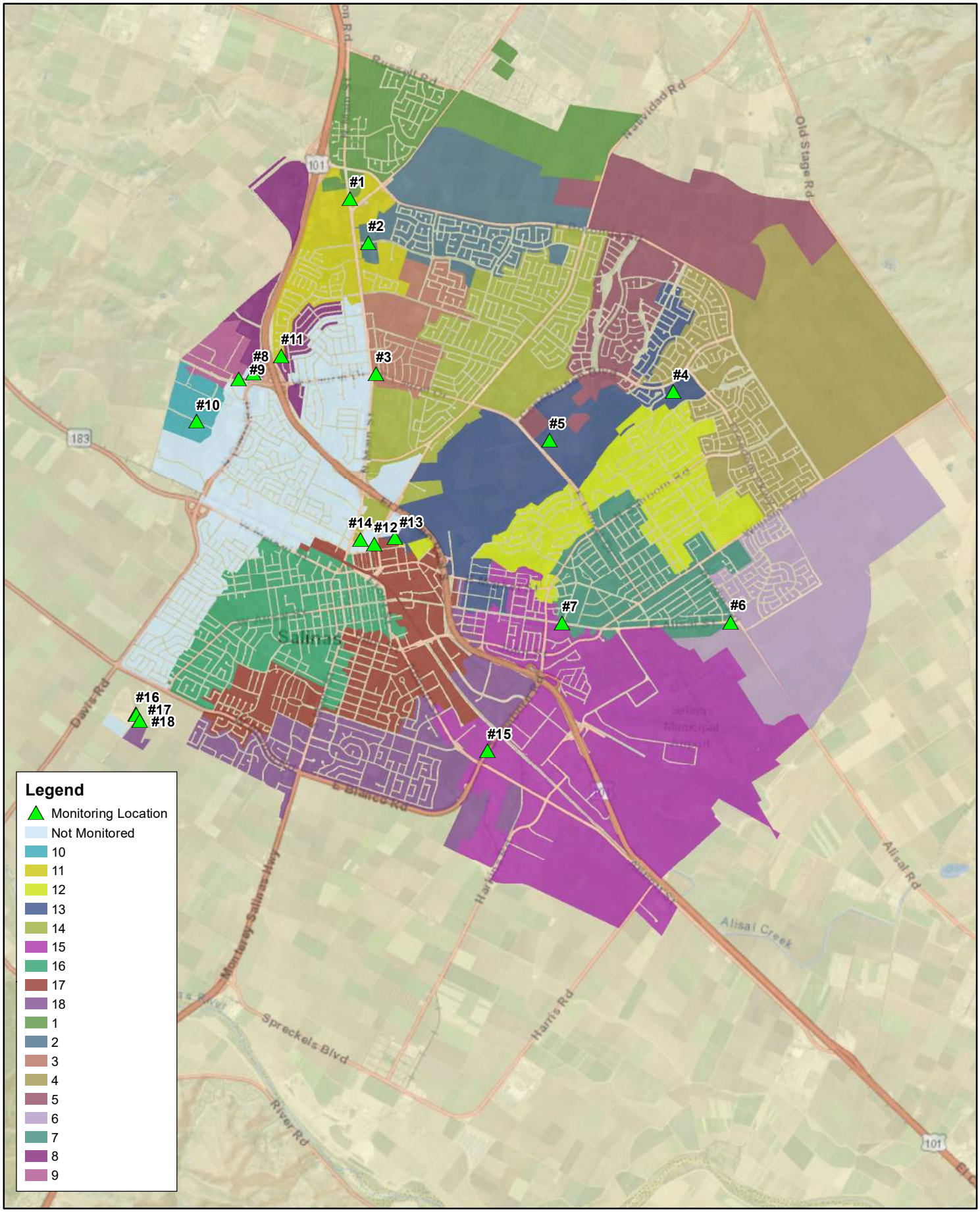
The peaking factors noted in this chapter were used to estimate future maximum day and peak hour wet weather flows for the future condition. City standards recommend a peak Rainfall-Dependent Infiltration and Inflow (RDII) unit flow of 500 gallons per acre per day (gpapd), based on new plastic sewer pipes. This RDII unit flow was applied to the total growth area of 4,960 acres to calculate the additional peak wet weather flow from future conditions. Table 4-9 provides a summary of the collection system's existing and future flows.

TABLE 4-9. EXISTING AND FUTURE FLOW SUMMARY

FLOW CONDITION	EXISTING FLOW (GPD)	FUTURE FLOW (GPD)	NOTES
AVERAGE DAILY FLOW (ADF)	10,460,000	17,715,200	Additional Future Flow=7,255,160 gpd (see Table 4-8)
MAXIMUM DAY DRY WEATHER FLOW (MDDWF)	15,690,000	26,572,800	Based on MDDWF peaking factor of 1.5
PEAK HOUR WET WEATHER FLOW (PHWWF) 10-YR, 6-HR STORM	25,755,500	35,605,300	Based on peak RDII unit factors for the 10 year, 6-hour storm event for existing; Based on 500 gpapd for future areas

Table 4-8. Additional Future Average Daily Flows By Growth Area

City Growth Area	Low Density Residential Dwelling Units	Medium Density Residential Dwelling Units	High Density Residential Dwelling Units	Mixed Use Residential Dwelling Units	gpd	Commercial & Mixed Use Facilities (sq. ft)	gpd	Industrial Facilities (sq. ft)	gpd	Estimated # of Students	gpd	SubTotal Estimated Future Flow (gpd)
Focused Growth: Abbott Street	24	109	--	242	74,791	3,425,027	256,877	819,724	81,972	--	0	413,640
Focused Growth: East Alisal Street/East Market Street	--	227	91	--	63,518	2,327,648	174,574	--	0	--	0	238,090
Focused Growth: Laurel Drive at North Main Street	--	--	--	262	52,336	3,212,100	240,907	--	0	--	0	293,240
Focused Growth: North Main Street/Soledad Street	33	171	62	202	93,130	2,554,430	191,582	130,276	13,028	--	0	297,740
Focused Growth: South Main Street	--	--	--	283	56,434	4,373,795	328,035	--	0	--	0	384,470
Focused Growth Subtotal	*57*	*507*	*153*	*989*	*340,208*	*15,893,000*	*1,191,975*	*950,000*	*95,000*	*0*	*0*	*1,627,180*
Future Growth: Central Area Specific Plan	1,367	1,359	1,185	--	779,927	489,700	36,728	--	0	4,033	18,149	834,800
Future Growth: West Area Specific Plan	1361	1,803	1,085	91	865,477	571,500	42,863	--	0	2,354	10,593	918,930
Future Growth: East Area Specific Plan	2,699	1,669	263	121	947,786	2,898,291	217,372	--	0	--	0	1,165,160
Future Growth: East Area	1,305	1,221	147	157	564,215	1,493,396	112,005	4,997,912	499,791	--	0	1,176,010
Future Growth: Southeast Area	--	--	--	--	0	--	0	4,672,741	467,274	--	0	467,270
Future Growth: West Boronda FGA	39	--	--	--	7,770	587,113	44,033	1,102,347	110,235	--	0	162,040
Future Growth Subtotal	*6,771*	*6,052*	*2,680*	*369*	*3,165,175*	*6,040,000*	*453,000*	*10,773,000*	*1,077,300*	*6,387*	*28,742*	*4,724,210*
Target Area B	--	--	--	--	0	87,120	6,534	1,502,820	150,282	--	0	156,820
Target Area F	--	--	--	--	0	87,120	6,534	--	0	--	0	6,530
Target Area K	--	--	--	--	0	250,470	18,790	1,570,338	157,030	--	0	175,820
Target Area L	--	--	--	--	0	620,730	46,550	--	0	--	0	46,550
Target Area N	--	--	--	--	0	337,590	25,320	--	0	--	0	25,320
Target Area V	--	--	--	--	0	810,448	60,780	--	0	--	0	60,780
Target Area Subtotal	*0*	*0*	*0*	*0*	*0*	*2,193,478*	*164,508*	*3,073,158*	*307,312*	*0*	*0*	*471,820*
Bolsa Knolls	625	--	--	--	90,651	68,418	5,130	--	0	--	0	95,780
Salinas Ag-Industrial Center	--	--	--	--	0	--	0	3,361,743	336,174	--	0	336,170
System Total	**7,453**	**6,559**	**2,833**	**1,358**	**3,596,034**	**24,194,896**	**1,814,613**	**18,157,901**	**1,815,786**	**6,387**	**28,742**	**7,255,160**



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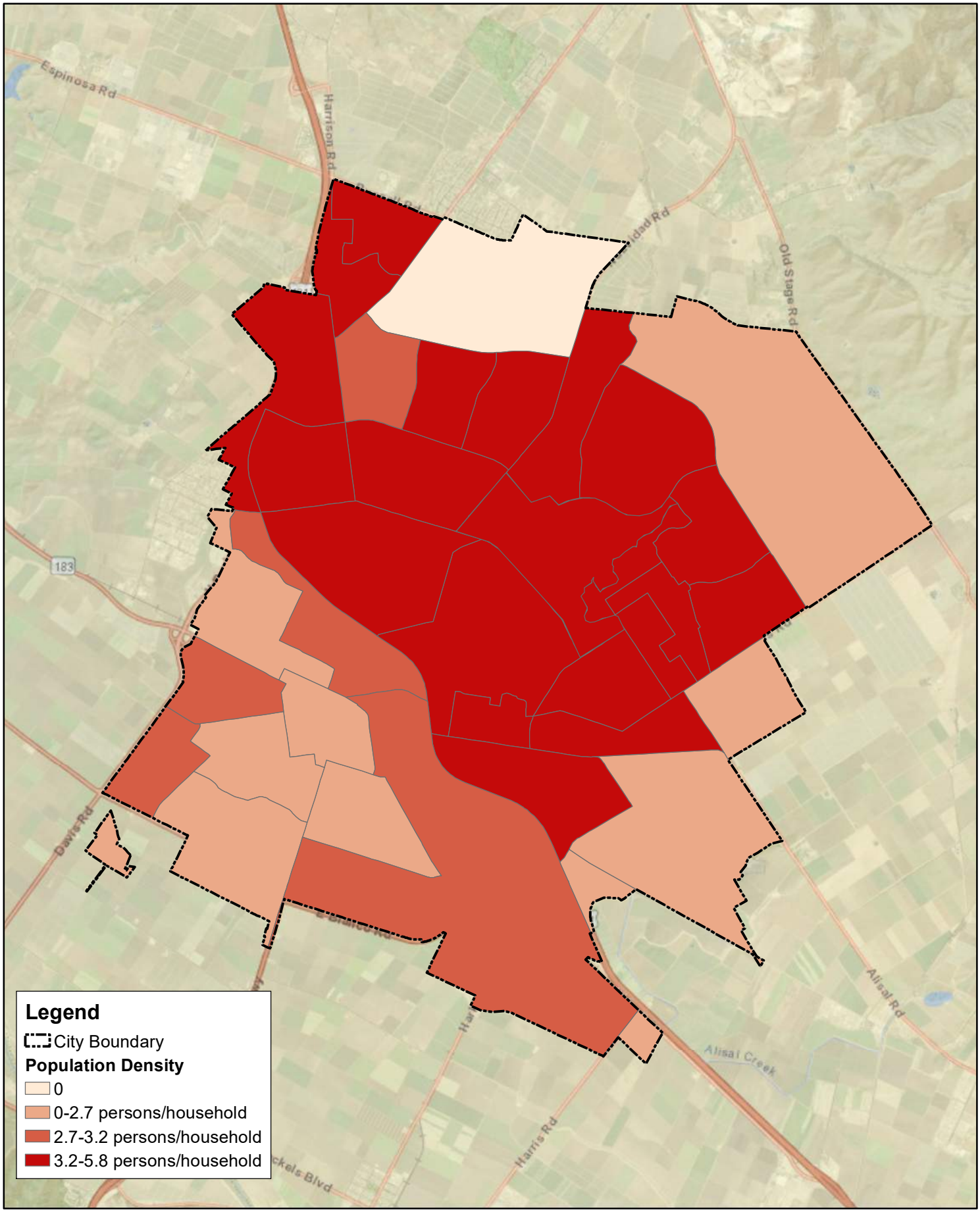
1 inch = 5,000 feet

SALINAS SEWER MASTER PLAN UPDATE

FIGURE 4-1
FLOW MONITORING LOCATION & SEWERSHEDS

NOTES:
ESRI BASEMAP.
WALLACE GROUP DID NOT PERFORM BOUNDARY SURVEY SERVICES FOR THIS MAP. NOT A LEGAL DOCUMENT.
MAP PRODUCED FEBRUARY 2023.

SALINAS



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SALINAS SEWER MASTER PLAN UPDATE

FIGURE 4-2
POPULATION DENSITY HEATMAP

NOTES:
ESRI BASEMAP.
WALLACE GROUP DID NOT PERFORM BOUNDARY SURVEY SERVICES FOR THIS MAP. NOT A LEGAL DOCUMENT.
MAP PRODUCED MAY 2022.

