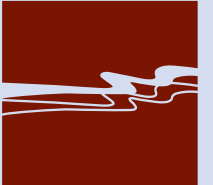


# SEASIDE COUNTY SANITATION DISTRICT

## Sewer Master Plan and Rate Study

MAY 10, 2011

PREPARED BY



WALLACE GROUP®

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**SEASIDE COUNTY SANITATION DISTRICT  
SEWER MASTER PLAN AND RATE STUDY  
MAY 2011**



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- Appendix B Lift Station Pump Curves
- Appendix C 2010 Sewer Model Calibration and Backup Results Data
- Appendix D Surveyor's Report for Seaside County Sanitation District Sanitary Sewer Manhole Survey
- Appendix E Rate Analysis Memorandums and Presentations to Seaside County Sanitation District Board

# Seaside County Sanitation District

## Sewer Master Plan - List of Acronyms

May 2011

ADF	Average Daily Flow
AMBAG	Association of Monterey Bay Area Government
BLVD	Boulevard
CC	Community Commercial
CDI	Coastal Dependent Industrial
CEQA	California Environmental Quality Act
CFS	Cubic Feet per Second
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Project
DESC	Description
DIA	Diameter
EIR	Environmental Impact Report
EIT	Engineer-In-Training
ELEV	Elevation
ETC	et cetera
FOG	Fats, Oils, and Grease Program
FORA	Fort Ord Reuse Authority
FPS	Feet per Second
FRM	Fluid Resource Management
FT	Foot
GAL	Gallon
GIS	Geographic Information System
GISP	Geographic Information System Professional
GPD	Gallons per Day
GPM	Gallons per Minute
GPS	Global Positioning System
HC	Heavy Commercial
HM	Habitat Management
HP	Habitat Reserve
HP	Horsepower
I/I	Infiltration and Inflow
ID	Identification
IN	Inches
IR	Industrial Research
ISMND	Initial Study and Mitigated Negative Declaration
LF	Linear Foot
LS	Lift Station
MDDWF	Maximum Day Dry Weather Flow
MDF	Maximum Day Flow
MGD	Million Gallons per Day
MH	Manhole

MRWPCA	Monterey Regional Water Pollution Control Agency
MST	Monterey Salinas Transit
MPUSD	Monterey Peninsula Unified School District
MX	Mixed Use
NA	Not Applicable
NAD	North American Datum
NAVD	North American Vertical Datum
ND	Negative Declarations
No.	Number
O&M	Operations and Maintenance
OP	Office Professional
PE	Professional Engineer
PC	Planned Community
PHDWF	Peak Hour Dry Weather Flow
PHWWF	Peak Hour Wet Weather Flow
PI	Public/Institutional
POS	Parks and Open Space
PVC	Polyvinyl Chloride
RC	Recreational Commercial
RGC	Regional Commercial
RH	High Density Residential
RLS	Low Density Single-Family Residential
RM	Medium Density Residential
RMS	Medium Density Single-Family Residential
RMS	Root Mean Square
RTK	Real Time Kinematic
SCSD	Seaside County Sanitation District
sec.	Second
SF	Square Foot
SMP	Sewer Master Plan
SSMH	Sanitary Sewer Manhole
SSMP	Sanitary Sewer Management Plan
ST	Street
TGO	Trimble's Geomatic Office
TOC	Table of Contents
VCP	Vitrified Clay Pipe
VFD	Variable Frequency Drive
VS	Visitor Serving Residential
vs.	Versus
VSC	Visitor Serving Commercial
w/	With
WWF	Wet Weather Flow
WWTP	Waste Water Treatment Plant

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# CHAPTER 1

## INTRODUCTION

This report presents the Sewer Master Plan for Seaside County Sanitation District (SCSD). SCSD is located in Monterey County to the north of the Monterey Peninsula adjacent to Monterey Bay. SCSD is a special district formed on March 1, 1950 and is currently responsible for the maintenance and operation of the sewer collection system serving the Cities of Del Rey Oaks, Sand City, and Seaside (excluding the Former Fort Ord Military Installation). SCSD is governed by a Board of Directors made up of the Mayors of the three cities. Each city is vastly different in composition and size.

Preparation of the Sewer Master Plan will assist SCSD in prioritizing both existing and future collection system needs through repair, rehabilitation, replacement, or new facilities. The master planning process will also tie the needs assessment, both existing and future, to the budgeting process.

### ENVIRONMENTAL REVIEW

In accordance with Title 14, California Code of Regulations, Chapter 3, Article 18 (Statutory Exemptions), this Sewer Master Plan 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, CEQA must be satisfied for any major capital improvement project described in this report that will be implemented by SCSD in the future, through the preparation of an appropriate Categorical Exemption, ND, or EIR.

### AUTHORIZATION AND SCOPE OF WORK

On January 20, 2009, SCSD authorized Wallace Group to prepare a comprehensive Sewer Master Plan and Rate Study. The scope of work is as follows:

**Sewer Flow Monitoring:** Conduct sewer flow monitoring for a one-month period in 8 different locations within Region "A". Depending on weather conditions, this monitoring will provide information on existing dry weather and wet weather conditions. Flows will be analyzed to determine the diurnal peaks, estimate inflow and infiltration, and prepare a memo summarizing the findings for SCSD.

**Lift Station Evaluation:** Conduct evaluations of the four lift stations. The evaluation will assess the condition of the pumps, controls, wet well (excluding structural integrity), and coatings. Pump test will be conducted at each location to confirm flow and head. The assessment will be reviewed and recommendations for upgrades to the lift stations will be provided. A memorandum discussing the findings of the evaluation will be provided to SCSD.

**Survey:** Record information to be used in the GIS Database will be reviewed. Manholes critical for the development of the sewer model will be surveyed in the field.

The field work will include elevations of the rim, dipping to the invert, and taking pictures of each of the manholes identified.

**GIS Map and Database:** An ESRI ArcGIS® 9.3 geodatabase for Region “A” will be developed. The first step in the development of the geodatabase will be to utilize ESRI’s sewer system database design or create a simplified database design to store attribute information required to store/model the sewer system inside a GIS geodatabase.

The sewer geodatabase will be developed to allow for integration with the sewer modeling software. This will allow SCSD to efficiently transfer sewer collection system changes between the GIS and the sewer modeling software.

Updated maps for the Study Area that delineate sewer pipes, sewer structures, tributary areas, etc. for existing and future systems will be generated. These maps will be compiled from the newly developed sewer geodatabase, sewer modeling results, and locations of future development. These maps will be properly scaled and formatted for SCSD’s use.

Atlas maps of the collection system will be prepared. These maps are 11”X17” in size at a legible scale (typically 1”=200’) that can be placed in operators’ vehicles. These atlas maps are useful for documenting daily activities, identifying problem locations, and noting changes to the database.

**Land Use Evaluation and Wastewater Flow:** Population and density information from the various City General Plans, previous wastewater flow estimates, and data from the sewer flow monitoring to will be used to determine the existing and future dry weather and wet weather flow characteristics for Regions A, B, C, and D.

**Sanitary Sewer Management Plan and Ordinance Review:** The effort SCSD has already completed for compliance with the Sanitary Sewer Management Plan (SSMP) will be evaluated. The requirements from Monterey Regional Water Pollution Control Agency (MRWPCA) to confirm future programs and the financial impact of these requirements and SCSD’s ordinances and legal authority to complete the task needed will be reviewed.

**Collection System Modeling:** The HYDRA® sewer model developed from the 2004 Sanitary Sewer Master Plan Update will be converted to MWH Soft® InfoSWMM sewer modeling program to re-evaluate the condition of the existing collection system. The collection system will be modeled under dry and wet weather conditions for the existing and future loadings. Only the 8-inch sewer mains and larger, with some exceptions will be modeled. The exceptions would be 6-inch trunk mains that collect or carry a reasonable amount of wastewater.

**Sanitary Sewer Master Plan:** The information determined in the previous tasks will be used to prepare a Sewer Master Plan. The master plan will provide a summary of the existing facilities, wastewater flows, identified system capacity deficiencies for existing and future conditions, recommended capital improvement projects (CIP), recommended operation and maintenance practices, and recommended inspection programs. The CIPs will be grouped into two categories;

- Near Term - those projects that require immediate attention due to existing deficiencies;
- Long Term - those projects that are required due to future development (duration depending on future development).

A cost estimate will be determined for each of the CIPs and Operations and Maintenance (O&M) Activities, which will include construction and soft costs.

**Rate Study:** Based on the CIPs and O&M Activities identified in the Sewer Master Plan, a rate study will be prepared to identify the number and type of connections, current financial status of the District, and funding alternatives based on the needs of the District.

## **ACKNOWLEDGEMENTS**

Wallace Group thanks and gratefully acknowledges the following SCSD, City of Monterey, and Monterey Regional Water Pollution Control Agency staff for their efforts, involvement, input and assistance in preparing this Sewer Master Plan and Rate Study:

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 David Pendergrass, City of Sand City  
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This Sewer Master Plan and Rate Study was completed with the help of many team members. They include:

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## CHAPTER 2

### LAND USE AND POPULATION

This Chapter presents the land use and existing and future population forecasts for Seaside County Sanitation District (SCSD). The purpose of establishing the existing populations and land uses is to better understand the existing wastewater flow characteristics throughout SCSD, which would then help forecast the wastewater flows that will be contributed in the future by vacant or under-utilized land. All figures and tables for Chapter 2 are located at the end of this chapter.

#### LAND USE

For this report, the SCSD service area and surrounding areas are divided into seven Regions: "A", "B", "C", "D1", "D2", "E", and "F". Figure 2-1 depicts the various study regions for SCSD. Region "A" is comprised of the existing developed portion of SCSD, and encompasses the existing SCSD wastewater service area. The service area is bounded on the north by Military Avenue, General Jim Moore Boulevard to the east, Monterey Bay to the west and City of Monterey to the south. Regions "B" and "C" are comprised of vacant land that is known as the Former Fort Ord area. This area will be developed in the future and may ultimately be served by SCSD. Region "D" is split into two different regions: Regions "D1" and "D2". Both regions are within the City of Monterey. Region "D1" is served by the City of Monterey. An alternative for SCSD to serve this area has been proposed. An evaluation of the improvements required for SCSD to serve this region is provided in Chapter 8. Region "D2" is part of the Former Fort Ord area. Although this area is within the City of Monterey, there is a possibility this area could be served by SCSD. Regions "E" and "F" are currently served by Marina Coast Water District and will not be evaluated in this Sewer Master Plan.

#### Region "A"

Region "A" is comprised of primarily residential development with the commercial core along the coast line, which has a wide variety of uses including heavy commercial, institutional, low density residential and high density residential. The SCSD service area is comprised of a total of 2,400 acres, with grades typically dropping from east to west towards the Monterey Bay. Table 2-1 provides a summary of the land uses within Region "A", the total number of parcels, the total parcel acreage for each zoning, and the square footage of commercial building. Figure 2-2 depicts the land uses within Region "A".

To determine wastewater flows in Chapter 4, the zoning has been combined to identify key parcel types that have higher impact on wastewater flows. These key parcel types are presented in Table 2-2.

Region "A" does not contain a significant portion of vacant land that can be developed in the future; however, there are areas throughout Region "A" that will experience re-development. This re-development will densify existing partially developed property, add

mixed use, and/or change uses on the properties. Several new developments have also been identified that may be developed within Region “A” that could impact the collection system. The timing for construction of these projects is unknown. The developments may include:

- Del Monte Hotel on Del Monte Blvd. This is a new hotel with 95 proposed rooms<sup>1</sup>.
- King Venture “Collections on Monterey Bay” Project, located in Sand City on Sand Dunes Drive. This project is proposed to include 342 new residential units<sup>2</sup>.
- Security National Guarantee, “Monterey Bay Shores” Project, located in Sand City off of California Avenue and Sand Dunes Drive. This new project is proposed to include 161 hotel rooms, 88 commercial condos, and 92 ownership condos<sup>2</sup>.
- Orosco’s “South of Tioga” Project is proposed to include new residential condo/apartment units, commercial development and a new hotel. The size of the development is unknown.
- The West Broadway Specific Plan, which proposes redevelopment of the existing commercial development on Broadway<sup>3</sup>. This project is proposed to include an additional 523 residential units, 406,800 sq. ft. of commercial, which includes a public library and hotel with up to 250 rooms and a convention center.

Figure 2-3 illustrates the locations of these anticipated projects. The development potential provided is only preliminary and will most likely change prior to the projects being approved. The development potential above is only used as guidance for estimating future loading for the collection system evaluation and has no bearing on the projects’ ability to be approved by its local governing agency. It is recommended that a detailed engineering study be completed on the collection system for each project prior to it being approved.

### **Regions “B” and “C”**

Regions “B” and “C” are part of the Former Fort Ord Area and have been re-zoned by the Fort Ord Reuse Authority (FORA). Regions “B” and “C” are completely undeveloped at this time. SCSD may provide sewer service to both Regions. FORA completed a Base Reuse Plan, adopted June 13, 1997, which has subsequently been incorporated into the City of Del Rey Oaks and City of Seaside’s General Plans. The anticipated land uses for each region are as follows:

#### **Region B**

Region “B”, located within the City of Del Rey Oaks, is approximately 420 acres of developable land. There is also additional land that is designated for open space. Under the FORA Reuse Plan, the developable area is designated for business park/light industrial and visitor servicing facilities, including either a hotel or golf course. The City of Del Rey Oaks Draft Initial Study and Mitigated Negative Declaration (ISMND), dated

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<sup>1</sup> Information provided by City of Seaside.

<sup>2</sup> Information provided by City of Sand City.

<sup>3</sup> Schaaf & Wheeler. September 19, 2008. *Draft Technical Memorandum – Subject: Implementation of Water Resources Infrastructure for the West Broadway Urban Village Specific Plan.*

November 17, 2006 has proposed a mixed use overlay of the Former Fort Ord Area (see Figure 2-4). Figure 2-4 has the following land uses for Region “B”:

- 55 acres of Office Professional
- 25 acres of Community Commercial
- 320 acres of Visitor Serving Commercial
- 20 acres of Open Space

#### Region “C”

Region “C”, located in the City of Seaside is comprised of primarily low density residential with open space and some recreational uses. There are approximately 325 acres of low density residential, which equates to approximately 2,600 residential units. Figure 2-5 illustrates the land uses for Region “C”.

#### **Region “D1”**

Region “D1” is located within the City of Monterey. An evaluation of Region “D1” is provided in Chapter 8.

#### **Region “D2”**

Region “D2” is located within the City of Monterey. It is comprised of land designated for Industrial Research (67 acres), Planned Community (34 acres), and Parks and Open Space (34 acres). It is estimated that there will be approximately 272 residential units in the Planned Community area. Figure 2-6 illustrates the land uses for Region “D2”<sup>4</sup>.

### **POPULATION**

Two sources of data were used to determine the existing and future population served by SCSD. The first population source was the General Plan and Housing Element for each of the three cities. Each city’s General Plans were completed at different times and therefore the existing date that determines the existing population varied between all three cities. The second source was the Association of Monterey Bay Area Government (AMBAG) 2008 Regional Forecast. This AMBAG 2008 Regional Forecast was for the Counties of Monterey, San Benito, and Santa Cruz. The report broke down the number of housing units, population and employment for each of the cities within these counties. AMBAG provides 30 years of population forecasts every five years, starting at 2005.

To compare against the General Plans from each of the three cities, Year 2010 from the AMBAG report was used as the base year defining existing population. Year 2030 was used to determine the planning horizon for this document, which may or may not coincide with full build-out. The following describes each of the three cities and their specific attributes.

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<sup>4</sup> Information provided by City of Monterey.

## **City of Del Rey Oaks**

### General Plan

The City of Del Rey Oaks is located along the south side of SCSD. Del Rey Oaks updated their General Plan in January 1997; however, the Housing Element was not included in this update and thus refers back to the Housing Element dated April 1993. The City of Del Rey Oaks did prepare an updated Housing Element in 2006, but it has not been adopted by the City Council. Even though the Housing Element has not been adopted, it provides the most recent population data and will be used to compare to AMBAG's projections. Based on the number of existing units within the City of Del Rey Oaks and a household density of 2.34 persons per household, the City of Del Rey Oaks estimated existing population is approximately 1,700 persons. Based on the 2006 Final Draft Housing Element, the 20-year forecasted population is only 60 persons greater than year 2000. Therefore, the future build-out population for City of Del Rey Oaks, based on the General Plan is approximately 1,760 persons.

### AMBAG

For the City of Del Rey Oaks, AMBAG notes an estimated Year 2010 population of 1,627 persons and a future Year 2030 build-out population of 3,197 persons.

### City of Del Rey Oaks Population Summary

Based on the above analysis, Table 2-3 provides a summary of the population projections for the City of Del Rey Oaks.

## **City of Sand City**

### General Plan

The City of Sand City is located along the bay on the west side of SCSD with approximately 1.5 miles of ocean frontage. The City of Sand City's General Plan was adopted in 2002. This city is mainly comprised of commercial and industrial development with a small residential population.

Based on the 2000 census, the population of Sand City was approximately 260 persons. Table 2-3 of the February 2002 General Plan notes that the City of Sand City projects the build-out population to be 1,295 persons. This is based on household densities ranging between 2.0 and 2.5 persons per household.

### AMBAG

AMBAG notes that the estimated Year 2010 population for City of Sand City is 447 persons and the future Year 2030 population will be approximately 1,498 persons.

### City of Sand City Population Summary

Based on the above analysis, Table 2-4 provides a summary of the population projections for the City of Sand City.

## **City of Seaside**

The City of Seaside comprises the majority of SCSD. The SCSD boundary, however, does not include all of the City of Seaside. The lands to the north, Regions "E" and "F" are within the City of Seaside boundary, but wastewater collection services are currently

served by the Marina Coast Water District. This study does not evaluate the potential for SCSD to serve these two regions.

SCSD's boundary within the City of Seaside is bordered on the north by Military Avenue, on the east by General Jim Moore Boulevard, on the west by City of Sand City, and on the south by Cities of Del Rey Oaks and Monterey. The lands east of General Jim Moore Blvd. (Regions "B" and "C") are anticipated to be developed in the future and may ultimately be served by SCSD.

#### General Plan

The City of Seaside adopted their General Plan on August 5, 2004. The General Plan does not provide an estimate of the existing population, but does provide the population projections at full build-out. Based on the General Plan, the build-out population is estimated with a household density of 3.29 persons per household. Since the General Plan includes areas outside of the SCSD boundary, the population within SCSD had to be extrapolated based on land use densities. The information was extrapolated by calculating the total area of residential zoning on the City of Seaside's GIS Parcel Mapping versus the total area of residential zoning within SCSD's boundary and then multiplying by the density for each zone. Table 2-5 provides a summary of the estimated build-out population in the City of Seaside, excluding Regions "E" and "F" per the General Plan. However, the population projection does include the re-development of West Broadway per its Specific Plan. The projected build-out population for the portion of the City of Seaside to be served by SCSD, excluding Regions "E" and "F" is estimated at 24,784 persons. The General Plan does not estimate when the build-out population will occur.

#### AMBAG

AMBAG notes that the estimated Year 2010 population in the City of Seaside is 34,666 and the future Year 2030 population is projected to be 35,017. This is not much population growth within the City of Seaside in the next 20 years. Since AMBAG does not break out the SCSD boundary from their population estimates, it is assumed that the ratio of SCSD acreage to total acreage is indicative of population and therefore, the population of SCSD from AMBAG's population projections are 55 percent of the total population or approximately 19,060 persons for existing and 19,260 persons in the future. AMBAG projection does not include the re-development of West Broadway. Therefore, the total future population is estimated at 19,260 persons plus 1,720 persons or 20,980 persons.

#### Region "C"

In addition to the population noted above, SCSD may serve Region "C", which is within the City of Seaside city limits. Based on a density of 3.29 persons per household and a total of 2,600 units, the estimated population for Region "C" is 8,554 people.

#### City of Seaside Population Summary

Based on the above analysis, Table 2-6 provides a summary of the population projections for the City of Seaside that is served by SCSD.

### **City of Monterey – Region “D1”**

The population for Region “D1” was not established. An evaluation of Region “D1” is provided in Chapter 8.

### **City of Monterey – Region “D2”**

Region “D2” is currently undeveloped, therefore existing population is zero. The household density for the City of Monterey is 2.10 persons (2000 California State Census). Based on this density and 272 units to be constructed in Region “D2”, the estimated future Year 2030 population for Region “D2” is 571 persons.

### **Population Summary**

Table 2-7 provides a summary of estimated existing Year 2010 population, and the estimated future Year 2030 population projections for each city based on their General Plan and AMBAG’s 2008 Regional Forecast.

The estimated existing populations from the General Plans are approximately the same as the AMBAG 2008 Regional Forecast. The future population from the General Plans is less than 10% higher than the AMBAG 2008 Regional Forecast, excluding Region “D2”. For the purposes of the SCSD Sewer Master Plan Update, the population estimates from the General Plans will be used since they are slightly more conservative. Therefore, the existing population is estimated at 21,020 persons and the future population is estimated at 36,964 persons.

**Table 2-1. Region "A" Land Use Designations**

Zoning	Description	Number of Parcels <sup>1</sup>				Parcel Acreage <sup>2</sup>				Square Footage <sup>2</sup>			
		Del Rey Oaks	Sand City	Seaside	Total	Del Rey Oaks	Sand City	Seaside	Total	Del Rey Oaks	Sand City	Seaside	Total
CC	Community Commercial	49	1	207	257	34	1	50	85	316,593	105,265	780,172	1,202,029
HC	Heavy Commercial	NA	NA	32	32	NA	NA	6	6	NA	6,927	77,323	84,250
MX	Mixed Use	NA	96	208	304	NA	42	36	78	NA	519,108	524,066	1,043,175
PI	Public/Institutional	13	2	18	33	78	5	82	165	NA	11,675	671,789	683,464
POS	Parks and Open Space	10	3	38	51	49	18	102	169	NA	NA	NA	NA
RGC	Regional Commercial	NA	37	207	244	NA	66	90	156	NA	679,094	5,588	684,682
RLS	Low Density Single-Family Residential	754	NA	2,294	3,048	163	NA	415	578	1,226,387	NA	5,287,631	6,514,018
RH	High Density Residential	NA	NA	162	162	NA	NA	56	56	NA	NA	880,181	880,181
RM	Medium Density Residential	63	1	344	408	11	3	52	66	81,978	37,748	716,792	836,518
RMS	Medium Density Single-Family Residential	NA	NA	3,068	3,068	NA	NA	349	349	NA	NA	5,643,733	5,643,733
<b>Total</b>		<b>879</b>	<b>140</b>	<b>6,578</b>	<b>7,607</b>	<b>286</b>	<b>135</b>	<b>1,238</b>	<b>1,708</b>	<b>1,624,958</b>	<b>1,359,817</b>	<b>14,587,274</b>	<b>17,572,049</b>

NA - Not Applicable

<sup>1</sup> The number of parcels in City of Seaside based on City of Seaside GIS parcel base map and only includes the portion of Seaside that is within SCSD. The number of parcels in Cities of Del Rey Oaks and Sand City are based on number of buildings.

<sup>2</sup> Acreage and square footage totals in City of Seaside based on City of Seaside GIS parcel base map and only includes the portion of Seaside that is within SCSD. Acreage totals in the City of Del Rey Oaks and City of Sand City are based on draft 2006 Amendments to the General Plan and 2002-2017 General Plan, respectively.

**Table 2-2. Parcel Types of Highest Wastewater Significance**

<b>Parcel Type</b>	<b>Estimated Quantity</b>	<b>Source</b>
Residential	21,020 persons	Chapter 2, Population Summary
Hotel Rooms	698 rooms	Based on data from SCSD staff
Commercial	2,974,898 sf	Square footage totals in City of Seaside based on City of Seaside GIS parcel base map and only includes the portion of Seaside that is within SCSD. Square footage totals in the Cities of Del Rey Oaks and Sand City are based on outlines of buildings. Does not include schools or hotels.
School	3,215 students	Student population provided by SCSD staff.