SALINAS

FIGURE 4-3. DIURNAL CURVE

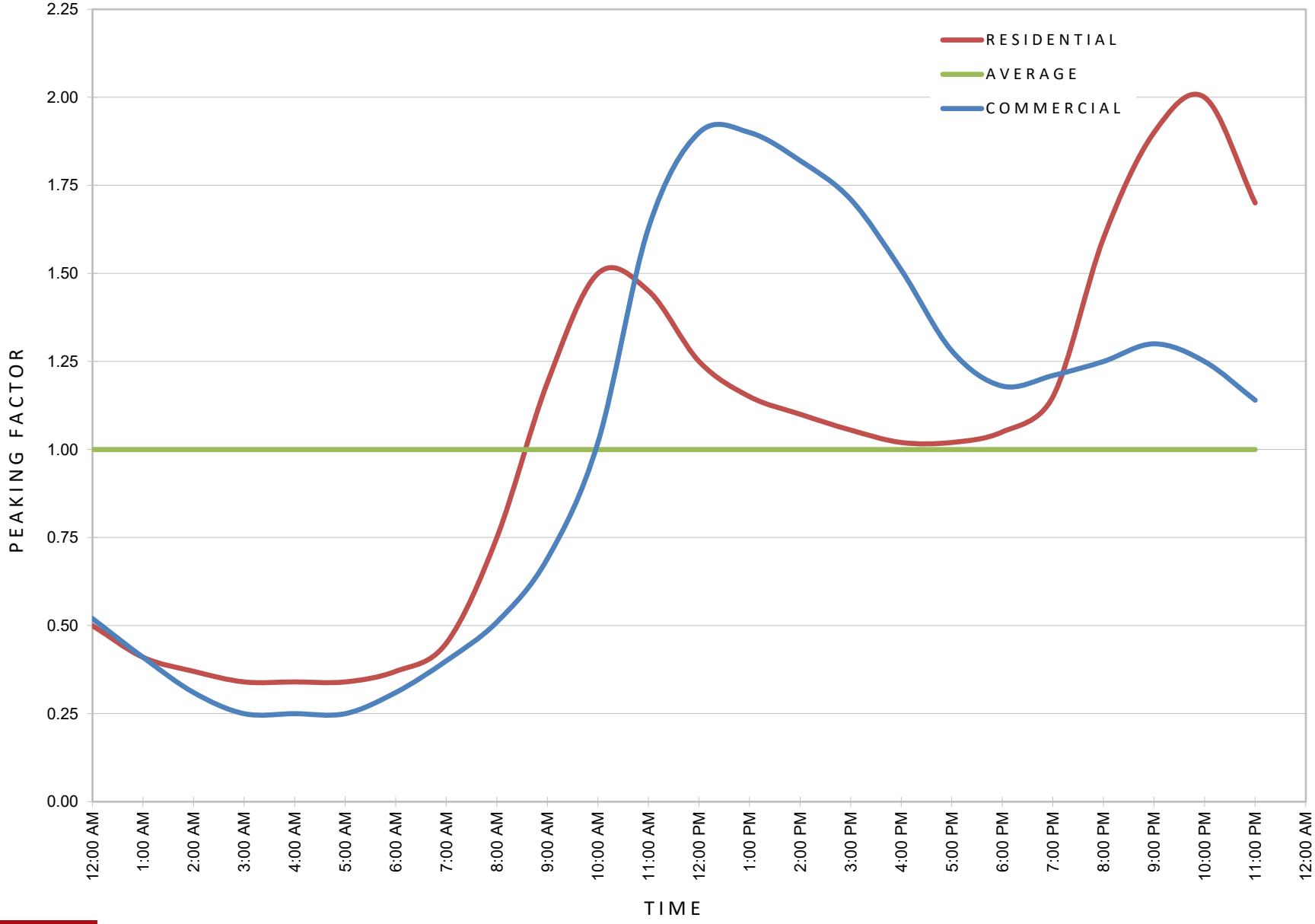

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FIGURE 4-4. SEWERSHED 1 AVERAGE DAILY MONITORED FLOW

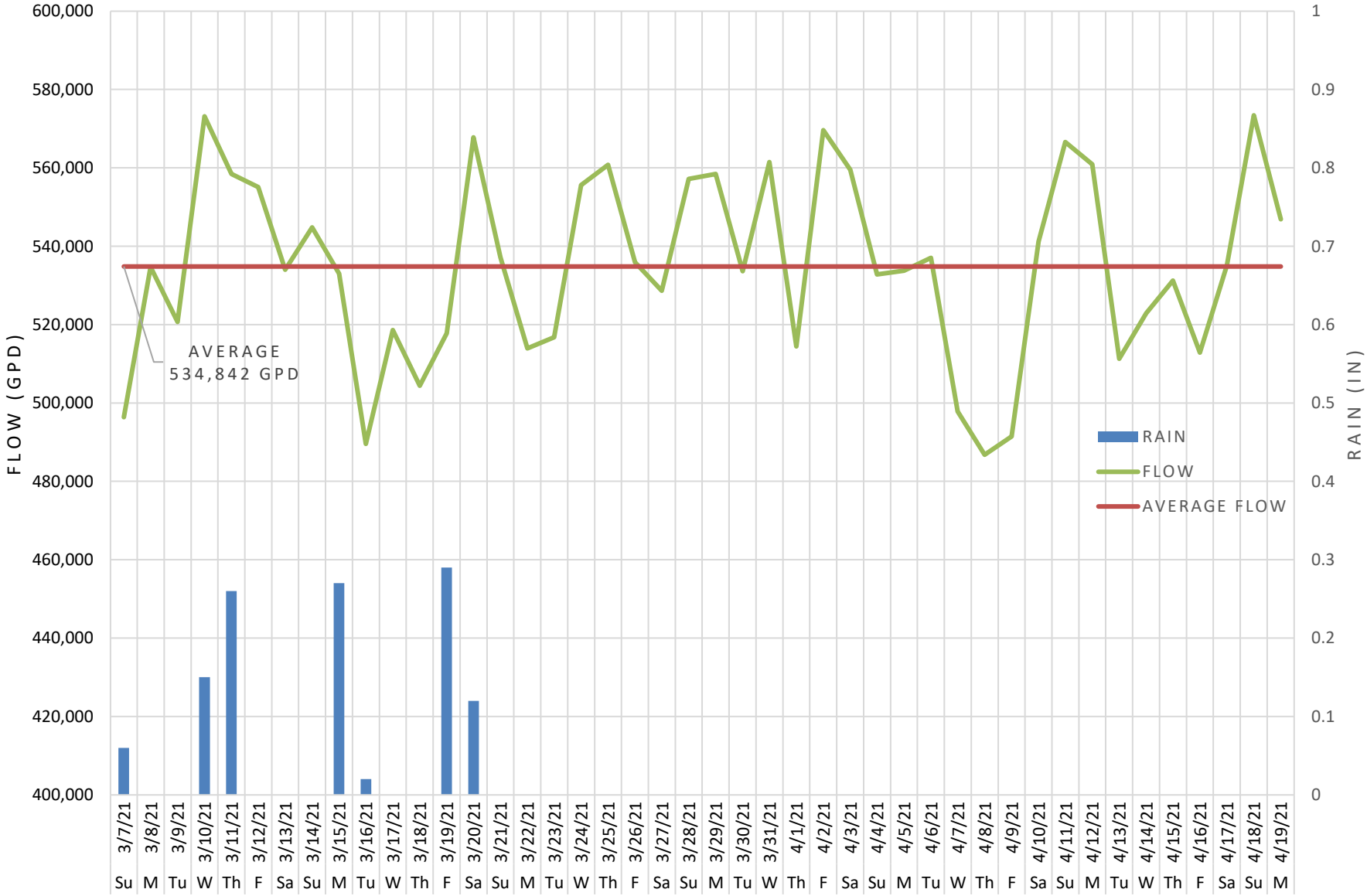

FIGURE 4-5. SEWERSHED 2 AVERAGE DAILY MONITORED FLOW

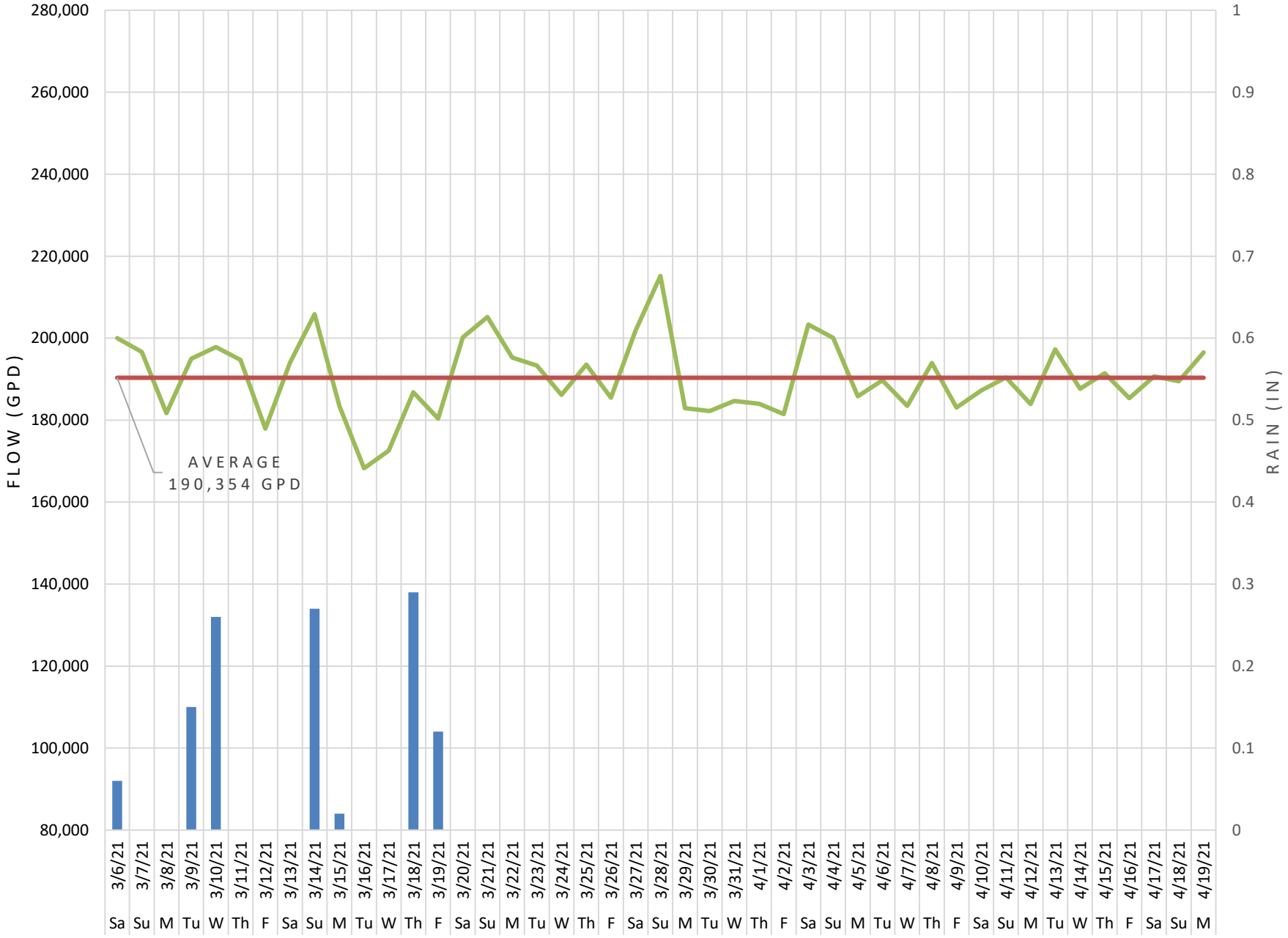

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FIGURE 4-6. SEWERSHED 3 AVERAGE DAILY MONITORED FLOW

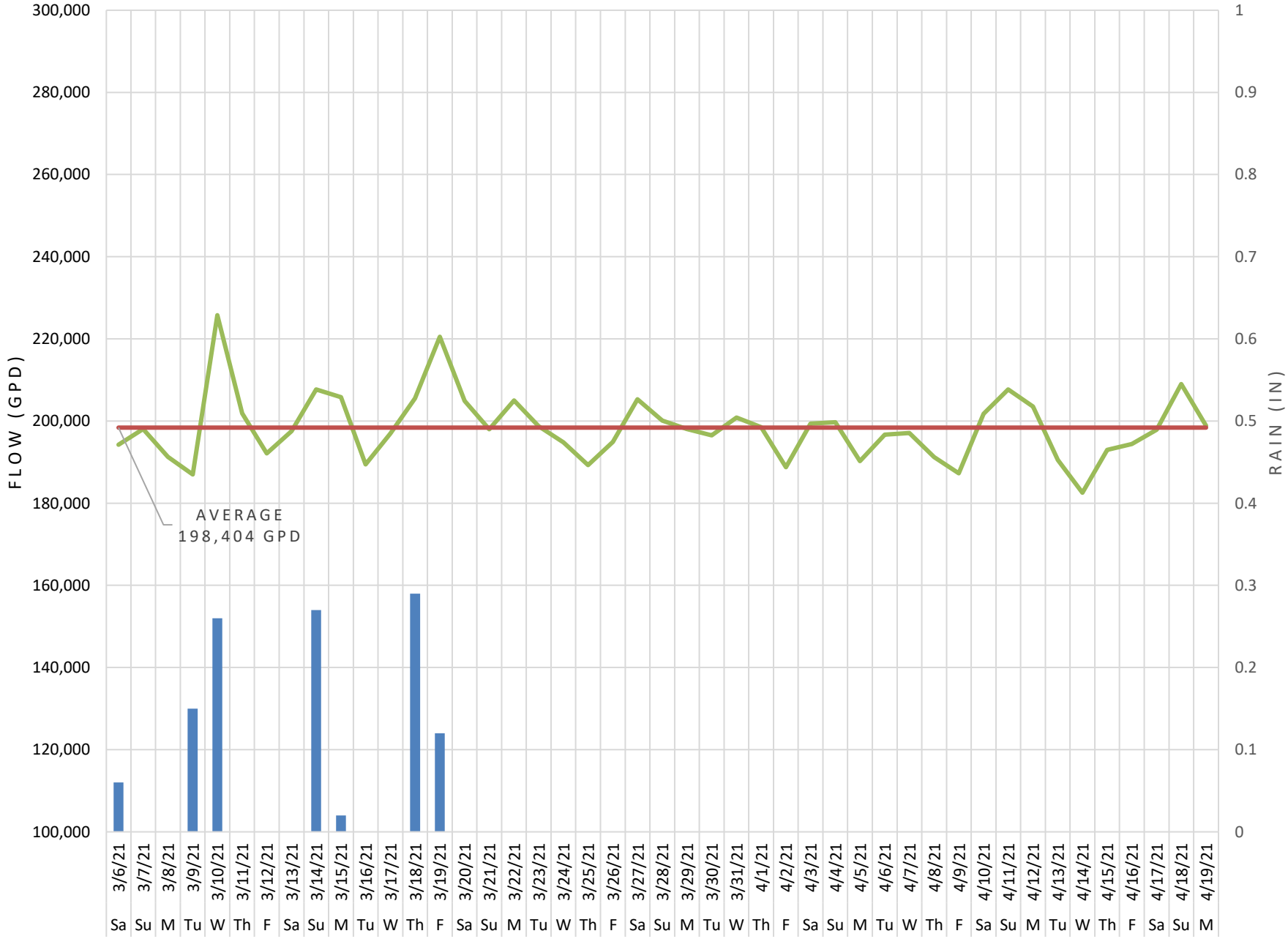

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FIGURE 4-7. SEWERSHED 4 AVERAGE DAILY MONITORED FLOW

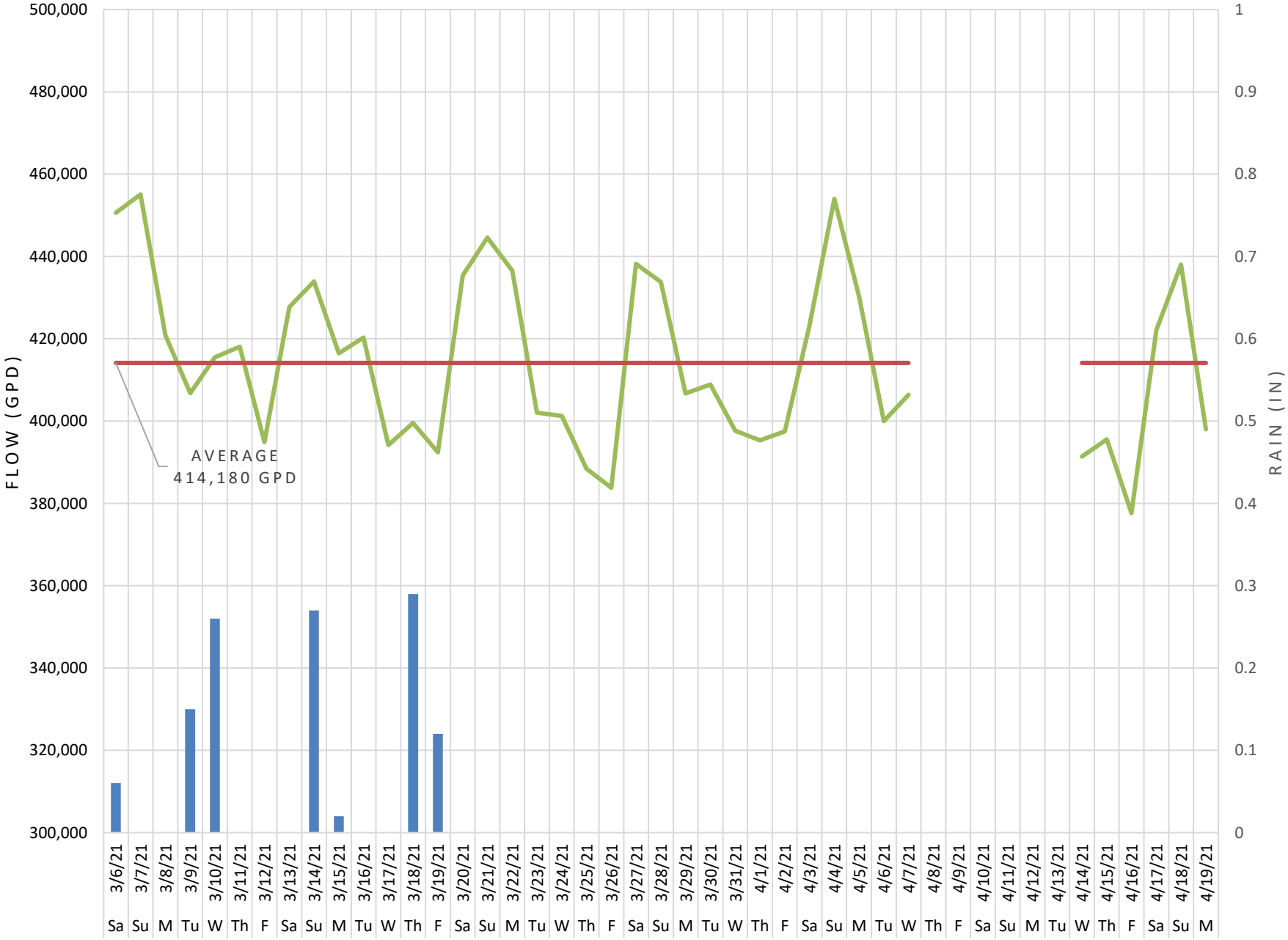

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FIGURE 4-8. SEWERSHED 5 AVERAGE DAILY MONITORED FLOW

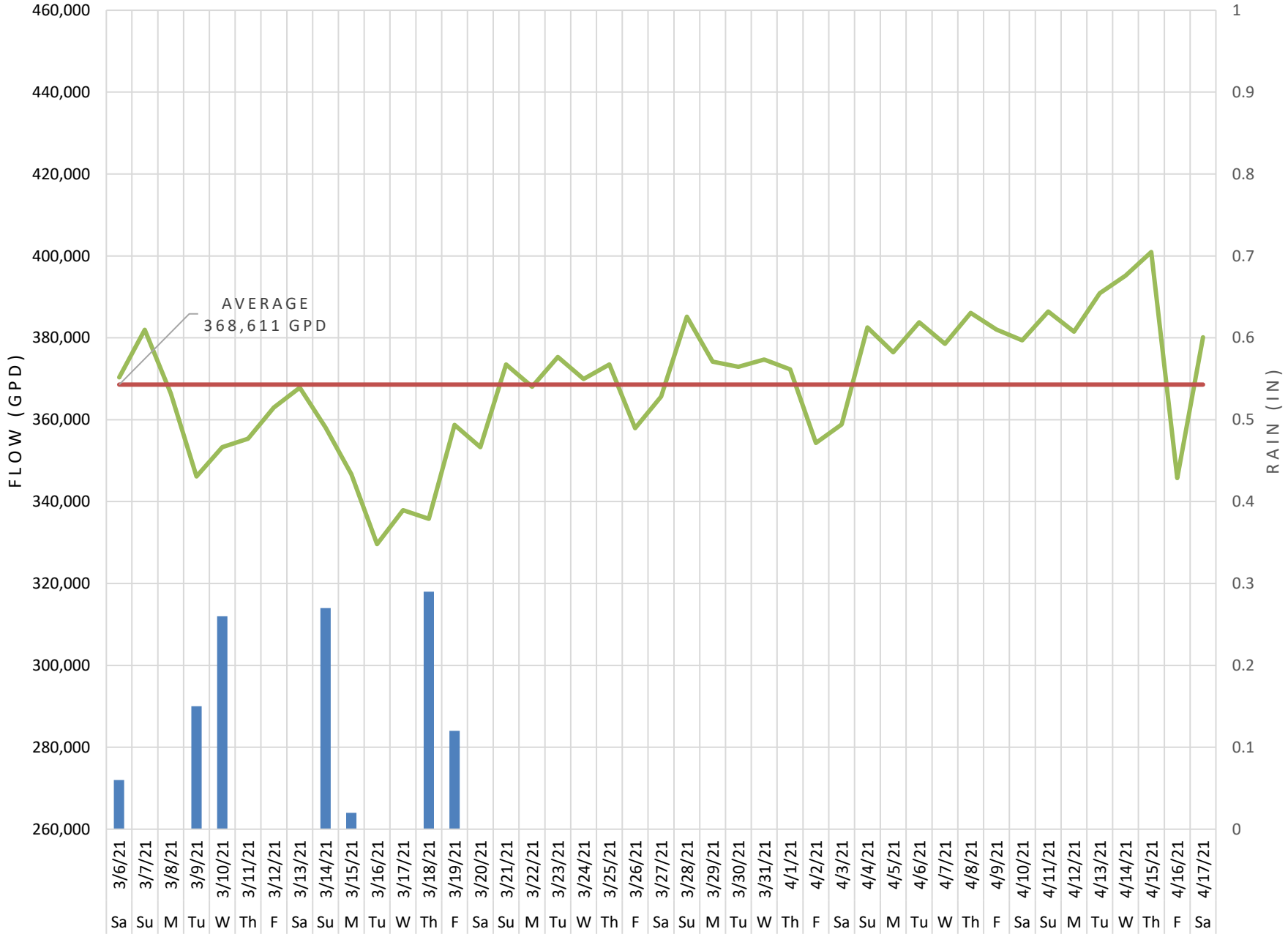

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FIGURE 4-9. SEWERSHED 6 AVERAGE DAILY MONITORED FLOW

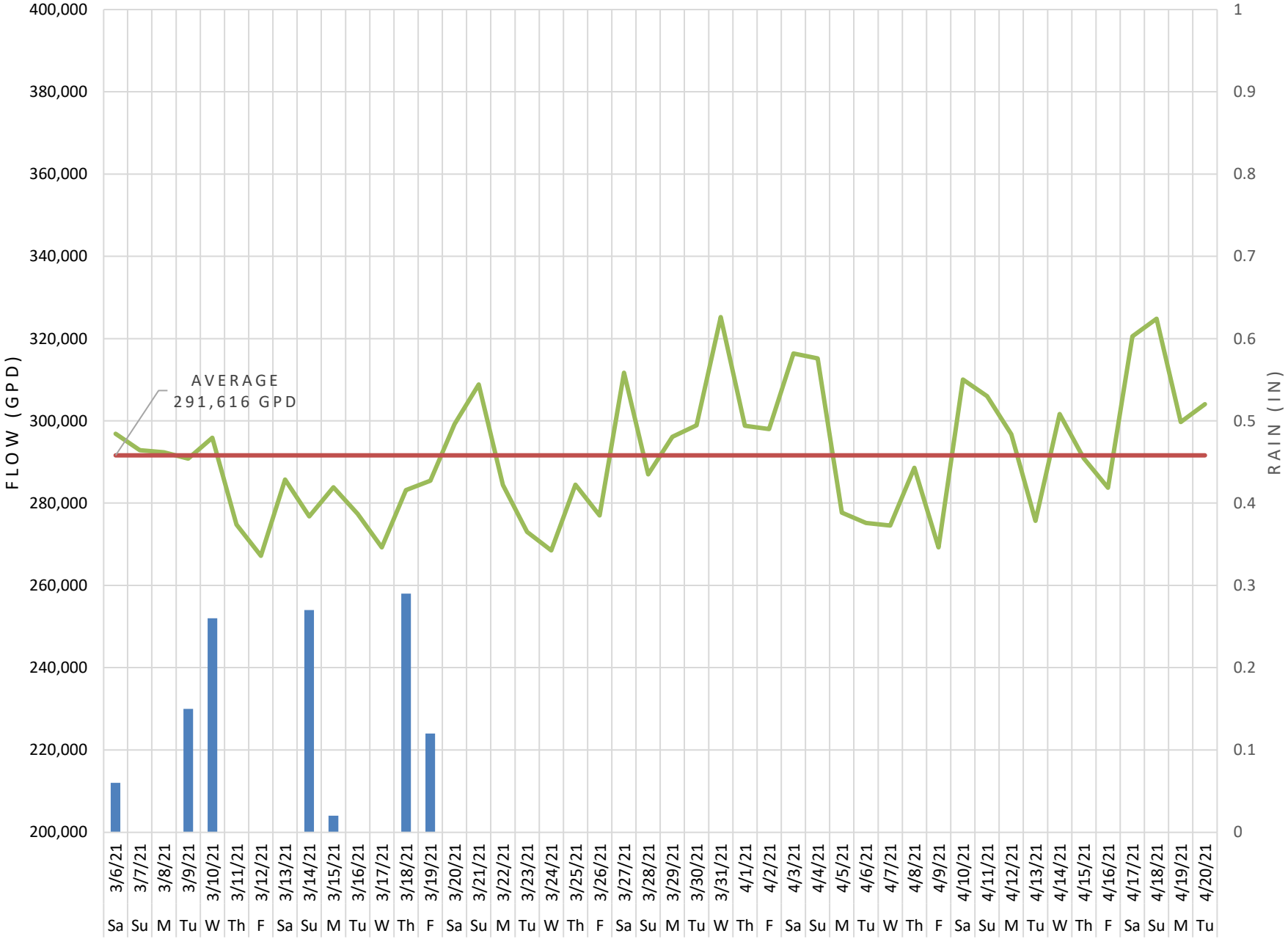

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FIGURE 4-10. SEWERSHED 7 AVERAGE DAILY MONITORED FLOW

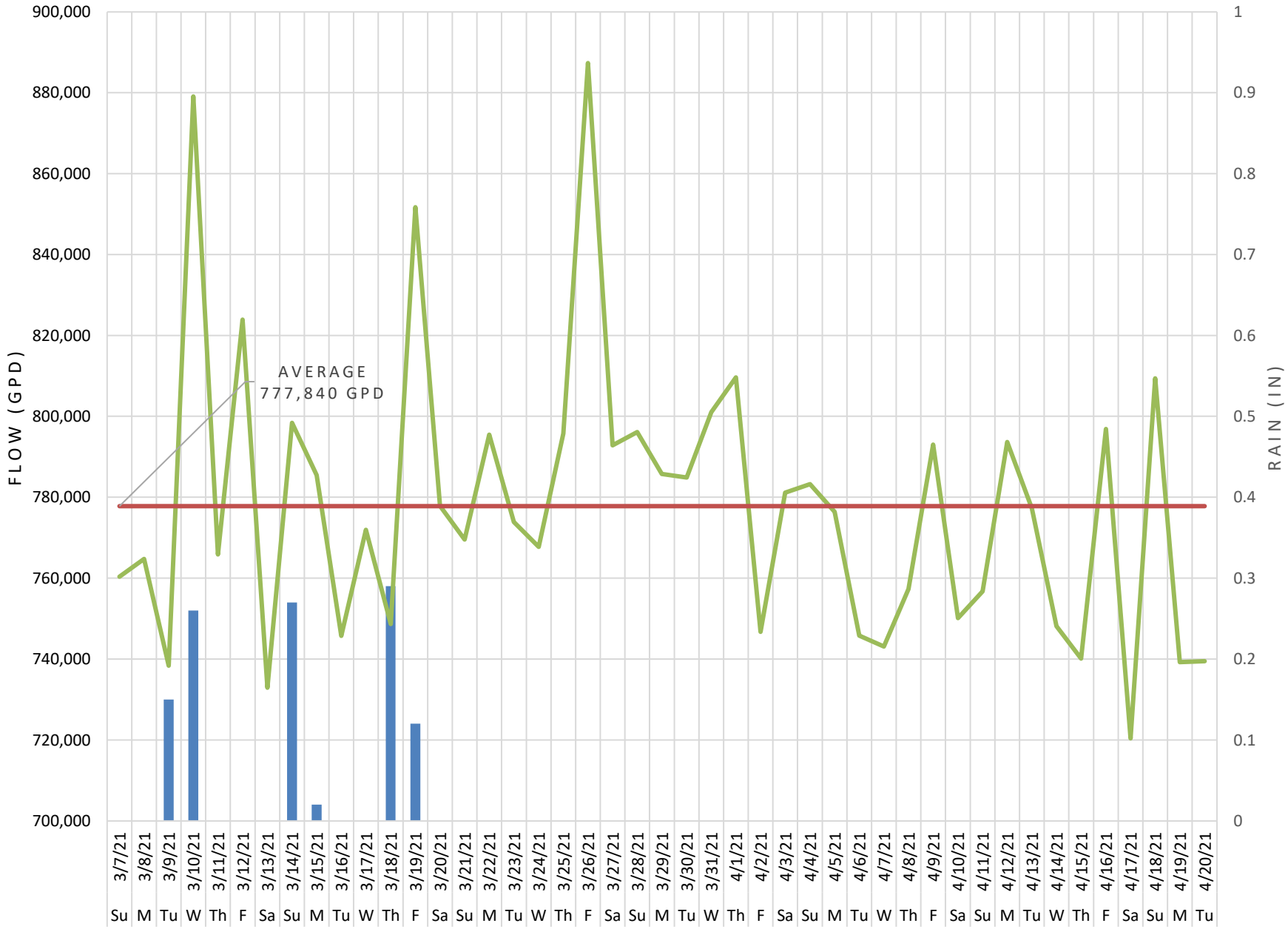

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FIGURE 4-11. SEWERSHED 8 AVERAGE DAILY MONITORED FLOW

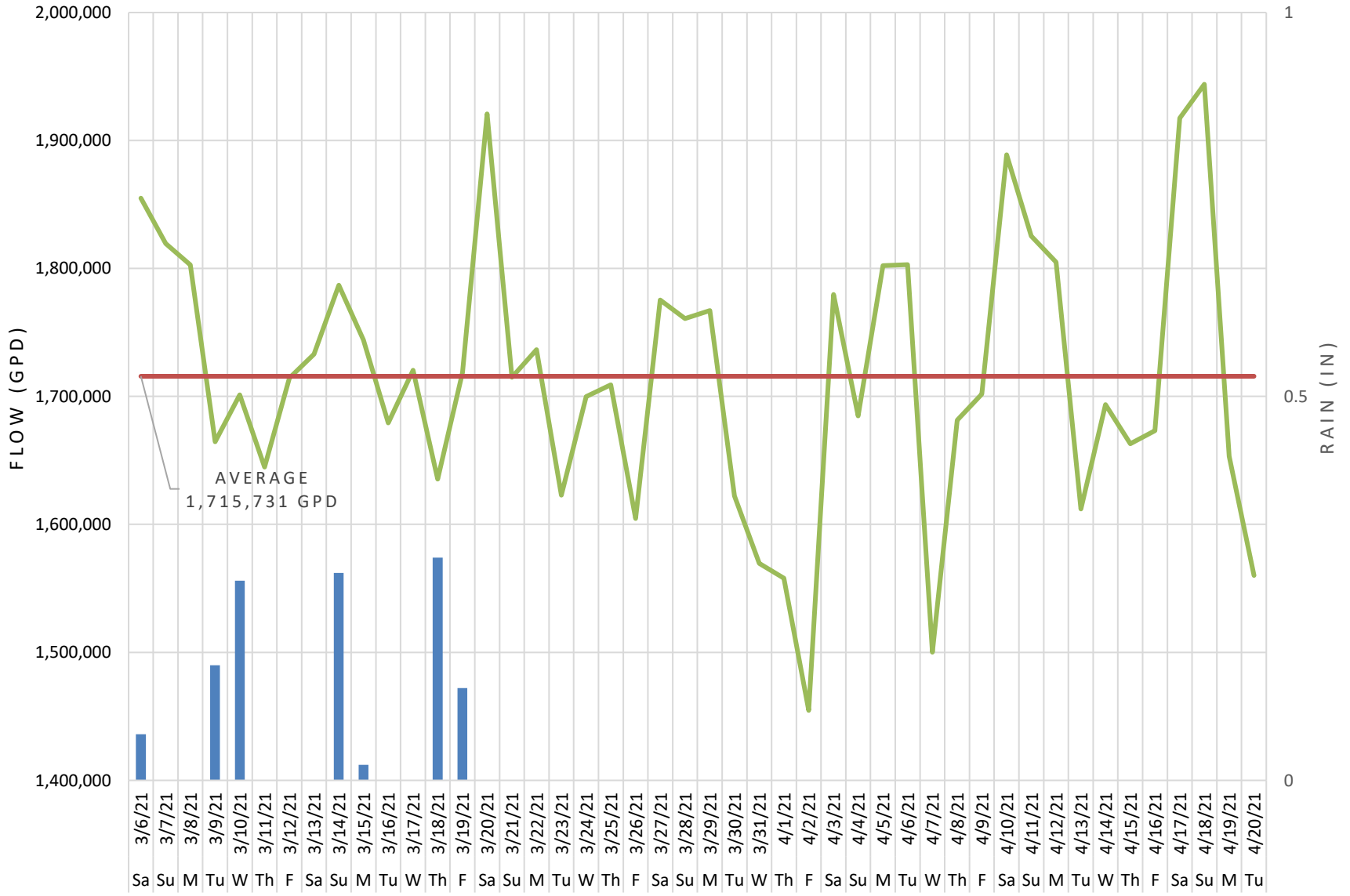

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FIGURE 4-12. SEWERSHED 9 AVERAGE DAILY MONITORED FLOW

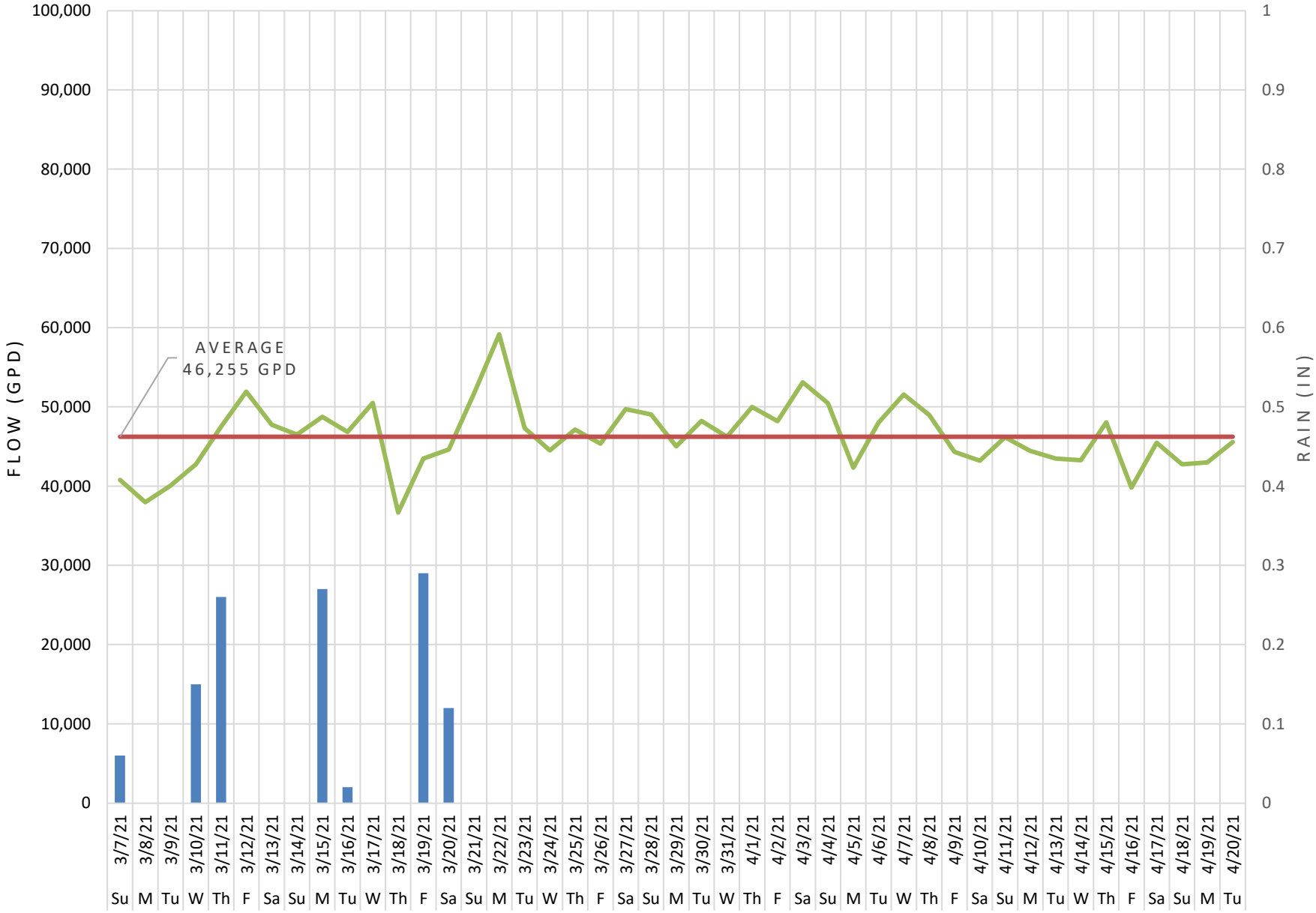

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FIGURE 4-13. SEWERSHED 10 AVERAGE DAILY MONITORED FLOW

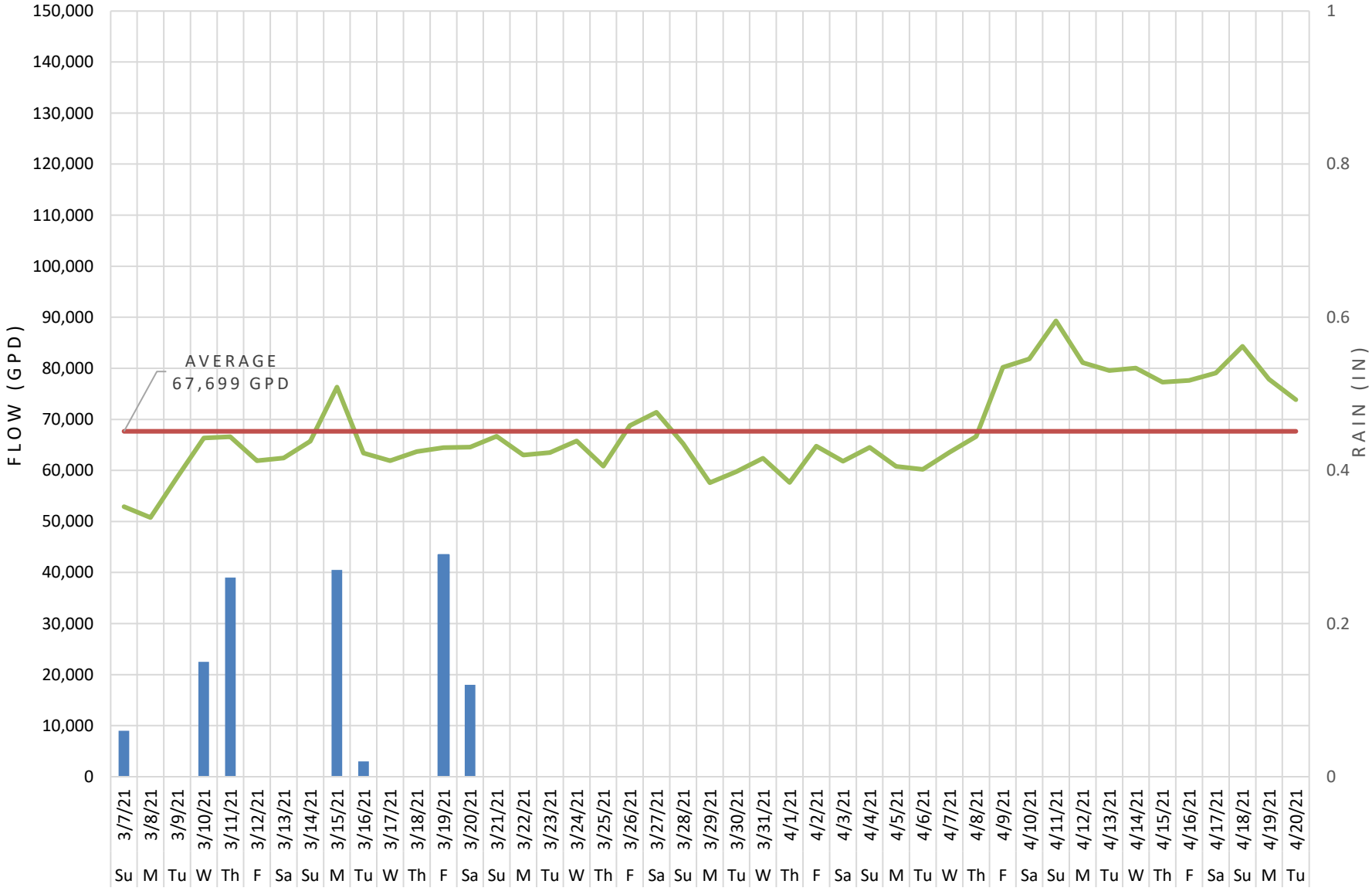

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FIGURE 4-14. SEWERSHED 11 AVERAGE DAILY MONITORED FLOW

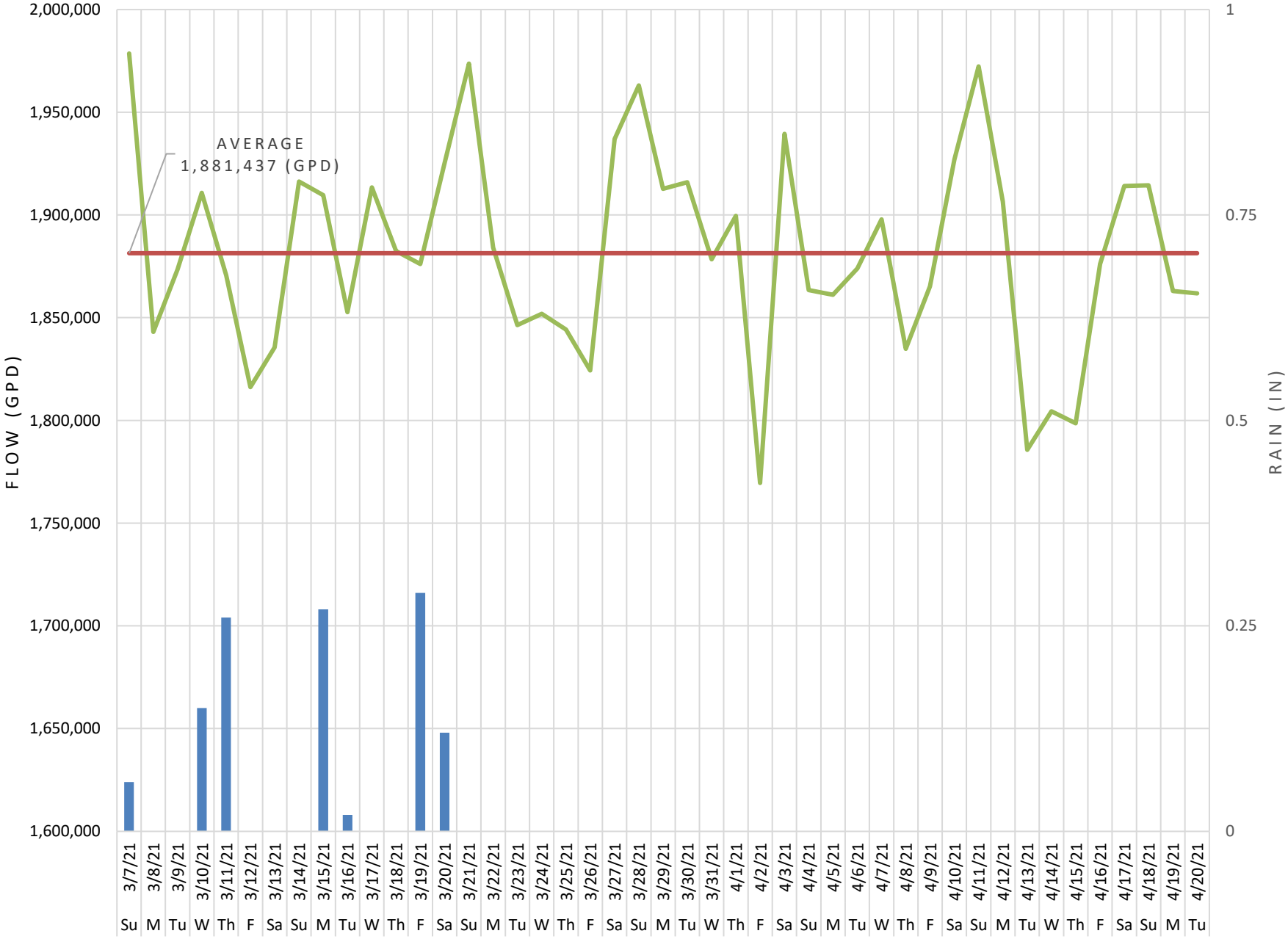

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FIGURE 4-15. SEWERSHED 12 AVERAGE DAILY MONITORED FLOW

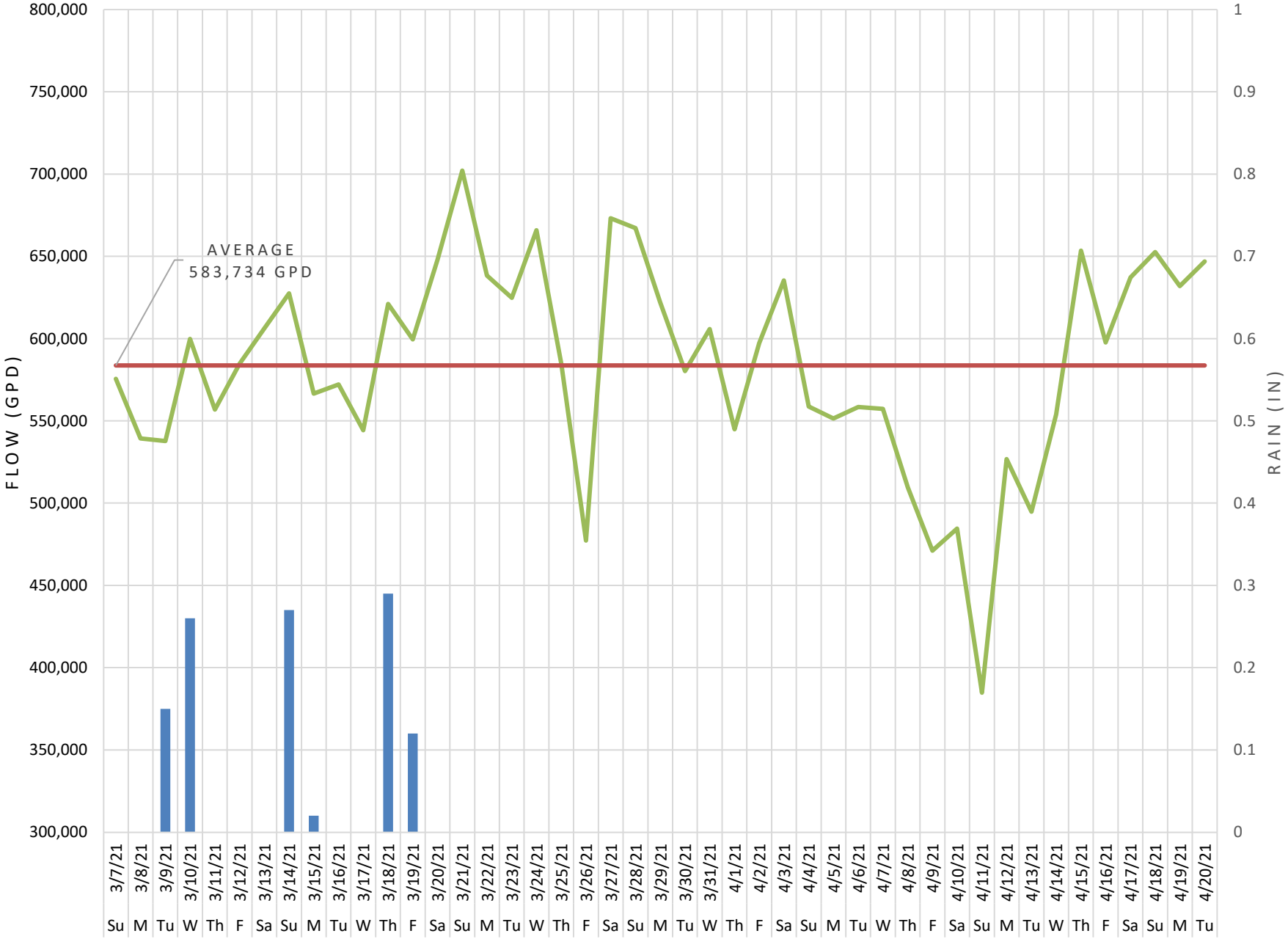

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FIGURE 4-16. SEWERSHED 13 AVERAGE DAILY MONITORED FLOW

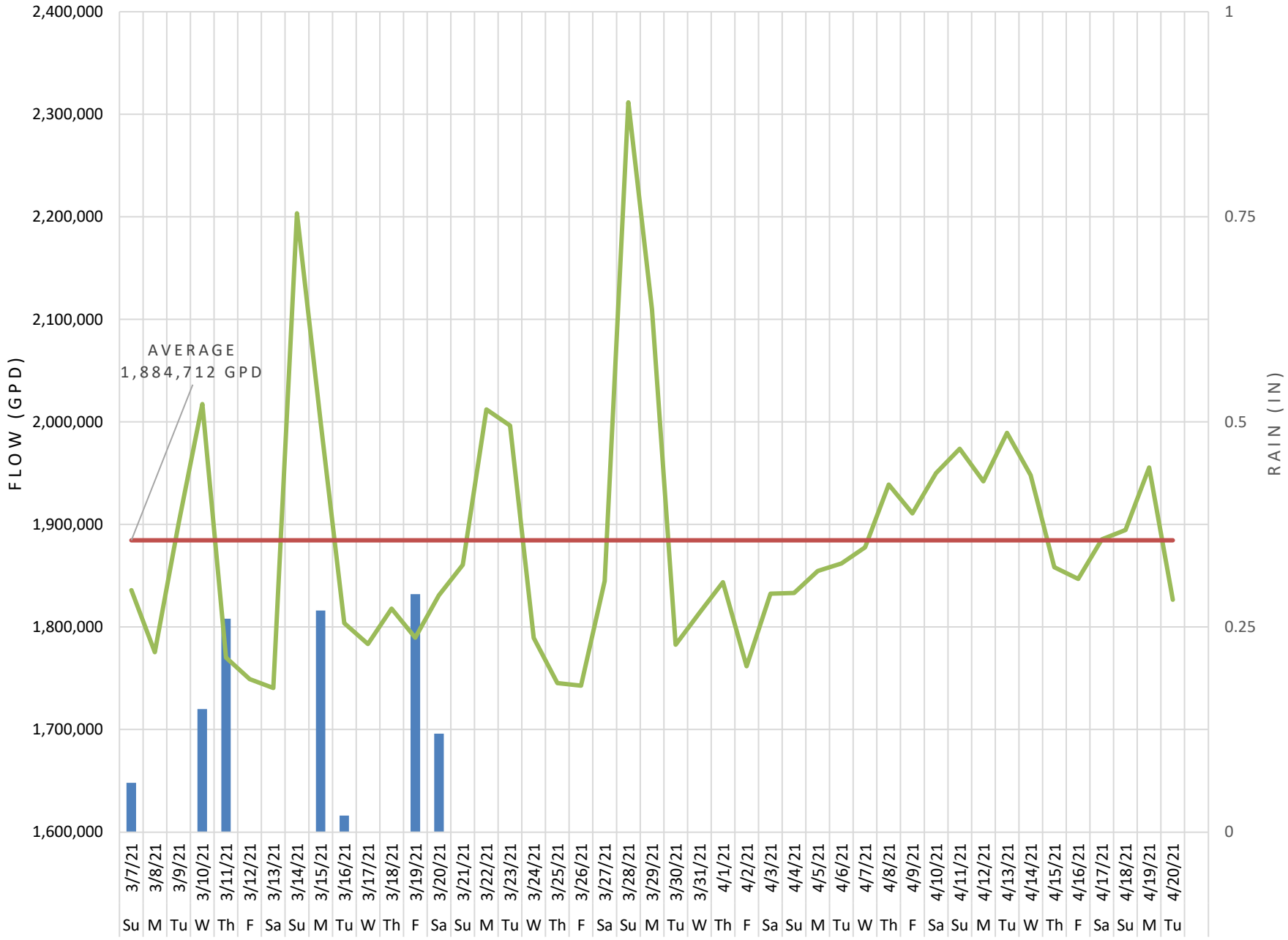

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FIGURE 4-17. SEWERSHED 14 AVERAGE DAILY MONITORED FLOW

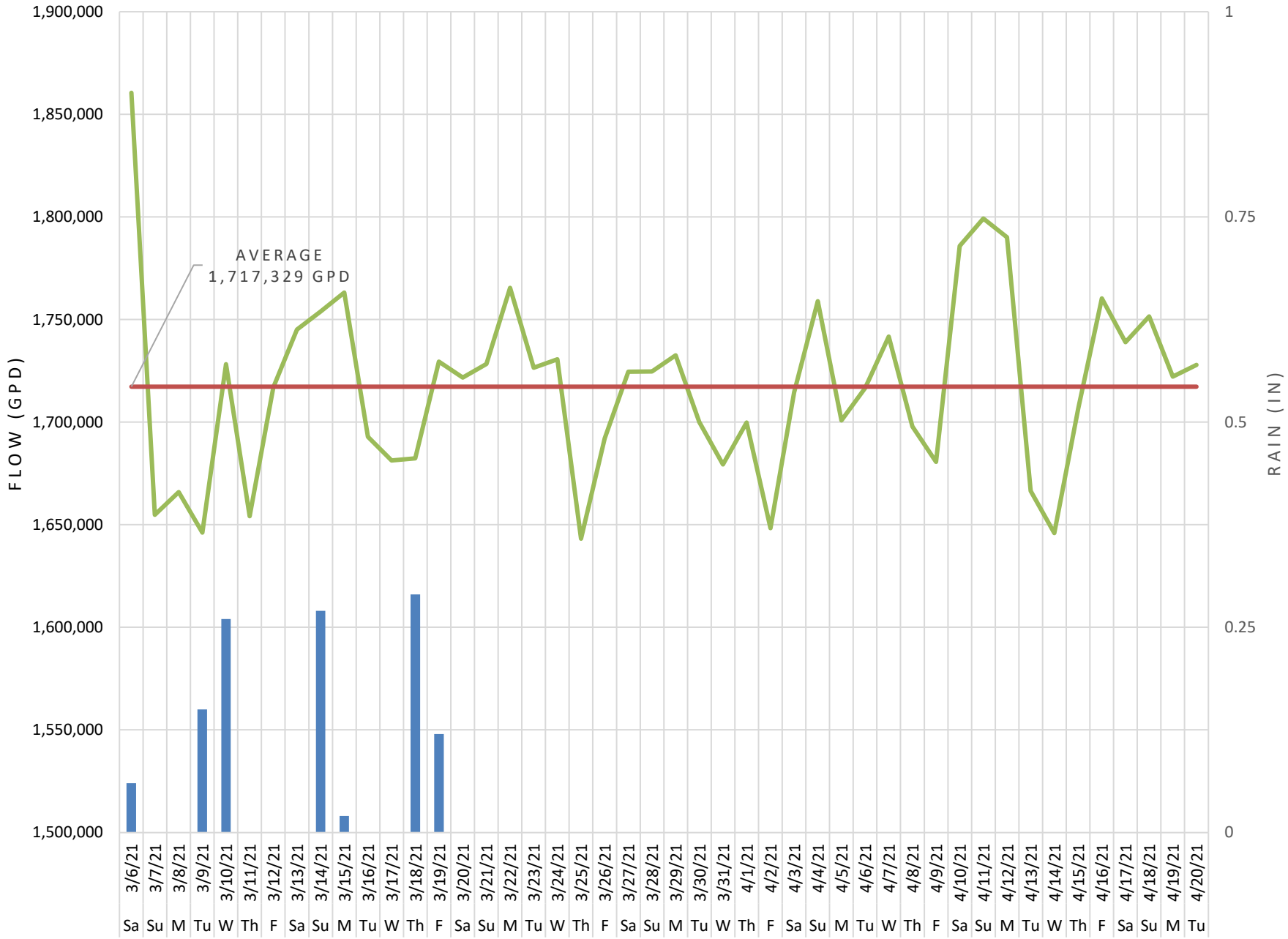

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FIGURE 4-18. SEWERSHED 15 AVERAGE DAILY MONITORED FLOW

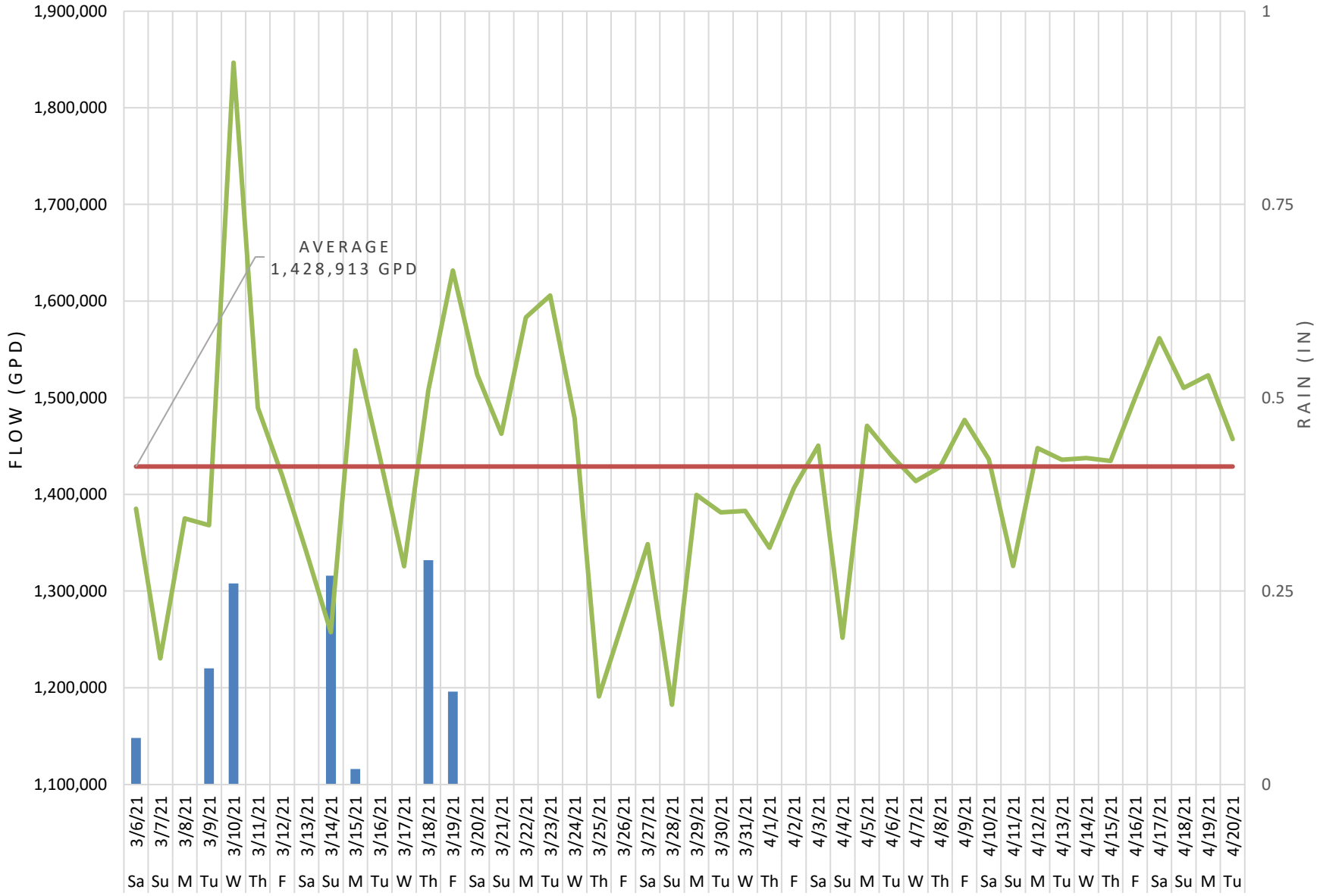

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FIGURE 4-19. SEWERSHED 16 AVERAGE DAILY MONITORED FLOW

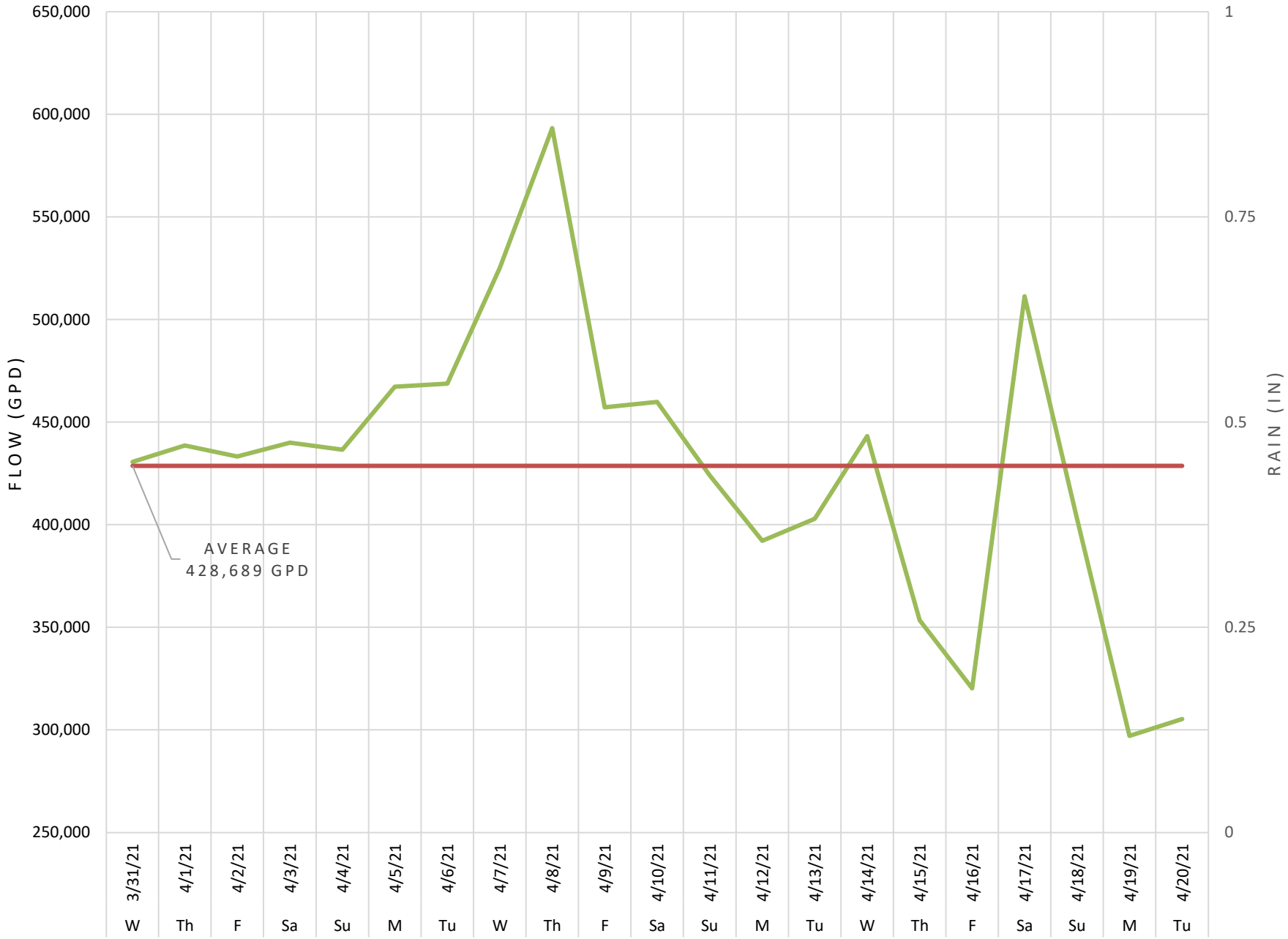

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FIGURE 4-20. SEWERSHED 17 AVERAGE DAILY MONITORED FLOW

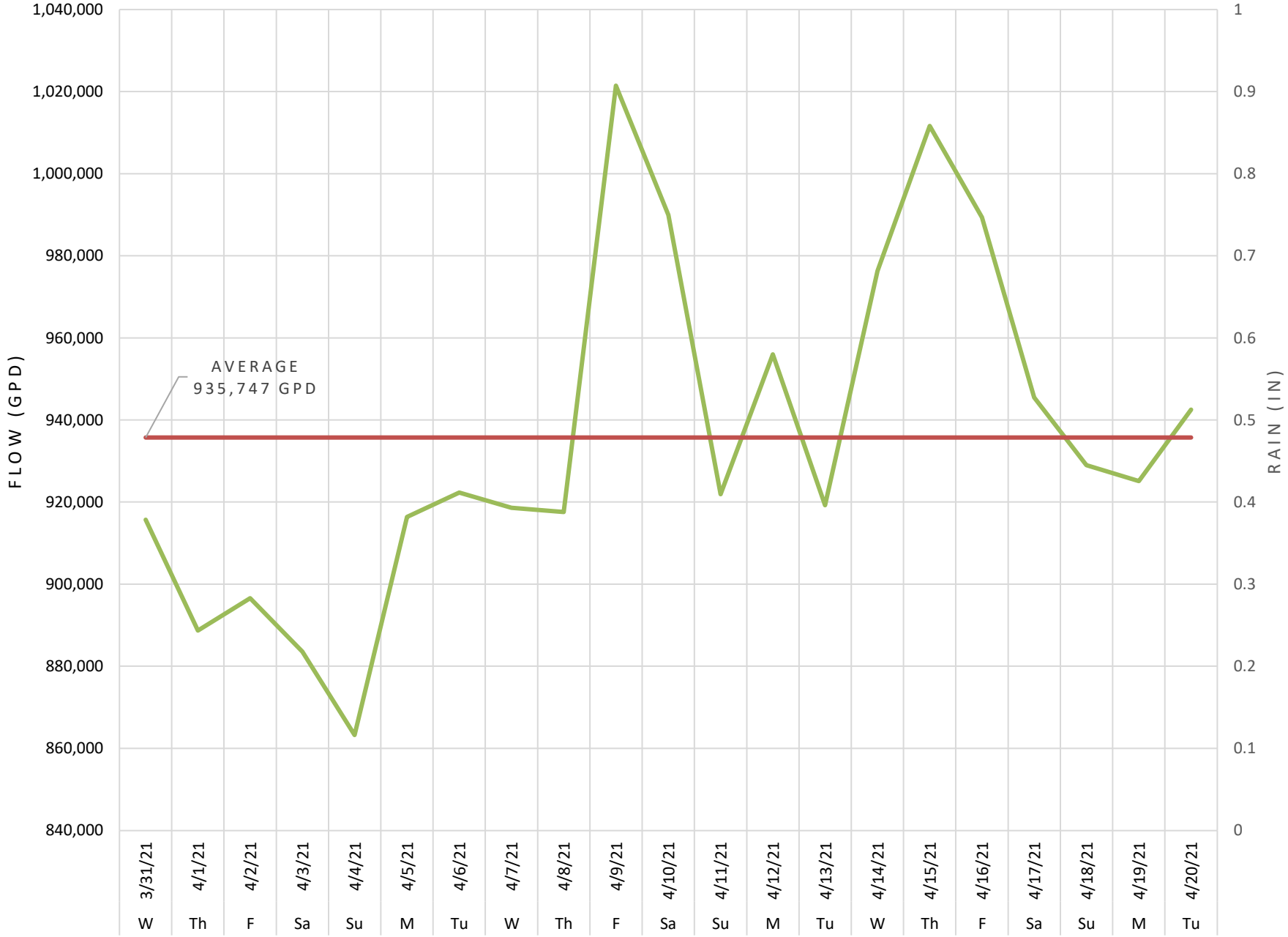

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FIGURE 4-21. SEWERSHED 18 AVERAGE DAILY MONITORED FLOW

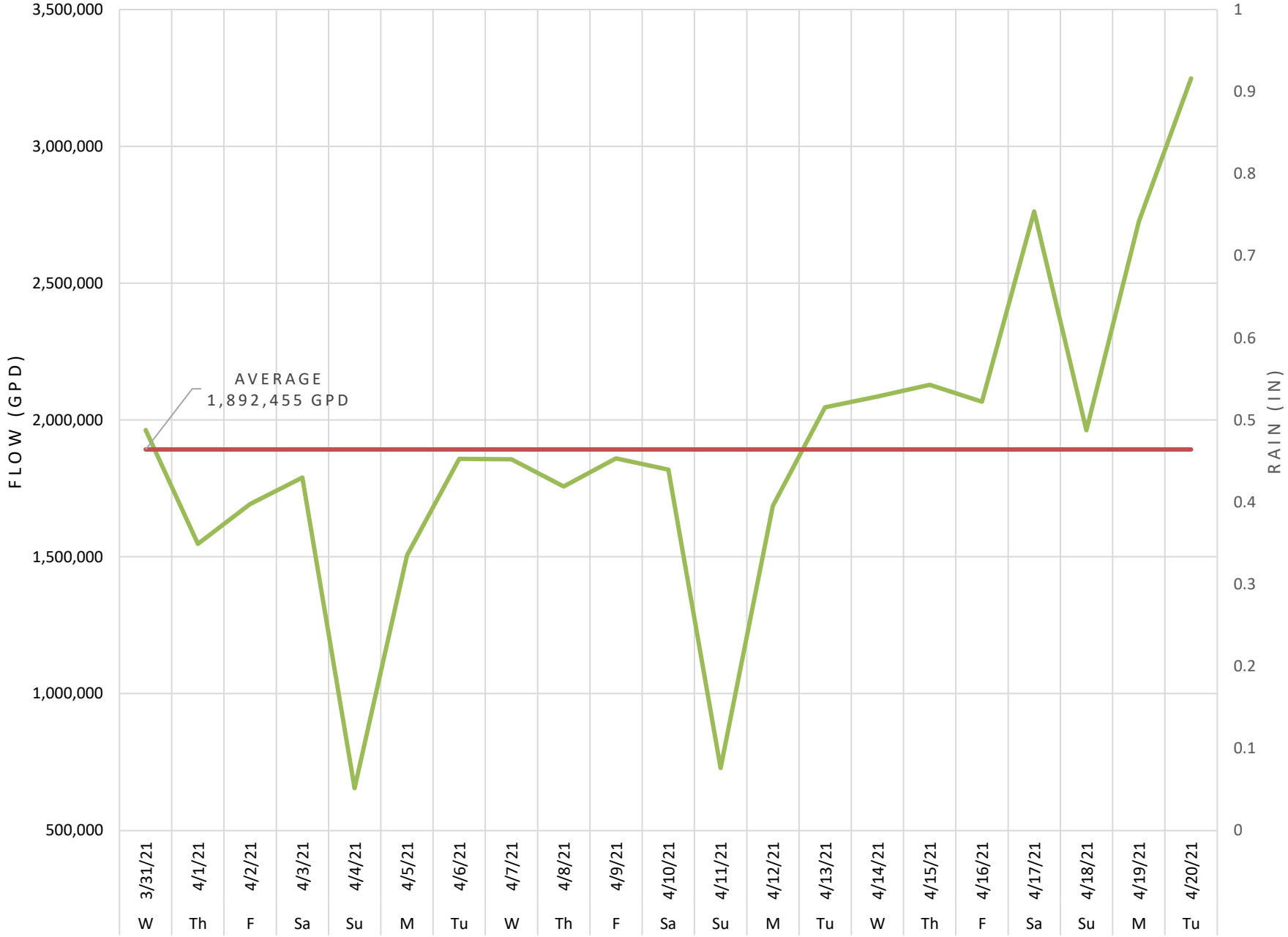

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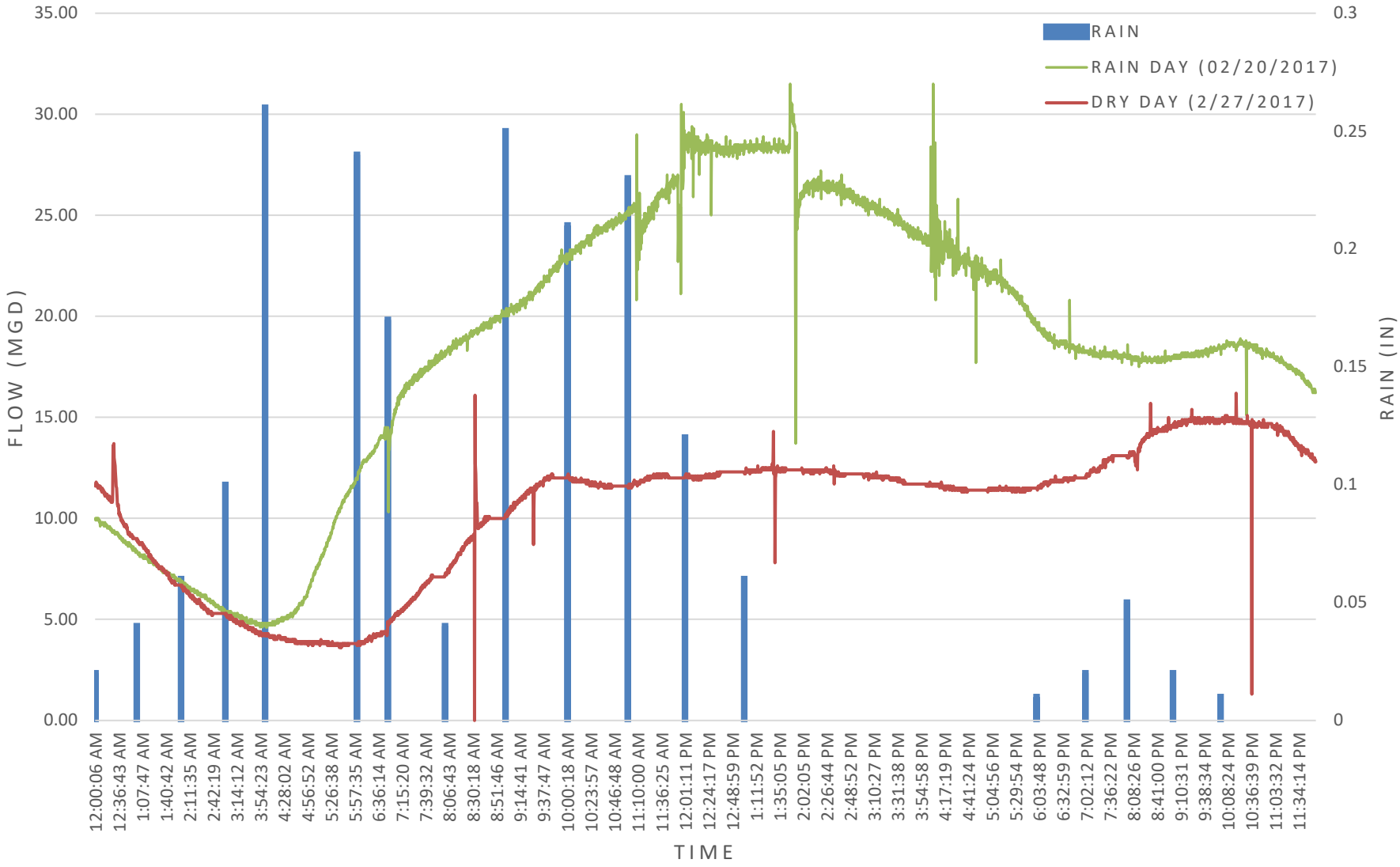
FIGURE 4-22. FEBRUARY 2017
DRY WEATHER VS WET WEATHER FLOW



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CHAPTER 5
LIFT STATION EVALUATION

This Chapter presents the evaluation of the City's lift stations for their ability to meet existing and future wastewater flow demands. All figures are located at the end of this chapter.

LIFT STATION BACKGROUND

The City owns and operates ten (10) lift stations located throughout the collection system. The City also maintains the Vista Nueva Lift Station under an assessment district. All lift station force mains tie into the City's gravity system for conveyance to SAPS. City staff conducts regular maintenance of the City's lift stations. In 2018, staff initiated a Supervisory Control and Data Acquisition (SCADA) program to monitor all lift stations. This SCADA program monitors motor run times and sends an alarm to staff directly if there are any operational issues at the lift stations. City staff are unable to operate the lift stations from the SCADA system, only monitor.

The tenants at Harris Place Industrial Park have requested that the City assume operations and maintenance of the privately-owned lift station. The City is currently preparing a separate study to determine the feasibility of operating the Harris Place Lift Station. The review of this lift station is being completed under a separate report.

Fluid Resource Management (FRM), a sub-consultant to Wallace Group, conducted evaluations of the City's eleven lift stations and the lift station at Harris Place. Very little information is available or was able to be collected by FRM during their site inspection of the Harris Place Lift Station. Table 5-1 provides a summary of each lift station. Additional information for each lift station is discussed below. All lift stations are shown on Figure 5-1.

As discussed in Ch. 3, the City also receives wastewater flows from ten (10) private lift stations located throughout the City and shown on Figure 3-3. These private lift stations are not part of this lift station evaluation.

Table 5-1. Lift Station Summary

		Lift Station										
		Airport (Moffett)	**Carpenter Hall**	**De La Torre**	**Harkins Road**	**Lake Street[4.]**	**Las Casitas[5.]**	**Mill Lake**	**Santa Rita**	**Spicer**	**TP2**	**Vista Nueva[5.]**
Type		Submersible	Dry Pit	Dry Pit	Dry Pit	Dry Pit	Dry Pit	Dry Pit	Dry Pit	Dry Pit	Dry Pit	Submersible
Pump Manufacturer		Flygt	Smith/Loveless	Smith/Loveless	Smith/Loveless	ITT Flygt	Smith/Loveless	Smith/Loveless	Smith/Loveless	Smith/Loveless	Smith/Loveless	ITT Flygt
Number of Pumps		2	2	2	2	3	2	2	2	2	2	2
Horsepower (HP), each		10	30	5	5	30	10	15	30	7.5	10	3
Date Constructed		1981	Unknown	1964	Unknown	1967	1971	1964	Unknown	1967	Unknown	1990
Pump Model #		3127.090-181044, 3127.090-5766	MU237600-03/10-01, MU237600-03/10-02	6412746, 6412763	66N40657, 66N40658	9080091, 980150	122190009, 122190011	3Y6579005A13 DQ	7907700L-1, 791170C-1	67541123, 67541125	99-1024B-2, 99-1024B-1	9640005, 9640095
Phase		3	3	3	3	3	3	3	3	3	3	3
Voltage		208	230	240	240	240	240	240	240	240	240	240
Speed (rpm)		1740	1175	1165	870	860	1200	1760	1200	1155	1300	1740
Motor Controller/VFD		Across the line contactor	VFD Altivar 660	Across the line contactor	Across the line contactor	VFD 1Y1261	Soft Start	Soft Start	Across the line contactor	Across the line contactor	VFD, hand mode uses contactor	Across the line contactor
Pump Design Point	gpm	550	2,250	200	350	2,600	150	500	1,530	400	400	175
	TDH (ft)	---	---	37	18	---	50	58	433	32	50	54
Flow (pump1) (GPM)	Rated	550	2,250	200	350	2,400	150	500	1,530	400	400	175
	Measured	467	1,600	342	228	2,400	357	---	1,489	195	564	220
Flow (pump2) (GPM)	Rated	550	2,250	200	350	2,600	150	500	1,530	400	400	175
	Measured	448	1,600	354	281	2,600	345	---	1,661	218	491	79
Flow (pump3) (GPM)	Rated	---	---	---	---	2,800	---	---	---	---	---	---
	Measured	---	---	---	---	2,800	---	---	---	---	---	---
Permanent Standby Generator		yes	yes	no	no	yes	yes	yes	yes	no	yes	no
Portable Generator Power Receptacle		yes	no	yes	unsafe	yes	yes	yes	yes	unsafe	yes	yes
Bypass Capabilities		yes	no	no	no	yes	no	no	no	no	no	yes, 4"
Wet Pit Coating		no	peeling	no	no	yes	no	no	yes	no	yes	no
Wet Well Diameter or Length (ft)		6	7	4	4	5.25	4	4	8	4	6	6
Wet Well Width (ft)		---	---	---	---	25	---	---	---	---	---	---
Wet Well Surface Elevation (ft)		63.3	50.8	55.8	61.4	54.8	53.2	42.0	78.8	55.4	56.1	51.0
Wet Well Bottom Elevation (ft)		48.30	20.8	41.3	43.42	14.75	32.2	20	59.3	30.4	21.57	35
Wet Well Depth (ft)		15	30	14.5	18	40.00	21	22	19.5	25	34.5	16
Est. Wet Well Capacity (gallons)[6.]		3,170	10,898	1,372	1,692	26,247	1,410	1,879	6,388	2,350	5,285	3,382
Wet Well Set Points (feet)[1]	Low Alarm	Not listed	1.0	0.8	1.0	1.1	Not listed	0.4	1.5	0.1	0.2	Not listed
	Off	3.0	2.0	1.7	2.0	1.8	1.6	1.5	3.5	1.8	1.3	1.0
	Lead On	4.0	5.6	3.5	4.0	2.5	3.5	3.0	6.5	4.5	3.3	5.0
	Lag On	4.5	6.0	3.8	4.3	3.2	4.1	3.5	7.0	5.0	3.5	7.0
	Last On	---	---	---	---	4.2	---	---	---	---	---	---
	High Alarm	13.5	8.0	5.5	5.0	6.0	5.8	4.0	8.5	6.0	4.5	7.0
Wet Well Operating Volume (gal)[2]		211	1,036	169	188	687	179	141	1,128	254	423	846
Wet Well Maximum Volume (gal)[3]		3,170	2,015	442	376	4,811	1,410	338	2,632	555	909	#VALUE!
Force Main Diameter (inches)		8	12	6	6	12	8	6	10	6	6	4
Force Main Material		PVC	DI	DI	DI	DI	AC	DI	DI	DI	DI	PVC
Force Main Length (feet)		3,706	47	588	300	167	1,035	920	1,128	386	82	378
Force Main Start Elevation (feet)		55.2	25.8	49.3	48.4	37.08	36.49	27.50	71.80	45.00	26.57	48.80
Force Main End Elevation (feet)		59.3	40.3	58.4	56.9	41.00	88.23	49.07	88.19	54.78	46.73	62.00
Force Main Total Static Head (feet)		8.0	17.5	15.4	11.5	24.5	54.4	27.6	25.4	22.6	23.9	26.0

Table Notes:

NA - Not Available

1. Information provided by FRM site visit conducted 4/9/2021.
2. Wet well operating volume calculated based on operating range from Pump Off to Lead On.
3. Wet well maximum volume calculated based on maximum desired operating range (Low Alarm to High Alarm).
4. Lake Street has two discharge force mains. Pump #1 is connected to 12" dia. FM. Pumps #2 and #3 discharge to 14" dia. FM. All three pumps have same sized motors and pumps even though they all have different serial/model numbers (Personal Communication Doyle McFarland 5/5/2022).
5. Wet well high level alarm setting provided by Gary Gabriel email 5/12/2022 for Las Casitas and Vista Nueva.
6. Wet well estimated capacity from station-specific ERP.

PHYSICAL DESCRIPTION

Information regarding the physical characteristics of the eleven lift stations was provided by FRM and City staff, and some of the above ground features were visually reviewed by Wallace Group during site visits.

Airport (Moffett) Lift Station

Airport Lift Station is located in the northwest corner of the property at 730 La Guardia Street near the Municipal Airport and serves approximately 584 acres. This lift station collects flow from the commercial and industrial area south of the airport. This is a duplex lift station with submersible Flygt pumps each rated at 550 gpm. At over 3,700 lineal feet, the force main for this station has the longest run of the stations in the Salinas collection system. This lift station has a dedicated backup generator on an automatic transfer switch and bypass capabilities.

Carpenter Hall Lift Station

Carpenter Hall Lift Station is located near the center of the sewer collection system behind the building at 512 North Main Street. There is an access road off North Main Street near 422 North Main Street that leads to the lift station. This lift station collects flow from approximately 508 acres of residential, commercial, industrial properties, and schools in the area. This is a duplex lift station with Smith & Loveless pumps each rated at 2,250 gpm located in a dry pit. The pumps are controlled by VFDs. This lift station has a dedicated backup generator on an automatic transfer switch but no power receptacle or bypass capabilities. This is the City's second largest lift station.

De La Torre Lift Station

De La Torre Lift Station is located in the southwest corner of the property adjacent to 1222 De La Torre Street near the Municipal Airport. This lift station collects flow from approximately 10 acres of commercial properties and hotels in the area west of the airport. This is a duplex lift station with Smith & Loveless pumps each rated at 200 gpm located in a dry pit. This lift station has facilities to connect a portable backup generator but has no permanent electrical generator or bypass capabilities.

Harkins Road Lift Station

Harkins Road Lift Station is located near the southern boundary of the sewer collection system between Harkins Road and the railroad tracks. This lift station collects flow from approximately 146 acres of commercial and industrial properties in the area. This is a duplex lift station with Smith & Loveless pumps each rated at 350 gpm located in a dry pit. This lift station has no permanent electrical generator and an unsafe or transfer switch to connect a portable backup generator. It also has no bypass capabilities.

Lake Street Lift Station

Lake Street Lift Station is located near the center of the sewer collection system near Carr Lake at 146 East Rossi Street. This lift station collects flow from residential, commercial, industrial, hotels, and schools from a large upstream area of approximately 4,108 acres. This is a triplex lift station with Flygt pumps each rated at approximately 2,800 gpm located in a dry pit. The pumps are controlled by VFDs. This lift station has a dedicated backup generator on an automatic transfer switch and bypass capabilities. This is the City's largest lift station.

Las Casitas Lift Station

Las Casitas Lift Station is located near the eastern edge of the sewer collection system in a residential area at 721 Las Casitas Drive. This lift station collects flow from approximately 38 acres of residential properties and schools in the area. This is a duplex lift station with Smith & Loveless pumps each rated at 150 gpm located in a dry pit. This lift station has a dedicated backup generator on an automatic transfer switch but does not have bypass capabilities.

Mill Lake Lift Station

Mill Lake Lift Station is located near the western edge of the sewer collection system in a residential area at 81 Gardenia Drive. This lift station collects flow from approximately 43 acres of residential and commercial properties in the area. This is a duplex lift station with Smith & Loveless pumps each rated at 500 gpm located in a dry pit. This lift station has a dedicated backup generator on an automatic transfer switch but does not have bypass capabilities.

Santa Rita Lift Station

Santa Rita Lift Station is located near the northern edge of the sewer collection system in a commercial and residential area at 2021 Sucre Court. This lift station collects flow from residential, commercial, industrial, hotels, and schools from the upstream area of approximately 348 acres, including a small portion of flows through the Bolsa Knolls special assessment district. This is a duplex lift station with Smith & Loveless pumps each rated at 1,530 gpm located in a dry pit. This lift station has a dedicated backup generator on an automatic transfer switch but does not have bypass capabilities. This is the City's third largest lift station.

Spicer Lift Station

Spicer Lift Station is located in a commercial and industrial area at 59 Spicer Street. This lift station collects flow from approximately 79 acres of residential, commercial, industrial properties, and hotels in the area. This is a duplex lift station with Smith & Loveless pumps each rated at 400 gpm located in a dry pit. This lift station cannot have a dedicated backup generator and currently does not have a safe receptacle for a transfer switch and no bypass capabilities.

TP2 Lift Station

TP2 Lift Station is located near Spicer Lift Station in a commercial and industrial area at 650 Elvee Drive. This lift station collects flow from residential, commercial, industrial, hotels, and schools from the upstream area of approximately 136 acres. This is a duplex lift station with Smith & Loveless pumps each rated at 400 gpm located in a dry pit. The pumps are controlled by VFDs set at 48 Hertz maximum output to control vibration. This lift station has a dedicated backup generator on an automatic transfer switch but no bypass capabilities.

Vista Nueva Lift Station

Vista Nueva Lift Station is located near the western edge of the collection system in a residential area at 704 Garner Avenue. This lift station collects flow from the approximately 6 acres of residential properties in the area. This is a duplex lift station with submersible Flygt pumps each rated at 175 gpm. This lift station does not have a dedicated backup generator but does have receptacle and transfer switch for a portable generator and bypass capabilities.

Harris Road Lift Station

Harris Lift Station is a private lift station located in the industrial area south of the sewer collection system at 1 Harris Place. This lift station collects flow from the industrial in the area. This is a duplex lift station with submersible pumps (manufacturer unknown) rated at approximately 100 to 140 gpm. This lift station does not have a dedicated backup generator or bypass capabilities, but does have a receptacle and transfer switch for a portable generator..

HYDRAULIC PERFORMANCE EVALUATION – EXISTING CONDITIONS

The hydraulic characteristics of each lift station and deficiencies are noted below. Design criteria that apply to the lift stations and force mains are summarized as follows:

1. Force main velocities should be greater than 2 feet per second to maintain self-cleansing properties but less than 5 feet per second to minimize head loss and potential for water hammer.
2. Lift stations should be sized to convey peak flows with the largest pump out of service. Station "capacity" is therefore calculated with the largest pump out of service. This means that the lift station should be capable of operating with only one pump for a duplex station or two pumps for a triplex station.
3. Lift station wet wells should be sized to have adequate emergency storage.
4. Control settings within the wet well should be set to limit the number of pump starts per hour to acceptable limits as defined by the pump manufacturer. Larger lift stations may require a variable frequency drive to meet this requirement, especially those that receive direct discharge from other lift stations.
5. Lift stations should have a means of conveying peak flow during a power outage.

Force Main Hydraulic Evaluation

Force main friction loss was calculated to estimate total pump head and identify pump operating points based on manufacturer's pump curves, data provided by City staff, and observed pumping rates. Pump curves for those lift stations which the City had available are included in Appendix D. The following items are of interest:

- Airport LS is based on manufacturer's pump curves because the flow was measured when there were potential problems with the pump motors. However, the measured flow rate is approximated by derating the pump to 52% design rpm which could be caused by the worn motors.
- Carpenter Hall LS is based on manufacturer's pump curves. However, the measured flow rate is approximated by derating the pump to 62% design rpm which could be caused by the VFD.
- Pump curve for De La Torre is assumed similar to Harkins Rd. pump since manufacturer's data is unavailable and are adjusted to 125% to match the measured flows.
- Pump curve for Harkins Road is based on manufacturer's pump curves because the flow was measured when there were noted problems with the check valves.
- TP2 based upon VFD set at 48 Hz maximum by City staff to prevent excessive vibration in the pumps. Operating the pumps at full capacity would result in higher force main flow velocities and system losses.
- Pump curve for Vista Nueva is extrapolated from calibration data from City staff since manufacturer's data is unavailable.

The force mains and pumps were evaluated for hydraulic capacity. The physical condition of the lift station pumps and appurtenances was visually inspected by FRM with recommendations for follow up actions, which are provided in Appendix E.

Force main velocities were calculated based on estimated operating point of the lift station pumps. Calculated velocities are summarized in Table 5-2. As noted above, force main velocities should be greater than 2 feet per second to maintain self-cleansing properties but less than 5 feet per second to minimize head loss and the potential for water hammer. It is recommended that lift stations with force main velocities greater than 5 feet per second should be evaluated further as part of any lift station upgrades. Based on the calculated velocities identified in Table 5-2, the velocities within the force mains for about half of the lift station are within acceptable ranges. However, the calculated velocities in the force mains for the following lift stations is of concern:

- Carpenter Hall Lift Station operating in simplex and duplex modes without speed reduction from the VFDs causes the force main velocity to be 8.5 and 14.8 feet per second, respectively. Reducing the pump output to 62% approximates the measured flow but still causes excessive force main velocity of 8.2 feet per second in duplex mode
- Harkins Road Lift Station operating in duplex mode causes the force main velocity to be 5.2 feet per second, the upper limit of recommended maximum velocity.
- Lake Street Lift Station is the only triplex lift station in the system. Lake Street Pump #1 is connected to 12" dia. force main. Pumps #2 and #3 discharge to 14" dia. force main. Operating the lift station in simplex, duplex, and triplex modes without speed reduction from the VFDs causes the force main velocities to be 7.4 feet per second for the 12” dia. force main, and 6.1 and 9.7 feet per second, respectively, for the 14” dia. force main.
- Las Casitas Lift Station pumps have a design rating of 150 gpm at 50 feet Total Dynamic Head (TDH). However, the calculated and measured pumping rates are 395 gpm and 350 gpm, respectively. The force main flow velocity at the design pumping rate of 150 gpm is 1.5 fps. Although this is lower than the recommended minimum flow rate of 2 fps, the flow rate at 395 gpm is 2.5 fps, which is acceptable.
- Mill Lake Lift Station operating in simplex and duplex modes causes the force main velocity to be 5.8 and 7.1 feet per second, respectively.
- Santa Rita Lift Station operating in simplex and duplex modes causes the force main velocity to be 5.8 and 7.1 feet per second, respectively.
- TP2 Lift Station operating in simplex and duplex modes without speed reduction from the VFDs causes the force main velocity to be 8.4 and 11.9 feet per second, respectively. Reducing the pump output to 80% approximates the measured flow but still causes excessive force main velocity of 6.3 and 9.2 feet per second in simplex and duplex modes, respectively.
- Vista Nueva Lift Station operating in simplex and duplex modes causes the force main velocity to be 5.4 and 6.4 feet per second, respectively.

Table 5-2 Force Main Evaluation

		Lift Station											
		Airport (Moffett)[2.]	Carpenter Hall[3.]	De La Torre[4.]	Harkins Road[5.]	Lake Street Simplex[6.]	Lake Street Duplex[6.]	Las Casitas	Mill Lake	Santa Rita	Spicer	TP2[7.]	Vista Nueva[8.]
Force Main Properties													
Force Main Diameter	inches	8	12	6	6	12	14	8	6	10	6	6	4
Hazen Williams C	--	140	110	110	110	110	110	130	110	110	110	110	140
Force Main Length[1.]	feet	3,821	163	703	415	282	282	1,150	1,035	1,243	501	197	493
Elevation Head	feet	8.0	17.5	15.4	11.5	24.5	24.5	54.4	27.6	25.4	22.6	23.9	26.0
Design Flows													
Simplex Flow	gpm	550	2,250	200	350	2,600	2,600	150	500	1,530	400	400	175
Velocity	ft/sec	3.5	6.4	2.3	4.0	7.4	5.4	1.0	5.7	6.2	4.5	4.5	4.5
Estimated Pump Capacity													
Simplex Flow	gpm	640	1,600	345	370	2,600	--	395	510	1,420	205	555	210
Velocity	ft/sec	4.1	4.5	3.9	4.2	7.4	--	2.5	5.8	5.8	2.3	6.3	5.4
Friction Loss[1]	ft	26.7	1.3	9.9	6.7	5.7	--	3.8	30.1	20.0	2.7	6.7	12.8
Total Pump Head	ft	34.7	18.8	25.3	18.2	30.2	--	58.2	57.7	45.4	25.3	30.6	38.8
Duplex Flow	gpm	780	2,900	395	455	--	2,950	560	630	1,740	260	810	250
Velocity	ft/sec	5.0	8.2	4.5	5.2	--	6.1	3.6	7.1	7.1	3.0	9.2	6.4
Friction Loss[1]	ft	38.5	4.0	12.8	9.8	--	3.4	7.2	44.6	29.1	4.2	13.5	17.7
Total Pump Head	ft	46.5	21.5	28.1	21.3	--	27.9	61.6	72.1	54.6	26.8	37.4	43.7
Triplex Flow	gpm	--	--	--	--	--	4,650	--	--	--	--	--	--
Velocity	ft/sec	--	--	--	--	--	9.7	--	--	--	--	--	--
Friction Loss[1]	ft	--	--	--	--	--	7.9	--	--	--	--	--	--
Total Pump Head	ft	--	--	--	--	--	32.4	--	--	--	--	--	--

Table Notes

na - Not Available

1. Minor losses are included in the friction loss calculations for all lift stations as an assumed equivalent length of 115 LF. This approximates losses for 1 check valve, 3 elbows, 2 tees, and 1 gate valve in the force main.
2. Airport LS is based on manufacturer's pump curves because the flow was measured when there were potential problems with the pump motors. However, the measured flow rate is approximated by derating the pump to 52% design rpm which could be caused by the worn motors.
3. Carpenter Hall LS is based on manufacturer's pump curves. However, the measured flow rate is approximated by derating the pump to 62% design rpm which could be caused by the VFD.
4. Pump curve for De La Torre is assumed similar to Harkins Rd. Pump since manufacturer's data is unavailable and are adjusted to 125% to match the measured flows.
5. Pump curve for Harkins Road is based on manufacturer's pump curves because the flow was measured when there were noted problems with the check valves.
6. Lake Street Pump #1 is connected to 12" dia. FM. Pumps #2 and #3 discharge to 14" dia. FM. All three pumps have same sized motors and pumps even though they all have different serial/model numbers (Personal Communication Doyle McFarland 5/5/2022).
7. TP2 based upon VFD set at 48 Hz maximum by city staff to prevent excessive vibration in the pumps.
8. Pump curve for Vista Nueva is from calibration data from city staff since manufacturer's data is unavailable.

Existing Lift Station Inflow

Table 5-3 provides a summary of existing flows for each lift station based on the unit flow factors for contributing land uses as described in Chapter 4. The calculated flows for each lift station represent gravity flow to the lift station from its tributary area. Lake Street Lift Station also receives flow from the Las Casitas and Vista Nueva Lift Stations. These flows are added to the calculated land-based gravity flows in Table 5-3 in the row labeled "w/ Simplex Flow."

Pumping Capacity Evaluation

Lift stations should be sized to convey peak hour dry weather (PHDW) flows with the largest pump out of service. Station "firm capacity" is therefore calculated with the largest pump out of service. This means that the lift station should be capable of operating with only one pump for a duplex station or two pumps for a triplex station.

Table 5-4 provides a comparison of lift station flows with the largest pump not operating, that is simplex operation for all lift stations except Lake Street Lift Station which is shown for duplex operation since this is the only triplex lift station in the system. The middle row in Table 5-4 shows how well the lift stations are matched to the existing PHDW inflow. It shows that many of the lift stations are oversized. Lake Street will require the third pump to assist under existing PHDW conditions, which is a deficiency.

Lift stations should also be sized to convey peak hour wet weather (PHWW) flows with all the pumps operating. Table 5-4 provides a comparison with all the pumps operating for all lift stations. The bottom row in Table 5-4 shows how well the lift stations can handle PHWW flow. All of the lift stations have adequate excess capacity, except Lake Street which shows marginal excess capacity under PHWW flow conditions. The capacity of Lake Street Lift Station during rain events could be adversely affected by RDII due to the submerged manholes at Carr Lake.

Table 5-3 Existing Lift Station Inflow by Land Use

		Lift Station Existing Flow Rates (gpd)										
		Airport (Moffett)	**Carpenter Hall**	**De La Torre**	**Harkins Road**	**Lake Street**	**Las Casitas**	**Mill Lake**	**Santa Rita**	**Spicer**	**TP2**	**Vista Nueva**
Residential (gpd)		0	563,915	0	0	2,562,149	64,040	59,173	306,498	0	97,621	19,830
Commercial (gpd)		25,570	21,816	1,139	43,425	142,320	0	4,330	5,048	37,051	35,858	0
Industrial (gpd)		4,936	195	0	24,548	14,869	91	0	1,500	12,260	75	0
Hotel Rooms (gpd)		0	0	2,386	0	2,781	0	0	358	652	113	0
Schools (gpd)		0	3,832	0	0	58,479	1,562	0	8,762	0	2,195	0
Upstream Lift Station		NA	NA	NA	NA	Las Casitas Vista Nueva	NA	NA	NA	NA	NA	NA
Total Average Daily Flow	gpd	30,506	589,757	3,525	67,973	2,780,598	65,693	63,503	322,166	49,963	135,862	19,830
	gpm	21	410	2	47	1,931	46	44	224	35	94	14
	w/ Simplex LS[1.]	NA	NA	NA	NA	2,536	NA	NA	NA	NA	299	NA
Maximum Day Dry Weather Flow	Peaking Factor	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
	gpd	45,759	884,636	5,288	101,960	4,170,897	98,539	95,255	483,248	74,945	203,793	29,745
	gpm	32	614	4	71	2,896	68	66	336	52	142	21
	w/ Simplex LS[1.]	NA	NA	NA	NA	3,501	NA	NA	NA	NA	347	NA
Peak Hour Dry Weather Flow	Residential Diurnal Factor	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	Residential Peaking Factor	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Commercial Diurnal Factor	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
	Commercial Peaking Factor	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	gpd	86,942	1,765,395	10,046	193,723	8,309,027	196,830	189,860	964,146	142,395	401,850	59,490
	gpm	60	1,226	7	135	5,770	137	132	670	99	279	41
	w/ Simplex LS[1.]	NA	NA	NA	NA	6,375	NA	NA	NA	NA	484	NA
Peak Hour Wet Weather Flow	gpm	192	2,000	19	90	6,109	107	312	975	156	775	32

Table Notes:

1. Flow is calculated with upstream lift station(s) operating in simplex mode.

Table 5-4 Lift Station Flow Comparison Summary

	Lift Station										
	Airport (Moffett)	**Carpenter Hall**	**De La Torre**	**Harkins Road**	**Lake Street[1.2.]**	**Las Casitas**	**Mill Lake**	**Santa Rita**	**Spicer**	**TP2**	**Vista Nueva**
Operating Mode	Across the line contactor	VFD Altivar 660	Across the line contactor	Across the line contactor	VFD 1Y1261	Soft Start	Soft Start	Across the line contactor	Across the line contactor	VFD, hand mode uses contactor	Across the line contactor
Existing Peak Hour Dry Weather Flow by Land Use (gpm)	60	1,226	7	135	6,375	137	132	670	99	279	41
Average Flow by Simplex Pump[1.]	640	1,600	345	370	5,550	395	510	1,420	205	555	210
Percent Difference	960%	31%	4845%	175%	-13%	189%	287%	112%	107%	99%	408%
Existing Peak Hour Wet Weather Flow by Land Use (gpm)	192	2,000	19	90	6,109	107	312	975	156	775	32
Average Flow by Duplex Pumping[2.]	780	2,900	395	455	7,250	560	630	1,740	260	1,050	250
Percent Difference	306%	45%	1979%	406%	19%	423%	102%	78%	67%	35%	681%

1. Flow at Lake Street Lift Station is for duplex operation since this is the only triplex lift station in the system.
2. Flow at Lake Street Lift Station is for triplex operation.

Wet Well Capacity Evaluation

To determine the adequacy of the wet well capacity under existing conditions, each lift station was evaluated under three different operating conditions, as follows:

1. Worst Case Scenario – this is when the flow coming into the lift station is exactly half of the flow rate of the pump
2. Average Daily Flows
3. Peak Hour Dry Weather Flows

Pump run times were calculated based on the lift station operating volumes and estimated pump flows. Lift station pumps should typically cycle not more than 10 times per hour to limit pump starts. Smaller horsepower pumps may be able to cycle up to 25 times per hour. This recommendation, however, should be based on actual pump manufacturer's recommendations. It is recommended that lift stations should cycle at minimum once per day and preferably two to three times per day to minimize potential for odor. Table 5-5 summarizes the wet well cycle time calculations without the VFD operational. As Table 5-5 notes, Carpenter Hall, Lake Street, and TP2 have VFDs that could greatly limit the amount of pump cycling on and off.