**Table 2-3. City of Del Rey Oaks Population Summary**

	<b>General Plan</b>	<b>AMBAG</b>
Existing	1,700	1,627
Future	1,760	3,197

**Table 2-4. City of Sand City Population Summary**

	<b>General Plan</b>	<b>AMBAG</b>
Existing	260	447
Future	1,295	1,498

**Table 2-5. City of Seaside Build-out Population Extrapolations**

<b>Land Use Zone</b>	<b>Total Acreage</b>	<b>Total Population</b>	<b>SCSD Acreage</b>	<b>SCSD Population</b>
Low Density Single Family Residential	801	15,297	414	7,906
High Density Residential	161	9,297	57	3,291
Medium Density Residential	104	4,100	52	2,050
Medium Density Single Family Residential	423	11,126	348	9,153
Mixed Use	153	3,083	33	664
West Broadway Redevelopment	NA	1,720	NA	1,720
<b>Total</b>	<b>1,642</b>	<b>44,623</b>	<b>904</b>	<b>24,784</b>

**Table 2-6. City of Seaside Population Summary**

	<b>General Plan</b>	<b>AMBAG</b>
Existing	NA	19,060
Region "A" Future	24,784	20,980
Region "C" Future	8,554	8,554
<b>Total Future</b>	<b>33,338</b>	<b>29,534</b>

NA – Not Available

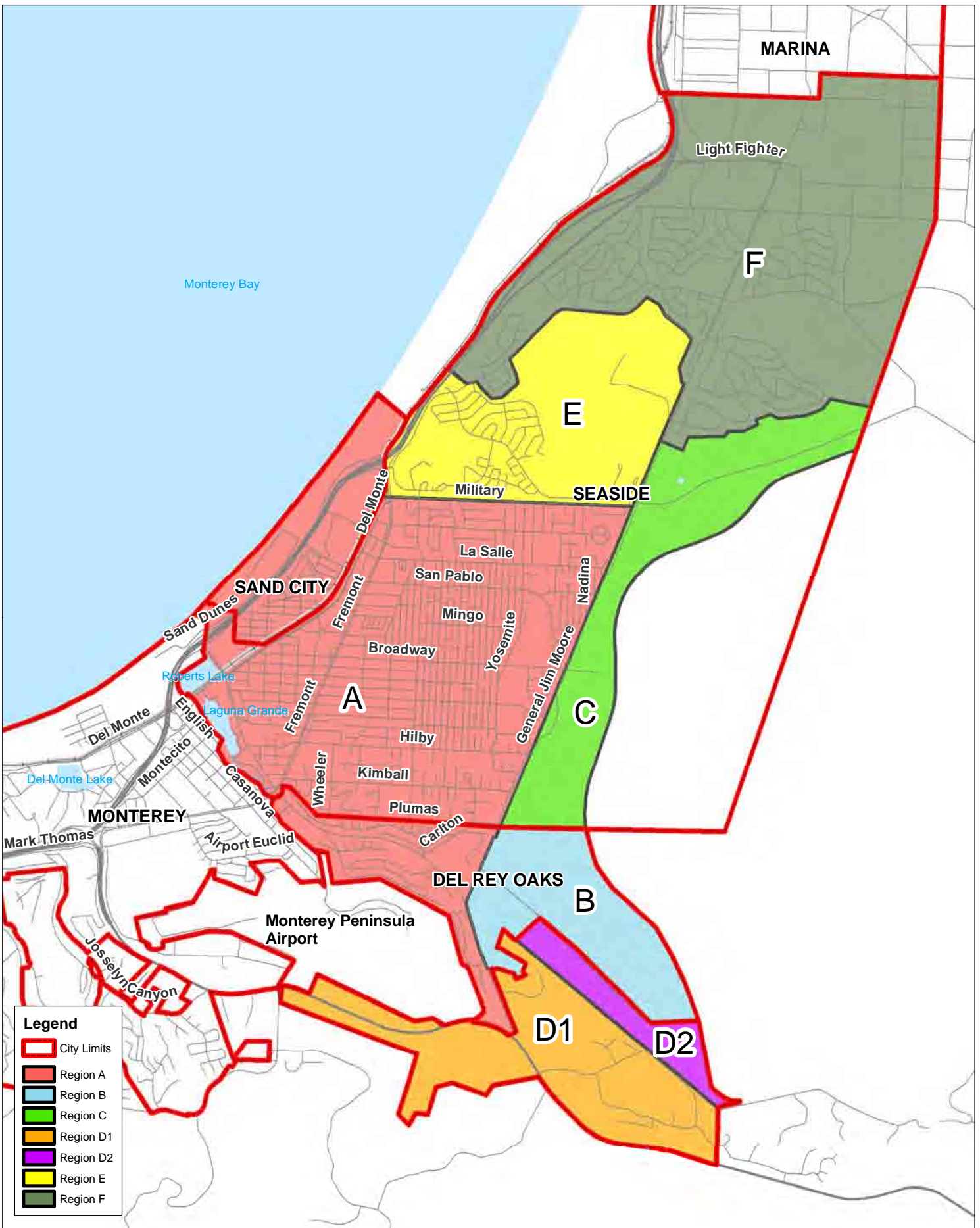
**Table 2-7. Population Projection Summary**

	<b>Del Rey Oaks</b>	<b>Sand City</b>	<b>Seaside</b>	<b>Monterey</b>	<b>Total</b>
<b>General Plans</b>					
<b>Existing</b>					
<b>Region "A"</b>	1,700 <sup>1</sup>	260 <sup>1</sup>	19,060 <sup>2</sup>	0	<b>21,020</b>
<b>Future</b>					
<b>Region "A"</b>	1,760	1,295	24,784 <sup>3</sup>	0	27,839
<b>Region "B"</b>	0	0	0	0	0
<b>Region "C"</b>	0	0	8,554	0	8,554
<b>Region "D2"</b>	0	0	0	571	571
<b>Total</b>	<b>1,760</b>	<b>1,295</b>	<b>33,338</b>	<b>571</b>	<b>36,964</b>
<b>AMBAG 2008 Regional Forecast</b>					
<b>Existing</b>					
<b>Region "A"</b>	1,627	447	19,060 <sup>3</sup>	0	<b>21,134</b>
<b>Future</b>					
<b>Region "A"</b>	3,197	1,498	20,980 <sup>3</sup>	0	24,238
<b>Region "B"</b>	0	0	0	0	1,437
<b>Region "C"</b>	0	0	8,554	0	8,554
<b>Total</b>	<b>3,197</b>	<b>1,498</b>	<b>29,534</b>	<b>0</b>	<b>34,229</b>

<sup>1</sup> Existing population based on 2000 census.

<sup>2</sup> Assumed an estimated existing population of 19,060 persons for City of Seaside based on AMBAG's existing population for comparison purposes only.

<sup>3</sup> Population based on extrapolated acreage from parcels within SCSD boundary only. This population does not include population outside of SCSD boundary. Population also includes population increase for West Broadway re-development.



- Legend**
- City Limits
  - Region A
  - Region B
  - Region C
  - Region D1
  - Region D2
  - Region E
  - Region F