Table 5-5 shows that most of the lift stations wet well operating volumes are undersized. Increasing the operating volumes for Harkins Road, Lake Street, Las Casitas, Mill Lake, Santa Rita and TP2 could improve pump performance, reduce the need for VFDs, and as shown below, increase the amount of time available for potential pumping failures.

Airport Lift Station

The Airport Lift station receives approximately 21 gpm under average daily flow conditions, and 60 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station is cycling approximately 6 times per hour under average flow conditions and approximately 15 times per hour under peak hour dry weather flow. Based on these pump cycling times the wet well has adequate capacity for existing flows and therefore, this lift station is not required to be upgraded due to hydraulic constraints.

Carpenter Hall Lift Station

The Carpenter Hall Lift Station receives approximately 410 gpm under average daily flow conditions, and 1,226 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station pumps are controlled by VFDs. In the event that the VFDs were disengaged, the pumps would cycle approximately 18 times per hour under average flow conditions and approximately 17 times per hour under peak hour dry weather flow. Although not required, the wet well operating volume, estimated as 1,000 gallons, could be increased in the event that the VFDs are disengaged.

De La Torre Lift Station

This lift station receives approximately 2 gpm under average daily flow conditions, and 7 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station is cycling approximately once per hour under average flow conditions and approximately 2 times per hour under peak hour dry weather flow. Based on these pump cycling times, the wet well operating volume is adequate for existing flows and therefore, this lift station is not required to be upgraded due to hydraulic constraints. However, the lift station appears to be cycling infrequently, with average residence time approximately 70

minutes, which may lead to odor issues during the hot summer months. The lift station pump appears to be substantially oversized with the pump on cycle time lasting for only about 30 seconds during average daily flow. Reducing the pump flow rate could help reduce operating costs and potential issues with extended wet well residence times. However, the force main size would also need to be decreased to ensure minimum velocities in the main.

Harkins Road Lift Station

This lift station receives approximately 47 gpm under average daily flow conditions, and 135 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station is cycling approximately 13 times per hour under average flow conditions and approximately 27 times per hour under peak hour dry weather flow. Based on these pump cycling times, the wet well operating volume is marginal for existing flows. The wet well operating volume is estimated at 190 gallons. Depending upon the configuration of the influent piping, this could be increased since the estimated total wet well volume is 1,700 gallons.

This lift station is not required to be upgraded due to existing hydraulic constraints. The lift station pump appears to be substantially oversized for existing conditions, with the pump on cycle lasting for only about 30 seconds during average daily flow. However, Harkins Road is expected to receive future flows, discussed later in this chapter.

Lake Street Lift Station

This lift station receives approximately 1,930 gpm under average daily flow conditions, and 6,375 gpm under peak flow conditions. Based on these inflows it is anticipated that this station operates in simplex or triplex mode under average and peak flows, respectively. The lift station pumps are controlled by VFDs. In the event that the VFDs were disengaged, the pumps would cycle approximately 100 times per hour under average flow and peak hour dry weather flow. Although not required, the wet well operating volume, estimated as 690 gallons, could be increased in the event that the VFDs are disengaged. This is based on estimated pump cycling times without VFDs and the estimated total wet well volume of 26,000 gallons. Also, the pumps and force mains appear to be undersized based upon the high pumping times, high sewage inflow rate, and high velocities in the force mains.

Las Casitas Lift Station

This lift station receives approximately 46 gpm under average daily flow conditions, and 137 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station is cycling approximately 14 times per hour under average flow conditions and approximately 30 times per hour under peak hour dry weather flow. Based on these pump cycling times, the wet well operating volume is marginal for existing flows. The lift station pump appears to be oversized with the pump on cycle lasting for only about 30 seconds during average daily flow. The wet well operating volume is estimated at 180 gallons. Depending upon the configuration of the influent piping, this could be increased because the estimated total wet well volume is 1,400 gallons.

Mill Lake Lift Station

This lift station receives approximately 44 gpm under average daily flow conditions, and 132 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station is cycling approximately 17 times per hour under average flow conditions and approximately 40 times per hour under peak hour dry weather flow. Based on these pump cycling times, the wet well operating volume is inadequate for existing flows. The lift station pump appears to be oversized with the pump on cycle lasting for only about 18 seconds during average daily flow. The wet well operating volume is estimated at 140 gallons. Depending upon the configuration of the influent piping, this could be increased because the estimated total wet well volume is 1,900 gallons and the pumping rate could be decreased thereby reducing pumping cycling and operating costs.

Santa Rita Lift Station

This lift station receives approximately 224 gpm under average daily flow conditions, and 670 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station is cycling approximately 10 times per hour under average flow conditions and approximately 19 times per hour under peak hour dry weather flow. Under average flow conditions, this lift station is right at the recommended 10 cycles per hour. The lift station pump appears to be oversized for existing conditions with the pump on cycle lasting for only about 1 minute during average daily flow. However, Santa Rita Lift Station is expected to receive future flows, discussed later in this chapter.

Spicer Lift Station

This lift station receives approximately 35 gpm under average daily flow conditions, and 100 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station is cycling approximately 7 times per hour under average flow conditions and approximately 12 times per hour under peak hour dry weather flow. Based on these pump cycling times, the wet well operating volume is adequate for existing flows and no upgrades are recommended based upon hydraulic considerations.

TP2 Lift Station

This lift station receives approximately 94 gpm under average daily flow conditions, and 280 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station pumps are controlled by VFDs. In the event that the VFDs were disengaged, the pumps would cycle more than 11 times per hour under average flow conditions and more than 20 times per hour under peak hour dry weather flow1. Although not required, the wet well operating volume, estimated at 420 gallons, could be increased in the event that the VFDs are set at 60 Hz maximum. This is based on estimated pump cycling times without VFDs and the estimated total wet well volume of 5,290 gallons. Also, the pumping rate could be decreased thereby reducing pumping cycling and operating costs. Reducing the pumping rate would also reduce the high velocities in the force main.

Vista Nueva Lift Station

This lift station receives approximately 14 gpm under average daily flow conditions, and 41 gpm under peak flow conditions. Based on these inflows it is anticipated that this station always operates in simplex mode. The lift station is cycling approximately once per hour under average flow conditions and approximately 2 times per hour under peak hour dry weather flow. Based on these pump cycling times, the wet well operating volume is adequate for existing flows and therefore, this lift station is not required to be upgraded due to hydraulic constraints. However, the lift station appears to be cycling infrequently, with average residence time approximately 60 minutes, which may lead to odor issues during the hot summer months.

[1] TP2 cycle times in Table 5-5 are based upon VFD set at 48 Hz maximum by city staff to prevent excessive vibration in the pumps. Allowing the pumps to run without VFDs at 60 Hz would increase the simplex flow rate from 555 gpm to 740 gpm.

Table 5-5 Lift Station Cycle Times

		Lift Station										
		Airport (Moffett)	**Carpenter Hall**	**De La Torre**	**Harkins Road**	**Lake Street[1,2]**	**Las Casitas**	**Mill Lake**	**Santa Rita**	**Spicer**	**TP2**	**Vista Nueva**
Operating Mode		Across the line contactor	VFD Altivar 660	Across the line contactor	Across the line contactor	VFD 1Y1261	Soft Start	Soft Start	Across the line contactor	Across the line contactor	VFD, hand mode uses contactor	Across the line contactor
Wetwell Operating Volume	gallons	211	1,036	169	188	687	179	141	1,128	254	423	846
Estimated Simplex Pump Operation[1]	gpm	640	1,600	345	370	5,550	395	510	1,420	205	555	210
Estimated Duplex Pump Operation[2]	gpm	780	2,900	395	455	7,250	560	630	1,740	260	810	250
Design Simplex Pump Operation	gpm	550	2,250	200	350	5,200	150	500	1,530	400	400	175
Worst Case Number of Pump Cycles per Hour (Flow In = One-half Pump Rate)												
Estimated Simplex	minutes	1.3	2.6	2.0	2.0	0.5	1.8	1.1	3.2	5.0	3.0	16.1
Pump Operation	Cycles per Hour	45.4	23.2	30.6	29.5	121.1	33.2	54.3	18.9	12.1	19.7	3.7
Design Simplex	minutes	1.5	1.8	3.4	2.1	0.5	4.8	1.1	2.9	2.5	4.2	19.3
Pump Operation	Cycles per Hour	39.0	32.6	17.7	27.9	113.5	12.6	53.2	20.3	23.6	14.2	3.1
Existing Average Daily Flow												
Estimated Simplex	minutes	10.3	3.4	69.6	4.6	0.5	4.4	3.5	6.0	8.8	5.4	65.7
Pump Operation	Cycles per Hour	5.8	17.6	0.9	13.1	109.9	13.6	17.1	10.0	6.8	11.1	0.9
Design Simplex	minutes	10.4	3.1	70.0	4.6	0.6	5.6	3.5	5.9	8.0	5.9	66.7
Pump Operation	Cycles per Hour	5.8	19.4	0.9	13.0	106.0	10.7	17.1	10.2	7.5	10.2	0.9
Peak Hour Dry Weather Flow												
Estimated Simplex	minutes	3.9	3.6	24.8	2.2	0.6	2.0	1.4	3.2	5.0	3.0	25.5
Pump Operation	Cycles per Hour	15.5	16.6	2.4	27.3	102.8	30.0	41.6	18.8	12.1	19.7	2.4
Design Simplex	minutes	3.9	1.9	25.1	2.3	0.6	14.7	1.5	3.0	3.4	5.0	26.8
Pump Operation	Cycles per Hour	15.2	32.3	2.4	26.4	102.8	4.1	41.3	20.0	17.6	12.0	2.2
Estimated Simplex Pump Operation Average Daily Flow	Pump On (min)	0.3	0.9	0.5	0.6	0.1	0.5	0.3	0.9	1.5	0.9	4.3
	Pump Off (min)	10.0	2.5	69.1	4.0	0.4	3.9	3.2	5.0	7.3	4.5	61.4
Estimated Triplex Pump Operation Peak Hour Dry Weather Flow	Pump On (min)	-	-	-	-	0.5	-	-	-	-	-	-
	Pump Off (min)	-	-	-	-	0.1	-	-	-	-	-	-

Table Notes:

1. Simplex flow at Lake Street Lift Station is for duplex operation.
2. Duplex flow at Lake Street Lift Station is for triplex operation.

Emergency Response Time Evaluation

Another critical factor for lift station design is the emergency response time that is available to an operator before a sanitary sewer overflow (SSO) occurs in the event of total pump failure, such as due to power outage or other anomaly. Standby generators are on site at many of the City's lift stations, including Airport, Carpenter Hall, Lake Street, Las Casitas, Mill Lake, Santa Rita, and TP2 which will reduce the risk of a SSO due to a power failure. Of those stations not provided with a standby generator, Harkins Road and Spicer, have emergency power receptacles for portable generators that are unsafe to use. Carpenter Hall has a permanent standby generator but is the only lift station without a power receptacle for a portable generator. It is recommended that all lift stations, at a minimum, have an emergency power receptacle with transfer switch to connect a portable generator in the event of a power outage. Power failures are not the only cause of emergencies, total pump failure can occur and therefore, having adequate emergency response time for operators to respond prior to a sanitary sewer overflow is critical.

Emergency response time was evaluated for each lift station, as summarized in Table 5-6. Per discussions with City Operation's Staff, a minimum of 30-minute response time is desired. Response time was calculated based on the amount of time between high water alarm and overflow. None of the lift stations appear to have a dedicated overflow line that gravity flows into the collection system. The overflow location is based on upstream topography and is shown in the station-specific emergency response plans (ERPs). Additional storage capacity was calculated using the volume of the upstream manholes that did not exceed the hydraulic grade line of the ERP-identified overflow location. Additional storage in upstream manholes was not calculated for Carpenter Hall, De La Torre, Las Casitas, Mill Lake, and Vista Nueva lift stations. These locations did not have sufficient as-built or survey of the upstream manholes to determine additional storage.

The response time for a lift station can be increased by increasing available storage in the wet well or providing an overflow to additional emergency storage. Alternatively, the need for immediate response can be eliminated by installing permanent stand-by generators. Results for each lift station are provided as follows:

Airport Lift Station

The Airport Lift station receives approximately 21 gpm under average daily flow conditions, and 60 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 2,115 gallons. Additional storage was estimated in the manholes between the lift station and the low point manhole noted in the lift station-specific ERPs. The available storage including these manholes is estimated at 3,220 gallons with emergency response times of 152 minutes and 53 minutes for ADF and PHDW flows, respectively. Since these response times are greater than 30 minutes, there are no modifications recommended to increase response times under existing conditions.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole in La Guardia Street approximately 320 feet away. From there the SSO would travel approximately 1,200 LF in the street prior to entering a storm drain inlet that leads to a drainage ditch that is 50 feet away.

Carpenter Hall Lift Station

The Carpenter Hall Lift Station receives approximately 410 gpm under average daily flow conditions, and 1,226 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 6,334 gallons. Based on these inflows and the available volume, response times from high-level alarm is 15 minutes to 5 minutes for ADF and PHDW flows,

respectively. The emergency response times could be increased by installing an emergency overflow tank.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole immediately adjacent to the lift station. From there the SSO would travel approximately 800 LF in a surface ditch prior to entering a drainage ditch.

De La Torre Lift Station

This lift station receives approximately 2 gpm under average daily flow conditions, and 7 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 846 gallons. Based on these inflows and the available volume, response times from high-level alarm is 346 minutes to 121 minutes for ADF and PHDW flows, respectively. Since these response times are greater than 30 minutes, there are no modifications recommended to increase response times under existing conditions.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole in De La Torre Street approximately 1,000 feet from the lift station. From there the SSO would travel approximately 300 LF in the street prior to entering a storm drain inlet that leads to a drainage ditch approximately 30 feet away.

Harkins Road Lift Station

This lift station receives approximately 47 gpm under average daily flow conditions, and 135 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 1,222 gallons. Based on these inflows and the available volume, response times from high-level alarm is 26 minutes to 9 minutes for ADF and PHDW flows, respectively. Since these response times did not meet the minimum time criteria, additional storage was estimated in the manholes between the lift station and the low point manhole noted in the lift station-specific ERPs. The available storage including these manholes is estimated at 6,514 gallons with emergency response times of 138 minutes and 48 minutes for ADF and PHDW flows, respectively. Since these response times are greater than 30 minutes, there are no modifications recommended to increase response times under existing conditions.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole in Dayton Street approximately 1,600 feet from the lift station. From there the SSO would travel less than 20 LF in the street prior to entering a storm drain inlet that leads to a drainage ditch approximately 5,000 feet away.

Lake Street Lift Station

This lift station receives approximately 1,900 gpm under average daily flow conditions, and 5,800 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 5,506 gallons. Based on these inflows and the available volume, response times from high-level alarm is 3 minutes to 1 minutes for ADF and PHDW flows, respectively. Since these response times did not meet the minimum time criteria, additional storage was estimated in the manholes between the lift station and the low point manhole noted in the lift station-specific ERPs. The available storage including these manholes is estimated at 45,077 gallons with emergency response times of 23 minutes and 8 minutes for ADF and PHDW flows, respectively. The emergency response times could be increased by installing an emergency overflow tank.

The ERP for this lift station notes that the SSO locations during lift station failure would be a manhole in Carr Lake approximately 6,300 feet from the lift station and a manhole on N Madeira across from Chavez Park. From the Carr Lake location the SSO would travel less than 20 LF to a drainage ditch. At the other location the SSO would travel less than 100 LF to a drainage ditch.

Las Casitas Lift Station

This lift station receives approximately 46 gpm under average daily flow conditions, and 137 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 1,426 gallons. Based on these inflows and the available volume, response times from high-level alarm is 31 minutes to 10 minutes for ADF and PHDW flows, respectively. The emergency response times could be increased further by installing an emergency overflow tank.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole in Ranchero Road located approximately 300 feet away. From there the SSO would travel approximately 600 LF in the street prior to entering a storm drain inlet that leads to a drainage ditch located less than 20 feet away.

Mill Lake Lift Station

This lift station receives approximately 44 gpm under average daily flow conditions, and 132 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 1,692 gallons. Based on these inflows and the available volume, response times from high-level alarm is 38 minutes to 13 minutes for ADF and PHDW flows, respectively. The emergency response times could be increased by installing an emergency overflow tank.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole in Heather Circle located 300 feet away. From there the SSO would travel less than 50 LF in the street prior to entering a storm drain inlet that leads to a drainage ditch located approximately 600 feet away.

Santa Rita Lift Station

This lift station receives approximately 224 gpm under average daily flow conditions, and 670 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 4,136 gallons. Based on these inflows and the available volume, response times from high-level alarm is 15 minutes to 5 minutes for ADF and PHDW flows, respectively. Since these response times did not meet the minimum time criteria, additional storage was estimated in the manholes between the lift station and the low point manhole noted in the lift station-specific ERPs. The available storage including these manholes is estimated at 7,533 gallons with emergency response times of 34 minutes and 11 minutes for ADF and PHDW flows, respectively. The emergency response times could be increased by installing an emergency overflow tank.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole in North Main Street near Massa Street approximately 760 feet away. From there the SSO would travel approximately 60 LF in the street prior to entering a storm drain inlet that leads to a drainage ditch located approximately 600 feet away.

Spicer Lift Station

This lift station receives approximately 35 gpm under average daily flow conditions, and 100 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 1,786 gallons. Based on these inflows and the available volume, response times from high-level alarm is 51 minutes to 18 minutes for ADF and PHDW flows, respectively. Since these response times did not meet the minimum time criteria, additional storage was estimated in the manholes between the lift station and the low point manhole noted in the lift station-specific ERPs. The available storage including these manholes is estimated at 3,691 gallons with emergency response times of 106 minutes and 37 minutes for ADF and PHDW flows, respectively. Since these response times are greater than 30 minutes, there are no modifications recommended to increase response times under existing conditions.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole in Brunken Avenue approximately 850 feet from the lift station. From there the SSO would travel approximately 600 LF in the street prior to entering a storm drain inlet that leads to a drainage ditch located 300 ft away.

TP2 Lift Station

This lift station receives approximately 94 gpm under average daily flow conditions, and 280 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 6,346 gallons. Based on these inflows and the available volume, response times from high-level alarm is 67 minutes to 23 minutes for ADF and PHDW flows, respectively. Since these response times did not meet the minimum time criteria, additional storage was estimated in the manholes between the lift station and the low point manhole noted in the lift station-specific ERPs. The available storage including these manholes is estimated at 11,246 gallons with emergency response times of 119 minutes and 40 minutes for ADF and PHDW flows, respectively. Since these response times are greater than 30 minutes, there are no modifications recommended to increase response times under existing conditions.

The ERP for this lift station notes that the SSO location during lift station failure would be a remote manhole in a field approximately 750 feet from the lift station. From there the SSO could travel approximately 90 LF across the field prior to entering a drainage ditch. It is recommended to install a manhole monitor upstream of the lift station to increase awareness of potential SSOs.

Vista Nueva Lift Station

This lift station receives approximately 14 gpm under average daily flow conditions, and 41 gpm under peak flow conditions. The available volume between the high-level alarm and overflow is estimated at 1,904 gallons. Based on these inflows and the available volume, response times from high-level alarm is 138 minutes to 46 minutes for ADF and PHDW flows, respectively. Since these response times are greater than 30 minutes, there are no modifications recommended to increase response times under existing conditions.

The ERP for this lift station notes that the SSO location during lift station failure would be a manhole in Garner Avenue approximately 750 feet from the lift station. From there the SSO would travel less than 50 LF in the street prior to entering a drain inlet that would flow to a water body at Carr Lake located less than 100 feet away.

Table 5-6 Lift Station Emergency Response Time

	Lift Station										
	Airport (Moffett)	**Carpenter Hall**	**De La Torre**	**Harkins Road**	**Lake Street**	**Las Casitas**	**Mill Lake**	**Santa Rita**	**Spicer**	**TP2**	**Vista Nueva**
High Water Alarm (ft)	5	8	5.5	5	6	5.83	4	8.5	6	4.5	7
Overflow (ft)	15	30	15	18	40	21	22	20	25	35	16
Overflow Location/ MH	O8-003	Wet well	No GIS ID	Q6-005	K5-003, J6-016	I7-019	J4-020	D4-026	N5-014	M5-034	J7-038
Storage Volume (gal)	3,220	6,334	846	6,514	5,506	1,426	1,692	7,533	3,691	11,246	1,904
ADF Inflow without Upstream LS (gpm)	21	410	2	47	1,931	46	44	224	35	94	14
ADF Response Time (min)	**152**	**15**	**346**	**138**	**3**	**31**	**38**	**34**	**106**	**119**	**138**
ADF Inflow with Upstream LS (gpm)	NA	NA	NA	NA	2,326	NA	NA	NA	NA	NA	NA
ADF Response Time (min)	NA	NA	NA	NA	2	NA	NA	NA	NA	NA	NA
PHDWF Inflow without Upstream LS (gpm)	60	1,226	7	135	5,770	137	132	670	99	279	41
PHDWF Response Time (min)	**53**	**5**	**121**	**48**	**1**	**10**	**13**	**11**	**37**	**40**	**46**
PHDWF Inflow with Upstream LS (gpm)	NA	NA	NA	NA	6,165	NA	NA	NA	NA	NA	NA
PHDWF Response Time (min)	NA	NA	NA	NA	**1**	NA	NA	NA	NA	NA	NA

NA= Not Applicable

HYDRAULIC PERFORMANCE EVALUATION - FUTURE CONDITIONS

It is critical to understand what upgrades are required to meet estimated future flows in addition to correcting existing deficiencies. The following sections analyze each lift station for future wastewater flows under the same criteria as existing wastewater flows.

Future Wastewater Flows and Recommendations

Future flow for each lift station was calculated based on planned developments and future development in accordance with the City's General Plan land use, as described in detail in Chapters 2 and 4. Due to variability in wastewater generation from different industrial and commercial users, it is difficult to accurately predict future flow conditions for this type of development. As development occurs, flow contributions will need to be addressed on a case-by-case basis and additional modeling may be required**. Note, the future flow estimates are based on the wastewater flowing to each lift station by gravity. If the proposed future development includes any lift stations, this will increase the point flow to the downstream collection system and existing lift stations that may impact the recommendations noted in this chapter and the collection system chapter.**

The following summarizes anticipated future flow contribution to each lift station and are shown in Table 5-7. Future lift station tributary area boundaries are depicted on Figure 5-2.

Airport (Moffett) Lift Station

This lift station collects flow from the commercial and industrial area south of the airport. Future flows to the domestic wastewater collection system from expansion of commercial development in the Southeast FGA is estimated to be minimal and the lift station would have sufficient capacity for anticipated future flows. This is contrary to the findings reported in the previous master plan. Based on ground level topography in the future expansion area for commercial development near De La Torre Lift Station, it is anticipated that only minimal future flows would be routed to this lift station. As commercial development is proposed in this region, this will need to be verified.

Carpenter Hall Lift Station

This lift station collects flow from residential, commercial, industrial, and schools in the area. Future flows to this lift station from the proposed developments in North Boronda FGA and Target Growth Areas K and V are estimated to increase by 5 percent. Since the future PHDW flow of 1,286 gpm is less than the simplex pumping capacity of 1,600 gpm, the existing lift station has sufficient excess capacity to manage future flows.

De La Torre Lift Station

This lift station collects flow from the commercial and hotels in the area west of the airport. Future flows to the domestic wastewater collection system from expansion of commercial development in a portion of Southeast FGA is estimated to be more than 6,000 percent increase.

The existing average daily flow and peak hour dry weather flow are estimated to be 2 gpm and 7 gpm, respectively. Assuming future flows from expansion of commercial development in the Southeast FGA is routed to this lift station, flows are estimated to increase average daily flow and peak hour dry weather flow to 165 gpm and 469 gpm, respectively. The lift station should be upgraded before the peak hour dry weather flow exceeds the estimated simplex flow of approximately 350 gpm.

Harkins Road Lift Station

This lift station collects flow from the commercial and industrial areas in the area. Future flows to the domestic wastewater collection system from the Salinas Ag-Industrial Center is estimated to be more than 118 percent increase.

The existing average daily flow and peak hour dry weather flow are estimated to be 47 gpm and 135 gpm, respectively. Based on the Salinas Ag-Industrial Center sewer connections per the Ruggeri-Jensen-Azar and Associates Sanitary Sewer System Analysis Report, future flows to Harkins Road Lift Station are estimated to increase average daily flow and peak hour dry weather flow to 103 gpm and 563 gpm, respectively. This report did identify that a localized sanitary sewer pump station will be needed to connect sewer flows from the development to the City's existing system at Dayton Street. The report did not size this pump station, so an assumed 270 gpm point flow was included in the model based on the peaking factors identified in this SSMPU. This assumption will need to be verified once the sizing of this localized lift station is complete.

Based on the above assumptions, Harkins Road lift station should be upgraded before the peak hour dry weather flow exceeds the estimated simplex flow of approximately 370 gpm.

Lake Street Lift Station

This lift station collects flow from residential, commercial, industrial, hotels, and schools from a large upstream area. Future flows to this lift station from the proposed developments in North Boronda FGA and Target Growth Area V are estimated to increase by 96 percent. Since this lift station is undersized for existing conditions, it should be upgraded as soon as possible.

This lift station is undersized for existing conditions and should be upgraded prior to any future development in North Boronda FGA and Target Growth Areas K and V. The existing average daily flow and peak hour dry weather flow are 1,931 gpm and 6,375 gpm, respectively. The future average daily flow and peak hour dry weather flow are 3,777 gpm and 11,847 gpm, respectively. The maximum duplex and triplex pumping rates are 5,550 gpm and 7,250 gpm, respectively. Since the duplex pumping rate is less than PHDW for both existing and future conditions, this lift station should be upgraded to meet both existing and future needs.

Las Casitas Lift Station

This lift station collects flow from the residential properties in the area with no anticipated significant development proposed. Future flows to the domestic wastewater collection system from expansion of residential development is expected to be minimal and the lift station would have sufficient capacity for anticipated future flows.

Mill Lake Lift Station

This lift station collects flow from the residential and commercial in the area with no anticipated significant development proposed. Future flows to the domestic wastewater collection system from expansion of residential development is expected to be minimal and the lift station would have sufficient capacity for anticipated future flows.

Santa Rita Lift Station

This lift station collects flow from residential, commercial, industrial, hotels, and schools from the upstream area. Future flows to this lift station from the proposed developments in Target Growth Areas K and the septic conversion from Bolsa Knolls are estimated to increase by 81 percent. Since the future PHDW flow of 1,198 gpm

is less than the simplex pumping capacity of 1,575 gpm, the existing lift station has sufficient excess capacity to manage future flows.

Spicer Lift Station

This lift station collects flow from residential, commercial, industrial, and hotels in the area with no anticipated significant development proposed. Future flows to the domestic wastewater collection system from expansion of commercial and industrial development is minimal and the lift station would have sufficient capacity for anticipated future flows.

TP2 Lift Station

This lift station collects flow from residential, commercial, industrial, hotels, and schools from the upstream area. Future flows to this lift station from the proposed developments in the upstream Focused Growth Area and East FGA are estimated to increase by approximately 110 percent. The lift station would need to be upgraded to accommodate the expected increase in future flows.

The existing average daily flow and peak hour dry weather flow are 94 gpm and 484 gpm, respectively. Future flows to this lift station from the proposed developments in the upstream Focused Growth Area and East FGA are estimated to increase the ADF and PHDW flows from 94 gpm to 198 gpm and from 279 gpm to 580 gpm, respectively. The estimated future flows are based upon implementing the proposed CIP upgrade at SSMH M6-012 at East Alisal and South Sanborn that addresses an existing deficiency and reroutes flow away from TP2 to South Sanborn. Therefore, only 12 percent of the flow from potential future development in East FGA would contribute to TP2. The lift station should be upgraded before the peak hour dry weather flow exceeds the estimated simplex flow of approximately 550 gpm.

Vista Nueva Lift Station

This lift station collects flow from the residential in the area with no anticipated significant development proposed. Future flows to the domestic wastewater collection system from expansion of residential development is minimal and the lift station would have sufficient capacity for anticipated future flows.

Table 5-7 Summary of Future Lift Station Wastewater Flows

		Lift Station Future Flow Rates (gpd)										
		Airport (Moffett)	**Carpenter Hall**	**De La Torre**	**Harkins Road**	**Lake Street**	**Las Casitas**	**Mill Lake**	**Santa Rita**	**Spicer**	**TP2[1.]**	**Vista Nueva**
Residential (gpd)		0	563,915	0	0	4,583,023	64,040	59,173	392,939	0	152,462	19,830
Commercial (gpd)		25,570	52,207	234,779	43,425	779,671	0	4,330	180,872	37,051	130,195	0
Industrial (gpd)		4,936	195	0	104,694	14,869	91	0	1,500	12,260	75	0
Hotel Rooms		0	0	2,386	0	2,781	0	0	358	652	113	0
Schools		0	3,832	0	0	58,479	1,562	0	8,762	0	2,195	0
Upstream Lift Station		NA	NA	NA	NA	Las Casitas Vista Nueva	NA	NA	NA	NA	NA	NA
Total Average Daily Flow	gpd	30,506	620,148	237,165	148,119	5,438,824	65,693	63,503	584,431	49,963	285,040	19,830
	Percent Increase[2.]	0%	5%	6628%	118%	96%	0%	0%	81%	0%	110%	0%
	gpm	21	431	165	103	3,777	46	44	406	35	198	14
	w/ Simplex LS[1]	NA	NA	NA	NA	4,382	NA	NA	NA	NA	NA	NA
Maximum Day Dry Weather Flow	Peaking Factor	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	gpd	45,759	930,222	355,748	222,179	8,158,235	98,539	95,255	876,647	74,945	427,559	29,745
	gpm	32	646	247	154	5,665	68	66	609	52	297	21
	w/ Simplex LS[1]	NA	NA	NA	NA	5,820	NA	NA	NA	NA	NA	NA
Peak Hour Dry Weather Flow	Residential Diurnal Factor	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	Residential Peaking Factor	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Commercial Diurnal Factor	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
	Commercial Peaking Factor	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	gpd	86,942	1,852,010	675,920	422,139	16,188,101	196,830	189,860	1,724,569	142,395	835,232	59,490
	gpm	60	1,286	469	563	11,242	137	132	1,198	99	580	41
	w/ Simplex LS[2.]	NA	NA	NA	NA	11,847	NA	NA	NA	NA	NA	NA
Peak Hour Wet Weather Flow	gpm	192	2,045	313	398	9,498	107	312	1,430	156	913	32
	Percent Increase[3.]	0%	2%	1547%	342%	55%	0%	0%	47%	0%	18%	0%

Table Notes:

1. For TP2, only 12% of the future flows from East FGA is contributing to TP2 with a proposed weir constructed at SSMH M6-012 at East Alisal and South Sanborn (see CIP for existing deficiencies).
2. Flow is calculated with upstream lift station(s) operating in simplex mode.
3. Percent increase in future flow rate versus existing flow rate.

SITE INVESTIGATION SUMMARY & OVERALL RECOMMENDATIONS

Based on the hydraulic analysis and discussion provided, the following is a summary of recommendations for the City's eleven lift stations. The following table provides an overview of the recommendations for upgrades based upon the visual inspection of the lift stations. All of the lift stations should be upgraded such that a spare pump (motor and pump) is available for each lift station. Many of the lift stations, except Airport, Lake Street, and Vista Nueva, should be upgraded with emergency bypass piping systems and receptacles and/or transfer switches for a portable generator. The discussion below gives detailed recommendations for each lift station.

TABLE 5-8. SUMMARY OF LIFT STATION UPGRADES BASED UPON VISUAL INSPECTION

Recommended Lift Station Capital Improvements Location	Repair/Replace Pump/Motor	Replace Control Panel/MCC	Repair Control Panel Disconnects	Install/Upgrade Generator Receptacle & Transfer Switch	Move Control Panel to Above Grade	Evaluate Generator Upgrade	Upgrade Level Controller/SCADA	Coat Wet Well / Dry Well	Install Emergency Bypass	Install Emergency Overflow	Provide Washdown Water	Address Safety/Falling Hazard Concerns
Airport	X		X				X	X		X	X	
Carpenter	X		X	X		X	X		X	X	X	
De La Torre	X		X	X	X		X	X	X	X	X	
Harkins Rd	X		X	X	X		X		X	X	X	
Lake Street	X	X	X			X	X			X	X	X
Las Casitas	X		X		X		X	X	X	X	X	
Mill Lake			X		X		X		X	X	X	
Santa Rita			X		X	X	X	X	X	X	X	
Spicer			X	X	X		X		X	X	X	
TP2	X		X			X	X		X	X	X	X
Vista Nueva	X						X	X		X	X	X

Airport (Moffett)

Airport is a duplex lift station with 10 hp submersible Flygt pumps with an estimated simplex flow rate of 640 gpm which is more than the rated and measured flow of approximately 550 gpm and 470 gpm, respectively. Inspection of the pumps revealed that the motors need to be rebuilt which could restore pump performance to its rated capacity. This lift station has a dedicated backup generator on an automatic transfer switch, a receptacle for a portable generator, and bypass capabilities.

Existing and future PHDW flows into this lift station are estimated at only 60 gpm. Therefore, the pumps could be downsized instead of rebuilt. However, to maintain self-cleaning velocities in the forcemain, the wastewater flows must be at least 320 gpm. It is recommended to evaluate the condition of force main and determine if the main could be downsized by lining or other means. This would only be recommended if the forcemain needs to be replaced. Otherwise, it would be cost prohibitive.

The overall condition of this lift station is mixed. That is, some of the equipment is working, but the site inspection was unable to determine if it is working as engineered. The two pump motors are rated as good and poor, respectively. The wet well is rated as operational. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Install overloads on load side of contactors for motor protection
    b. Replace breaker disconnect handles for pumps 1 and 2 and install proper disconnect hardware
    c. Proper labeling for the line voltage on the cabinet and the back-up manual transfer switch lever positions
    d. Provide wiring diagram at station
    e. Replace Sch 40 pipe with proper electrical conduit
    f. Install XP fittings/seals on conduits
    g. Upgrade to standardized SCADA
2) Mechanical Upgrades
    a. Replace pumps and motors
    b. Move check valves into a vault located outside of the wet well
3) Site and Piping Upgrades
    a. Install emergency overflow tank
    b. Replace wet well coating
    c. Relocate wet well vent
    d. Provide on-site water for wash down
    e. Determine extent of corrosion on discharge piping and rehabilitate as needed
4) Additional Studies
    a. N/A
5) Maintenance Upgrades
    a. Replace LCD screen for the automatic transfer switch
    b. Paint the generator enclosure
    c. Replace the handle to wet well

Carpenter Hall

Carpenter Hall is a duplex lift station with 30 hp dry-pit Smith & Loveless pumps. This lift station has a dedicated backup generator but no receptacle for a portable generator or bypass capabilities. The generator should be evaluated for replacement since the generator has required extensive repairs. The pumps' estimated simplex flow rate is 3,000 gpm which is more than the measured flow of about 1,600 gpm due to the pumps operating on VFDs. Existing and future PHDW flows into this lift station are estimated at less than 1,300 gpm. The existing pumps are oversized to meet existing and future flows. In addition, the pumps are not operating at their best efficiency point at the reduced flow rate. It is recommended that the City replace the pumps, when needed, with pumps that better fit the needs of the existing and future demands. Note, the force main velocities should be considered if the pump flows are reduced to ensure 2 fps cleaning velocity is maintained.

The overall condition of this lift station is operational because the equipment is working, but unable to determine if it is working as engineered. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Label electrical cabinets with line voltage
    b. Repair or replace motor to pump #1
    c. Install disconnect switches for each pump at the bottom of the dry pit.
    d. Install receptacle and transfer switch for portable generator
2) Mechanical Upgrades
    a. Replace flow meter
    b. Install emergency bypass system
3) Site and Piping Upgrades
    a. Install emergency overflow tank
    b. Repair or replace wet well access lid
    c. Repair piping/penetration from dry well to wet well
    d. Provide on-site water for wash down
4) Additional Studies
    a. Evaluate generator for replacement
5) Maintenance Upgrades
    a. Grease seal for Pump #1
    b. Grease mechanical seal for Pump #2

De La Torre

De La Torre is a duplex lift station with 5 hp dry-pit Smith & Loveless pumps. This lift station does not have a dedicated backup generator or bypass capabilities but does have a receptacle for portable generator. The pumps' estimated simplex flow rate is 345 gpm which is more than the pumps' rated performance but approximates the measured flows of 342 gpm and 354 gpm, respectively. The pumps are over-sized to manage the existing flows and undersized for the anticipated future flows of 469 gpm. Therefore, the pumps and possibly the force main would need to be upsized sometime in the future to accommodate development. It is recommended that this be re-evaluated when the future development is in the planning stages.

The overall condition of this lift station, including both pumps, are currently in poor condition. This lift station is undersized to meet future development needs and will require an upgrade. It is unknown if the existing dry well is capable of housing upsized pumps and electrical. It is recommended that a study be completed to determine if the lift station should be completely replaced or can simply be upgraded.

In addition to this study, the proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Install a receptacle and transfer switch for portable electrical generator
    b. Replace the control panel breaker disconnects
    c. Replace the overload reset buttons for the contactors
    d. Install new control panel above ground
    e. Upgrade Level Controller system
2) Mechanical Upgrades
    a. Repair motors or replace complete pump and motor
3) Site and Piping Upgrades
    a. Install emergency overflow tank
    b. Install fencing around lift station
    c. Provide on-site water for wash down
    d. Install emergency bypass system
    e. Coat wet well and recoat the dry well floor
4) Additional Studies
    a. Perform study to determine if lift station is required to be replaced or is capable of being upsized to meet future demands
5) Maintenance Upgrades
    a. Replace the isolation valves and check valves
    b. Remove the debris in discharge pipe wye

Harkins Road

Harkins is a duplex lift station with 5 hp dry-pit Smith & Loveless pumps. This lift station does not have a dedicated backup generator or bypass capabilities. The receptacle for a portable generator is unsafe and should be upgraded as soon as possible. The pumps' estimated simplex flow rate is 370 gpm which is comparable to the pumps' rated performance and greater than the measured flows of 228 gpm and 281 gpm, respectively. Inspection of the pumps revealed that they are in poor condition and the check valves may be faulty. Repairing the pumps and check valves could restore pump performance to their rated capacities.

The pumps are over-sized to manage the existing flows and undersized for the anticipated future flows of 563 gpm. Therefore, the pumps and possibly the force main would need to be upsized sometime in the future to accommodate development. It is recommended that this be re-evaluated when the future development is in the planning stages. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Install receptacle and transfer switch for portable generator
    b. Replace the control panel breaker disconnects
    c. Replace the overload reset buttons for the contactors
    d. Label control panel with line voltage
    e. Install new control panel above ground
    f. Upgrade Level Controller system
2) Mechanical Upgrades
    a. Repair motors or replace complete pump and motor
3) Site and Piping Upgrades
    a. Install emergency overflow tank
    b. Install fencing around lift station
    c. Provide on-site water for wash down
    d. Install improved emergency bypass system
    e. Repair leak in the 6" force main downstream of the wye
4) Additional Studies
    a. N/A
5) Maintenance Upgrades
    a. Replace or repairing the isolation valves and check valves

Lake Street

Lake Street is a triplex lift station with 30 hp dry-pit Smith & Loveless pumps connected to two separate force mains – one pump routes flows to a 12-inch diameter main and the other two pumps route flow to a 14-inch diameter main. This lift station has a dedicated backup generator and receptacle for portable generator. The generator should be evaluated for replacement since the generator has required extensive repairs. Bypass capabilities were recently added with the Lake Street Emergency Sewer Replacement Project. The pumps' estimated simplex flow rate is 2,600 gpm which approximates the pumps' design rating and measured flow of about 2,600 gpm. The pumps' estimated duplex flow rate is 5,500 gpm. Existing and future PHDW flows into this lift station are estimated to be 5,770 gpm and 11,242 gpm, respectively.

This lift station has significant deficiencies including insufficient wet well storage, undersized pumps, aged force mains, ongoing clogging/ragging issues, and outdated controls and electrical system. This lift station also poses a safety/falling hazard to operators working at this lift station. It is recommended to completely replace this lift station and force mains in lieu of rehabilitation. This is an immediate need, thus, the deficiencies noted below should only be completed to keep the lift station operational until a new lift station is constructed.

The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Provide arc flash protection at pump contactors
    b. Replace the control panel breaker disconnects
    c. Upgrade Level Controller system
    d. Replace galvanized conduit with PVC conduit
    e. Label control panel with line voltage
    f. Install supports for conduits
    g. Replace MCC cabinet.
2) Mechanical Upgrades
    a. Upsize pumps
    b. Relocate ventilation intake
    c. Install a higher flow sump pump
3) Site and Piping Upgrades
    a. Install emergency overflow tank
    b. Replace floor and sink drain pipes
    c. Provide on-site water for wash down
    d. Provide restroom with hot water
    e. Install alarm system and video surveillance
4) Additional Studies
    a. Preliminary Design Report for upgraded lift station. Potentially relocate lift station across the street on the east side of West Rossi Street.
    b. Evaluate generator for replacement
5) Maintenance Upgrades
    a. Install a guard for the drive belt on ventilation system

Las Casitas

Las Casitas is a duplex lift station with 10 hp dry-pit Smith & Loveless pumps. This lift station has a dedicated backup generator but does not have bypass capabilities or a receptacle for portable generator. The pumps' estimated simplex flow rate is 395 gpm which is more than the pumps' rated performance but approximates the measured flows of 357 gpm and 345 gpm, respectively. The pumps are over-sized compared to the existing flows and the anticipated future PHDW flow of 137 gpm, however, due the forcemain size, the pumps cannot be downsized without also reducing the forcemain diameter which would be cost prohibitive.

The overall condition of this lift station, including both pumps, are currently in good to operational condition. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Install a new control panel above ground
    b. Repair or replace the breaker disconnects
2) Mechanical Upgrades
    a. N/A
3) Site and Piping Upgrades
    a. Install emergency overflow tank
    b. Install emergency bypass system
    c. Coat bottom of dry well and entire wet well
    d. Provide on-site water for wash down
4) Additional Studies
    a. N/A
5) Maintenance Upgrades
    a. Repair or replace Pump #2. Perform investigation to determine source of high pitch noise. Pull Pump 2 and install spare pump to see if this reveals the source.
    b. Replace the LCD screen to automatic transfer switch
    c. Spot repairs to generator enclosure
    d. Remove debris from wye
    e. Clean out and installing a blind flange at bottom of wye to facilitate cleaning
    f. Perform an investigation upstream of this location to determine source of grease build-up (aka Fats, Oil, and Grease, or FOG investigation)

Mill Lake

Mill Lake is a duplex lift station with 15 hp dry-pit Smith & Loveless pumps. This lift station has a dedicated backup generator but does not have bypass capabilities. The pumps' estimated simplex flow rate is 510 gpm which approximates the pumps' rated performance and the measured flows of 500 gpm. The pumps are over-sized compared to the existing flows and the anticipated future PHDW flow of 132 gpm. It is recommended that when the pumps are to be replaced, the pumps be replaced with smaller pumps but still maintain cleaning velocities. This will reduce the City's operational costs over time.

The overall condition of this lift station, including both pumps, are less than satisfactory condition. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Move control cabinet above ground
    b. Replace control panel breaker disconnects
    c. Provide label for voltage on the cabinet
    d. Move electrical conduit underground
2) Mechanical Upgrades
    a. N/A
3) Site and Piping Upgrades
    a. Install emergency overflow tank
    b. Install fencing around dry well
    c. Coat wet well
    d. Install emergency bypass system
    e. Provide on-site water for wash down
4) Additional Studies
    a. N/A
5) Maintenance Upgrades
    a. Repair the broken conduit leading into dry well
    b. Rebalance or replace pump impellers to remove vibrations
    c. Perform spot repairs for rust on generator enclosure
    d. Perform a FOG investigation upstream of this location to determine source of grease build-up

Santa Rita

Santa Rita is a duplex lift station with 30 hp dry-pit Smith & Loveless pumps. This lift station has a dedicated backup generator but does not have bypass capabilities. The pumps' estimated simplex flow rate is 1,420 gpm which approximates the pumps' rated performance and the measured flows of approximately 1,500 gpm. The pumps are oversized compared to the existing PHDW flow and the anticipated future PHDW flow of 1,200 gpm but are within reason to maintain as currently installed.

The overall condition of this lift station, including both pumps, are less than satisfactory condition. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Install control cabinet above grade
    b. Replace control panel breaker disconnects and overload reset buttons
    c. Provide label for voltage on the cabinet
    d. Repair broken conduit between dry and wet well
    e. Seal all penetrations into the dry well
    f. Upgrade Micro-Mac control system
    g. Move conduit underground
2) Mechanical Upgrades
    a. N/A
3) Site and Piping Upgrades
    a. Install emergency bypass system
    b. Install emergency overflow tank
    c. Repair wet well coating
    d. Provide on-site water for wash down
4) Additional Studies
    a. Evaluate generator for replacement
5) Maintenance Upgrades
    a. Repair rust on generator enclosure

Spicer

Spicer is a duplex lift station with 7.5 hp dry-pit Smith & Loveless pumps. This lift station does not have a dedicated backup generator or bypass capabilities. The receptacle for the portable generator is unsafe and should be upgraded as soon as possible. The pumps' estimated simplex flow rate is 205 gpm which is less than the pumps' rated performance and comparable to the measured flows of 195 gpm and 218 gpm, respectively. Inspection of the pumps revealed that they are in poor condition. Repairing the pump impellers could improve the pump performance[2]. Prior to implementing the following recommended upgrades, a study should be performed to determine if the wet well could be relocated outside of the street. If not, a study should be conducted to determine if an emergency overflow tank is required or if the gravity system has enough capacity to add sufficient response time in case of lift station failure. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Install cabinet above grade
    b. Installing a transfer switch for emergency back-up generator
    c. Replace control panel breaker disconnects and overload reset buttons
    d. Provide label for voltage on the cabinet
    e. Replace conduit in wet well
    f. Upgrade the SCADA control system
2) Mechanical Upgrades
    a. N/A
3) Site and Piping Upgrades
    a. Install emergency overflow tank
    b. Repair leak in the 6" force main in the dry well
    a. Install removeable bollards at the dry well
    a. Install emergency bypass system
    b. Coat the wet well
    c. Repair coating on the floor of the dry well
    b. Provide on-site water for wash down
4) Additional Studies
    a. Perform study to determine if the wet well can be relocated outside of the street.
5) Maintenance Upgrades
    a. N/A

[2] The pump impellers were replaced on May 18, 2022 with non-clog impellers. The pumps performance should be evaluated to confirm that the new impellers are operating adequately.

TP2

TP2 is a duplex lift station with 10 hp dry-pit Smith & Loveless pumps. This lift station has a dedicated backup generator but does not have bypass capabilities. The pumps' estimated simplex flow rate is 555 gpm with the pumps operating at 48 Hz. This is greater than the pumps' rated performance but approximates the measured flows of 565 gpm and 491 gpm. This pumping rate is based upon the VFDs set at 48 Hz maximum to mitigate vibrations in the pumps that may be due to the use of no clog impellers. The source of the vibrations could be investigated by rebalancing or replacing the impellers. If the VFDs were set to allow the pumps to operate at 60 Hz maximum, the pumps' estimated simplex flow rate would increase to 740 gpm, which would be sufficient to meet future PHDW flow of 580 gpm and the lift station would not need to be upsized.

The overall condition of this lift station, including both pumps, are rated less than satisfactory condition. The configuration of the lift station also poses a safety/falling risk to operators. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Replace splice box in wet well
    b. Install a main breaker with disconnect and disconnects for both pumps on the outside of the cabinet
    c. Label the cabinet with the voltage
    d. Install GFI protection for air compressor
2) Mechanical Upgrades
    a. Investigate vibration issue at 60 Hz. If vibrations persist, lift station upgrades will be required to meet future flows.
    b. Install on-site flow meter
3) Site and Piping Upgrades
    a. Install emergency bypass system
    b. Install emergency overflow tank
    c. Provide on-site water for wash down
4) Additional Studies
    a. The condition of the generator should be evaluated for possible repair or replacement
    b. Investigate how to mitigate safety risks to operators
5) Maintenance Upgrades
    a. N/A

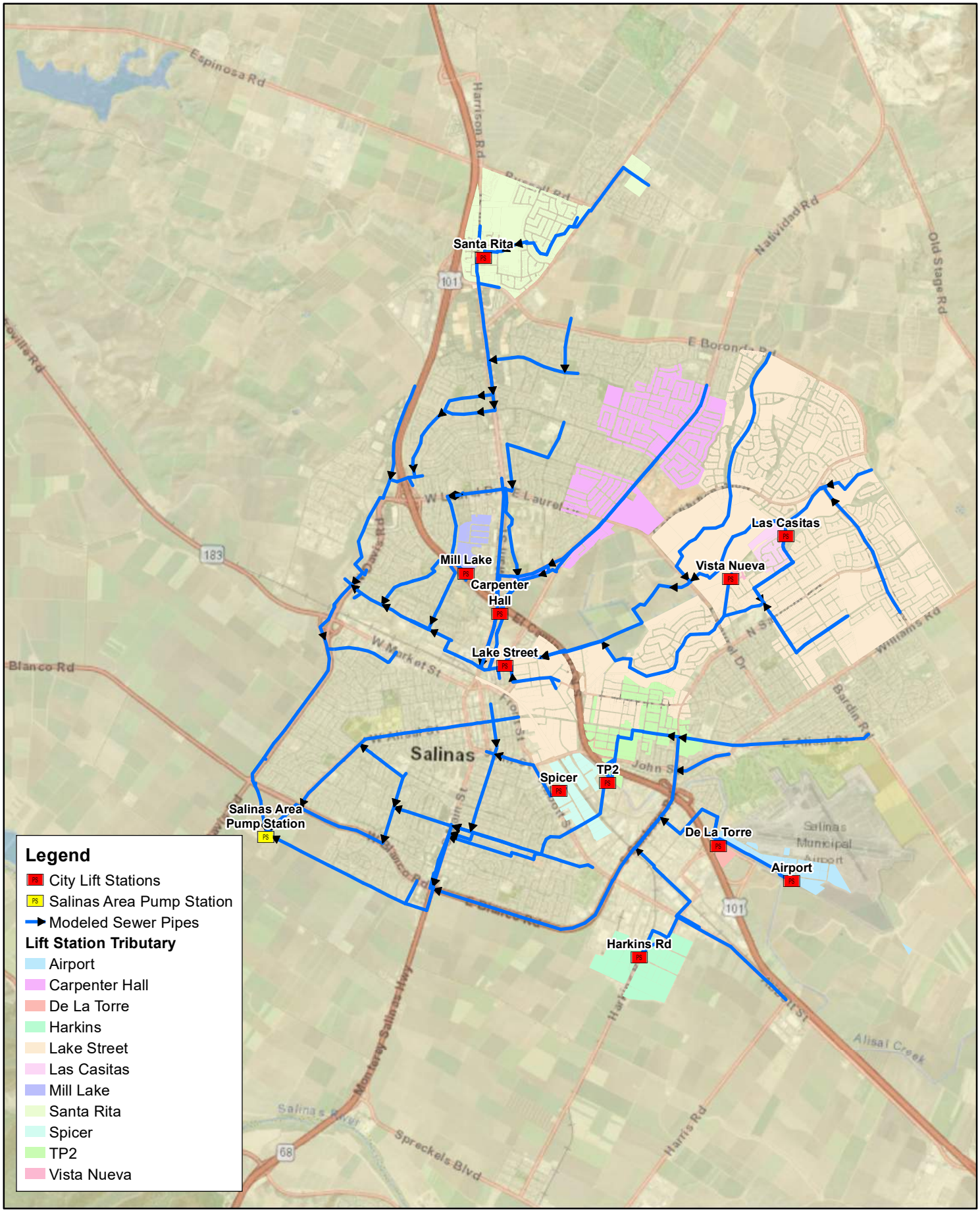
Vista Nueva

Vista Nueva is a duplex lift station with 7.5 hp submersible Flygt pumps[3]. This lift station has a receptacle for a portable generator and bypass capabilities but does not have a dedicated backup generator. The estimated simplex flow rate is 210 gpm which approximates the measured flow of 200 gpm for the pump that is in good condition. Inspection of the pumps revealed that one of the motors needs to be rebuilt which could restore pump performance to its rated capacity. The pumps appear to be over-sized for the future flows, but no upgrades are recommended.

The overall condition of this lift station is mixed with one of the pumps and wet well rated as good and operational, respectively, and the other pump rated poor. The configuration of the lift station also poses a risk to the safety of operators. The proposed CIP program includes the following upgrades based on field inspection report and hydraulic evaluation:

1) Electrical Upgrades
    a. Seal the conduits leading to the electrical cabinet
2) Mechanical Upgrades
    a. N/A
3) Site and Piping Upgrades
    a. Replace vault cover
    b. Coat wet well
    c. Install emergency overflow tank
    d. Provide on-site water for wash down
4) Additional Studies
    a. Conduct a study to determine source of moisture into the electrical cabinet
    b. Investigate ways to mitigate safety risks to operators
5) Maintenance Upgrades
    a. Repair or replace level indicator lights on control panel
    b. Replace Pump #2 volute

[3] Pump curve data and force main size and location are provided by Doyle McFarland in emails dated May 5, 2022.



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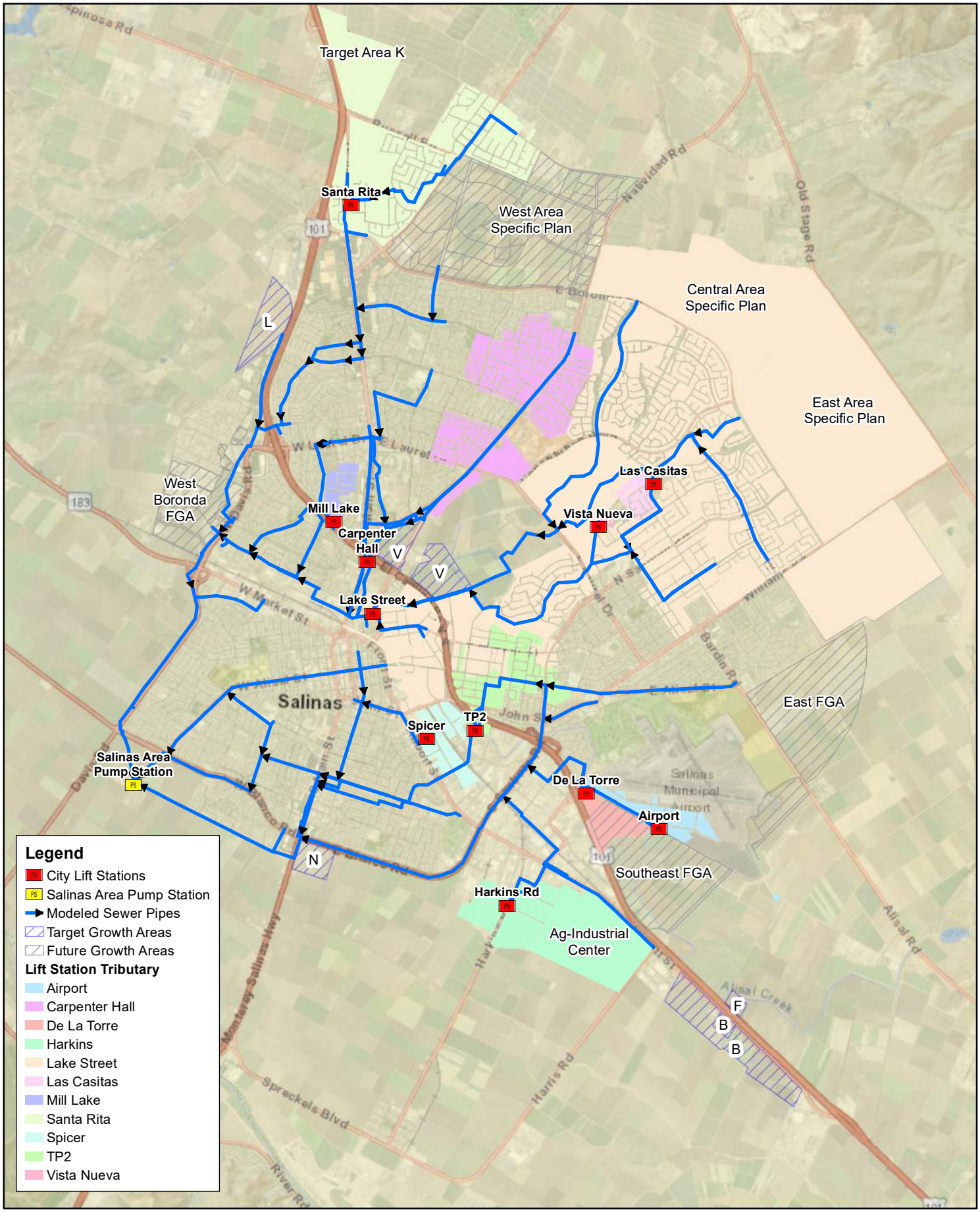
1 inch = 5,000 feet

SALINAS SEWER MASTER PLAN UPDATE

FIGURE 5-1
LIFT STATION
EXISTING TRIBUTARY AREAS

NOTES:
ESRI BASEMAP.
WALLACE GROUP DID NOT PERFORM BOUNDARY SURVEY SERVICES FOR THIS MAP. NOT A LEGAL DOCUMENT.
MAP PRODUCED MAY 2022.

SALINAS



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SALINAS SEWER MASTER PLAN UPDATE

FIGURE 5-2
LIFT STATION
FUTURE TRIBUTARY AREAS

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MAP PRODUCED FEBRUARY 2023.

SALINAS

CHAPTER 6
COLLECTION SYSTEM ANALYSIS

This Chapter presents the analysis of the domestic wastewater collection system for the City. Refer to Chapter 5 for a detailed evaluation of the City's eleven (11) lift stations and corresponding force mains. All figures are provided at the end of this chapter.

INTRODUCTION

As discussed in Chapter 3, the City's collection system is comprised of approximately 292 miles of gravity pipes, which vary in diameter from 6-inch to 54-inch, eleven (11) City-owned lift stations, and two (2) miles of force mains. The main trunk sewer system (typically 10-inch and larger, with some exceptions) was analyzed using Innovyze InfoSWMM Version 14.7 sewer modeling program to evaluate performance of the wastewater collection system under both existing and future flow conditions. Figure 6-1 provides an overview of the existing gravity wastewater collection system, lift stations, and force mains that were included in the hydraulic model.

COLLECTION SYSTEM ANALYSIS CRITERIA

The City's Public Works Department's Standard Specifications and Design Standards, updated March 2017, and the December 2019 City Sewer System Management Plan, were used as the basis to update the City's hydraulic criteria shown in Table 6-1. These standards were applied in the analysis of the trunk sewer collection system model to identify deficiencies and recommended improvements.

One of the performance criteria for gravity sewer lines is the maximum allowable flow depth, often expressed as the d/D ratio. The variables used in this ratio include the depth of flow in a pipe, d, divided by the diameter of the pipe, D. The maximum d/D criteria defined in the Sewer System Management Plan is 0.90 for all existing pipes and 0.75 for new developments. Based on discussion and review with the City, the maximum allowable flow depth criteria is based on pipe diameter ranges, consistent with industry standards that typically have varying levels of d/D ratios for various pipe sizes. Refer to Table 6-1 for the allowable d/D for all pipe sizes.

Another performance criteria to note are the forcemain hydraulics. The City standards currently state a minimum velocity of 3.5 ft/s and maximum velocity of 6.0 ft/s. As discussed in Ch. 5, forcemain velocities should be greater than 2.0 ft/s to maintain self-cleansing properties but less than 5.0 ft/s to minimize head loss and potential for water hammer. These update criteria are shown in Table 6-1.

TABLE 6-1. HYDRAULIC CRITERIA FOR EXISTING SYSTEMS

STANDARD	CRITERIA
VELOCITY	Minimum: 2.0 ft/s for peak flows; 1.75 ft/s at average rate of flow Maximum: 8.0 ft/sec
MINIMUM SLOPE	6-inch: 1.0% 8-inch: 0.40% 10-inch: 0.26% 12-inch & above: 0.20%
FRICTION FACTOR	Manning's n (gravity)=0.013 for Vitrified Clay Pipe (VCP) 0.011 for Polyvinyl Chloride (PVC) Hazen-Williams C (pressure)=100 to 120 depending on pipe size, material, and age
MINIMUM PIPE SIZE	8-inch
MAXIMUM ALLOWABLE FLOW DEPTH	10-inch or less: d/D=0.67 12-inch to 24-inch: d/D=0.80 27-inch or greater: d/D=0.90
SURCHARGING	Allowed as long as the Hydraulic Grade Line (HGL) remains at least 5-Feet Below the rim elevation
FORCEMAIN HYDRAULICS	Minimum: 2.0 ft/s Maximum: 5.0 ft/s

COLLECTION SYSTEM MODEL DEVELOPMENT

A hydraulic model of the sewer collection system was developed by Wallace Group with the Innovyze InfoSWMM Version 14.7 sewer modeling program. InfoSWMM utilizes Manning's Equation for open channel flow (gravity pipes), Dynamic Wave analysis for flow routing through the collection system, and the Hazen-Williams Equation for pressurized flow conditions (force mains). Model results were evaluated for pipeline capacity, flow velocity, and maximum d/D ratio under various flow conditions.

Flow Allocation

Existing and future flows were analyzed in the sewer model for dry and wet weather conditions. As discussed in Chapter 4, peaking factors were obtained during flow monitoring and flow rates were derived on a per-parcel basis by land use. These wastewater flows were allocated to individual sewer manholes based on the closest manhole to the land use parcel. Each tributary area represents the total residential, hotel, commercial, and institutional customers contained within the tributary boundary.

Future flows were allocated to the model based on most probable connection location of the Future Growth Areas, Focused Growth Areas, and Target areas. Refer to Figure 6-2 for the future flow allocations. Any deficiencies identified in this SSMPU are based on these assumed connections and the wastewater flows (by gravity, not pumped) discussed in Ch. 4. Additional modeling should be performed during the planning and design phases for each of these future developments should wastewater flows, tie-in

locations to the City's collection system, or timing of future developments be different than what is shown on Figure 6-2.

Model Calibration

Approximately six weeks of sewer flow data was collected in support of the hydraulic model development, as described in Chapter 4 of this report. Representative data for each flow monitoring location was compared to the model results. Through this process, both the land use flow factors and the diurnal curves were adjusted to represent the system flows as recorded through the flow monitoring.

The City provided pump curves for each of the eleven lift stations. The lift stations were calibrated based on FRM's measured flows during their lift station evaluation. If FRM noted worn impellers, poor pumping conditions, etc., the pump curve was adjusted to represent FRM's measured pumping rate.

System Conditions Analyzed

The hydraulic model was utilized to analyze dry and wet weather system flows for both existing and future flow conditions. Within the model, multiple scenarios were developed that represent these various conditions. Existing and future scenarios were utilized to identify system upgrades required in order to meet performance criteria and to identify areas recommended for high priority maintenance operations. Scenarios developed consist of the following:

- Existing ADF Scenario: This scenario represents the trunk sewer system under existing, average dry weather flow conditions.
- Future ADF Scenario: This scenario represents the trunk sewer system under future, average dry weather flow conditions with all future development connecting to the existing collection system.
- Existing MDDW Flow Scenario: This scenario represents the trunk sewer system under existing, maximum dry weather flow conditions. This scenario includes peak hour dry weather flow (PHDWF).
- Existing MDDW Flow + Reclamation Ditch Diversion: This scenario represents the trunk sewer system under existing, maximum dry weather flow conditions plus 6 cfs diversion coming from the reclamation ditch, since this diversion happens during the dry weather season only.
- Future MDDW Flow Scenario: This scenario represents the trunk sewer system under future, maximum dry weather flow conditions, with all future development connecting to the existing collection system. This scenario includes PHDWF.
- Future MDDW Flow + Reclamation Ditch Diversion: This scenario represents the trunk sewer system under future, maximum dry weather flow conditions plus the 6 cfs diversion coming from the reclamation ditch, since this diversion happens during the dry weather season.
- Existing PHWW Flow Scenario: This scenario represents the trunk sewer system under existing, peak hour wet weather flow conditions.
- Future PHWW Flow Scenario: This scenario represents the trunk sewer system under future, peak hour wet weather flow conditions, with all future development connecting to the existing collection system.

COLLECTION SYSTEM MODEL RESULTS – EXISTING FLOW CONDITIONS

Deficient System Capacity

The following locations were identified through the analysis as having insufficient capacity to meet the City's performance standards while conveying existing population wastewater flows. Figure 6-3 shows a system-wide map of available capacity under existing worst case peak conditions. Pipes with available capacity are shown in green, marginal capacity (within 10% of exceeding the maximum allowable hydraulic capacity) are shown in yellow, and above the maximum allowable hydraulic capacity are shown in red. Refer to Figure 6-4 for an overall map of the recommended areas for pipe upgrades.

Where improvements are recommended to the collection system, worst case d/D values are provided for reference. These d/D values represent a snapshot of the system under either: a) existing conditions, or b) proposed conditions with all improvements in place. In many cases, recommended upgrades would increase downstream maximum d/D, exceeding the City's standards, if the downstream recommended improvements were not constructed. Through the digital sewer model, maximum d/D was analyzed for the system, ensuring that recommended upgrades did not trigger additional downstream improvements.

Cesar Chavez

This segment receives a large amount of flow from the Alisal community, a dense part of the City. A majority of the flow comes from residential lots, but there are also several commercial lots along N Sanborn Road, and several schools.

The Cesar Chavez Park Existing CIP project proposes to upsize approximately 2,100 feet of 15-inch vitrified clay pipe (VCP) to 18-inch polyvinyl chloride (PVC) pipe from MH-J7-007 near Garner Ave to MH-K7-017 near E Laurel Dr. These pipe segments have d/D values ranging from 0.66 to 0.95 full during existing peak flow conditions. Upsizing would decrease the d/D to a range of 0.38 to 0.58.

This project also proposes upsizing approximately 3,000 ft of 21-inch VCP to 24-inch PVC pipe from MH-K7-017 near E Laurel Dr to MH-L6-001 near Circle Dr. These pipe segments have d/D values of 0.39 to 1 during existing peak conditions. Four (4) manholes are also surcharging within 5 ft of the manhole rim in this section. Upsizing would decrease d/D values to a range of 0.29 to 0.66.

An additional 3,500 ft of 24-inch VCP should be upgraded to 27-inch PVC from manhole L6-001 near Circle Dr to manhole K5-007 near Longbow Way. These pipe segments have d/D values from 0.60 to 0.85 during existing peak flow conditions. Upsizing this pipe will reduce d/D values to within 0.48 and 0.61.

In addition to the pipe replacements, it is also proposed to construct approximately 70 ft of new 24-inch pipe from MH-K5-007 to MH-K5-014, to split flow between 24-inch and 30-inch parallel mains.

City maintenance crews have noted that CCTV evaluation recorded pipe encrustations and manholes condition repairs for the pipe segment between K5-001 and K5-003.

Cherokee Dr

This segment of pipe is an important collector for the northern portion of Salinas. It receives a large amount of residential flow from the Santa Rita neighborhoods as well as commercial flows from the Northridge Mall and Santa Rita Plaza.

The Cherokee Dr. Existing CIP project proposes to replace approximately 1,600 feet of 18-inch VCP with 24-inch PVC pipe on Cherokee Dr from Seminole Way (MH-G3-008) to Tulane St (MH-H3-009). Cherokee Dr has insufficient capacity for existing conditions, with pipes segment d/D values between 0.67 and 1.0 during existing peak flow conditions. Four (4) of the twelve (12) manholes in this section are also surcharging within 5 ft of the manhole rim in the existing PHWWF condition. Upsizing these segments will reduce d/D values to between 0.34 and 0.48.

Upstream TP2

The Upstream TP2 Diversion Existing CIP project proposes to divert flows along East Alisal to South Sanborn Road by increasing the invert at MH-M6-012 by 0.35 ft. This can be done by constructing a weir within the existing manhole. The weir will cause the 18-inch along East Alisal to act as an overflow line, lessening the flow just downstream of TP2, which currently has a d/D value of 0.91 to 1.0 under existing peak conditions and two (2) surcharging manholes within 5 ft of the manhole rim.

It should be noted that future flows will affect this CIP, causing a need for upsizing the pipes along South Sanborn Rd.

Noice Dr/ Tyler St

The Noice Dr./Tyler Street existing CIP consists of two sections of pipe: one on Noice Drive and one on Tyler Street. These two sections are connected on West Laurel Drive and consist of VCP with diameters of 12-inches or less.

Noice Drive receives mostly residential flow, but also some commercial flow from N Main St, as well as flow from the North Salinas High School. For this section the Noice Dr/ Tyler St Existing CIP project proposes to replace approximately 2,100 feet of 8-inch VCP to 12-inch PVC pipe from MH-G4-015 at Chaparral St to MH-H4-011 at E Laurel Dr. This pipe segment has a d/D of 1.0 during existing peak flow conditions. Seven (7) of the nine (9) manholes on this segment are also surcharging to within 5 ft of the manhole rim during peak conditions. Upsizing would bring d/D values at peak condition down to 0.43 to 0.53.

Based on survey of this area, the downstream invert at MH-H4-012 is higher than the upstream invert at MH-H4-011. As part of this CIP, it is recommended to reconstruct MH-H4-012 to match inverts and change the flow direction from MH-H4-011 to MH-H4-012.

Additionally, it is recommended that approximately 170 ft of new 12-inch PVC pipe be constructed to connect MH-H4-006 to MH-H4-001 at West Laurel Drive and North Main Street. This new pipe will relieve the parallel 8-inch lines along North Main St that exceeds capacity under existing peak flow conditions.

Tyler Street also receives mostly residential flows with some commercial flow, and flow from one school, Kamman Elementary. It is recommended that approximately 3,300 feet of 12-inch VCP along West Laurel Dr. and Tyler St. from MH-H3-023 to MH-I3-001 should be upsized to 15-inch PVC. The d/D value for this section is 1.0 and nine (9) of the eleven (11) manholes are surcharging to within 5 ft of the manhole rims in the existing PHWWF condition. Upsizing would bring d/D values down to 0.43 to 0.70.

Natividad Rd or Alternative Natividad Consolidation

Natividad Road is a principal arterial in Salinas and this segment of pipe collects flow mostly from residential lots, with portions coming from commercial, and a few schools.

The Natividad Rd CIP project proposes to replace approximately 2,700 feet of 12-inch VCP to 15-inch PVC pipe from MH-G6-002 to MH-H6-003. These pipe segments have a d/D value of 1.0 during existing peak flow conditions. Upsizing would reduce d/D values to a range of 0.31 to 0.68. This project also recommends an overflow weir be constructed 0.5 ft above MH-H6-003 invert to make the 12-inch parallel an overflow pipe. Approximately 3,600 ft of 15-inch VCP should be replaced with 18-inch PVC pipe from MH-H6-003 to MH-I5-007. These pipe segments have d/D values of 0.85 to 1.0 during existing peak flow conditions.

At Sherwood Dr, approximately 305 ft of 12-inch VCP from MH-J5-003 to MH-J5-005 should be upsized to 15-inch PVC pipe. An additional 2,000 ft of 15-inch VCP should be upsized to 18-inch PVC from MH-J5-005 to MH-J4-010. These segments of pipe have d/D values of 0.99 to 1.0 during existing peak flow conditions. Eighteen (18) of the manholes are also surcharging within 5 ft of the manhole rim in the existing PHWWF condition. Upsizing would bring down the d/D values to between 0.39 and 0.54.

As an alternative project, the Natividad Consolidation CIP proposes to abandon the parallel 12-inch overflow and upsize the approximately 7,400 ft of 15-inch pipe to 21-inch from MH-H6-003 to MH-I5-011 and 24-inch from MH-I5-011 to MH-J4-022, as well as upsize approximately 1,100 feet of 21-inch line to 30-in line from MH-J4-022 to MH-K4-002. Note, the last segment of this CIP proposes to upsize the 21-inch line under HWY 101.

Northridge Mall

This segment of pipe runs on North Main Street from East Boronda Road to just past San Juan Grade Road. This pipe receives mostly residential flows, in addition to commercial flows from Northridge Mall and Santa Rita Plaza, as well as flows from three schools.

The Northridge Mall Existing CIP project proposes the upsizing of approximately 2,300 ft of 15-inch VCP to 18-inch PVC pipe from MH-E4-007 to MH-F4-011 along N Main St. These pipe segments have a d/D of 1.0 during existing peak flow conditions. Upsizing will reduce the d/D to a range of 0.31 to 0.80.

It is also recommended to connect the 18-inch pipe to the 27-inch pipe at MH-F4-031, abandoning 1,800 feet of the parallel 12-inch line along North Main Street from MH-F4-

031 to MH-G4-005. With current conditions, six (6) manholes are surcharging within 5 ft of the manhole rim in the existing PHWWF condition.

Low Pipe Velocity

Low pipe velocity results in the increased likelihood for solids to settle out of wastewater flow, leading to pipe backups and blockages. The City's design standards specify a minimum pipe velocity of 2.0 ft/s at peak conditions in order to "flush" out the line and maintain solids in suspension. A total of 325 modeled pipes were identified with a velocity below 2.0 ft/s under existing max day conditions. It is recommended that pipes identified with a maximum velocity of less than 2.0 ft/s be flushed on a regular basis that corresponds with the City's maintenance schedule. Total length of pipe running with a max day velocity less than 2.0 ft/s is 23 miles. Figure 6-5 depicts the pipes identified with low pipe velocities. Note, these recommendations are only for sewer mains modeled. It is anticipated that there are more sewer mains within the City's sewer collection system that have low velocities, thus a good sewer cleaning program is imperative to minimize risk of sanitary sewer overflows.

COLLECTION SYSTEM MODEL RESULTS – FUTURE FLOW CONDITIONS

As discussed, Figure 6-2 depicts the flow allocations that were used to analyze the future flow conditions in the model. It is important to understand that some of these deficient areas are due to a combination of multiple future developments. As stated previously, additional modeling should be performed during the planning and design phases of these future developments should wastewater flows, tie-in locations to the City's collection system, or timing of future developments be different than what is shown on Figure 6-2.

Deficient System Capacity

The following locations were identified through the analysis as having insufficient capacity to meet the City's performance standards while conveying future wastewater flows. The future flow scenarios assume that all existing CIPs identified by the sewer model have been constructed. Figure 6-6 shows a system-wide map of available capacity under future worst case peak conditions. Pipes with available capacity are shown in green, marginal capacity (within 10% of exceeding the maximum allowable hydraulic capacity) are shown in yellow, and above the maximum allowable hydraulic capacity are shown in red. Refer to Figure 6-7 for an overall map of the recommended areas for future pipe upgrades.

San Juan Grade

This section of pipe receives flow from the most northern part of the City, mainly from the residences of the Bolsa Knolls neighborhood. This pipe also receives some commercial flow, and flow from two schools.

The San Juan Grade Future CIP project upsizes approximately 3,800 ft of 8-inch and 10-inch VCP to 12-inch PVC pipe from MH-C5-008 to MH-D4-055. These pipe segments have d/D values of 0.33 to 1.0 during future peak flow conditions. Ten (10) of the MHs are surcharging within 5 ft of the manhole rim in the future PHWWF condition. Upsizing would bring the d/D values down to a range between 0.24 to 0.60.

North Davis Road

The North Davis Road Future CIP recommends upsizing approximately 240 ft of 18-inch to 24-inch from MH-H3-009 to MH-H3-013, 1,700 ft. of 24-inch to 30-inch from MH-H3-013 near Cherokee Dr to MH-H2-002 at Calle del Adobe, and 3,400 ft. of 30-inch to 32-inch from MH-H2-002 to MH-J2-047 at N Davis Rd. Under peak future conditions, this segment runs 43-100% full due to future flows. A majority of the future flows (81%) can be attributed to the West Area Specific Plan, with Target Area K contributing 15%, and Target Areal L contributing 4%.

It should be noted that this project assumes Existing Cherokee Drive CIP, and Existing Northridge Mall CIP have been constructed.

West Laurel Drive

The West Laurel Drive Future CIP recommends upsizing approximately 1,550 ft. of 12-inch to 15-inch from MH-H4-001 at N Main St to MH-H3-023 near Laurel Park. Under peak future conditions, this segment on West Laurel Drive runs 66-88% full. All future flows driving this project are from the Laurel Drive at North Main Street Focused Growth Area.

It should be noted that this project assumes Existing Noice Dr/Tyler Street CIP has been constructed.

Victor Street

The Victor Street Future CIP project recommends upsizing approximately 1,600 ft. of 15-inch to 18-inch from MH-J3-012 at Ashbury Way to MH-J2-007 at W Rossi St. Under peak future conditions, this segment along Victor St runs 73-98% full. All future flows driving this project are from the Laurel Drive at North Main Street Focused Growth Area.

It should be noted that this project assumes Existing Noice Dr/Tyler Street CIP has been constructed and Future West Laurel Dr. CIP has been constructed or will be constructed concurrently.

Freedom Parkway

The Freedom Parkway Future CIP project recommends the upsize of approximately 2,025 ft of 10-inch pipe to 15-inch from MH-J9-005 at Estrella Way to MH-J9-001 at N Sanborn Rd. An additional 2,725 ft of 12-inch pipe from MH-J9-001 to MH-I8-013 at Nogal Dr should be upsized to 18-inch. Under peak future conditions, this segment on Freedom Parkway runs 50-100% full and eight (8) manholes are surcharging within 5 ft. of the manhole rims. All future flows driving this project are from the East Area Specific Plan.

Natividad Creek Park

The Natividad Creek Park Future CIP project recommends upsizing approximately 230 ft of 18-inch to 21-inch from MH-H8-012 to MH-H8-004 and approximately 3,800 ft of 24-inch to 27-inch from MH-H8-004 at Freedom Pkwy to MH-I7-005 at the Twin Creeks Golf Course. Under peak future conditions, this segment through Natividad Creek Park runs 76-100% full. The future flows driving this project are split between the East Area Specific Plan at 58% and Central Area Specific Plan at 42%.

It should be noted that this project assumes Future Freedom Pkwy CIP has been constructed or will be constructed concurrently.