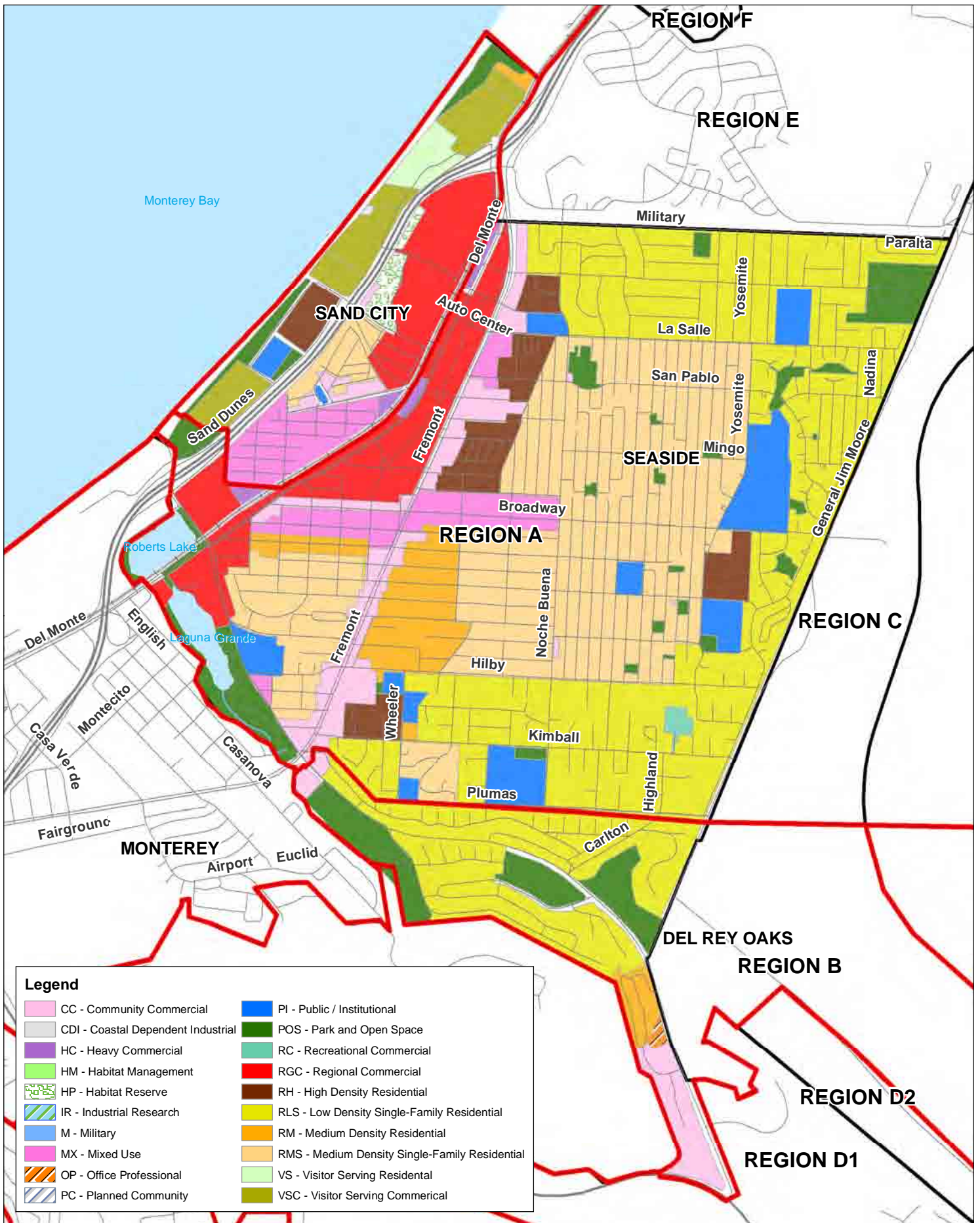


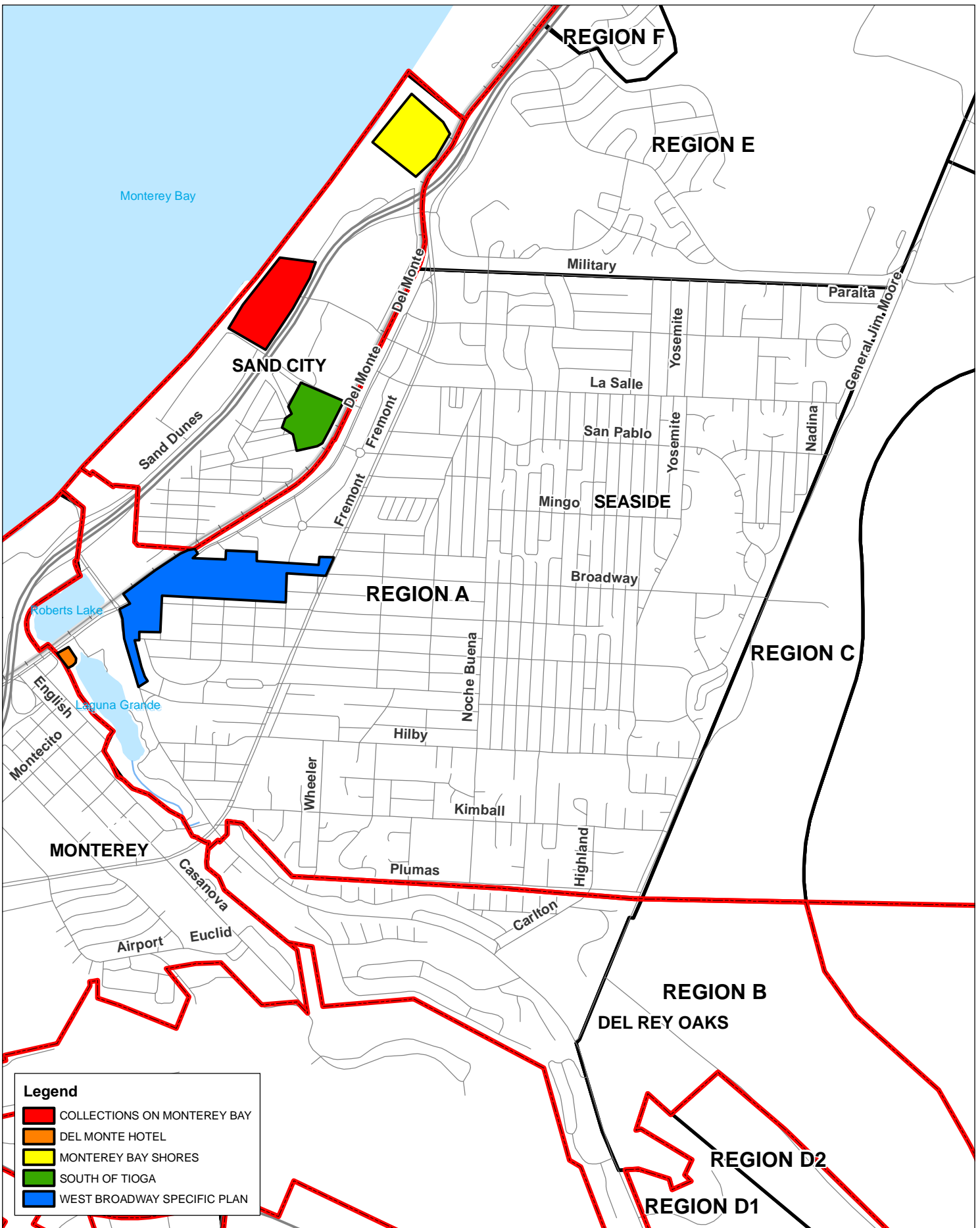
**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN**

**FIGURE 2-1: REGION MAP**

NOTES:  
 BASEMAP PROVIDED BY SCSD.  
 WALLACE GROUP DID NOT  
 PERFORM BOUNDARY SURVEY  
 SERVICES FOR THIS MAP. NOT  
 A LEGAL DOCUMENT. MAP  
 PRODUCED MAY 2011.







- Legend**
- COLLECTIONS ON MONTEREY BAY
  - DEL MONTE HOTEL
  - MONTEREY BAY SHORES
  - SOUTH OF TIOGA
  - WEST BROADWAY SPECIFIC PLAN



**SEASIDE COUNTY SANITATION DISTRICT**  
**2011 SEWER MASTER PLAN**  
**FIGURE 2-3: REGION A**  
**FUTURE DEVELOPMENT MAP**

NOTES:  
 BASEMAP PROVIDED BY SCSD.  
 WALLACE GROUP DID NOT  
 PERFORM BOUNDARY SURVEY  
 SERVICES FOR THIS MAP. NOT  
 A LEGAL DOCUMENT. MAP  
 PRODUCED MAY 2011.





Legend	
	CC - Community Commercial
	OP - Office Professional
	POS - Park and Open Space
	VSC - Visitor Serving Commercial

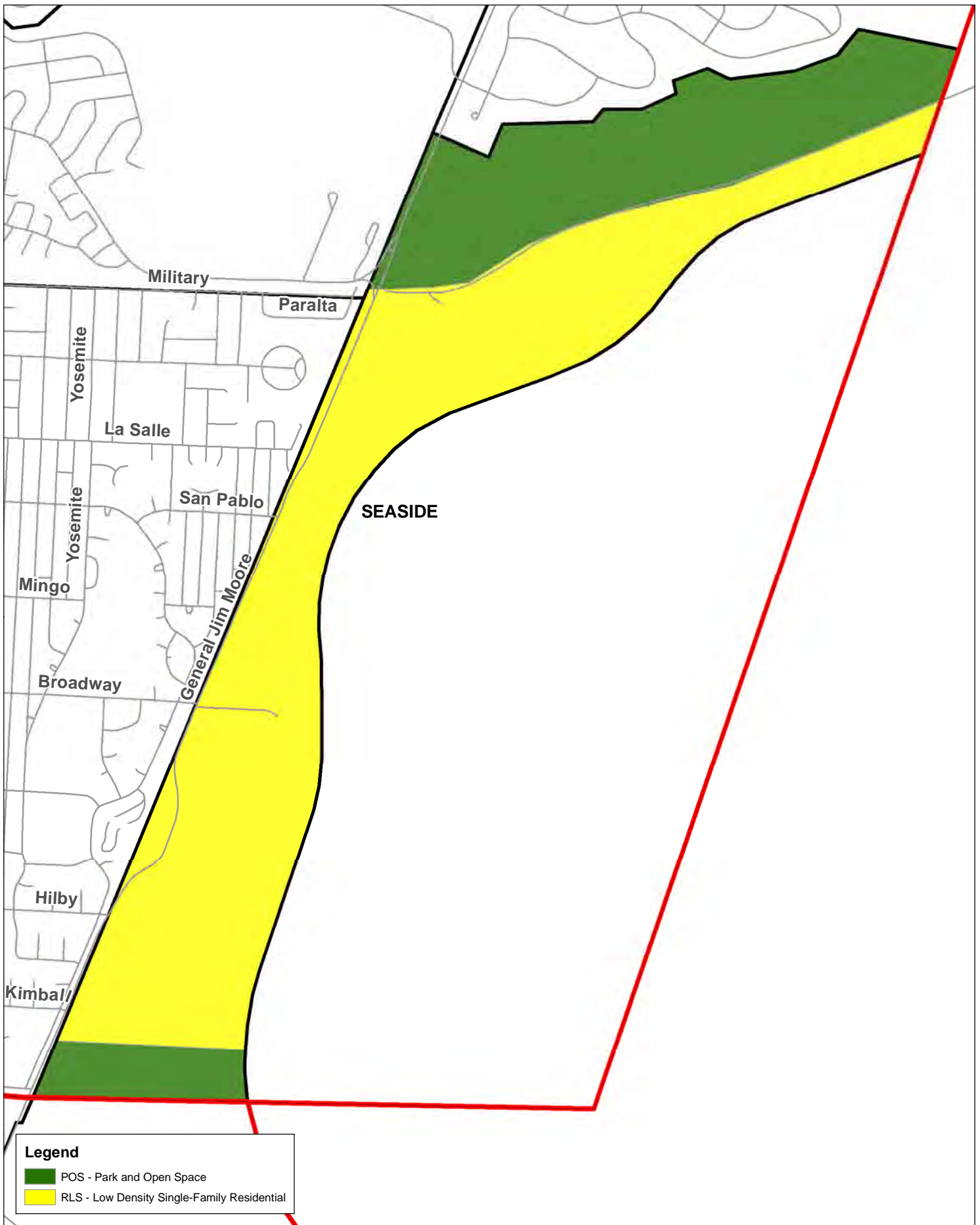


**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN**

**FIGURE 2-4: REGION B LAND USE MAP**

NOTES:  
 BASEMAP PROVIDED BY SCSD.  
 WALLACE GROUP DID NOT  
 PERFORM BOUNDARY SURVEY  
 SERVICES FOR THIS MAP. NOT  
 A LEGAL DOCUMENT. MAP  
 PRODUCED MAY 2011.





**Legend**

- POS - Park and Open Space
- RLS - Low Density Single-Family Residential



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## CHAPTER 3

### COLLECTION SYSTEM OVERVIEW

This Chapter provides an overview of the existing sewerage collection system for the Seaside County Sanitation District (SCSD). SCSD provides sanitation services (collection system only) to the Cities of Seaside, Del Rey Oaks, and Sand City. Monterey Regional Water Pollution Control Agency (MRWPCA) provides wastewater treatment. All tables and figures for Chapter 3 are located at end of this chapter.

#### COLLECTION SYSTEM OVERVIEW

The SCSD sewerage collection system consists of gravity sewer pipes ranging in diameters from 6-inch to 27-inch. SCSD also owns and operates four (4) lift stations with corresponding force mains. There is also one private lift station and force main located at La Salle Avenue in the City of Seaside. This lift station serves customers on Primrose Circle and Sandpiper Court. The La Salle Avenue lift station is incorporated into the sewer model to correctly model the flow coming from the development, but was not inspected or reported on as part of this master plan project. MRWPCA owns and operates the Seaside Lift Station that pumps all the wastewater from SCSD to the MRWPCA wastewater treatment plant.

Since the majority of SCSD collection system was constructed in the 1950's and 1960's, the pipe material throughout the system consists primarily of Vitrified Clay Pipe (VCP). A small percentage of Polyvinyl Chloride (PVC) pipe has been installed in newer construction. An inventory of existing sewer pipe diameters and materials are summarized in Tables 3-1 and 3-2 and shown on Figure 3-1.

The collection system has approximately 740 concrete manholes and approximately 295 brick manholes. Of these manholes, 47 of the concrete manholes and 45 of the brick manholes are drop manholes. Figure 3-2 shows an overview of the manhole material types throughout the system. There are also approximately 557 rod holes (cleanouts) located throughout the system.

#### Manholes

The manholes within the collection system pose several concerns to the operations and maintenance staff. These concerns include the following:

- The collection system has approximately 295 brick manholes located throughout the service area. Although the majority of these manholes are structurally sound, most are not coated and ultimately are a source of infiltration of water and sand. It is not cost effective to replace these manholes with concrete manholes unless the entire sewer main is being replaced; however, it is recommended to coat each of the manholes with an epoxy lining to protect the manholes from hydrogen sulfide corrosion as well as prevent infiltration of water and sand.

- The collection system has 47 concrete and 45 brick drop manholes located throughout the service area. Many of these drop manholes are constructed improperly, with pipes that enter the manhole above the manhole invert, resulting in cascading flow. Due to this construction, the wastewater in the manholes has severe turbulence, which produces gas byproducts and erodes the manholes. In addition, it is difficult for operators to enter the manhole without being exposed directly to the wastewater. It is recommended that all drop manholes be evaluated and identify and replace the manholes that are improperly constructed.
- Water and sand infiltration also appear to come through the lids of the manholes as well as through the sides of the manholes. It is recommended to install solid manhole lids in the locations where sand and/or water can be present over the manhole lid. There are approximately 73 manholes in the Sand City area suspected of being susceptible to water/sand infiltration. An alternative and less costly repair in some instances may be to install plastic manhole inserts that are placed just under the manhole lid and capture sand and water instead of entering the manhole.

In addition, there are 3 manholes downstream of the Military Avenue LS that have potential for overflowing due to the shallow depth of these manholes and undersized sewer mains downstream of the force main. It is recommended to install sealed manhole lids at these three manholes to reduce the risk of sewage spills (in addition to upgrading the undersized mains as discussed in Chapter 7).

- Since the majority of the collection system was constructed in the 1950's and 1960's, the spacing of the manholes does not meet current standards. If the spacing is too great, it is difficult for operation and maintenance crews to clean the sewer mains properly. There are approximately 207 pipe segments that are greater than 400 ft in length throughout the collection system. It is recommended that a manhole be installed mid-length between two manholes that are greater than 400 feet apart. These pipes should be evaluated on a case-by-case basis; in some instances recommended pipe upgrades would allow for new construction to correct the excessive pipe length or the pipe lengths may be close enough to 400 feet to not warrant the cost of a new manhole installation.
- In addition to manhole separation, often times, only rod holes were installed at the end of sewer mains instead of full manholes. These rod holes are similar to cleanouts and limit access for operation and maintenance crews to inspect and clean the sewer mains. There are approximately 557 rod holes throughout the collection system. It is recommended that all rod holes be upgraded with an 8-inch riser to allow for routine O&M activities including video inspection. It is recommended that SCSD identify the most critical rod holes (areas that need to be cleaned routinely) to be upgraded due to sewer problems first and then upgrade the remaining rod holes over a longer duration of time.