East Alisal Street

The East Alisal Street Future CIP project recommends upsizing approximately 5,400 ft. of 15-inch to 18-inch from MH-M8-010 near Bardin Rd to MH-M7-009 at Williams Rd. Additionally, approximately 2,200 ft of 18-inch should be upsized to 21-inch from MH-M7-009 to MH-M6-012 at N Sanborn Rd. Under peak future conditions, this segment runs 67-100% full and fourteen (14) manholes are surcharging within 5 ft of the manhole rims. All future flows driving this project are from the East Future Growth Area.

Abbott Street

The Abbot Street Future CIP project recommends upsizing approximately 1,300 ft of 12-inch to 15-inch from MH-Q7-001 at Harris Rd to MH-Q7-004. An additional 850 ft. of 12-inch pipe from MH-P6-015 to MH-P6-006 at Harkins Rd should be upsized to 15-inch, and 700 ft of 15-inch to 18-inch from MH-P6-006. Under peak future conditions, this segment runs 66-100% full. Under future max day flows three (3) manholes are surcharging within 5 ft of the manhole rim. The future flows driving this project are the East Future Growth Area at 59%, Target Area B at 39%, and Target Area F at 2%.

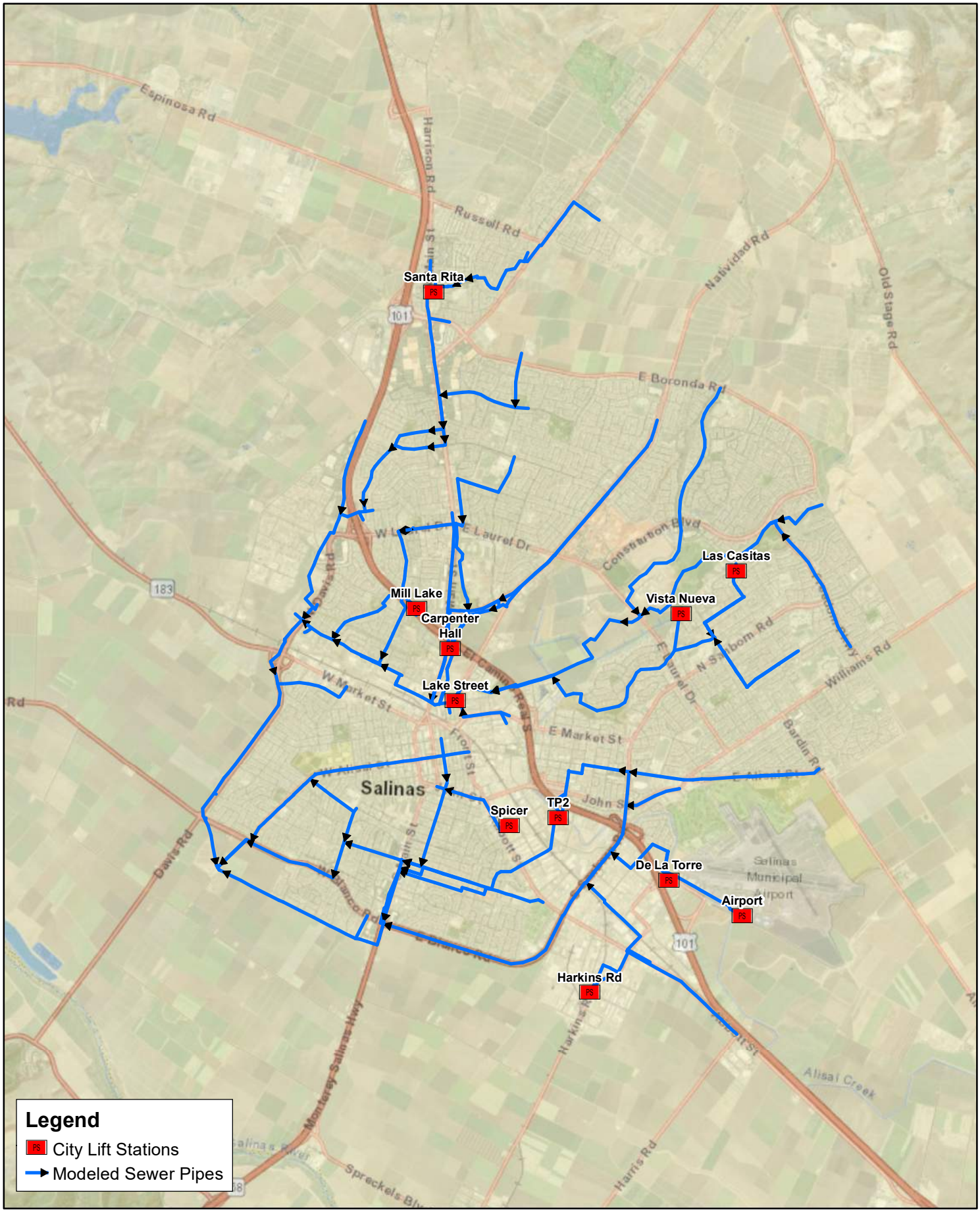
South Sanborn Road

In order to avoid upgrades at both South Sanborn and downstream of TP2, the South Sanborn Future CIP project proposes to increase the overflow elevation at MH-M6-012 to 65.09 ft in elevation (an additional 0.65 ft from Existing CIP Upstream TP2 Diversion). This hydraulic change would send future flows primarily down South Sanborn Road. Under peak future conditions, this segment runs 66-100% full and MH-N6-004 is surcharging. All future flows driving this project are from the East Future Growth Area.

This project proposes to upsize approximately 4,365 ft of 18-inch to 21-inch from MH-M6-012 at E Alisal St to MH O6-006 at Pellet Ave, 500 ft of 21-inch to 24-inch from MH O6-006 to MH O6-008 at Industrial St, and 1,500 ft of 24-inch to 27-inch from MH O6-008 to MH 05-002 near Abbott St. Since the overflow weir will send more flows down South Sanborn, these pipe upgrades will need to be constructed before the overflow elevation weir, ensuring that there is enough capacity to accommodate the flows down South Sanborn.

It should be noted that there is a concrete "weir" at MH N6-003 to stop South Sanborn Rd. flows from backing into Mayfair Dr. Detailed design for this project should consider raising the slope/invert on Mayfair Dr or increasing the slope along South Sanborn to prevent further backwater effects.

It should also be noted that this project assumes Future East Alisal CIP has been constructed or will be constructed concurrently.



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SALINAS SEWER MASTER PLAN UPDATE

FIGURE 6-1
WASTEWATER MODEL
OVERVIEW MAP

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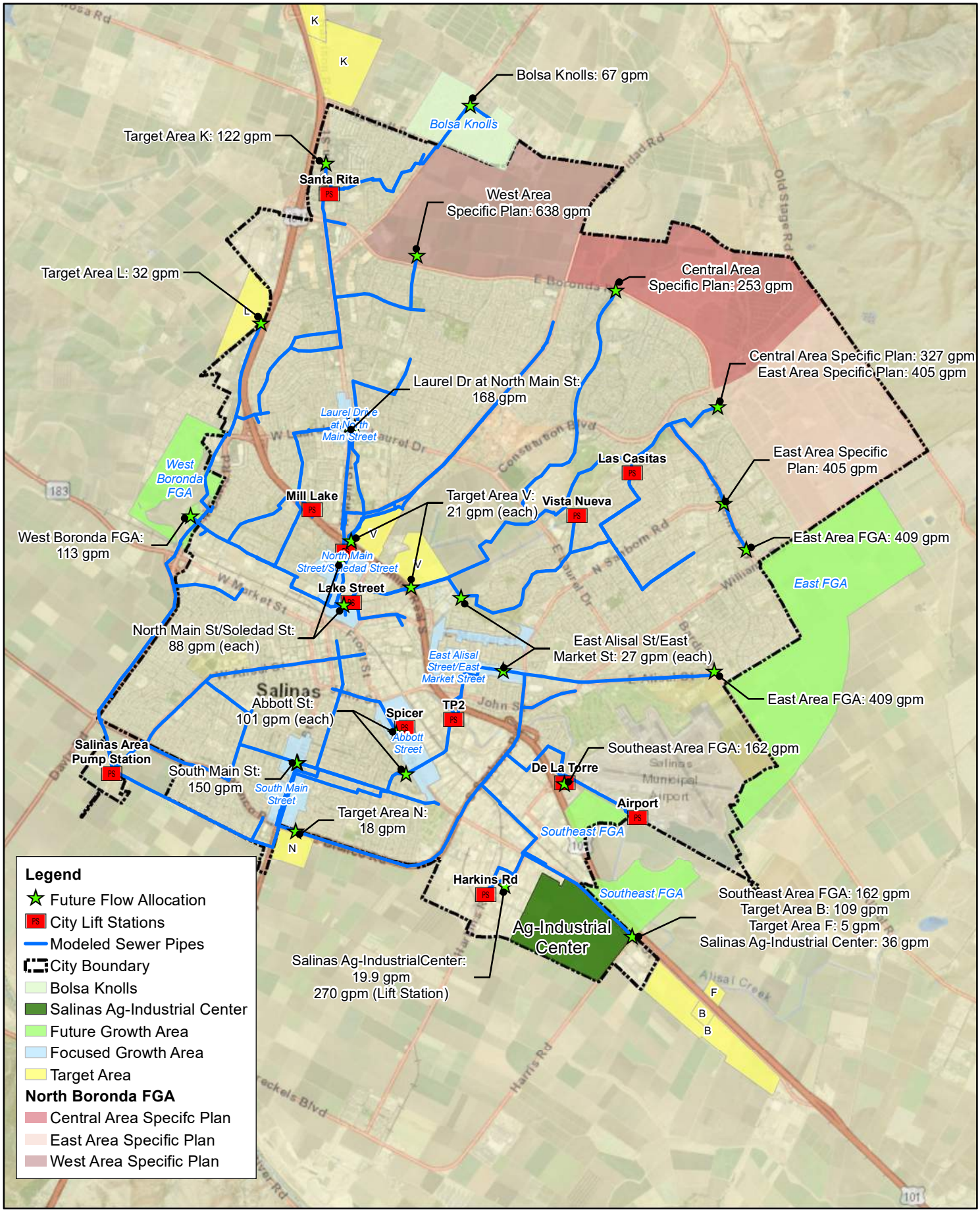

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FIGURE 6-2
FUTURE FLOW ALLOCATION

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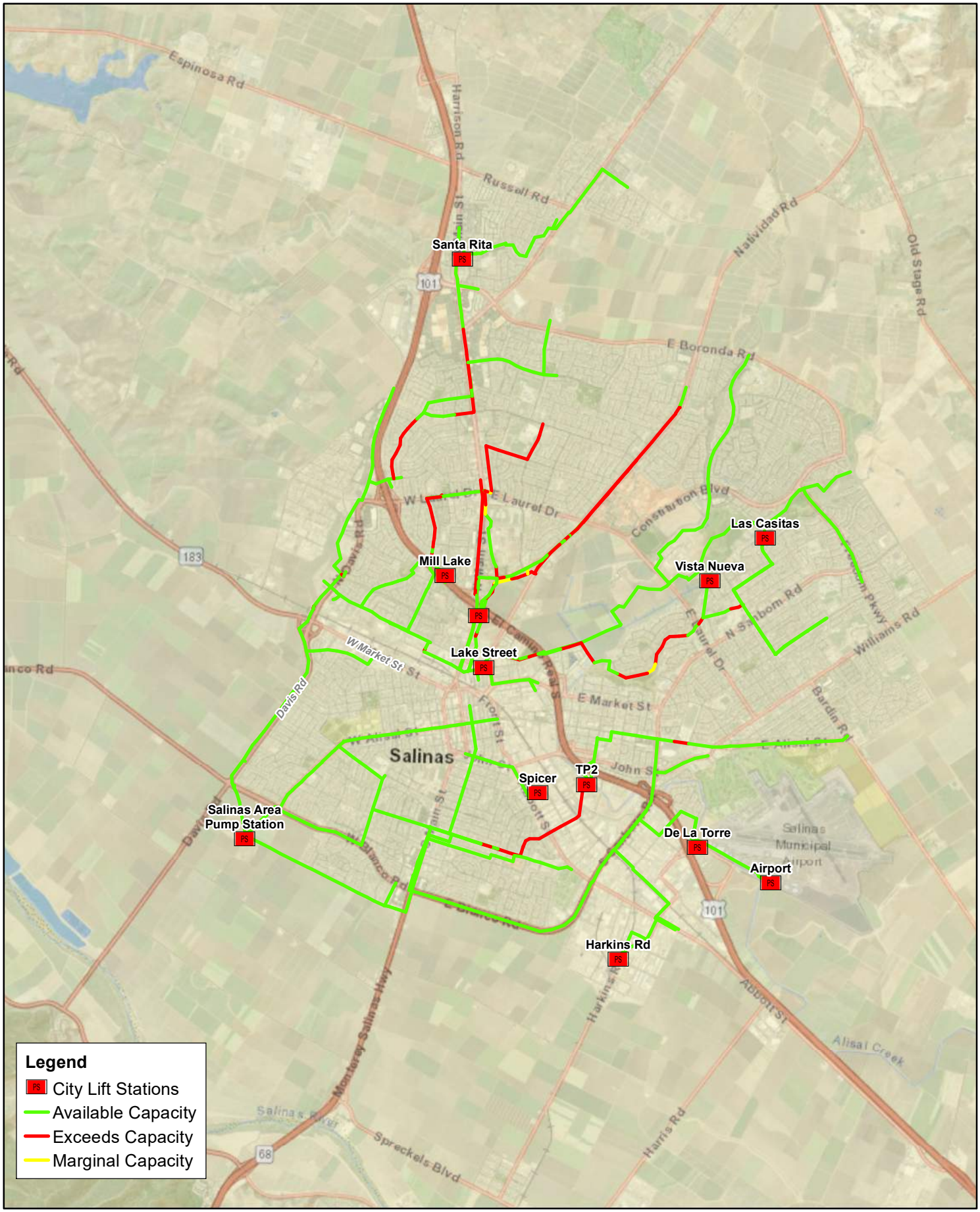

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FIGURE 6-3
EXISTING CAPACITY DURING PEAK CONDITIONS

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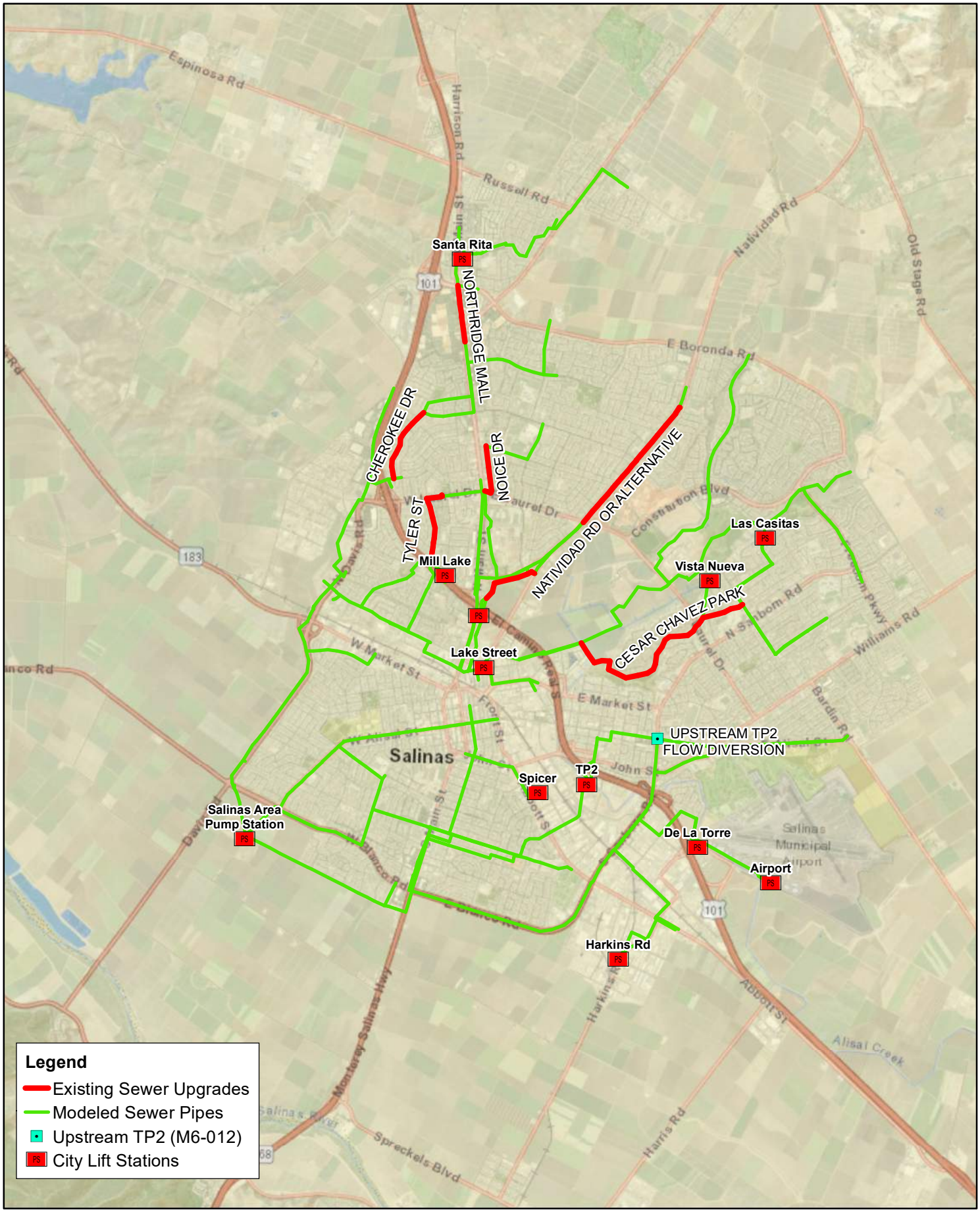

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FIGURE 6-4
EXISTING SEWER
UPGRADE PROJECTS

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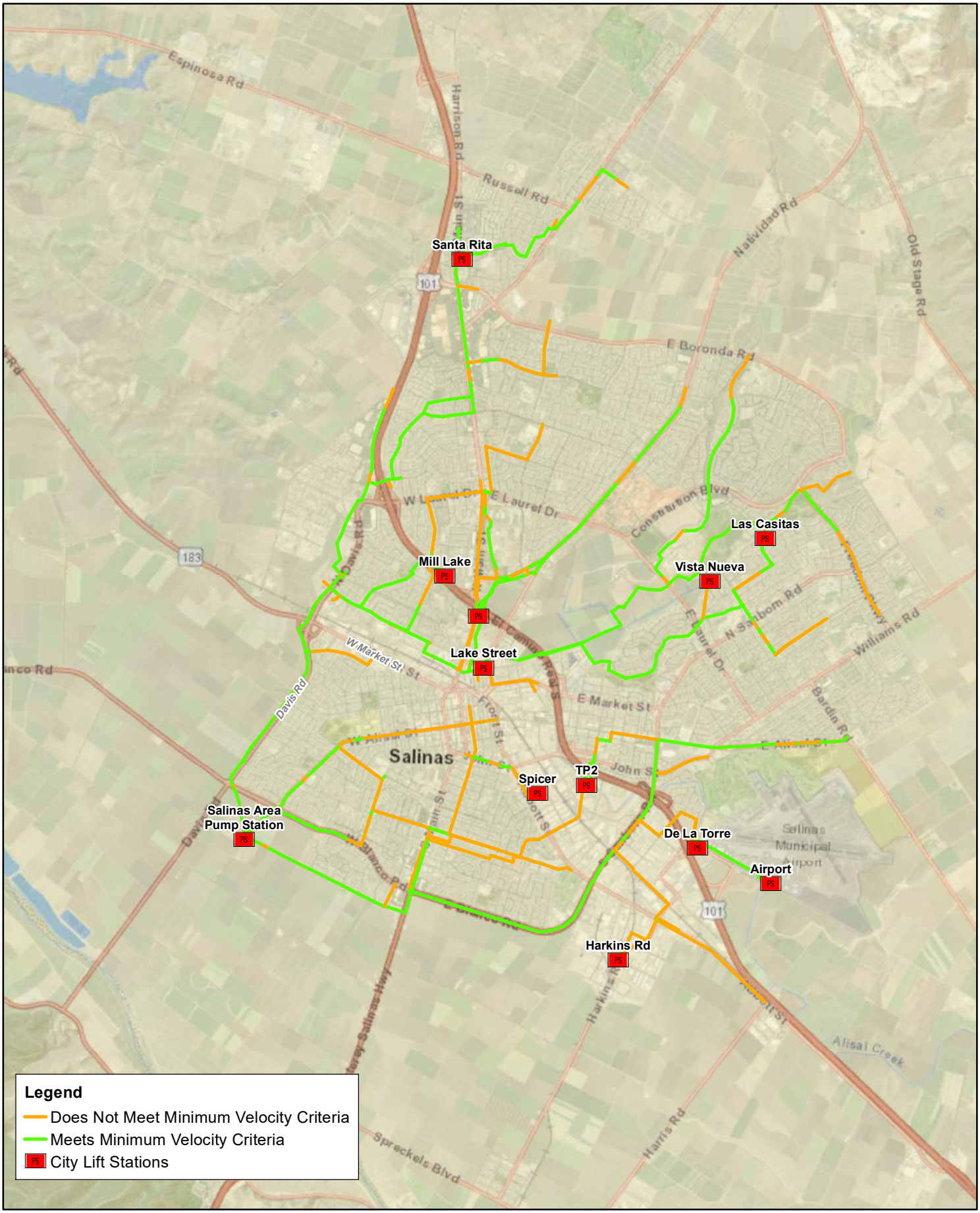

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FIGURE 6-5
LOW PIPE VELOCITY
DURING PEAK FLOW CONDITIONS

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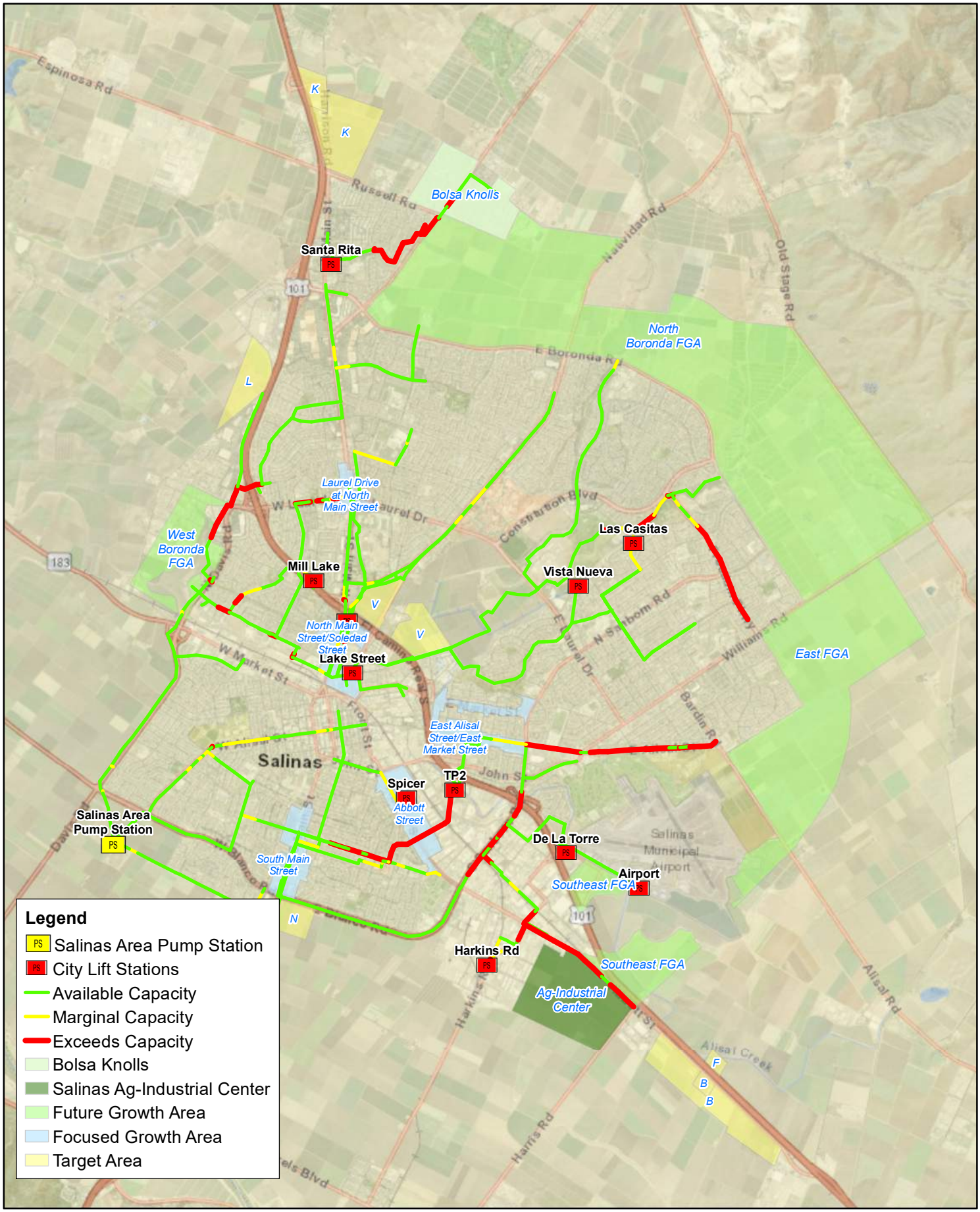

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FIGURE 6-6
FUTURE CAPACITY DURING PEAK CONDITIONS

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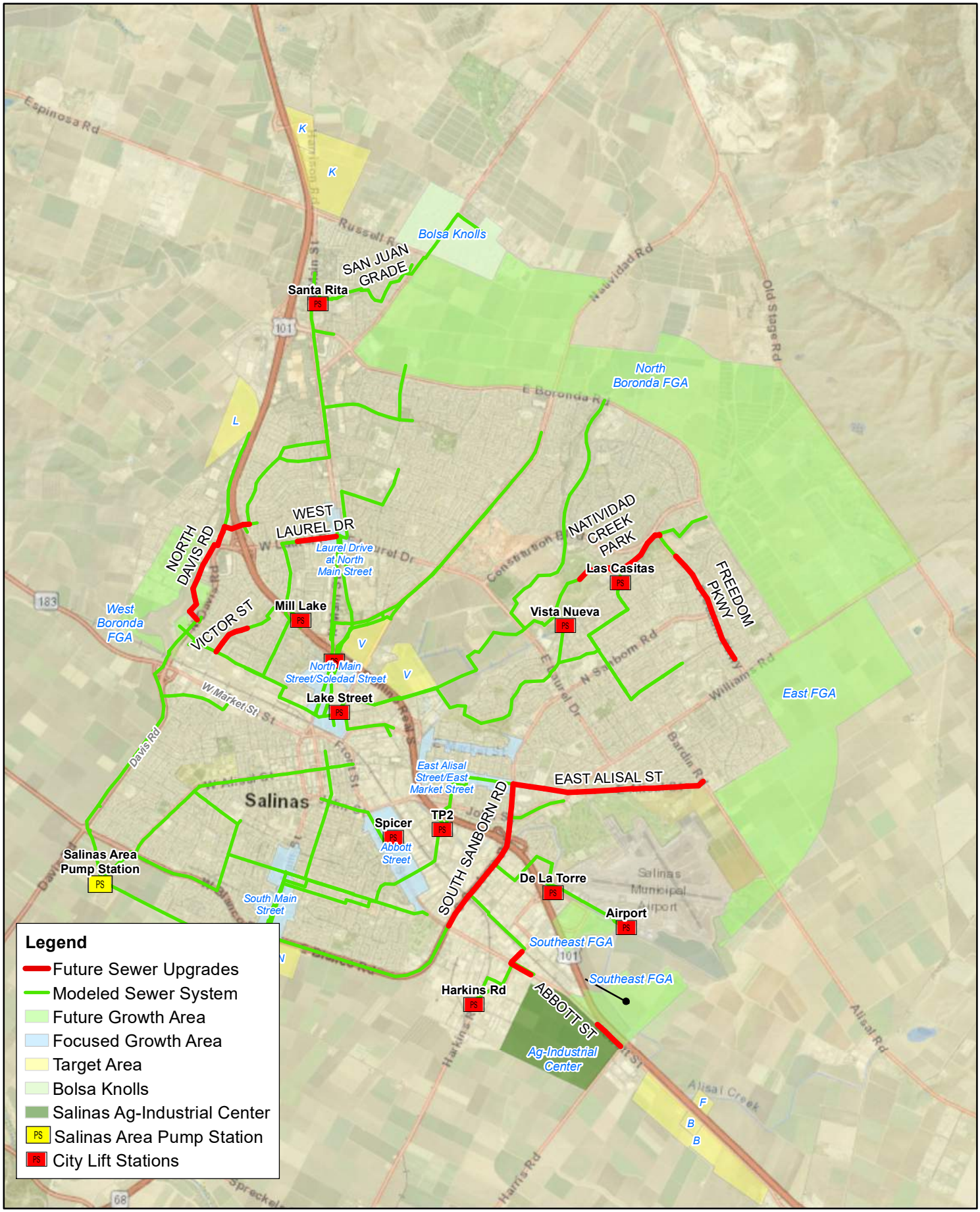

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FIGURE 6-7
FUTURE SEWER UPGRADE PROJECTS

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CHAPTER 7
CAPITAL IMPROVEMENT PROGRAM

This Chapter presents the proposed Capital Improvement Program (CIP), with a brief description of the proposed projects and a preliminary cost estimate for each. Also included in the CIP recommendations are general timelines for the improvements. The Mark Thomas 2017 CCTV Evaluation and O&M projects discussed in Chapter 3, I/I Evaluation discussed in Chapter 4, and Lift Station improvements discussed in Chapter 5 are included in the CIP.

BASIS OF CAPITAL IMPROVEMENT PROGRAM COSTS

The CIP costs were developed based on engineering judgment, confirmed bid prices for similar work in Monterey County, consultation with vendors and contractors, established budgetary unit prices for the work, and other reliable sources. Hard construction costs are typically escalated by a factor of 1.4 to allow budget for "soft costs" that include preliminary engineering, engineering, administration, construction management and inspection costs. All CIP costs are express in Year 2022 dollars, using the McGraw-Hill Engineering News Record (ENR) Construction Cost Index of **13004** (May 2022). Actual project costs will vary depending on economic conditions at the time of construction and should be escalated to the year or years schedule for the work.

Sewer Main Upgrade Unit Costs

Table 7-1 provides costs for the recommended capital improvement projects. The unit cost for replacement of gravity sewers includes the proposed pipelines, lateral re-connections, sewer bypassing, and traffic control. Construction methods such as pipe bursting and trenching were determined for different segments of each project depending on pipe conditions (existing sags, joint offsets, etc.) and number of lateral re-connections. Trenching was assumed for all new sewer main construction. Additionally, the City provided a GIS overlay of the known streets with concrete in the roadway. If the project required trenching in these roads, a unit cost was applied to account for removal and replacement of concrete in the roadway.

For the manhole condition assessment performed by the 2017 Mark Thomas CCTV Evaluation, the cost estimates for manhole repairs presented in Table 4 of the evaluation were escalated to Year 2022 dollars and used. The Mark Thomas CCTV Evaluation can be found in Appendix B of this SSMPU.

TABLE 7-1. SEWER MAIN CONSTRUCTION UPGRADE UNIT COSTS

CONSTRUCTION TYPE	UNIT COST/LINEAL FEET
6-INCH BURSTING	$380
6-INCH TRENCHING	$400
8-INCH BURSTING	$420
8-INCH TRENCHING	$450
10-INCH BURSTING	$460
10-INCH TRENCHING	$500
12-INCH BURSTING	$510
12-INCH TRENCHING	$560
15-INCH BURSTING	$590
15-INCH TRENCHING	$660
18-INCH BURSTING	$690
18-INCH TRENCHING	$780
21-INCH BURSTING	$800
21-INCH TRENCHING	$920
24-INCH BURSTING	$930
24-INCH TRENCHING	$1,090
27-INCH BURSTING	$1,080
27-INCH TRENCHING	$1,280
30-INCH BURSTING	$1,250
30-INCH TRENCHING	$1,510
32-INCH BURSTING	$1,390
32-INCH TRENCHING	$1,690
36-INCH BURSTING	$1,690
36-INCH TRENCHING	$2,100
CONCRETE IN ROADWAY	$65
MANHOLE REPLACEMENT	$16,000 EACH
COAT MANHOLE	$4,000 EACH
INSPECTION PORT	$3,500 EACH

CIP RANKING

The existing capital improvement projects were ranked to determine what priority the existing recommended projects should be constructed. These projects include those identified through the hydraulic model, lift station evaluation, Mark Thomas 2017 CCTV Evaluation, and the O&M repairs noted by City operations and maintenance crews.

Table 7-2 evaluates each of the projects in five categories: overflow to a water body of the State, if it meets design criteria, if it is identified by the City as a maintenance hot spot, its community impact, and if it is near a City manhole monitor that alerts crews if a manhole is surcharging. With input from the City, each category was provided a weighted importance factor based on the relative importance of the category. The importance factor is multiplied by the score of the project received and then added together to determine its final score.

It is recommended that the City review these projects periodically to determine if any substantial changes have occurred that may re-prioritize a project to a higher ranking. The future capital improvement projects were not ranked since they are determined by construction of the future developments that were identified for this SSMPU.

Lift Station CIPs

Lift Station CIPs have been categorized in two separate ways: one based on improvements needed at each lift station as a whole and the other based on improvement project type for all lift stations. Table 7-3 ranks each individual lift station based on eight categories: overflow to a water body, inspection frequency, existing pumping capacity deficiencies, peak hour emergency response time, if bypassing capabilities are needed, if an onsite generator with automatic transfer switch is needed, if control system upgrades are needed, and potential impact to the community. Although not included in the scoring, Table 7-3 also shows if the lift station would be impacted by future development. This criterion is important to consider if the lift station is being considered for upgrade and the likelihood of the upgrade being impacted by future development.

The other categorization of lift station improvements is based on project type. The following projects have been grouped together and ranked by City staff. See cutsheets at the end of this chapter for the lift stations that these projects apply to.

1. Controller Upgrades and Standardization
2. Install Emergency Bypass and Washdown Water
3. Safety/Falling Hazard Concerns
4. Generator Replacement
5. Onsite Standby Generator
6. Power Receptacle
7. Painting/Coating Maintenance

Depending on timing of full replacement of the lift stations, it may be recommended to upgrade lift station components that will aid in operation and maintenance, which are the Projects #1-7 noted above. This will allow time for the City to develop a funding plan for full replacement. This excludes Lake Street Lift Station, which needs full replacement immediately.

TIMING OF RECOMMENDED IMPROVEMENTS

The existing capital improvement projects are triggered by existing deficiencies, while the future capital improvement projects are triggered by one or more future developments connecting to the City's collection system. All projects identified as existing deficiencies based on the hydraulic model or O&M and are detailed out in Table 7-4. These existing projects are due to existing wastewater flows, but it is also important for these projects to be completed to accommodate future wastewater flows. All lift station existing CIP projects are detailed in Table 7-5. These existing projects are recommended to be completed within the next 1-7 years. The last four projects are unranked but are still considered existing deficiencies to be addressed by the City. The Inflow/Infiltration evaluation should be performed during a significant wet weather year in the next 1-5 years. The CCTV Inspection program should evaluate the entire collection system every 5 years or approximately 20% of the system per year. The brick manhole and flushing inlet replacements are considered lower priority due to the ongoing nature of the projects as the City performs continuous inspection of these area. Over the next 15 years, all brick manholes should be coated or replaced and all flushing inlets should be replaced with an 8-inch inspection port or new manhole.

The future capital improvement projects are triggered by potential future development. Since the timing of these projects and wastewater flow projections have not been finalized, it is recommended that additional modeling be performed during the planning and design phases of these future developments. The future projects presented in Table 7-6 assume the future wastewater flow allocations shown in Figure 6-2.

Recommended projects have not been evaluated for potential environmental impacts as a part of this study. Projects will be subject to the requirements of CEQA prior to approval and funding.

Following the tables, Figures 7-1 to 7-33 are project description sheets are provided for the sewer projects identified by sewer modeling (both existing and future) and the lift station upgrades (by lift station or project type). These description sheets can be used by City staff in the planning for each project and for inclusion in fiscal year budget requests.

Exhibit 1 in Appendix F shows all sewer upgrade projects and the sewer repairs noted by City crews.