## Operation and Maintenance Problem Areas

Staff from the SCSD operations department identified the known problem areas throughout the collection system. Routine maintenance tasks performed by operations staff consist of the following:

- Treating problem sewer pipes for root intrusion
- Power jetting problem sewer pipes with grease buildup on a monthly or semi-annual basis utilizing Jet Power II®
- Vacuuming problem sewer pipes on a yearly basis
- Checking problem sewer manholes on a weekly basis
- Treating problem manholes with Triple X Cleaner® for grease removal on a monthly basis

Figure 3-3 shows an overview of SCSD's trouble spots that require continuous maintenance operations and attention. It is recommended that SCSD work with MRWPCA to enhance the fats, oil, and grease (FOG) program specifically in the areas where known grease problems occur. This should include educational pamphlets, inspections, and enforcement actions when necessary.

Based on discussions with SCSD operation and maintenance staff, the following segments of the collection system are continual maintenance problems that need to be addressed:

### 942 Angelus Way Sewer Main Upgrade

There is an existing 6-inch VCP sewer main in the side yard of a private residence at Angelus Way just before the south side of Del Rey Park, which crosses a creek. The sewer main transitions to steel at the creek crossing. The steel main was constructed to span the creek without a casing, which means the steel sewer main is exposed to the atmosphere. SCSD operation and maintenance crews have identified a pinhole leak at the top of the sewer main. SCSD has provided a temporary fix to this condition by installing a sleeve over the pinhole location.

### Del Rey Park Sewer Main Upgrade

There is an existing 6-inch VCP gravity sewer main that conveys wastewater from the homes on Los Encinos Drive and Via Verde in Del Rey Oaks along the south side of the park to the west before crossing a creek and connecting to the sewer main on Angelus Way. This 6-inch sewer main is prone to maintenance problems due to inaccessibility caused by the location near to and under the creek. There may also be some operations problems due to pipe offsets and root intrusion caused by trees and shrubs growing above the sewer main.

### Root Intrusion Sewer Main Replacement

SCSD has over 19,300 lineal feet of sewer main that are treated yearly for continual root intrusion. Once a root has found access into the sewer main through a small crack or joint, the root will continue to grow and eventually block the flow through the sewer main. SCSD can slow the process down by cutting the roots back and treating the pipe with chemicals to kill the roots, but this effort is time consuming and costly for SCSD. It is recommended that the known problem areas be videoed to determine the condition of

the pipe and replace the segments of sewer main that appear to be in poor condition. At this time it is estimated that approximately 30 percent or 5,800 lineal feet of the existing sewer mains that have root intrusion problems will need to be replaced. If the identified mains are 6-inch diameter it is recommended they are upsized to 8-inch at the time of replacement to meet current SCSD standards.

### **Lift Stations**

SCSD owns four lift stations located throughout the collection system; however, they contract with MRWPCA to maintain the lift stations. These lift stations are briefly summarized in this chapter. Refer to Chapter 6 for detailed descriptions and the complete evaluation of the four lift stations and corresponding service areas.

- **Station #19 – Del Monte Lift Station:** Del Monte Lift Station is located at the intersection of Del Monte Boulevard and Canyon Del Rey Boulevard, in the City of Seaside. The lift station receives flow from customers along Canyon Del Rey Boulevard, Del Monte Boulevard from Roberts Avenue, and Rosita Lift Station. The lift station discharges through a 12-inch diameter cast iron force main to manhole #A9-23 at the intersection of Del Monte Boulevard and Palm Avenue.
- **Station #20 – Rosita Lift Station:** Rosita Lift Station is located at the intersection of Rosita Road and Angelus Way, in the City of Del Rey Oaks. The lift station receives flow from customers along Canyon Del Rey Boulevard at Highway 68 to Angelus Way. The lift station discharges through a 6-inch diameter cast iron force main to manhole #B12-2 at the intersection of Canyon Del Rey Boulevard and Rosita Road.
- **Station #21 – Military Avenue Lift Station:** Military Avenue Lift Station is located north of Military Avenue within a lot dedicated for the lift station, in the City of Seaside. The lift station receives flow from approximately 47 residential customers along Military Avenue. The lift station discharges through a 4-inch diameter cast iron force main to manhole #D7-5 in the southeast corner of Metz Park.
- **Station #22 – Tioga Lift Station:** Tioga Lift Station is south of Tioga Avenue in a lot dedicated for the lift station, in Sand City. The lift station receives flow from approximately two (2) residential customers and six (6) commercial customers. The lift station discharges through a 4-inch diameter cast iron force main to manhole #B8-53 at the intersection of Tioga Avenue and California Avenue.

### **O&M RELATED CAPITAL IMPROVEMENT PROGRAM RECOMMENDATIONS**

Based on operation and maintenance problems described in this chapter, the following are recommendations for capital improvement projects:

#### **Brick Manhole Inspection**

See Figure 3-2 for brick manhole locations. Inspect 250 brick manholes and identify those brick manholes that have infiltration of water and/or sand and/or are showing signs

of corrosion. Based on the results of this inspection, it is recommended to install an epoxy lining on the brick manholes that were identified as problem brick manholes.

#### Drop Manhole Inspection

See Figure 3-2 for drop manhole locations. Inspect 92 drop manholes and identify those drop manholes that are improperly constructed and are causing high turbulence within the manhole. Based on the results of this inspection, it is recommended to replace or reconstruct the drop manholes that are improperly constructed. It is estimated that 30 percent, or approximately 30 drop manholes, will need to be reconstructed.

#### Manhole Lid Replacement

See Figure 3-4 for locations of new manhole lids and inserts. Install 76 solid manhole lids in the locations where sand and/or water can be present over the manhole lid. This is primarily in the flatter regions closer to the bay. An alternative and less costly repair in some instances may be to install plastic manhole inserts that are placed just under the manhole lid to capture sand and water, preventing material from entering the manhole.

#### New Manhole Installations

See Figure 3-4 for the locations of the sewer mains greater than 400 feet. Install 207 new manholes where the span between existing manholes is greater than 400 feet.

#### Rod Hole Replacement

See Figure 3-4 for the locations of the Rod Hole locations. Upgrade 557 rodholes with an 8-inch riser. It is recommended to compile a priority list of manholes prior to replacement based on operations and maintenance problems. Purchase a new video camera for sewer inspections that fits within the newly installed 8-inch risers.

#### FOG Program

Work with MRWPCA to enhance the fats, oil, and grease (FOG) program targeting the known high grease areas. The program should include an educational program, inspection program, and enforcement program.

#### 942 Angelus Way Sewer Main Upgrade

See Figure 3-5. It is recommended to replace the existing 6-inch steel sewer main with a new 8-inch (SCSD minimum recommended pipe diameter) ductile iron sewer main for a total length of 80 feet. It may also be necessary to sleeve the portion of the sewer main that crosses the creek. This reach would span between Manholes # B12-52 and #B12-53.

#### Del Rey Park Sewer Main Upgrade

See Figure 3-5. It is recommended to replace the existing 6-inch VCP main with 8-inch PVC, from Los Encinos Drive to Via Verde (Manhole C12-31 to Manhole C12-29), and construct a new 8-inch PVC sewer main that crosses Del Rey Park, from Via Verde at Los Encinos Drive (manhole #C12-29) to the existing 12-inch VCP sewer main located on the north side of the park (between manhole #'s C12-23 and C12-39). Total project length is approximately 425 feet. After completion of the new main, it is recommended to abandon the existing sewer main from manhole C12-29 to manhole B12-52.

Root Intrusion Sewer Main Inspection and Replacement

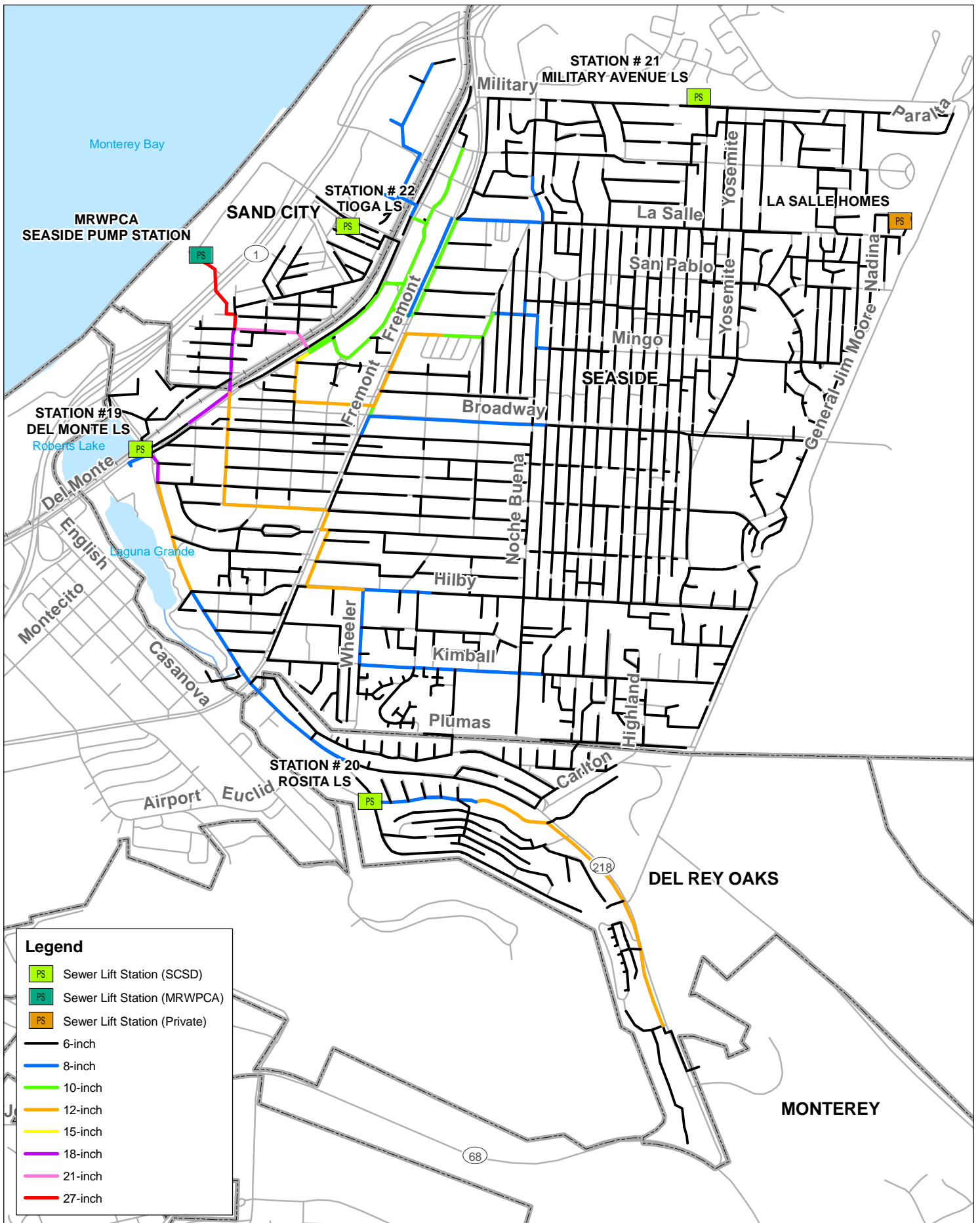
See Figure 3-3 for the sewer mains that SCSD currently treats for root intrusion problems. It is recommended to video inspect these sewer mains (19,300 ft) to identify mains that require replacement. It is estimated that 30 percent or approximately 5,800 feet of these sewer mains will need to be replaced.

**Table 3-1. Existing Pipeline Inventory by Material**

<b>Material</b>	<b>Length</b>	
	<b>Feet</b>	<b>Miles</b>
VCP	379,827	72.0
PVC	6,433	1.2
<b>Total</b>	<b>386,260</b>	<b>73.2</b>

**Table 3-2. Existing Pipeline Inventory by Diameter**

<b>Diameter (inches)</b>	<b>Length</b>	
	<b>Feet</b>	<b>Miles</b>
6	337,620	64.0
8	20,567	3.9
10	8,978	1.7
12	14,292	2.7
15	221	0.0
18	2,129	0.4
21	1,124	0.2
27	1,329	0.3
<b>Total</b>	<b>386,260</b>	<b>73.2</b>



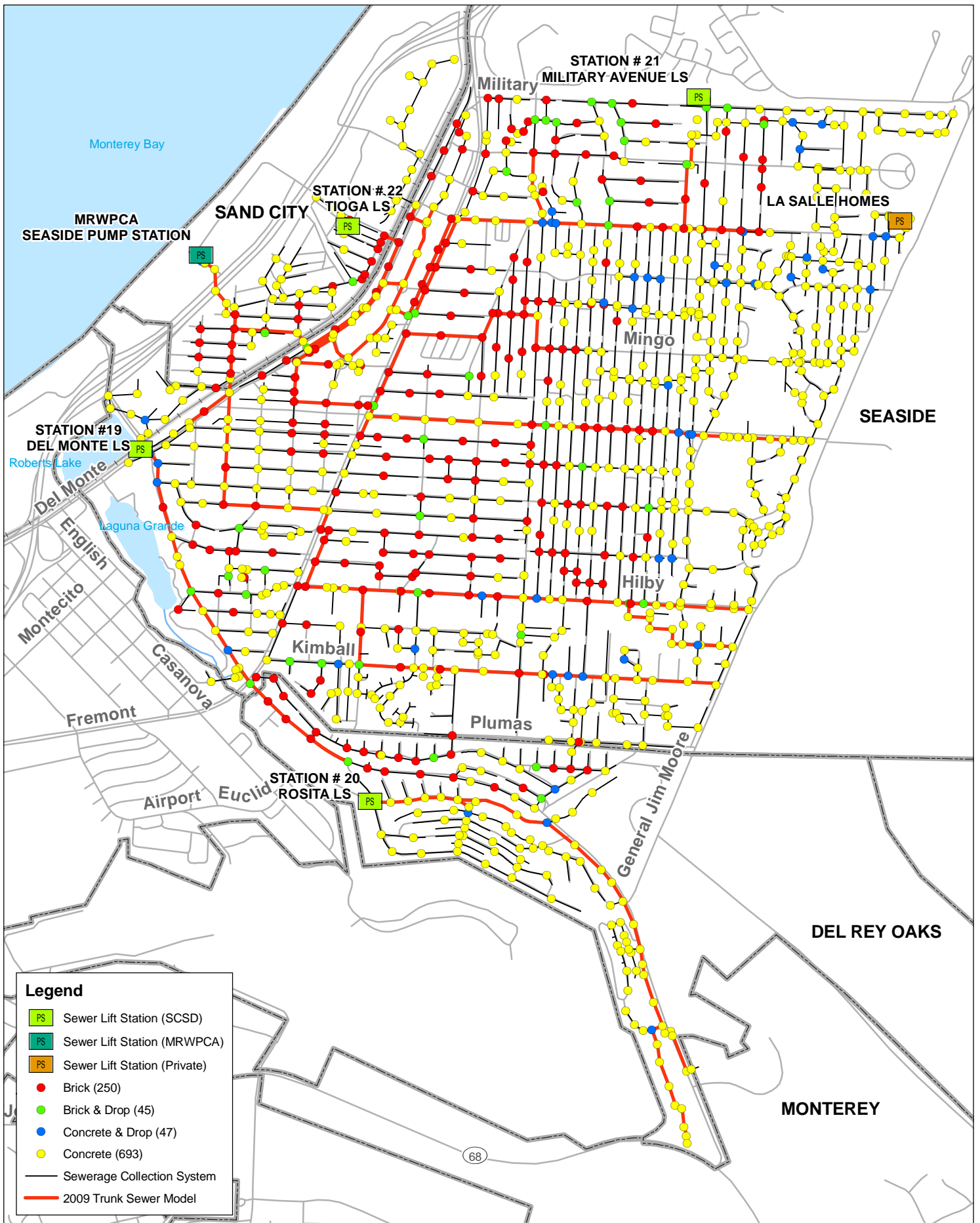
**Legend**

- Sewer Lift Station (SCSD)
- Sewer Lift Station (MRWPCA)
- Sewer Lift Station (Private)
- 6-inch
- 8-inch
- 10-inch
- 12-inch
- 15-inch
- 18-inch
- 21-inch
- 27-inch

**SEASIDE COUNTY SANITATION DISTRICT**  
**2011 SEWER MASTER PLAN**  
**FIGURE 3-1: COLLECTION SYSTEM**  
**OVERVIEW MAP**

NOTES:  
 BASEMAP PROVIDED BY SCSD.  
 WALLACE GROUP DID NOT  
 PERFORM BOUNDARY SURVEY  
 SERVICES FOR THIS MAP. NOT  
 A LEGAL DOCUMENT. MAP  
 PRODUCED MAY 2011.



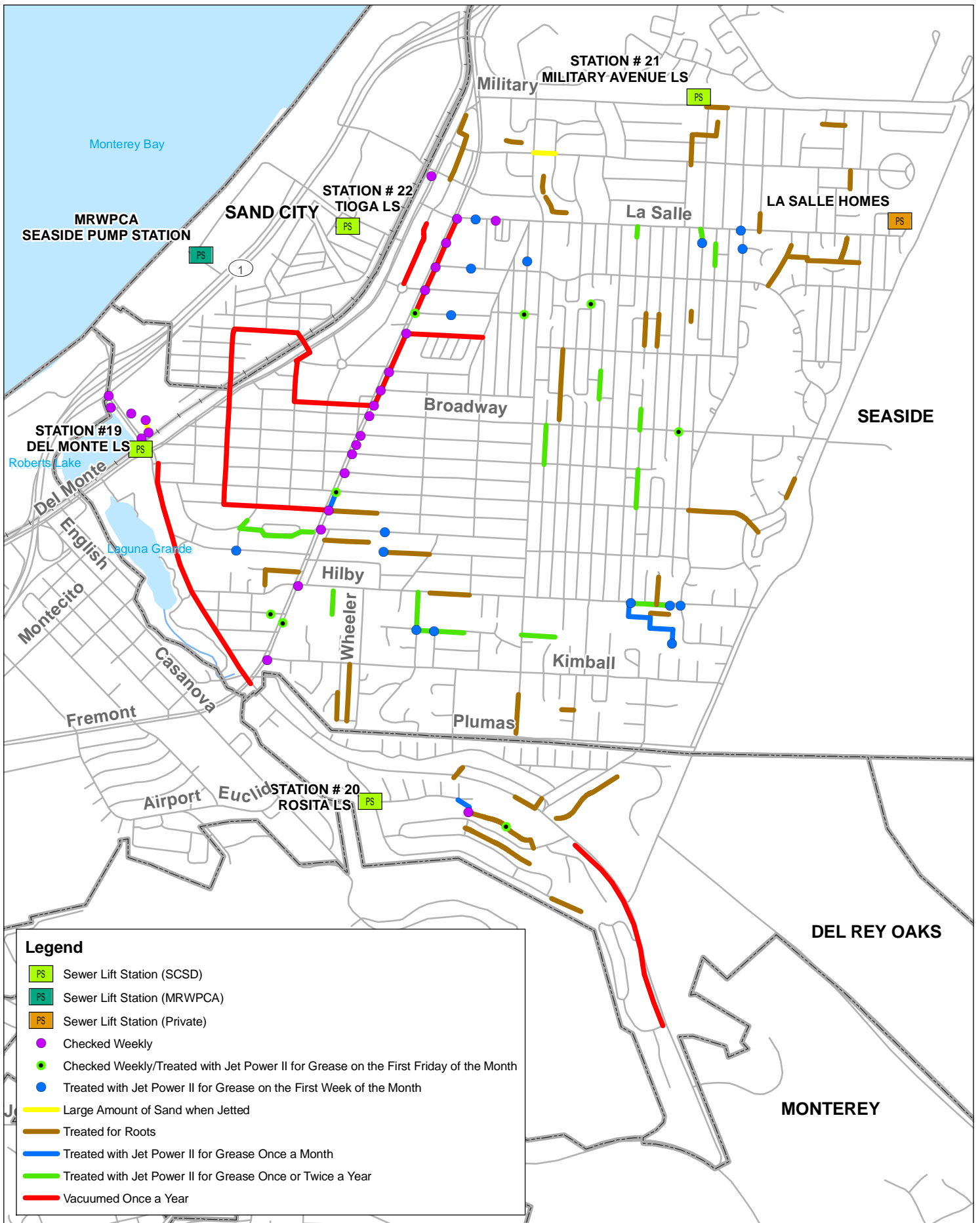


**Legend**

- Sewer Lift Station (SCSD)
- Sewer Lift Station (MRWPCA)
- Sewer Lift Station (Private)
- Brick (250)
- Brick & Drop (45)
- Concrete & Drop (47)
- Concrete (693)
- Sewerage Collection System
- 2009 Trunk Sewer Model

**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN  
FIGURE 3-2: SEWER MANHOLE  
OVERVIEW MAP**

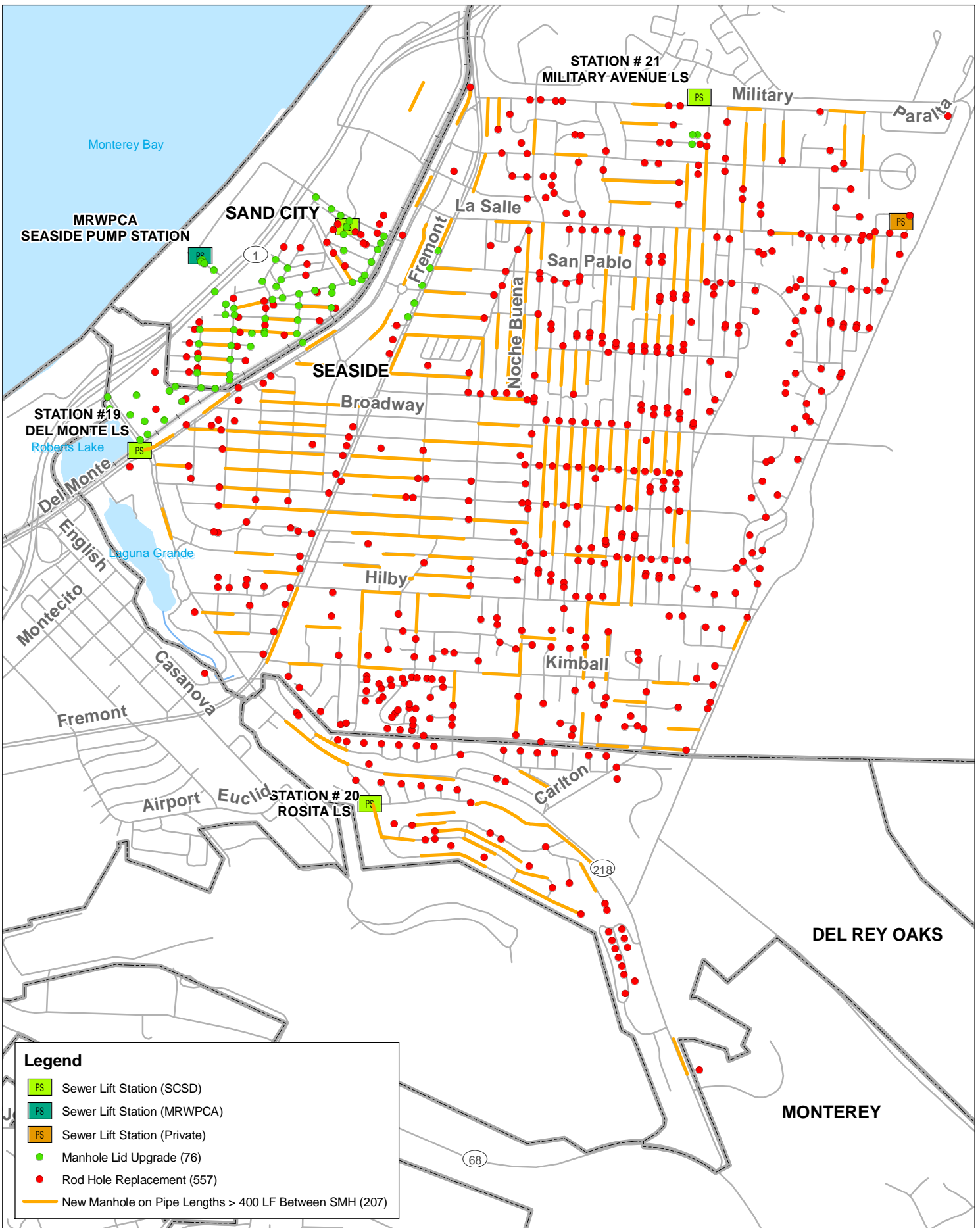
NOTES:  
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SEASIDE COUNTY SANITATION DISTRICT  
 2011 SEWER MASTER PLAN  
**FIGURE 3-3: SEWER MAINTENANCE OVERVIEW MAP**