TABLE 7-2
CITY OF SALINAS SSMPU
EXISTING HYDRAULIC AND MAINTENANCE REPAIR CIP RANKING MATRIX

Importance Factor		5	4	3	2	1			
Project Name	Type of Project	Overflow to Water Body of the State Yes - 10 No - 0	Design Standard Meets Design Standard - 0 Doesn't Meet Design Standards - 2 Surcharging - 5 Overflowing - 10	Maintenance Hot Spot Not Critical - 0 Yearly Check - 5 Weekly or Monthly Checks - 10	Community Impact < 5,000 - 0 5,001 to 10,000 - 5 >10,000 - 10	Near City Manhole Monitor Yes-5 No-0	Impacted By Future Development Yes/No	Score = Importance Factor X Points	Ranking
Cesar Chavez Park (includes North Madeira Avenue Repairs)	Hydraulic Deficiency	10	5	5	10	0	Yes, East Alisal Redevelopment	105	1
Upper Carr Lake Repairs	O&M	10	0	10	10	0	Yes, North Boronda FGA	100	2
Upstream TP2 Diversion	Hydraulic Deficiency	10	5	0	10	0	No	90	3
Northridge Mall	Hydraulic Deficiency	10	5	0	10	0	Yes, Target area K	90	4
East Market and Upstream of Lake Street Repairs	O&M	10	0	5	5	0	No	75	5
Louis & Van Buren Repairs	O&M	10	0	5	0	5	No	70	6
West Market at Davis Overcrossing	O&M	10	0	5	0	0	Yes, West Boronda FGA	65	7
Cherokee Dr	Hydraulic Deficiency	0	5	0	10	5	Yes, Target Area K	45	8
Malarin St and Wilgart Way Repairs	O&M	0	5	5	5	0	No	45	9
Romie Lane Repairs & Reconfiguration Analysis	O&M	0	0	10	5	0	No	40	10
King Street Repairs	O&M	0	0	10	0	5	No	35	11
Del Monte and Mae Repairs	O&M	0	0	10	0	5	No	35	12
Riker Street Repair	O&M	0	0	10	0	5	No	35	13
West Market Street Repairs	O&M	0	0	10	0	5	No	35	14
Johnson Place Repairs	O&M	0	5	5	0	0	No	35	15
N Main St Hwy 101 Underpass Bunker Repair	O&M	0	0	10	0	0	Yes, Target area V	30	16
Donner Way Repair	O&M	0	0	10	0	0	No	30	17
San Miguel Ave Repair	O&M	0	0	10	0	0	No	30	18
Noice Drive/Tyler Street	Hydraulic Deficiency	0	5	0	5	0	No	30	19
Natividad Rd or Alternative Natividad Consolidation	Hydraulic Deficiency	0	5	0	5	0	Yes, Target area V, north boronda FGA	30	20
Acacia, Bautista, Woodside Repairs	O&M	0	0	5	0	5	No	20	21
Comanche, Polk, and North First Repairs	O&M	0	0	5	0	5	Yes, Target area K	20	22
Sherwood Dr Repairs	O&M	0	0	5	0	5	Yes, Target area V	20	23
East Laurel and Williams Repairs	O&M	0	0	5	0	0	No	15	24
Hoover Street Repair	O&M	0	0	5	0	0	No	15	25

TABLE 7-2
CITY OF SALINAS SSMPU
EXISTING HYDRAULIC AND MAINTENANCE REPAIR CIP RANKING MATRIX

Importance Factor		5	4	3	2	1			
Project Name	Type of Project	Overflow to Water Body of the State Yes - 10 No - 0	Design Standard Meets Design Standard - 0 Doesn't Meet Design Standards - 2 Surcharging - 5 Overflowing - 10	Maintenance Hot Spot Not Critical - 0 Yearly Check - 5 Weekly or Monthly Checks - 10	Community Impact < 5,000 - 0 5,001 to 10,000 - 5 >10,000 - 10	Near City Manhole Monitor Yes-5 No-0	Impacted By Future Development Yes/No	Score = Importance Factor X Points	Ranking
Katherine Ave & Pajaro St Repairs	O&M	0	0	5	0	0	No	15	26
Wood Street Reconfiguration Analysis	O&M	0	0	5	0	0	No	15	27
Inflow/Infiltration Evaluation	Hydraulic	--	--	--	--	--	--	--	Dependent on significant wet weather year
CCTV Inspection Program	O&M	--	--	--	--	--	--	--	Annual Program
Brick Manhole Inspection & Replacement	O&M	--	--	--	--	--	--	--	Ongoing Inspection
Flushing Inlet (Cleanout) Inspection & Replacement	O&M	--	--	--	--	--	--	--	Ongoing Inspection

TABLE 7-3
CITY OF SALINAS SSMPU
EXISTING LIFT STATION CIP RANKING MATRIX

Importance Factor	5	4	3	3	2	2	2	1			
Project Name	Overflow to Water Body of the State Yes - 10 No - 0	Inspection Frequency Emergency Callouts-10 Daily Inspections-5 Weekly Inspections-0	Existing Pumping Capacity Deficiencies Yes-10 No-0	Peak Hour Emergency Response Time 0-15 minutes-10 15-30 minutes-5 Greater than 30 minutes-0	Bypass Required? Yes-5 No-0	Onsite Generator with Automatic Transfer Switch Required? Yes-5 Replace Generator-3 No-0	Critical Control/Electronic Upgrades Required? Yes-5 No-0	Community Impact < 5,000 - 0 5,001 to 10,000 - 5 >10,000 - 10	Impacted By Future Development Yes/No	Score = Importance Factor X Points	Ranking
Lake St Lift Station	10	10	10	10	0	3	5	10	Yes, Target Area V, East Alisal Street/East Market Street, Central Area and East Area Specific Plans, and East Area FGA **Pumps must be upsized for future flows.**	176	1
Santa Rita Lift Station	10	10	0	10	5	3	5	5	Bolsa Knolls Septic Conversion & Target Area K	151	2
Carpenter Hall Lift Station	10	5	0	10	5	3	0	10	Yes, North Boronda FGA and Targe Areas K & V	126	3
De La Torre Lift Station	10	10	0	0	5	5	5	0	Possible, Southeast FGA **Pumps may need to be upsized for future flows**	120	4
Spicer Lift Station	10	10	0	0	5	5	5	0	No	120	5
Mill Lake Lift Station	10	5	0	10	5	0	5	0	No	120	6
Vista Nueva Lift Station	10	10	0	0	0	0	0	0	No	90	7
Las Casitas Lift Station	10	0	0	10	0	0	5	0	No	90	8
TP2 Lift Station	10	0	0	0	5	3	0	10	Yes, East Alisal Street/East Market Street and East FGA. **Pumps must be upsized for future flows.**	76	9
Harkins Lift Station	0	10	0	0	5	5	5	0	Yes, Salinas Ag-Industrial Center **Pumps must be upsized for future flows**	70	10
Airport Lift Station	10	0	0	0	0	0	0	0	Yes, Southeast FGA	50	11

TABLE 7-4.
CITY OF SALINAS EXISTING CAPITAL IMPROVEMENT PROGRAM (CIP)

Project #	Title	Description	Tributary Area	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost ($)	Soft Cost ($)*	Total Project Cost ($)**
1	**Cesar Chavez Park**	Upsize sewer main	Lake St	2,100	15	18	Acosta Plz	Garner Ave to E Laurel Dr	J7-007	K7-017	$8,369,000	$3,347,600	**$11,716,600**
			Lake St	3,000	21	24	Open Space/Park	E Laurel Dr to near Circle Dr	K7-017	L6-001			
			Lake St	3,500	24	27	Open Space/Park	Circle Dr to Longbow Way	L6-001	K5-007			
		New sewer main	Lake St	70	--	24	Open Space/Park	Near Yorkshire Way	K5-007	K5-014			
CCTV evaulation noted pipe encrustations and manholes need new frames, covers, and lining in a portion of the Cesar Chavez Park CIP. These repairs are noted below and should be replaced if Cesar Chavez Park CIP is not constructed in the near term.													
1.1		Mark Thomas 2017 Findings Minor defects, needs new frame and cover, lining interior of manhole (Garde:10) (K5-001); Visible agregate and broken frame, needs new frame & cover, lining interior of manhole (Grade: 3) (K5-003); Pipe (Grade:4),WLS of 0.6, encrustations	Lake St	380	24	24	N Madeira Ave	N Madeira north of Cesar Chavez park between St Helen Way and Terrace St	K5-001	K5-003	$438,000	$175,200	**$613,200**
2	**Upper Carr Lake Repairs**	Mark Thomas 2017 Findings New MH frame and cover, install marker (Grade:5) (MH I6-004); expose and raise MH- curently buried (Grade:10) (I6-006); New MH frame and cover, install marker (Grade:10) (I6-005); (I6-004 to I6-006) Pipe WLS =0.35, root ball, (Grade: 3); (I6-006 to I6-005) (Grade:2)	Lake St	410	21	21	Laurel Dr.	Bike Trail Near Veteran's Way	I6-004	I6-005	$396,500	$158,600	$555,100
		Mark Thomas 2017 Findings New MH frame & cover w/ PCC collar, line in 5 yrs (Grade:3) (J6-001); New frame & cover w/ PCC collar, line in 5 yrs (Grade:3) (J6-002);Pipe d/D: 0.75, grease deposits (Grade: 10)	Lake St	300	27	27	Trail around Upper Carr Lake	Off of E Laurel Dr near Veteran's Way	J6-001	J6-002	$406,000	$162,400	$568,400
										Total Repair Project Costs	$802,500	$321,000	**$1,123,500**
3	**Upstream TP2 Diversion**	Weir Construction	TP2	--	--	--	East Alisal St	South Sanborn Rd	M6-012	--	$45,000	$18,000	**$63,000**
4	**Northridge Mall**	Upsize sewer main	--	2,300	15	18	North Main St	From East Boronda Road to San Juan Grade Road	E4-007	F4-011	$1,916,000	$766,400	**$2,682,400**
		Sewer Main Connection/Realignment	--	320	--	18	North Main St	From Big 5 Sporting Goods to Harden Pkwy	F4-007	F4-031			

TABLE 7-4.
CITY OF SALINAS EXISTING CAPITAL IMPROVEMENT PROGRAM (CIP)

Project #	Title	Description	Tributary Area	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost ($)	Soft Cost ($)*	Total Project Cost ($)**
5	**East Market and Upstream of Lake Street Repairs**	Mark Thomas 2017 Findings Expose and raise MH to grade, buried (Grade:10) (K5-008)	Lake St	--	--	--	Yorshire Way	Yorkshire Way, between Longbow Way and Doncaster Pl	K5-008	--	$5,900	$2,360	$8,260
		Mark Thomas 2017 Findings Expose and raise MH to grade, buried (Grade:10) (K5-010); Pipe broken, encrustations (Grade:5)	Lake St	150	24	24	Longbow Way	Long bow Way and Kern St	K5-009	K5-010	$169,400	$67,760	$237,160
		Mark Thomas 2017 Findings Replace frame & cover w PCC collar, reline, Corroded frame & chimney (Grade: 10) (K5-012); Replace Frame & cover w PCC collar, install marker, corrosion, grease and surcharge (Grade:10) (K5-021); Pipe cracks, grease deposits, (Grade:3); Replace frame & cover w PCC collar, install marker, corroded frame and aggregate (Grade:3) (K5-019); Replace frame & cover, install ecc. Cone for fence, corroded frame & heavy grease & surch. (Grade:10) (K5-020); Pipe WLS: 0.25,d/D:0.9, grease deposits (Grade:2)	Lake St	840	24 & 30	24 & 30	East of Sun St	Between Sun St and HWY 101	K5-012, K5-019	K5-020, K5-021	$1,125,100	$450,040	$1,575,140
		Mark Thomas 2017 Findings New frame & cover, lining interior of manhole (Grade:10) (L4-002 and L4-004)	Lake St	--	--	--	E Market St	E Market St, between Sun St and Peach Dr	L4-002	L4-004	$23,800	$9,520	$33,320
										Total Repair Project Costs	$1,324,200	$529,680	**$1,853,880**
The Louis and Van Buren maintenance repairs are along the future San Juan Grade CIP. These segments should be replaced if the future San Juan Grade CIP is not constructed in the near term.													
6	**Louise and Van Buren Street Repair**	Pipe sags, surcharging manholes	Santa Rita	260	8	8	Louise St	Louise St, between Lenny St and Louise Ct	D5-001	D4-003	$149,000	$59,600	$208,600
		Pipe sags, surcharging manholes	Santa Rita	70	8	8	Van Buren Ave	near East Bolivar St	D4-007	D4-055	$63,500	$25,400	$88,900
										Total Louise and Van Buren St Repair Project Costs	$212,500	$85,000	**$297,500**
7	**West Market at Davis Overcrossing**	Bunker doors on Large Trunk line need replacement	--	--	--	--	West Market St	N Davis Road Overcrossing	J2-045	K2-038	$13,350	$5,340	**$18,690**
8	**Cherokee Drive**	Upsize sewer main	--	1,600	18	24	Cherokee Dr	From Seminole Way to Tulane Street	G3-008	H3-009	$1,920,000	$768,000	**$2,688,000**
9	**Malarin St and Wilgart Way Repairs**	Pipe issue joints, roots	--	380	8	8	Wilgart Way	Wilgart Way, E Romie Ln to Fl	O4-050	O4-011	$171,000	$68,400	$239,400
		Mark Thomas 2017 Findings Heavy corrosion, reline manhole (Grade:4)	--	--	--	--	Near Railroad	Between Work St and Brunken Ave, near railroad	N5-003	--	$9,300	$3,720	$13,020
		Mark Thomas 2017 Findings Grease deposits and surcharging, recommend PCC collar to prevent I/I, new bench and rechannelize (Grade:10)	--	--	--	--	Los Palos Dr	Near intersection of Los Palos Dr and Fairmont Dr	O5-019	--	$6,300	$2,520	$8,820
										Total Repair Project Costs	$186,600	$74,640	**$261,240**
10	**Romie Lane Repairs & Reconfiguration Analysis**	Hydrogen Sulfide damage, MH rings and lids need replacement. Concrete in roadway. Recommended reconfiguration analysis before repairs.		4,030	18	18	Romie Lane	Near Los Palos Drive to South Main Street	O4-007	N3-002	--	$100,000	**$100,000**
11	**King Street Repairs**	Major pipe sags	TP2	1,170	8	10	King St	King St, E Market to E Alisal	L5-033	L5-039	$585,000	$234,000	**$819,000**
12	**Del Monte and Mae Repairs**	Trough pipe missing in MH	Lake St	--	--	--	C Street	On C St, Galindo St to Mae Ave	--	K8-012	$16,000	$6,400	$22,400
		Pipe sags, needs replacement	Lake St	820	8	8	Del Monte Ave	Del Monte Ave, Mae Ave to Green St	K8-011	J8-020	$369,000	$147,600	$516,600

TABLE 7-4.
CITY OF SALINAS EXISTING CAPITAL IMPROVEMENT PROGRAM (CIP)

Project #	Title	Description	Tributary Area	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost ($)	Soft Cost ($)*	Total Project Cost ($)**
		Pipe sags, broken pipe, trough and pipe are gone	Lake St	830	6	6	Mae Ave	Mae Ave, D St to Del Monte	J8-008	K8-013	$332,000	$132,800	$464,800
										Total Repair Project Costs	$717,000	$286,800	**$1,003,800**
13	**Riker Street Repair**	Pipe has damage and missing sections at manhole	--	20	6	6	Riker Street	Lang Street	--	M3-035	$8,000	$3,200	**$11,200**
14	**West Market Street Repairs**	Pipe has major sags, consider re-alignment of section. Concrete in roadway.	--	450	8	8	Villa Street	At Villa St and Kirkwood Ave	L2-016	K3-016	$231,750	$92,700	$324,450
		Both F.I.'s are blown out	--	--	--	--	West Market St	Near El Cerrito Market	L3-043	L3-010	$32,000	$12,800	$44,800
		Pipe sags. Concrete in roadway.	--	840	6	6	Capitol St	Capitol St, W Market St to Archer St	L3-013	L3-040	$336,000	$134,400	$470,400
		Pipe sags. Concrete in roadway. Replace F.I. with new manhole.	--	710	6	6	Capitol St	Capitol St, Archer St to F.I.	L3-041	F.I	$346,150	$138,460	$484,610
										Total Repair Project Costs	$945,900	$378,360	**$1,324,260**
15	**Johnson Place Repairs**	Pipe damage, sags, spidering under tracks, ongoing backups, MH O5-005 has settled, always surcharging	--	1,470	12	12	Johnson Pl	Johnson Pl Abbott Pl to railroad tracks	N5-011	O5-005	$839,200	$335,680	**$1,174,880**
16	**N Main St Hwy 101 Underpass Bunker Repair**	Bunker damage to pipe, pipe missing at bunker on both sides, clogging	--	50	10	10	N Main St	N Main St at Hwy 101	J4-012	J4-013	$25,000	$10,000	**$35,000**
17	**Donner Way**	Pipe damages, sags, etc.	Carpenter Hall	280	8	8	Donner Way	Truckee Way to Emerald Dr	G6-037	G6-060	$126,000	$50,400	**$176,400**
18	**San Miguel Ave Repair**	Pipe Damage; broken pipe 10-feet from manhole	--	10	8	8	Pajaro St	Pajaro St and San Miguel	04-025	O3-038	$4,500	$1,800	**$6,300**
19	**Noice Drive/Tyler Street**	Upsize sewer main	--	2,100	8	12	Noice Dr	From Chaparral Street to East Laurel Drive	G4-015	H4-011	$3,400,000	$1,360,000	**$4,760,000**
		Reconstruct manhole	--	--	--	--	E Laurel Dr	East Laurel Drive near N Main Street	H4-012	--			
		New sewer main	--	60	--	12	E Laurel Dr	East Laurel Drive to North Main Street	H4-006	H4-001			
		Upsize sewer main	--	3,300	12	15	Tyler Street	West Laurel Drive down to HWY 101	H3-023	I3-001			
20	**Natividad Rd**	Upsize sewer main	Carpenter Hall	2,700	12	15	Natividad Rd	From near Sausal Drive to East Alvin Drive	G6-002	H6-003	$6,090,000	$2,436,000	**$8,526,000**
		Weir Construction	Carpenter Hall	--	--	--	Natividad Rd	East Alvin Drive	H6-003	--			
		Upsize sewer main	Carpenter Hall	3,600	15	18	Natividad Rd	East Alvin Drive to near East Laurel Drive	H6-003	I5-007			
			Carpenter Hall	305	12	15	Off of Sherwood Dr	From Sherwood Drive toward East Bernal Drive	J5-003	J5-005			
			Carpenter Hall	2,000	15	18	Parallel to E Bernal Dr and N Main St	From near Sherwood Dr to Santa Clara Ave	J5-005	J4-010			
	Alternative Natividad Consolidation	Upsize sewer main	--	2,400	15	21	Natividad Rd	East Alvin Drive to Pacheco St	H6-003	I5-011	$9,120,000	$3,648,000	**$12,768,000**
			--	5,000	15	24	Natividad Rd	to Sherwood Park on East Bernal Drive	I5-011	J4-022			
			--	1,100	21	30	Easement	Portion along Alpine Dr	J4-022	J4-011			
			--	620	21	30	Under Highway 101		J4-011	K4-002			

TABLE 7-4.
CITY OF SALINAS EXISTING CAPITAL IMPROVEMENT PROGRAM (CIP)

Project #	Title	Description	Tributary Area	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost ($)	Soft Cost ($)*	Total Project Cost ($)**
21	Acacia, Bautista, Woodside Repairs	Pipe Sags, replace F.I. with new manhole	--	130	8	8	Acacia Circle North	W Acacia St	F.I.	N3-039	$74,500	$29,800	$104,300
		Pipe Sags	--	280	8	8	Woodside Dr	Woodside Dr, Teakwood Pl to Riker St	O3-016	O3-015	$126,000	$50,400	$176,400
		Pipe Sags	--	490	8	8	Bautista Dr	Bautista Dr, W Romie Ln to Orange Dr	N3-014	N3-060	$220,500	$88,200	$308,700
		Pipe issue joints, roots, offsets, replace F.I. with new manhole	--	230	8	8	Bautista Dr	Bautista Dr, F.I to W Acacia	F.I	N3-029	$119,500	$47,800	$167,300
										Total Repair Project Costs	$540,500	$216,200	**$756,700**
22	Comanche, Polk, and North First Repairs	Pipe issue, joints, replace F.I. with new manhole	--	690	6	6	Comanche Way	Shawnee Way to Cherokee Dr	F.I.	G3-010	$292,000	$116,800	$408,800
		Pipe issue joints, roots, replace F.I. with new manhole	--	490	8	8	Polk St	Polk St, Monroe St to W Laurel Dr	F.I.	I3-045	$236,500	$94,600	$331,100
		Pipe sags	--	640	8	8	N 1st St	N 1st St, Boeing Ave, W Curtis St	H4-061	H4-054	$288,000	$115,200	$403,200
										Total Repair Project Costs	$816,500	$326,600	**$1,143,100**
23	Sherwood Dr Repairs	Pipe cracks at 220-ft mark downstream from K4-052. Obstruction (possibly old water line) in K4-076	Lake St	840	12	12	Sherwood Dr	Near Sioux Dr to E Rossi St	K4-052	K4-076	$486,400	$194,560	**$680,960**
24	East Laurel and Williams Repairs	Pipe sags, broken pipe	--	450	10	10	Easement	E Laurel Dr at 105 Oregon St	K7-011	K7-014	$225,000	$90,000	$315,000
		Pipe sags	--	1,080	8	8	Williams Rd	Williams Rd, E Market St to Quilla St	L7-009	M7-006	$486,000	$194,400	$680,400
										Total Repair Project Costs	$711,000	$284,400	**$995,400**
25	Hoover Street Repair	F.I. repair blown out	Santa Rita	--	--	--	Hoover Street	1885 Hoover Street	--	--	$16,000	$6,400	**$22,400**
26	Katherine Ave & Pajaro St Repairs	Mark Thomas 2017 Findings Exposed aggregate & heavy corrosion,fiberglass peeling, weld cover, recommend reline manhole, new bench, and rechannelize (Grade:10) (O4-001); Welded/broken cover, recommend new frame & cover (Grade:10), (O4-002); Pipe d/D 0.85 (Grade: 1)	--	--	--	--	Katherine Ave	Katherine Ave and Alameda Ave	O4-001	O4-002	$16,800	$6,720	$23,520
		Mark Thomas 2017 Findings Corrosion, broken cover, rechannel, needs new manhole (Grade:10)	--	--	--	--	Pajaro St	Pajaro St near Katherine Ave	O4-006	NA	$14,600	$5,840	$20,440
										Total Repair Project Costs	$31,400	$12,560	**$43,960**
27	Wood Street Reconfiguration Analysis	Pipe sags, always plugs, can't CCTV Entire area needs reconfiguration	Lake St	1,820	--	--	Easement	Between Wood and Roosevelt Street	L5-029	L5-034	--	$50,000	**$50,000**
--	CCTV Program	CCTV inspection of 20% (approximately 58 miles) of the collection system each year	All	--	--	--	--	--	--	--	--	$9,392,000	**$9,392,000**
--	Inflow/Infiltration Evaluation	Conduct full I/I evaluation of the entire collection system (during significant wet weather year) and update the sewer model	All	--	--	--	--	--	--	--	--	$140,000	**$140,000**
--	Brick Manhole Inspection & Coat/New Manhole Replacement	Inspect and replace brick manholes (108 based on field survey and City input)	All	--	--	--	--	--	--	--	Coat: $432,000 New Manhole: $1,728,000	Coat: $172,800 New Manhole: $691,200	**Coat: $604,800** **New Manhole: $2,419,200**
--	Flushing Inlet (Cleanout) Inspection & Port/New Manhole Replacement	Inspect and replace flushing inlets/cleanouts (1,403 based on City GIS)	All	--	--	--	--	--	--	--	Inspection Port: $4,910,500 New Manhole: $22,448,000	Inspection Port: $1,964,200 New Manhole: $8,979,200	**Inspection Port: $6,874,700** **New Manhole: $31,427,200**
												EXISTING SEWER PROJECT CIP TOTAL COSTS	**$59-$90 million**

***Soft costs include a 40% escalation of the construction costs for planning, engineering, CM, legal/admin.**
****All CIP costs are expressed in May 2022 dollars, using McGraw-Hill ENR Construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.**

TABLE 7-5.
CITY OF SALINAS EXISTING LIFT STATIONS CAPITAL IMPROVEMENT PROGRAM (CIP)

Project #	Title	Description	Tributary Area (Acres)	PHDW Flow (gpm)	Firm Capacity	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost ($)	Soft Cost ($)*	Total Project Cost ($)**
1	**Lake Street Lift Station**	Full lift station replacement/relocation, see cutsheet for summary	4,108	6,375	-13%	146 East Rossi Street	Intersection of E Lake St and E Rossi St across from Monterey County Housing Alliance	K4-022	K4-019	9,500,000	3,800,000	**13,300,000**
2	**Santa Rita Lift Station**	Full lift station replacement, see cutsheet for summary	348	670	112%	2021 Sucre Court	Behind the parking lot of Salinas Valley Motel	D4-019	--	3,500,000	1,400,000	**4,900,000**
3	**Spicer Lift Station**	Full lift station replacement, see cutsheet for summary	79	99	107%	59 Spicer St	On Spicer street near A & S Metals	N5-009	N5-007	2,200,000	880,000	**3,080,000**
4	**Mill Lake Lift Station**	Full lift station replacement, see cutsheet for summary	43	132	287%	81 Gardenia Dr	Off of Heather Circle	J4-020	I3-001	2,750,000	1,100,000	**3,850,000**
5	**Carpenter Hall Lift Station**	Lift station rehabilitation, see cutsheet for summary	508	1,226	31%	516 North Main St	Behind the Coast Auto Insurance parking lot	J4-011	K4-002	1,050,000	420,000	**1,470,000**
6	**De La Torre Lift Station**	Full lift station replacement, see cutsheet for summary	10	7	4845%	1200 De La Torre St	Across De La Torre St from Inns of California Salinas	O7-001	N7-009	1,200,000	480,000	**1,680,000**
7	**Vista Nueva Lift Station**	Full lift station replacement, see cutsheet for summary	6	41	408%	704 Garner Ave	Off Garner Ave near Natividad Creek	J7-034	J7-014	2,200,000	880,000	**3,080,000**
8	**Harkins Road Lift Station**	Full lift station replacement, see cutsheet for summary	146	135	175%	1200 Harkins Rd	Intersection of Dayton St and Harkins Rd	Q6-001	Q6-009	1,300,000	520,000	**1,820,000**
9	**Las Casitas Lift Station**	Lift station rehabilitation, see cutsheet for summary	38	137	189%	721 Las Casitas Dr	Near intersection of Ranchero Dr and Las Casitas Dr	I7-001	--	650,000	260,000	**910,000**
10	**TP2 Lift Station**	Full lift station replacement, see cutsheet for summary	136	279	99%	650 Elvee Dr	Across Alisal Creek from Fleet Service Center	N5-006	N5-022	2,500,000	1,000,000	**3,500,000**
11	**Airport Lift Station**	Lift station rehabilitation, see cutsheet for summary	584	60	960%	730 La Guardia St	South west corner of the Ramco Enterprise LP parking lot	O8-004	O8-005	800,000	320,000	**1,120,000**
											EXISTING LIFT STATION CIP TOTAL PROJECT COSTS	**38,710,000**

***Soft costs include a 40% escalation of the construction costs for planning, engineering, CM, legal/admin.**
****All CIP costs are expressed in May 2022 dollars, using McGraw-Hill ENR Construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.**

TABLE 7-6.
CITY OF SALINAS FUTURE CAPITAL IMPROVEMENT PROGRAM (CIP)

Title	Description	Tributary Area	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost ($)	Soft Cost ($)*	Total Project Cost ($)**
San Juan Grade	Upsize sewer main	Santa Rita	3,800	8 and 10	12	San Juan Grade Road	From Russell Rd to Van Buren Ave	C5-008	D4-055	$2,370,000	$948,000	**$3,318,000**
North Davis Road	Upsize sewer main	--	240	18	24	Tulane Street	Between Cherokee Dr and US HWY 101	H3-009	H3-013	$8,430,000	$3,372,000	**$11,802,000**
		--	1,700	24	30	N Davis Rd	HWY 101 to Calle del Adobe	H3-013	H2-002			
		--	3,400	30	32	Parallel to N Davis Rd	Calle del Adobe to intersect with N Davis Rd near Rossi Rico Parkway	H2-002	J2-047			
West Laurel Drive	Upsize sewer main	--	1,550	12	15	W Laurel Dr	From N Main St to near Laurel Park	H4-001	H3-023	$1,020,000	$408,000	**$1,428,000**
Victor Street	Upsize sewer main	--	1,600	15	18	Victor St	From Ashby Way to W Rossi St	J3-012	J2-007	$1,250,000	$500,000	**$1,750,000**
Freedom Parkway	Upsize sewer main	Lake St	2,025	10	15	Freedom Parkway	From Estrella Way to N Sanborn Rd	J9-005	J9-001	$3,280,000	$1,312,000	**$4,592,000**
		Lake St	2,725	12	18	Freedom Parkway	From N Sanborn Rd to Nogal Dr	J9-001	I8-013			
Natividad Creek Park	Upsize sewer main	Lake St	230	18	21	Natividad Creek Park	Crossing Freedom Parkway to Natividad Creek Park	H8-002	H8-004	$4,590,000	$1,836,000	**$6,426,000**
		Carpenter Hall	3,800	24	27	Natividad Creek Park	Natividad Creek Park to Twin Creeks Golf Course	H8-004	I7-005			
East Alisal Street	Upsize sewer main	--	5,400	15	18	E Alisal St	From Bardin Rd to Williams Rd	M8-010	M7-009	$5,780,000	$2,312,000	**$8,092,000**
		Part in TP2	2,200	18	21	E Alisal St	From Williams Rd to S Sanborn Rd	M7-009	M6-012			
Abbott Street	Upsize sewer main	--	1,300	12	15	Abbott St	From Harris Rd	Q7-001	Q7-004	$1,920,000	$768,000	**$2,688,000**
		--	850	12	15	Abbott St	To Harkins Rd	P6-015	P6-006			
		--	700	15	18	Harkins Rd	From Abbot St toward Schilling Pl	P6-006	after P6-003 (no City ID)			

TABLE 7-6.
CITY OF SALINAS FUTURE CAPITAL IMPROVEMENT PROGRAM (CIP)

Title	Description	Tributary Area	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost ($)	Soft Cost ($)*	Total Project Cost ($)**
South Sanborn Road	Increase Overflow Elevation	TP2	--	--	65.09 ft (elevation)	S Sanborn Rd	S Sanborn at E Alisal St	--	M6-012	$5,980,000	$2,392,000	**$8,372,000**
	Upsize Sewer Main	--	4,365	18	21	S Sanborn Rd	From E Alisal St to Pellet Ave	M6-012	O6-006			
		--	500	21	24	S Sanborn Rd	From Pellet Ave to Industrial St	O6-006	O6-008			
		--	1,500	24	27	S Sanborn Rd	From Industrial St to near Abbott St	O6-008	O5-002			
												$48,468,000

***Soft costs include a 40% escalation of the construction costs for planning, engineering, CM, legal/admin.**
****All CIP costs are expressed in May 2022 dollars, using McGraw-Hill ENR Construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.**

Existing CIP Project #1: Cesar Chavez Park

City of Salinas Capital Improvement Project Information Sheet

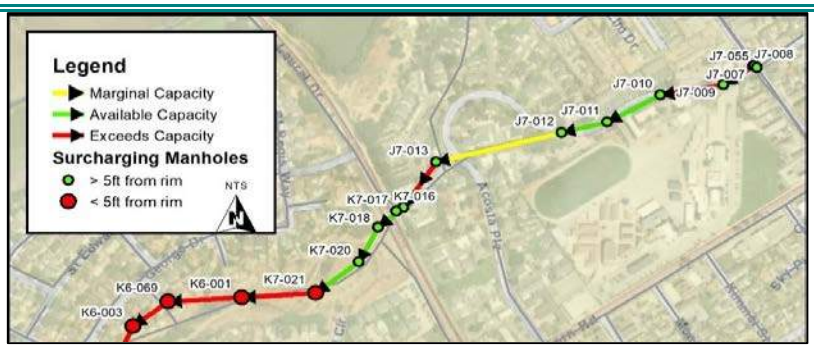
2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Project Components

- [x] Upgrade Gravity Pipeline
- [x] New Gravity Pipeline
- [ ] Upgrade Lift Station
- [ ] Upgrade Force Main
- [x] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole



SEE BELOW, TOP RIGHT

Project Need

- [x] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [ ] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$8,369,000
Planning, Engineering, CM, Legal/Admin (40%)	$3,347,600
Total Project Cost	**$11,716,600**

Project Description

The Cesar Chavez Park Existing CIP project proposes to upsize approximately 2,100 feet of 15-inch pipe to 18-inch pipe from MH-J7-007 near Garner Ave to MH-K7-017 near E Laurel Dr. These pipe segments run 66% to 95% full during existing peak flow conditions. This project also proposes upsizing approximately 3,000 ft of 21-inch pipe to 24-inch from MH-K7-017 near E Laurel Dr to MH-L6-001 near Circle Dr. These pipe segments run 39% to 100% full during existing peak conditions. Four (4) manholes are surcharging within 5 ft of the manhole rim in this section. An additional 3,500 ft of 24-inch should be upgraded to 27-inch from manhole L6-001 near Circle Dr to manhole K5-007 near Longbow Way. These pipe segments run at 60% to 85% full during existing peak flow conditions. The existing 21-inch and 24-inch pipe sizes are based on as-built records and should be field verified before upsizing.

In addition to the pipe replacements, it is also proposed to construct approximately 70 ft of new 24-inch pipe from MH-K5-007 to MH-K5-014 to split flow between 24-inch and 30-inch parallel mains.

It should be noted that CCTV evaluation recorded pipe encrustations and manholes condition repairs for the pipe segment between K5-001 and K5-003.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing CIP Project #3: Upstream TP2 Diversion

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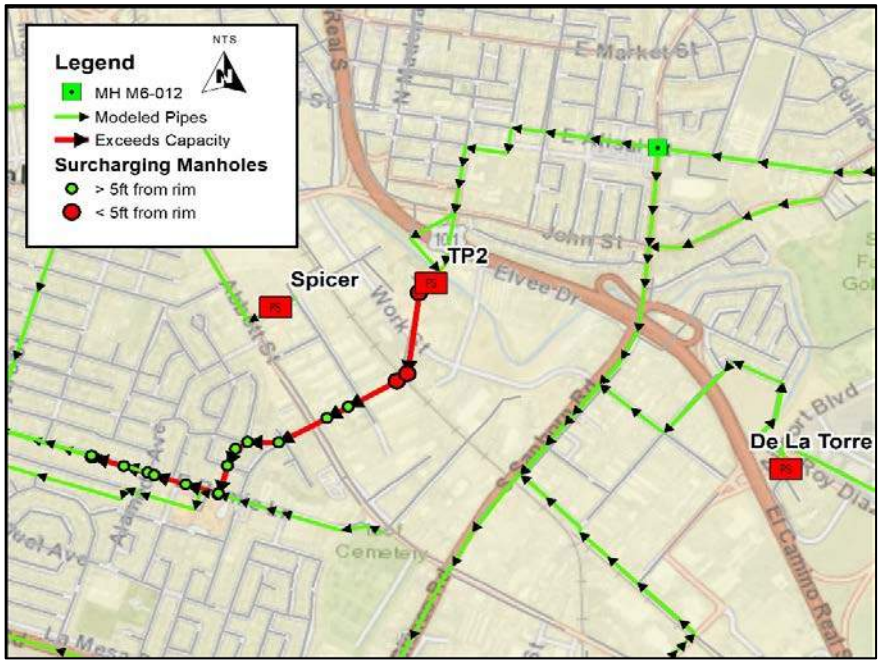
2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [ ] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [x] Replace Manhole



Project Need

- [x] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [ ] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$45,000
Planning, Engineering, CM, Legal/Admin (40%)	$18,000
Total Project Cost	**$63,000**

Project Description

The Upstream TP2 Diversion Existing CIP project proposes to divert flows along East Alisal to South Sanborn Rd. by increasing the invert at MH-M6-012 by 0.35 ft. This will cause the 18-inch along East Alisal to act as an overflow line, lessening the flow just downstream of TP2 which currently runs at 91-100% full under existing peak conditions.

It should be noted that future flows will affect this CIP, causing a need to upsize along South Sanborn Rd (see Future CIP South Sanborn Road).

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing CIP Project #4: Northridge Mall

City of Salinas Capital Improvement Project Information Sheet

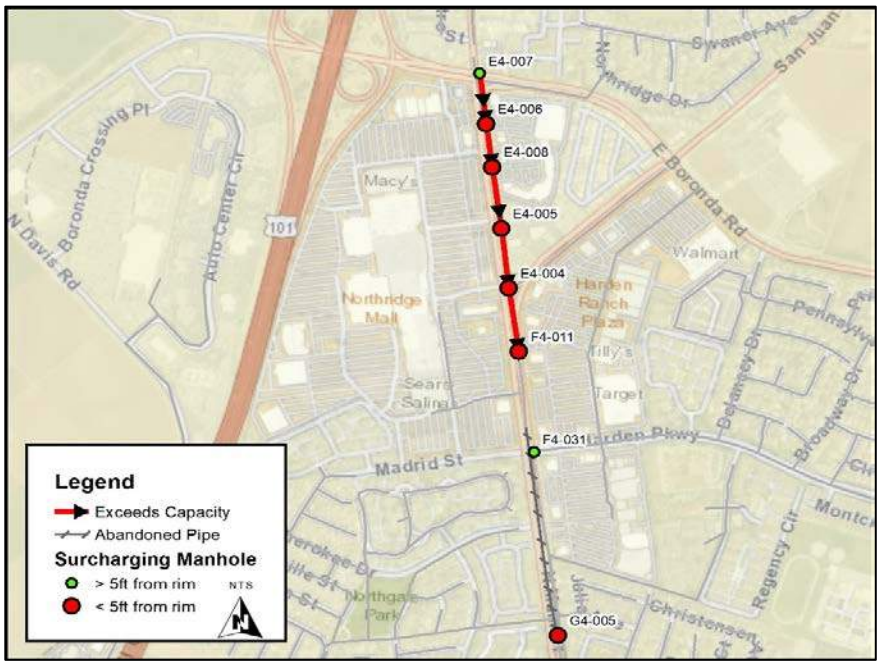
2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [x] Future Condition

Project Components

- [x] Upgrade Gravity Pipeline
- [x] New Gravity Pipeline
- [ ] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole



Project Need

- [x] Insufficient capacity for existing flow
- [x] Insufficient capacity for future flow
- [ ] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,916,000
Planning, Engineering, CM, Legal/Admin (40%)	$766,400
Total Project Cost	**$2,682,400**

Project Description

The Northridge Mall Existing CIP project proposes the upsizing of approximately 2,300 ft of 15-inch pipe to 18-inch from MH E4-007 to MH F4-011 along N Main St. These pipe segments run 100% full during existing peak flow conditions. It is also recommended to connect the 18-inch pipe at F4-007 to the 27-inch pipe at MH F4-031, abandoning 1,800 feet of the parallel 12-inch line along North Main Street from MH F4-031 to G4-005. This connection will require trenching in a roadway where concrete has been identified. A cost per lineal foot to remove and replace the concrete has been added to the construction cost. With current conditions, six (6) manholes are surcharging within 5 ft of the manhole rim in the existing PHWWF condition.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing CIP Project #8: Cherokee Drive

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [x] Future Condition

Project Components

- [x] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [ ] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [x] Insufficient capacity for existing flow
- [x] Insufficient capacity for future flow
- [ ] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,920,000
Planning, Engineering, CM, Legal/Admin (40%)	$768,000
Total Project Cost	**$2,688,000**

Project Description

The Cherokee Dr Existing CIP project proposes to replace approximately 1,600 feet of 18-inch pipe with 24-inch pipe on Cherokee Dr from Seminole Way (MH-G3-008) to Tulane St (MH-H3-009). Cherokee Dr has insufficient capacity for existing conditions. These pipes segments run 67% to 100% full during existing peak flow conditions. Four (4) of the twelve (12) manholes in this section are surcharging within 5 ft of the manhole rim in the existing PHWWF condition.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Existing CIP Project #19: Noice Drive/Tyler Street

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [x] Upgrade Gravity Pipeline
- [x] New Gravity Pipeline
- [ ] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [x] Replace Manhole

Project Need

- [x] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [ ] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$3,400,000
Planning, Engineering, CM, Legal/Admin (40%)	$1,360,000
Total Project Cost	**$4,760,000**

Project Description

The Noice Dr/ Tyler St Existing CIP project proposes to replace approximately 2,100 feet of 8-inch pipe to 12-inch pipe on Noice Dr from MH-G4-015 at Chaparral St to MH-H4-011 at E Laurel Dr. This pipe segment runs 100% full during existing peak flow conditions. It is also recommended to reconstruct MH-H4-012 to match inverts and change the flow direction from MH-H4-011 to MH-H4-012. Additionally, it is recommended that approximately 60 ft of new 12-inch pipe be constructed to connect MH-H4-006 to MH-H4-001 at West Laurel Dr and North Main St. This new pipe will relieve the parallel 8-inch lines along North Main St that exceeds capacity under existing peak flow conditions. Finally, approximately 3,300 feet of 12-inch pipe along West Laurel Dr. and Tyler St. from MH-H3-023 to MH-I3-001 should be upsized to 15-inch. Sixteen (16) of the twenty (20) manholes are surcharging within 5 ft of the manhole rim in the existing PHWWF condition.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing CIP Project #20: Natividad Rd or Alternative Natividad Consolidation

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Project Components

- [x] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [ ] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [x] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [ ] Existing condition limits O&M
- [x] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$6,090,000
Planning, Engineering, CM, Legal/Admin (40%)	$2,436,000
Total Project Cost	**$8,526,000**

Project Description

The Natividad Rd CIP project proposes to replace approximately 2,700 feet of 12-inch to 15-inch from MH-G6-002 to MH-H6-003. These pipe segments run 85% to 100% full during existing peak flow conditions. This project recommends an overflow weir be constructed 0.5 ft in MH-H6-003 to make the 12-inch parallel an overflow pipe. Approximately 3,600 ft of 15-inch pipe should be replaced with 18-inch from MH-H6-003 to MH-I5-007. These pipe segments run 100% full during existing peak flow conditions. At Sherwood Dr, approximately 305 ft of 12-inch pipe from MH-J5-003 to MH-J5-005 should be upsized to 15-inch and approximately 2,000 ft of 15-inch to 18-inch from MH-J5-005 to MH-J4-010. These segments of pipe are running at 100% full at existing peak flow conditions. Eighteen (18) of the manholes are surcharging within 5 ft of the manhole rim in the existing PHWWF condition.