NOTES:  
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 WALLACE GROUP DID NOT  
 PERFORM BOUNDARY SURVEY  
 SERVICES FOR THIS MAP. NOT  
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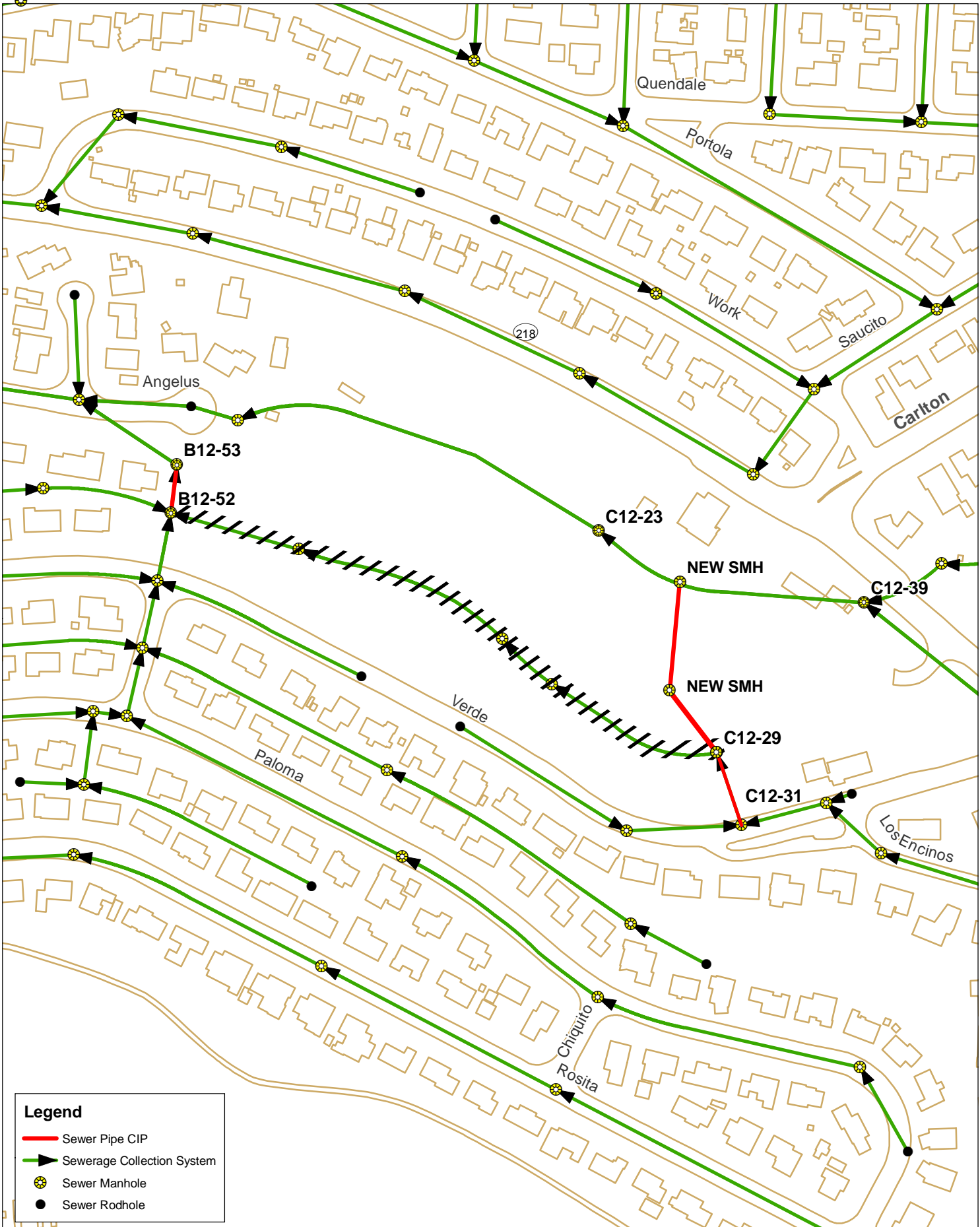
- Legend**
- Sewer Lift Station (SCSD)
  - Sewer Lift Station (MRWPCA)
  - Sewer Lift Station (Private)
  - Manhole Lid Upgrade (76)
  - Rod Hole Replacement (557)
  - New Manhole on Pipe Lengths > 400 LF Between SMH (207)

**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN**

**FIGURE 3-4: PROPOSED MANHOLES,  
ROD HOLES, AND MANHOLE LIDS MAP**

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**Legend**

- Sewer Pipe CIP
- ▶ Sewerage Collection System
- Sewer Manhole
- Sewer Rodhole

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 1 INCH = 200 FEET

**SEASIDE COUNTY SANITATION DISTRICT  
 2011 SEWER MASTER PLAN**

**FIGURE 3-5: 942 ANGELUS WAY  
 AND DEL REY PARK SEWER UPGRADES**

NOTES:  
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 PRODUCED MAY 2011.



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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 to be used for the analysis of the collection system for Seaside County Sanitation District (SCSD). Information pertaining to inflow and infiltration is provided in Chapter 5. All tables and figures for Chapter 4 are located at the end of this chapter.

#### INTRODUCTION

Historical wastewater flows were examined throughout the SCSD collection system by utilizing the following sources of data:

- Sewer flow monitoring results
- MRWPCA daily flow records from the Seaside Lift Station

A description of each is provided in the following sections.

#### SEWER FLOW MONITORING

To develop a better understanding of the existing wastewater flows from SCSD, in-line flow monitoring was conducted at eight different locations on main trunk lines throughout SCSD. The flow monitoring locations are as follows:

- **27-inch:** Located on Bay Avenue at Seaside Lift Station
- **Amador:** Located on Canyon Del Rey @ Amador Avenue
- **Rosita:** Located on Rosita Road @ Angelus Way
- **Contra Costa:** Located on Contra Costa Street @ Palm Avenue
- **Victory Toyota:** Located on Del Monte Boulevard @ Victory Toyota
- **Broadway:** Located on Broadway Avenue, just east of Fremont Blvd
- **Cypress Ford:** Located on The Mall @ Cypress Ford
- **Love Chevrolet:** Located on The Mall @ Love Chevrolet

The locations of the flow meters and their corresponding tributary areas are depicted on Figure 4-1. The flow meters were installed February 10, 2009 and removed March 26, 2009 to allow for a total of 44 days of monitoring.

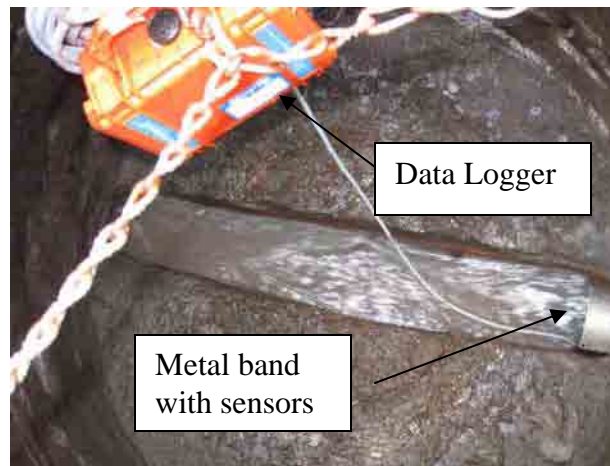
The sites chosen to install the flow meters were based on the proposed sewer model development. The flow meters were set to monitor and characterize large tributary areas that would provide information about the characteristics of the collection system.

## Flow Meters

The flow meters are insertion flow meters that consist of a circular metal band with sensors that are installed inside the sewer main in a manhole (see adjacent picture). They are installed so that the wastewater entering the manhole travels over the band with the sensors, which then reads the wastewater temperature, depth, and velocity every 5 minutes.

Since sewer flow monitoring does not record continuous flow, it only provides an estimate of the amount of wastewater flow generated by various areas of the community. It provides useful information about the diurnal patterns of the community and can show the impacts of inflow and infiltration. Additional information regarding inflow and infiltration is provided in Chapter 5. The following provides a summary of the benefits and the limitations with sewer flow monitoring:

Flow Meter Installation



### Benefits

- Provides reasonably accurate measurements of hourly and daily wastewater flow averages for various tributaries within the community.
- 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.
- Evaluates the impacts of inflow and infiltration and identifies where further detailed inflow and infiltration studies may be warranted.

### Limitations

- The flow meters record flow every 5 minutes. This flow reading is averaged over the 5 minutes. The averages are then totaled for the day to get total daily flows. Therefore, there are possibilities that the flow meter could miss higher peaks that may come through the collection system in between readings.
- Since wastewater is not a clean liquid, debris travels over the sensors, which causes blockages in the sewer mains and ultimately can change the levels and velocities in the sewer main producing inaccurate readings. If debris such as rags gets stuck on the bands, often times the level reading becomes zero, which reads as no flow in the manhole, which is incorrect.
- The flow meters need a minimum level, typically at least 1 inch over the sensor in order for the sensor to read the depth. If the level is less than 1-inch over the band, the sensor can only read velocity and cannot provide estimates of the flow. Through additional manipulation, flows can be estimated with only velocity readings, but these are typically not reliable.

## Flow Meter Results

A summary of the results from each of the flow monitoring stations is provided below. A graph of the average day demand versus daily rain totals are provided on Figures 4-2 through 4-6. The rain data was obtained through the Carmel Weather Station maintained by the California Irrigation Management Information System (CIMIS). More information about the rain data is provided in Chapter 5, Inflow and Infiltration.

### 27-inch

The 27-inch flow meter was installed to catch all flow from SCSD prior to it entering the Seaside Lift Station and being pumped to the MRWPCA Regional Treatment Plant. The flow meter was installed in manhole A8-05, receiving flow from a 27-inch concrete pipe that is extremely flat through this section of the collection system. In addition, this sewer main has a significant amount of sand accumulation. The 27-inch sewer receives flow from the entire SCSD tributary area.

Unfortunately, the flow results from this flow meter were not valid. Due to the sand traveling over the flow meter and sometimes depositing on top of the sensor, often times, level or velocity readings were not provided. This resulted in a total daily flow ranging from 0 gal/day to 640,000 gal/day. It was anticipated that total daily flows were expected around 1.8 mgd, based on review of the MRWPCA flow records. In addition, the diurnal curve for the 27-inch did not reflect what was expected. Therefore, the data from this flow meter will not be used.

### Amador

Canyon Del Rey @ Amador Avenue flow meter was installed at manhole A10-05 in an 18-inch diameter pipe just upstream of the Del Monte Lift Station. This flow meter received all of the flow from the south end of SCSD, primarily City of Del Rey Oaks, which includes the Rosita Lift Station.

The flow results from the Amador flow meter appeared to have no significant problems. Velocities and levels were good until the last seven days (March 20 through March 26<sup>th</sup>, 2009). Figure 4-2 depicts the daily flows versus the rain totals.