As an alternative, the Natividad Consolidation CIP proposes to abandon the parallel 12-inch overflow and upsize the approximately 7,400 ft of 15-inch pipe to 21-inch from MH-H6-003 to MH-I5-011 and 24-inch from MH-I5-011 to MH-J4-022, as well as upsize approximately 1,100 feet of 21-inch line to 30-in line from MH-J4-022 to MH-K4-002. Note, the last segment of this CIP proposes to upsize 620 feet of 21-inch to 30-inch under HWY 101.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing Lift Station CIP (BY LIFT STATION): Lake Street

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2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [x] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [ ] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [x] Replace Lift Station

Project Need

- [x] Insufficient capacity for existing flow
- [x] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$9,500,000
Planning, Engineering, CM, Legal/Admin (40%)	$3,800,000
Total Project Cost	**$13,300,000**

Project Description

Relocate lift station across the street on the east side of West Rossi Street. The costs are for a full lift station replacement. Costs include replacement of forcemain. Costs do not include any land acquisition.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing Lift Station CIP (BY LIFT STATION): Santa Rita

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$3,500,000
Planning, Engineering, CM, Legal/Admin (40%)	$1,400,000
Total Project Cost	**$4,900,000**

Project Description

It is recommended to do a full replacement of this lift station as it is in less than satisfactory condition. The costs provided are for full replacement. Costs do not include land acquisition if required. Costs do not include replacement of the forcemain.

Electrical Upgrades
- Install control cabinet above grade
- Install receptacle and transfer switch for portable generator
- Replace control panel breaker disconnects and overload reset buttons
- Provide label for voltage on the cabinet
- Repair broken conduit between dry and wet well
- Seal all penetrations into the dry well
- Upgrade Micro-Mac control system
- Move conduit underground

Mechanical Upgrades
- N/A

Site and Piping Upgrades
- Install emergency bypass system
- Install emergency overflow tank
- Repair wet well coating
- Provide on-site water for wash down

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing Lift Station CIP (BY LIFT STATION): Spicer

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$2,200,000
Planning, Engineering, CM, Legal/Admin (40%)	$880,000
Total Project Cost	**$3,080,000**

Project Description

It is recommended to do a full replacement of this lift station as it is in less than satisfactory condition. The costs provided are for full replacement. Costs do not include land acquisition if required. Costs do not include replacement of the forcemain.

Electrical Upgrades
- Install cabinet above grade
- Installing a transfer switch for emergency back-up generator
- Replace control panel breaker disconnects and overload reset buttons
- Provide label for voltage on the cabinet
- Replace conduit in wet well
- Upgrade the SCADA control system

Mechanical Upgrades
- N/A

Site and Piping Upgrades
- Install emergency overflow tank
- Repair leak in the 6" force main in the dry well
- Install removeable bollards at the dry well
- Install emergency bypass system
- Coat the wet well
- Repair coating on the floor of the dry well
- Provide on-site water for wash down

Additional Studies
- Perform study to determine if the wet well can be relocated outside of the street.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing Lift Station CIP (BY LIFT STATION): Mill Lake

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$2,750,000
Planning, Engineering, CM, Legal/Admin (40%)	$1,100,000
Total Project Cost	**$3,850,000**

Project Description

It is recommended to do a full replacement of this lift station as it is in less than satisfactory condition. The costs provided are for full replacement. Costs do not include land acquisition if required. Costs do not include replacement of the forcemain.

Electrical Upgrades
- Move control cabinet above ground
- Replace control panel breaker disconnects
- Install receptacle and transfer switch for portable generator
- Provide label for voltage on the cabinet
- Move electrical conduit underground

Mechanical Upgrades
- N/A

Site and Piping Upgrades
- Install emergency overflow tank
- Install fencing around dry well
- Coat wet well
- Install emergency bypass system
- Provide on-site water for wash down

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing Lift Station CIP (BY LIFT STATION): Carpenter Hall

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,050,000
Planning, Engineering, CM, Legal/Admin (40%)	$420,000
Total Project Cost	**$1,470,000**

Project Description

Costs provided are for the upgrades provided below. This lift station is anticipated to only be rehabilitated, not a full replacement.

Electrical Upgrades
- Label electrical cabinets with line voltage
- Repair or replace motor to pump #1
- Install disconnect switches for each pump at the bottom of the dry pit.
- Install receptacle and transfer switch for portable generator

Mechanical Upgrades
- Replace flow meter
- Install emergency bypass system

Site and Piping Upgrades
- Install emergency overflow tank
- Repair or replace wet well access lid
- Repair piping/penetration from dry well to wet well
- Provide on-site water for wash down

Additional Studies
- Evaluate generator for replacement

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing Lift Station CIP (BY LIFT STATION): De La Torre

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- ☑ Existing Condition
- ☑ Future Condition

Jurisdiction

- ☑ City of Salinas

Project Components

- ☐ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☑ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole

Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☑ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,200,000
Planning, Engineering, CM, Legal/Admin (40%)	$480,000
Total Project Cost	**$1,680,000**

Project Description

Recommend minor upgrades as needed to maintain the lift station for existing uses and then full replacement of the lift station to meet future demands. Costs included on this cut sheet are for a full replacement of this lift station but do not include property acquisition if required. Does not include forcemain replacement.

Electrical Upgrades
- Install a receptacle and transfer switch for portable electrical generator
- Replace the control panel breaker disconnects
- Replace the overload reset buttons for the contactors
- Install new control panel above ground
- Upgrade Level Controller system

Mechanical Upgrades
- Repair motors or replace complete pump and motor

Site and Piping Upgrades
- Install emergency overflow tank
- Install fencing around lift station
- Provide on-site water for wash down
- Install emergency bypass system
- Coat wet well and recoat the dry well floor

Additional Studies
- Perform study to determine if lift station is required to be replaced or is capable of being upsized to meet future demands

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Existing Lift Station CIP (BY LIFT STATION): Vista Nueva

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [x] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$2,200,000
Planning, Engineering, CM, Legal/Admin (40%)	$880,000
Total Project Cost	**$3,080,000**

Project Description

It is recommended to do a full replacement of this lift station as it is in less than satisfactory condition. The costs provided are for full replacement. Costs do not include land acquisition if required. Costs do not include replacement of the forcemain.

Electrical Upgrades
- Seal the conduits leading to the electrical cabinet

Mechanical Upgrades
- N/A

Site and Piping Upgrades
- Replace vault cover
- Coat wet well
- Install emergency overflow tank
- Provide on-site water for wash down

Additional Studies
- Conduct a study to determine source of moisture into the electrical cabinet

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY: KEW
Wallace Group
www.wallacegroup.us
San Luis Obispo, CA

Existing Lift Station CIP (BY LIFT STATION): Harkins Road

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [x] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [x] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,300,000
Planning, Engineering, CM, Legal/Admin (40%)	$520,000
Total Project Cost	**$1,820,000**

Project Description

Recommend minor upgrades as needed to maintain the lift station for existing uses and then full replacement of the lift station to meet future demands. Costs included on this cut sheet are for a full replacement of this lift station but do not include property acquisition if required. Does not include forcemain replacement.

Electrical Upgrades

- Install receptacle and transfer switch for portable generator
- Replace the control panel breaker disconnects
- Replace the overload reset buttons for the contactors
- Label control panel with line voltage
- Install new control panel above ground
- Upgrade Level Controller system

Mechanical Upgrades

- Replace pumps with smaller pumps when required (NIC)

Site and Piping Upgrades

- Install emergency overflow tank
- Install fencing around lift station
- Provide on-site water for wash down
- Install improved emergency bypass system

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Existing Lift Station CIP (BY LIFT STATION): Las Casitas

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$650,000
Planning, Engineering, CM, Legal/Admin (40%)	$260,000
Total Project Cost	**$910,000**

Project Description

Costs provided are for the upgrades provided below. This lift station is anticipated to only be rehabilitated, not a full replacement.

Electrical Upgrades
- Install a receptacle & transfer switch for portable electrical generator
- Install a new control panel above ground
- Repair or replace the breaker disconnects

Mechanical Upgrades
- N/A

Site and Piping Upgrades
- Install emergency overflow tank
- Install emergency bypass system
- Coat bottom of dry well and entire wet well
- Provide on-site water for wash down

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY: KEW
Wallace Group
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San Luis Obispo, CA

Existing Lift Station CIP (BY LIFT STATION): TP2

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [x] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [x] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$2,500,000
Planning, Engineering, CM, Legal/Admin (40%)	$1,000,000
Total Project Cost	**$3,500,000**

Project Description

It is recommended to do a full replacement of this lift station as it is in less than satisfactory condition. The costs provided are for full replacement. Costs do not include land acquisition if required. Costs do not include replacement of the forcemain.

Electrical Upgrades

- Install receptacle and transfer switch for portable generator
- Replace splice box in wet well
- Install a main breaker with disconnect and disconnects for both pumps on the outside of the cabinet
- Label the cabinet with the voltage
- Install GFI protection for air compressor

Mechanical Upgrades

- Investigate vibration issue at 60 Hz. If vibrations persist, lift station upgrades will be required to meet future flows.
- Install on-site flow meter

Site and Piping Upgrades

- Install emergency bypass system
- Install emergency overflow tank
- Provide on-site water for wash down

Additional Studies

- The condition of the generator should be evaluated for possible repair or replacement

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY: KEW
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San Luis Obispo, CA

Existing Lift Station CIP (BY LIFT STATION): Airport (Moffett)

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$800,000
Planning, Engineering, CM, Legal/Admin (40%)	$320,000
Total Project Cost	**$1,120,000**

Project Description

Costs provided are for the upgrades provided below. This lift station is anticipated to only be rehabilitated, not a full replacement.

Electrical Upgrades

- Install overloads on load side of contactors for motor protection
- Replace breaker disconnect handles for pumps 1 and 2 and install proper disconnect hardware
- Proper labeling for the line voltage on the cabinet and the back-up manual transfer switch lever positions
- Provide wiring diagram at station
- Replace Sch 40 pipe with proper electrical conduit
- Install XP fittings/seals on conduits

Mechanical Upgrades

- Replace pumps and motors
- Move check valves into a vault located outside of the wet well

Site and Piping Upgrades

- Install emergency overflow tank
- Replace wet well coating
- Relocate wet well vent
- Provide on-site water for wash down
- Determine extent of corrosion on discharge piping and rehabilitate as needed

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY: KEW
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San Luis Obispo, CA

Existing Lift Station CIP (BY PROJECT):
Controller Upgrades and Standardization

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Lift Station Priority

1. Lake St, Vista Nueva, Carpenter Hall, Santa Rita
2. Spicer, Harkins, TP2, Harris Rd.
3. Mill Lake, Las Casitas, Airport

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$410,000
Planning, Engineering, CM, Legal/Admin (40%)	$164,000
Total Project Cost	**$574,000**

Project Description

All of the lift stations need new and standardized controllers to improve O&M.

The lift station with the highest priority for controller replacement is Lake Street. Lake St has had a controls failure that lead to an overflow/spill. The next priority lift stations are Vista Nueva, Carpenter Hall, and Santa Rita. Mill Lake, Las Casitas, and Aiport lift stations are lowest priority because the controllers were replaced relatively recently. However, it has already become difficult to find replacement pieces for these controllers and updates to match the other lift stations will be necessary eventually.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Existing Lift Station CIP (BY PROJECT):
Emergency Bypass and Washdown Water

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [x] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Lift Stations

Emergency Bypass:

Santa Rita, Carpenter Hall, De La Torre, Harkins, Las Casitas, Mill Lake, Spicer, TP2

Washdown Water:

All Lift Stations

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$500,000
Planning, Engineering, CM, Legal/Admin (40%)	$200,000
Total Project Cost	**$700,000**

Project Description

An emergency bypass provides operations' staff the ability to bypass wastewater flows if/when the pumps or power go out at the lift station. Having an emergency bypass would greatly improve operations and maintenance. Santa Rita, Carpenter Hall, De La Torre, Harkins, Las Casitas, Mill Lake, Spicer, and TP2 currently do not have emergency bypass capabilities and thus require other means and methods, which often are costly, to pump down the lift stations if there are issues with the pumps or the facility loses power. This CIP will install a new bypass at each of the identified lift station sites.

Wash water is also needed at each of the lift stations and would improve operations. This CIP will install a hose bib connection that would allow operator's to connect a hose for washing hands or down the facility.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Existing Lift Station CIP (BY PROJECT):
Safety/Falling Hazard Concerns

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Lift Stations

Lake Street, TP2, Vista Nueva

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$600,000
Planning, Engineering, CM, Legal/Admin (40%)	$240,000
Total Project Cost	**$840,000**

Project Description

Some of the lift stations have unsafe configurations for operations and maintenance. These lift stations put the operators at risk for falls and injuries. This CIP will provide for a technical study to evaluate what safety features can be installed to increase the safety of the operators. This CIP has also provided an assumed construction budget ($200,000 each) to allow for improvements to be installed. This budget will need to be re-evaluated once the technical study has been completed.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Existing Lift Station CIP (BY PROJECT):
Generator Replacement

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Lift Station Priority

1. TP2
2. Lake Street
3. Santa Rita, Carpenter Hall

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,100,000
Planning, Engineering, CM, Legal/Admin (30%)	$330,000
Total Project Cost	**$1,430,000**

Project Description

Having a generator onsite at the lift stations is essential in case of an emergency. Some of the generators require replacement. TP2, Lake Street, Santa Rita, and Carpenter Hall will all need generator replacements in the near future.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Existing Lift Station CIP (BY PROJECT):
Onsite Standby Generator

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Lift Stations

De La Torre, Harkins, Vista Nueva

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [ ] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$600,000
Planning, Engineering, CM, Legal/Admin (30%)	$180,000
Total Project Cost	**$780,000**

Project Description

In case of an emergency having a backup generator at the lift stations is extremely important. The lift stations that do not currently have generators are the goal of this CIP while the ones that need replacement are a seperate CIP. Note the Spicer Lift Station site does not currently have a back up generator, but due to site constraints it will need to remain only using a portable generator.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Existing Lift Station CIP (BY PROJECT):
Power Receptacle
City of Salinas Capital Improvement Project Information Sheet
2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Lift Station Priority

1. Carpenter Hall
2. Harkins Rd, Spicer

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [x] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$155,000
Planning, Engineering, CM, Legal/Admin (25%)	$38,750
Total Project Cost	**$193,750**

Project Description

A power receptacle capable of connecting a portable generator to the lift stations is necessary in case of emergencies. Carpenter Hall is the highest priority because it is the only lift station without a receptacle. The next priority would be the lift stations that have unsafe hook ups that need replacement.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Existing Lift Station CIP (BY PROJECT):
Painting/Coating Maintenance

City of Salinas Capital Improvement Project Information Sheet

2023 Sanitary Sewer Master Plan Update

Project Trigger

- [x] Existing Condition
- [ ] Future Condition

Jurisdiction

- [x] City of Salinas

Lift Station Priority

All Lift Stations

Project Components

- [ ] Upgrade Gravity Pipeline
- [ ] New Gravity Pipeline
- [x] Upgrade Lift Station
- [ ] Upgrade Force Main
- [x] Rehabilitation/Repair
- [ ] Inspection and/or analysis
- [ ] Replace Manhole

Project Need

- [ ] Insufficient capacity for existing flow
- [ ] Insufficient capacity for future flow
- [x] Existing condition limits O&M
- [ ] Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$900,000
Planning, Engineering, CM, Legal/Admin (20%)	$180,000
Total Project Cost	**$1,080,000**

Project Description

To extend the life of the lift stations and reduce infiltration and inflow (I &I) of additional water into the system, fresh coatings are required. It is prudent to budget for coating the interior of wet wells, piping, underground facilities, etc every few years to extend the life of the facility. This CIP budget is a total dedicated budget to coating but can be spread out over several years.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

Future CIP Project: San Juan Grade

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

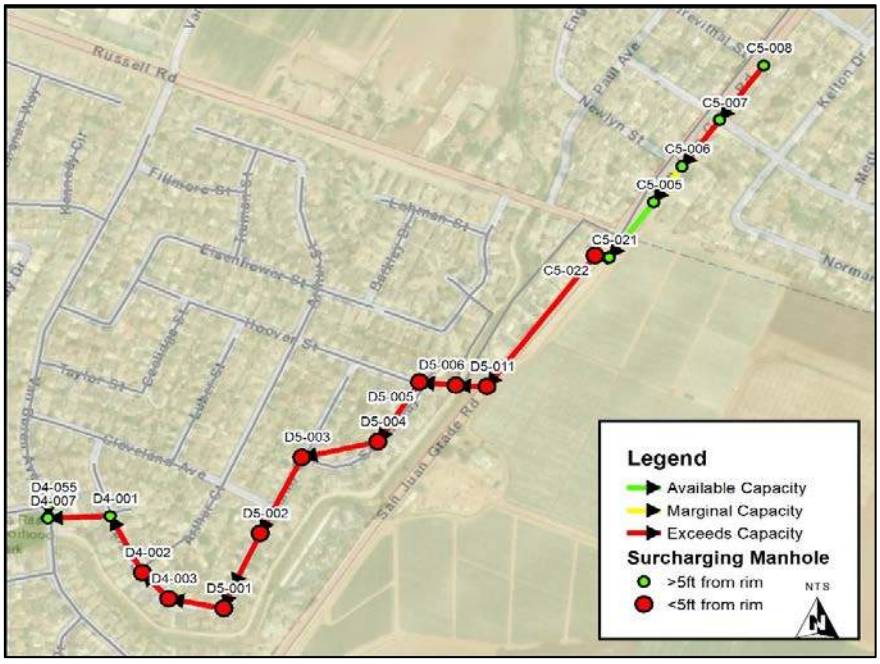
- ☐ Existing Condition
- ☑ Future Condition

Future Flows

Bolsa Knolls	100%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole



Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☐ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$2,370,000
Planning, Engineering, CM, Legal/Admin (40%)	$948,000
Total Project Cost	**$3,318,000**

Project Description

The San Juan Grade Existing CIP project upsizing approximately 3,800 ft of 8-inch and 10-inch pipe to 12-inch from MH C5-008 to D4-055. These pipe segments run 33% to 100% full during future peak flow conditions. Ten (10) of the MHs are surcharging within 5 ft of the manhole rim in the future PHWWF condition.

It should be noted that City maintanence crews have recorded pipe sags and surcharging manholes along pipe segments D5-001 to D4-003 and D4-007 to D4-055.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY: AC & AK
Wallace Group
www.wallacegroup.us
San Luis Obispo, CA

Future CIP Project: North Davis Rd.

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

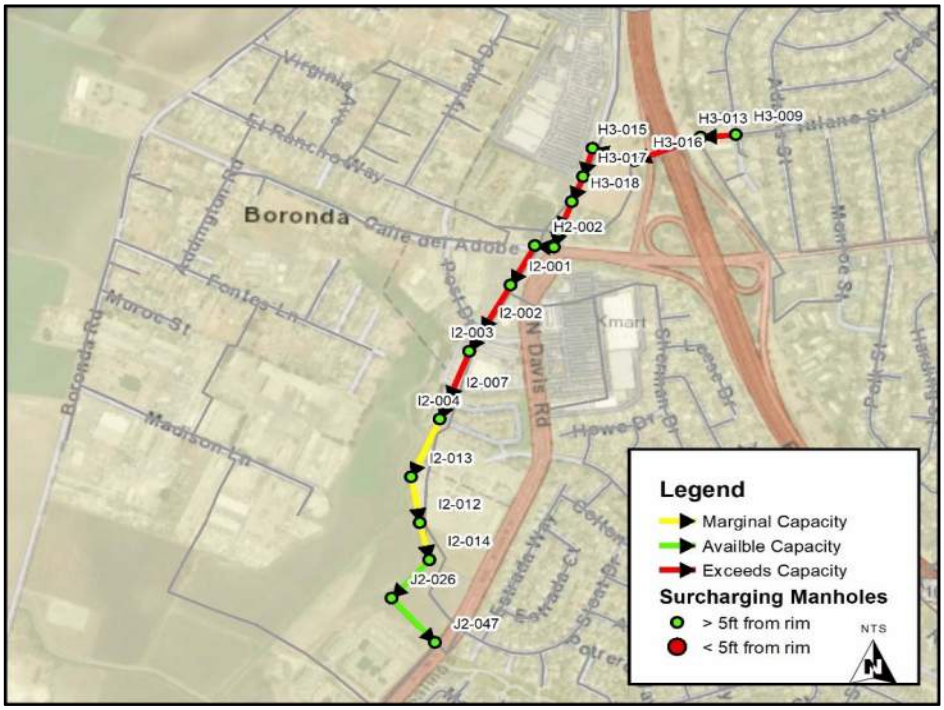
- ☐ Existing Condition
- ☑ Future Condition

Future Flows

West Area Specific Plan	74%
Target Area K	14%
Target Area L	4%
Bolsa Knolls	8%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole



Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☐ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$8,430,000
Planning, Engineering, CM, Legal/Admin (40%)	$3,372,000
Total Project Cost	**$11,802,000**

Project Description

The North Davis Road Future CIP recommends upsizing approximately 240 ft of 18-inch to 24-in from MH-H3-009 to MH-H3-013, 1,700 ft. of 24-inch to 30-inch from MH-H3-013 near Cherokee Dr to MH-H2-002 at Calle del Adobe, and 3,400 ft. of 30-inch to 32-inch from MH-H2-002 to MH-J2-047 at N Davis Rd. Under peak future conditions, this segment runs 43-100% full.
Note: This project assumes Existing Cherokee Drive CIP and Existing Northridge Mall CIP have been constructed.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY: AC & AK
Wallace Group
www.wallacegroup.us
San Luis Obispo, CA

Future CIP Project: West Laurel Dr.

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

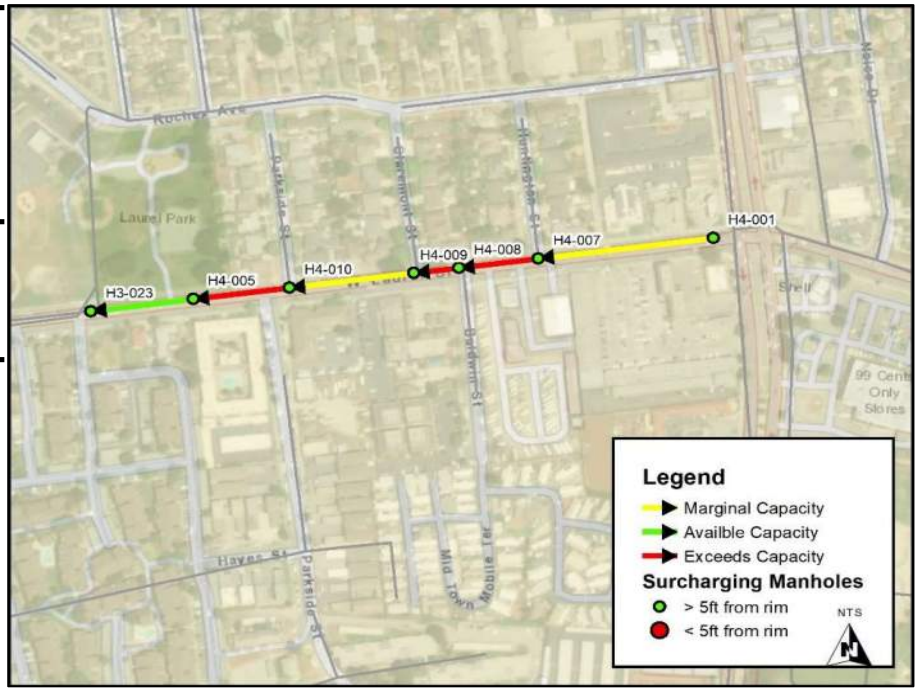
- ☐ Existing Condition
- ☑ Future Condition

Future Flows

Laurel Drive at N. Main Street FGA 100%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole



Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☐ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,020,000
Planning, Engineering, CM, Legal/Admin (40%)	$408,000
Total Project Cost	$1,428,000

Project Description

The West Laurel Drive Future CIP recommends upsizing approximately 1,550 ft. of 12-inch to 15-inch from MH-H4-001 at N Main St to MH-H3-023 near Laurel Park. Under peak future conditions, this segment on West Laurel Drive runs 66-88% full.

Note: This project assumes Existing Noice Dr/Tyler Street CIP has been constructed.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY: AC & AK
Wallace Group
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San Luis Obispo, CA

Future CIP Project: Victor St.

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

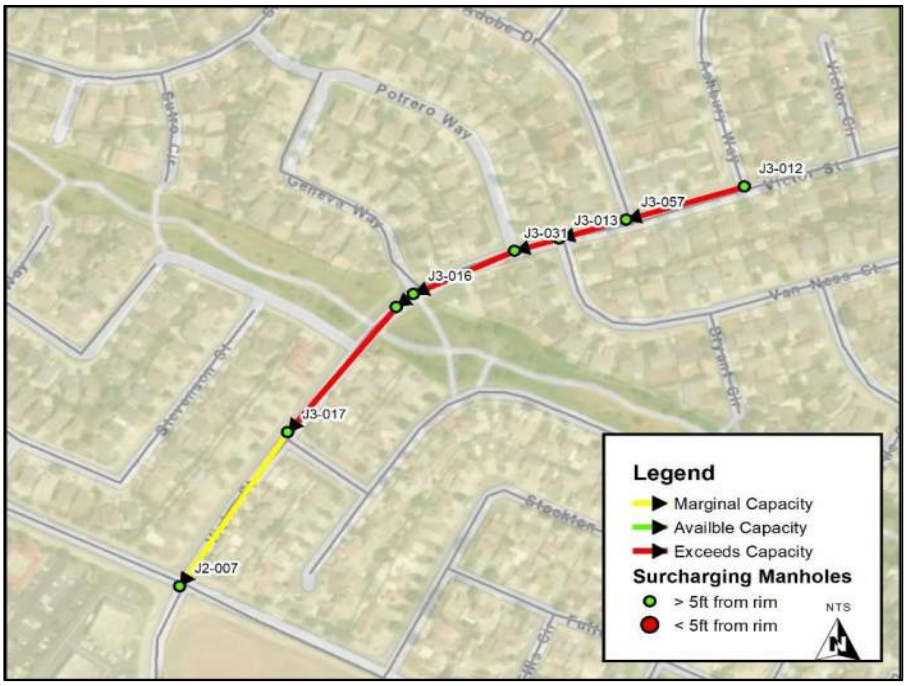
- ☐ Existing Condition
- ☑ Future Condition

Future Flows

Laurel Drive at N. Main Street FGA	100%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole



Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☐ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,250,000
Planning, Engineering, CM, Legal/Admin (40%)	$500,000
Total Project Cost	$1,750,000

Project Description

The Victor Street Future CIP project recommends upsizing approximately 1,600 ft. of 15-inch to 18-inch from MH-J3-012 at Ashbury way to MH-J2-007 at W Rossi St. Under peak future conditions, this segment along Victor St runs 73-98% full.

Note: This project assumes Existing Noice Dr/Tyler Street CIP has been constructed and Future West Laurel Dr. CIP has been constructed or will be constructed concurrently.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY: AC & AK
Wallace Group
www.wallacegroup.us
San Luis Obispo, CA

Future CIP Project: Freedom Pkwy

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

- ☐ Existing Condition
- ☑ Future Condition

Future Flows

East Area Specific Plan	100%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole

Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☐ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$3,280,000
Planning, Engineering, CM, Legal/Admin (40%)	$1,312,000
Total Project Cost	$4,592,000

Project Description

The Freedom Parkway Future CIP project recommends the upsize of approximately 2,025 ft of 10-inch pipe to 15-inch from MH-J9-005 at Estrella Way to MH-J9-001 at N Sanborn Rd. An additional 2,725 ft of 12-inch pipe from MH-J9-001 to MH-I8-013 at Nogal Dr should be upsized to 18-inch. Under peak future conditions, this segment on Freedom Parkway runs 50-100% full and 8 manholes are surcharging within 5 ft. of the manhole rims.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Wallace Group
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San Luis Obispo, CA

Future CIP Project: Natividad Creek Park

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

- ☐ Existing Condition
- ☑ Future Condition

Future Flows

East Area Specific Plan	58%
Central Area Specific Plan	42%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole

Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☐ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$4,590,000
Planning, Engineering, CM, Legal/Admin (40%)	$1,836,000
Total Project Cost	**$6,426,000**

Project Description

The Natividad Creek Park Future CIP project recommends upsizing approximately 230 ft of 18-inch to 21-inch from MH-H8-002 to MH-H8-004 and approximately 3,800 ft of 24-inch to 27-inch from MH-H8-004 at Freedom Pkwy to MH-I7-005 at the Twin Creeks Golf Course. Under peak future conditions, this segment through Natividad Creek Park runs 76-100% full.

Note: This project assumes Future Freedom Pkwy CIP has been constructed or will be constructed concurrently.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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San Luis Obispo, CA

Future CIP Project: East Alisal St.

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

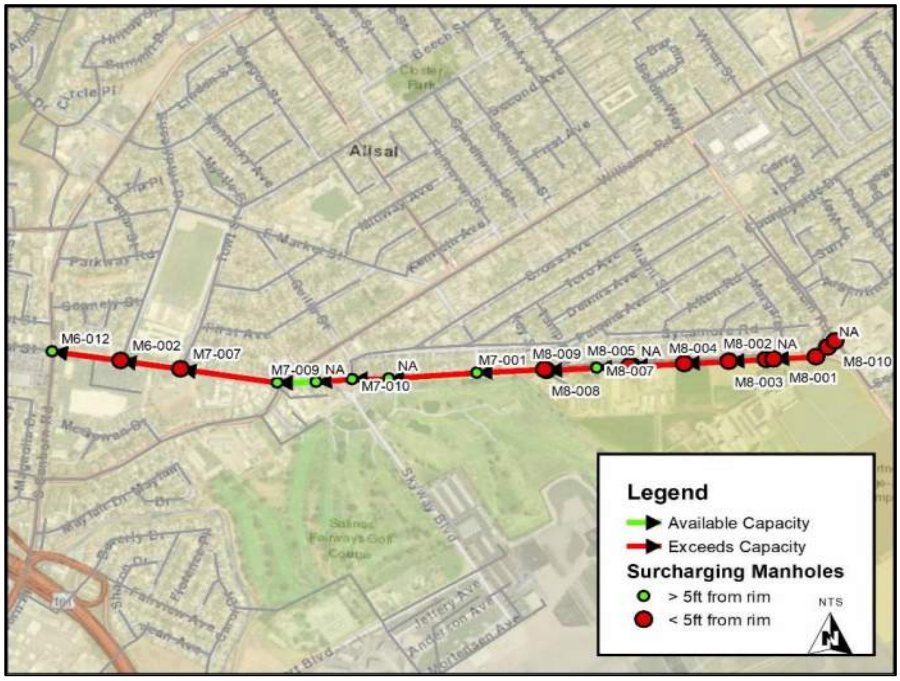
- ☐ Existing Condition
- ☑ Future Condition

Future Flows

East Future Growth Area	100%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole



Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☐ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$5,780,000
Planning, Engineering, CM, Legal/Admin (40%)	$2,312,000
Total Project Cost	$8,092,000

Project Description

The East Alisal Street Future CIP project recommends upsizing approximately 5,400 ft. of 15-inch to 18-inch from MH-M8-010 near Bardin Rd to MH-M7-009 at Williams Rd. Additionally, approximately 2,200 ft of 18-inch should be upsized to 21-inch from MH-M7-009 to MH-M6-012 at N Sanborn Rd. Under peak future conditions, this segment runs 67-100% full and 14 manholes are surcharging within 5 ft of the manhole rims.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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San Luis Obispo, CA

Future CIP Project: Abbott St.

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

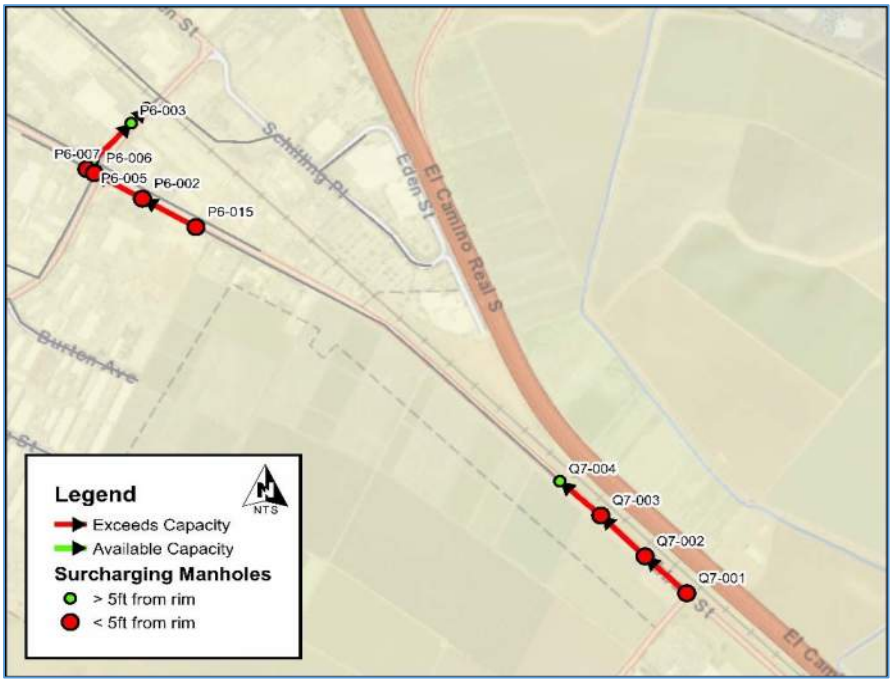
- ☐ Existing Condition
- ☑ Future Condition

Future Flows

East Future Growth Area	32%
Target Area B	21%
Target Area F	1%
Salinas Ag-Industrial Center	46%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole



Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☐ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$1,920,000
Planning, Engineering, CM, Legal/Admin (40%)	$768,000
Total Project Cost	**$2,688,000**

Project Description

The Abbot Street Future CIP project recommends upsizing approximately 1,300 ft of 12-inch to 15-inch from MH-Q7-001 at Harris Rd to MH-Q7-004. Between MH Q7-004 and P6-015, there is an exisitng 15-inch pipe that does not need to be upsized. An additional 850 ft. of 12-inch pipe from MH-P6-015 to MH-P6-006 at Harkins Rd should be upsized to 15-inch, and 700 ft of 15-inch to 18-inch from MH-P6-006 to the manhole after P6-003 (no City ID). Under peak future conditions, this segment runs 66-100% full. Under future max day flows seven of the manholes are surcharging within 5 ft of the manhole rim.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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Future CIP Project: South Sanborn Rd.

City of Salinas Capital Improvement Project Information Sheet

2022 Sanitary Sewer Master Plan Update

Project Trigger

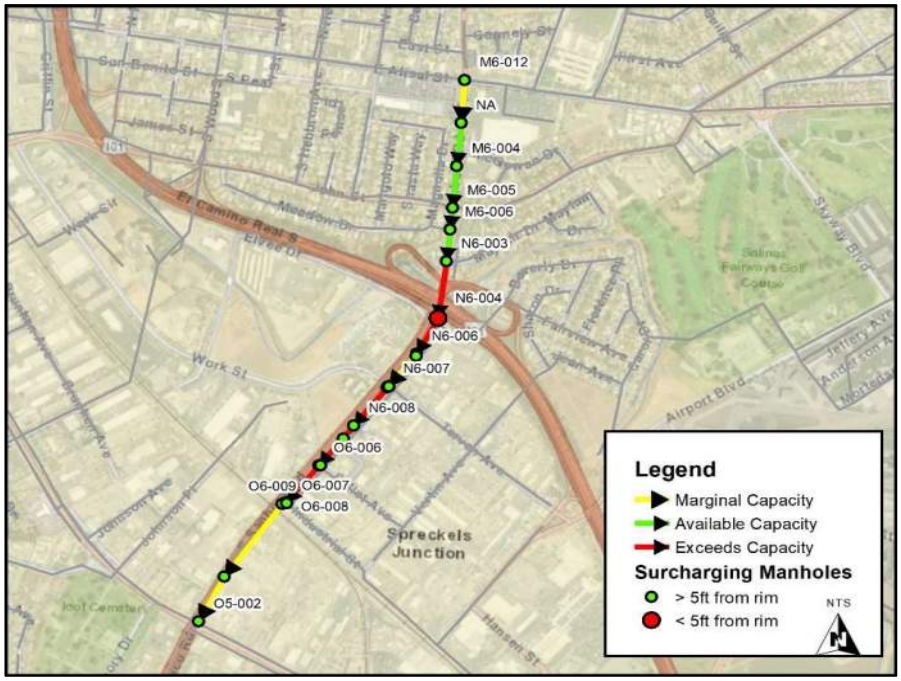
- ☐ Existing Condition
- ☑ Future Condition

Future Flows

East Future Growth Area	100%

Project Components

- ☑ Upgrade Gravity Pipeline
- ☐ New Gravity Pipeline
- ☐ Upgrade Lift Station
- ☐ Upgrade Force Main
- ☐ Rehabilitation/Repair
- ☐ Inspection and/or analysis
- ☐ Replace Manhole



Project Need

- ☐ Insufficient capacity for existing flow
- ☑ Insufficient capacity for future flow
- ☑ Existing condition limits O&M
- ☐ Consolidate parallel sewer mains

Project Cost Breakdown

Construction Cost[1]	$5,980,000
Planning, Engineering, CM, Legal/Admin (40%)	$2,392,000
Total Project Cost	$8,372,000

Project Description

In order to avoid upgrades at both South Sanborn and downstream of TP2, the South Sanborn Future CIP project proposes to increase the overflow elevation at MH-M6-012 to 65.09 ft in elevation (an additional 0.65 ft from Existing CIP Upstream TP2 Diversion). This hydraulic change would send future flows primarily down South Sanborn Road. Under peak future conditions, this segment runs 66-100% full and MH-N6-004 is surcharging. This project proposes to upsize approximately 4,365 ft of 18-inch to 21-inch from MH-M6-012 at E Alisal St to MH-O6-006 at Pellet Ave, 500 ft of 21-inch to 24-inch from MH O6-006 to MH O6-008 at Industrial St, and 1,500 ft of 24-inch to 27-inch from MH-O6-008 to MH-05-002 near Abbott St.

It should be noted that there is concrete "weir" at MH N6-003 to stop South Sanborn Rd. flows from backing into Mayfair Dr. Detailed design for this project should consider raising the slope/invert on Mayfair Dr or increasing the slope along South Sanborn to prevent further backwater effects.

Note: This project assumes Future East Alisal CIP has been constructed or will be constructed concurrently.

1. Construction costs are expressed in Year 2022 dollars, using an ENR construction Cost Index of 13004, and will need to be escalated to the year or years scheduled for the work.

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