The daily flows at the tail end of the flow monitoring (March 11<sup>th</sup> to March 19<sup>th</sup>) were fairly consistent, depicting slightly higher flows on the weekend, which is to be expected since this is primarily a residential tributary area. Between March 11 and March 19, 2009, there was no rain and infiltration appeared to stable. Based on these 9 days, the average daily flow in the Amador Tributary was approximately 259,000 gal/day or 180 gpm with a diurnal peaking factor of 1.5 or approximately 275 gpm.

### Rosita

The Rosita Flow meter was installed just upstream of the Rosita Lift Station in manhole B12-08 in an 8-inch diameter sewer main. This flow meter was installed to capture the flow from the residential homes in City of Del Rey Oaks. This flow meter isolated the flow readings from this tributary area prior to reaching the Amador flow meter.

The flow meter at Rosita was problematic. The flow level in the manhole was less than 1-inch and therefore, flow levels were not reading. Flows were not able to be determined for this tributary area.

### Contra Costa

The Contra Costa flow meter was installed on Contra Costa at Palm Avenue in manhole A9-45 in a 12-inch diameter sewer main. This tributary area primarily receives its flow from Hilby Avenue and Kimball Avenue, which is predominantly residential with the lower portion of the collection system commercial.

Figure 4-3 depicts the total daily flows versus rain totals. This exhibit shows interesting results. The total daily flow at the start of the metering was near 100,000 gal/day. Flows continued to rise steadily until February 22 where flows then stayed fairly constant at approximately 460,000 gal/day. These flows continued on throughout the duration of the flow monitoring with peaks as high as 510,000 gpd.

It is estimated that the population in this tributary area is approximately 5,200 people, plus some commercial and institutional services. At a minimum, the lowest flows in this tributary area would be a minimum of 300,000 gpd. Therefore, the total daily flow readings from February 11 through February 24, 2009 will not be used for this analysis.

The flows from March 9<sup>th</sup> through March 19<sup>th</sup>, 2009 were fairly consistent with no influence from any rain days. The average daily flow during this time period was 446,000 gpd or 310 gpm with a diurnal peaking factor of 1.9 or approximately 310 gpm.

### Victory Toyota

The Victory Toyota flow meter on Del Monte Blvd. was installed in manhole B9-28 in a 15-inch sewer main receiving flow primarily from Broadway Avenue and Phoenix Avenue, which are primarily residential with some commercial at the lower end of the tributary area.

The results for the Victory Toyota flow meter fluctuated from 600,000 gpd to 750,000 gpd with higher flows typically seen on the weekends, which is to be expected. There is one anomaly on February 26<sup>th</sup>. Readings appear to be too low on this day, likely due to debris caught on the flow meter. Figure 4-4 depicts the total daily flow versus rain totals. Based on the dry period from March 9<sup>th</sup> through the 19<sup>th</sup>, the average daily flow for the Victory Toyota tributary area was 684,000 gpd or 475 gpm with a diurnal peaking factor of 1.6 or 775 gpm.

### Broadway

The Broadway flow meter was installed on Broadway just upstream of Fremont Boulevard in manhole B9-72 in an 8-inch sewer main. This flow meter contributes to the Victory Toyota Tributary. This flow meter was installed to isolate the amount of flow coming down Broadway to assist with determining the collection systems' ability to handle future growth from the former Fort Ord area.

The flow meter was installed on February 10, 2009. However, before data was downloaded, the meter was washed out during routine flushing by SCSD staff. The meter was re-installed on March 20, 2009. Figure 4-5 depicts the total daily flow versus the rain totals from March 20, 2009 through March 26, 2009.

The final week of flow monitoring was fairly consistent. There was a slight rise in total flow during the small rain events (0.19 inches), but this also occurred on the weekend

when one would expect slightly higher flow totals. The average daily flow for this period was 171,000 gpd or 120 gpm with a diurnal peaking factor of 2.5 or 300 gpm. This peaking factor is higher than the other tributary areas. This is most likely due to the fact that it is a smaller tributary area with predominantly all residential.

#### Love Chevrolet

There were two flow meters installed on The Mall. The first was installed in front of the Love Chevrolet dealership in manhole B9-59 in a 12-inch diameter sewer main. This flow meter receives all the flow from the northwest section of SCSD, which is predominantly residential and includes Military Lift Station. Figure 4-6 depicts the total daily flow versus the rain totals.

The average daily flow between March 9<sup>th</sup> and 19<sup>th</sup>, which does not have any influence from rainfall, was 392,000 gpd or 270 gpm with a diurnal peaking factor of 2.2 or 600 gpm.

#### Cypress Ford

The meter at the Mall at Cypress Ford was installed at manhole B8-60 in a 10-inch sewer main. It was installed to read the small commercial tributary area. This flow meter had significant problems throughout the duration of the flow metering. This flow meter continuously was hung up with shop rags that would get trapped on the meter and the flow levels were not significant enough to provide depths. Therefore, flows were not able to be determined for this tributary area.

### **Flow Meter Summary**

Table 4-1 provides a summary of the average daily flows from each tributary and their corresponding peaking factors based on review of the actual field flow measurements, where the data was confirmed to be valid. Additional information regarding inflow and infiltration for each tributary area is provided in Chapter 5, Inflow and Infiltration. Based on the flow meters from Amador, Contra Costa, Victory Toyota, and Love Chevrolet, the estimated average daily flow for SCSD is approximately 1,781,000 gpd. This estimate does not include flow that should be contributed by the Cypress Ford and the 27<sup>th</sup> tributary areas since flow meter data was not obtained from these two tributaries. Therefore, the estimated average daily flow is approximately 5 to 10 percent low.

### **SEASIDE LIFT STATION DAILY FLOW RECORDS**

MRWPCA provided daily wastewater flow data from January 2002 through May 2009 for the Seaside Lift Station. This lift station however, also receives flow from the Cities of Monterey and Pacific Grove and continues to pick up flow from Fort Ord Lift Station and Fort Ord Treatment Plant prior to reaching MRWPCA's WWTP. Based on information provided from MRWPCA staff, in the past, the flow meter at the Seaside Lift Station force main has typically been unreliable, reading flows considerably higher than what is truly coming from SCSD. Therefore, to determine the total flows from SCSD, the flows from the Monterey lift station, Fort Ord lift station, and Fort Ord Treatment Plant were subtracted from MRWPCA's total wastewater plant flow. There were some discrepancies in this methodology since this analysis is relying on the accuracy of four lift station flow meters to obtain SCSD flows. Therefore, when determining the true daily

flow from SCSD, all wastewater flows that appeared to be abnormally low or high were removed from the database selection. Table 4-2 provides a summary of the average annual flows for SCSD from 2002 through 2009 as well as the minimum and maximum daily flows for each year.

## **EXISTING WASTEWATER FLOWS**

Based on the information from the sewer flow monitoring, MRWPCA's record information, and reliable wastewater resources such as Metcalf & Eddy, Wastewater Engineering Treatment and Reuse, fourth addition, the wastewater generation characteristics of various existing development types within SCSD were developed and are presented in Table 4-3. In addition, Table 4-4 breaks down the flow characteristics of the various tributary areas based on the wastewater generation factors.

### **Peaking Factor Analysis**

When discussing wastewater flows, it is important to define some of the terminology commonly used to describe and analyze wastewater flows.

*Average Daily Flow (ADF)* is the average daily wastewater flow over the course of a year and is generally obtained by averaging the mean monthly flows conveyed to a WWTP through the course of a year. In the case of this report the ADF is based on flow records from the Monterey Regional Water Pollution Control Agency's (MRWPCA) record lift station data. The ADF was determined using only the average annual flows from January 2006 through May 2009 since flows appeared to have increased slightly during this time period. Therefore, the ADF for SCSD is estimated at 1.80 mgd.

*Maximum Day Dry Weather Flow (MDDWF)* reflects the maximum day flow rate during the peak summer months. This condition reflects the seasonal variation in dry weather flow. For the purposes of this study, the recent historical MDDWF is 2.72 mgd based on flow records from MRWPCA's record lift station data, and this occurred on October 25, 2008, which results in a peaking factor of 1.5.

*Peak Hour Dry Weather Flow (PHDWF)*. In order to appropriately design wastewater collection system facilities, peak flow conditions must be quantified. Peak flow was determined based on flow monitoring that was conducted from February 10, 2009 through March 26, 2009. The peaking factor for the diurnal peak does not include inflow/infiltration (I/I) flow contributions to the collection system. Additional information pertaining to I/I is provided in Chapter 5 and in the description of peak hour wet weather flow below. Figure 4-7 provides a residential and commercial diurnal curve of the collection system with a dry weather peaking factor of 2.0 for residential and 2.1 for commercial.

*Peak Hour Wet Weather Flow (PHWWF)* is the maximum flow rate that occurs in a single hour during wet weather (a significant rain storm event). This factor is derived from standard engineering methodology and judgment combined with actual flow monitoring data. This flow condition may govern the design of the sewage collection system as it may represent the maximum flow rate that the

system must convey. PHWWF is derived by multiplying ADF times the diurnal peaking factor, then adding the wet weather flow component. The I/I flow amounts were determined as a fixed flow based on the flow monitoring results of each tributary area. This I/I factor is assumed constant and will not increase for future conditions. The existing PHWWF for SCSD varies depending on tributary area and is described in more detail in Chapter 5.

Table 4-5 provides a summary of the existing average daily flow and the peaking factors used for this report.

## **FUTURE WASTEWATER FLOWS**

Projection of wastewater flow is tied closely to population projections and anticipated development. As noted in Chapter 2 of this report, the future flows for this collection system may be comprised of not only infill and re-development within Region "A", but potentially receiving flow from Regions "B", "C", and "D2". Region "D1" also has potential for being diverted to SCSD's collection system and will be analyzed in Chapter 8 of this report.

Although it is assumed that water conservation measures will be taken, such as low flow plumbing fixtures for all future development, to determine the future flows, the existing flow factors, noted in Table 4-3 will be used. In addition, the existing peaking factors noted in Table 4-5 will also be used for estimating future development MDDWF and PHDWF. Tables 4-6 through 4-9 provide a breakdown of the land uses and the estimated wastewater flows from each region. Table 4-10 provides a summary of the estimated future wastewater flows from each region.

### **Region "A"**

Region "A", the core of SCSD's collection system has several new developments projected for in the future. Table 4-6 provides a summary of the future wastewater flows anticipated for Region "A". It is estimated that the future ADF for SCSD Region "A" will be 2.36 mgd.

### **Region "B"**

Region "B" is anticipated for some neighborhood commercial and public facilities, as well as potentially a hotel and/or golf course. Since the development type for this region is unknown at this time, assumptions were made to the intensity of the commercial development. It is assumed that the general commercial will be constructed with a 25 percent floor to area ratio and that a 150 room hotel will be constructed. Table 4-7 provides a summary of the future wastewater flows anticipated for Region "B". Based on these assumptions, it is estimated that the ADF for Region "B" is 0.09 mgd.

### **Region "C"**

Region "C", located along General Jim Moore Boulevard will be comprised of all residential development. It is anticipated that there will be approximately 2,600 residential units or an increase in population of over 8,500 persons. This will result in an

ADF for Region "C" of approximately 0.56 mgd. Table 4-8 provides a summary of the future wastewater flows anticipated for Region "C".

### **Region "D2"**

Region "D2" is also within the Former Fort Area and is designated for Industrial Research and Planned Community. It is estimated that there will be 535 residential units in the Planned Community zoning and approximately 25% floor to area of commercial development in the Industrial Research zoning. Based on these values, it is estimated that the ADF for Region "D2" is 0.11 mgd. Table 4-9 provides a summary of the future wastewater flows anticipated for Region "D2".

**Table 4-1. Flow Meter Summary of Average and Maximum Day Flows**

Tributary Areas	Average Day Flows		Maximum Day Flow	
	gpd	gpm	Peaking Factor	gpm
27"	Unable to be determined			
Amador	259,000	180	1.5	275
Rosita	Unable to be determined			
Contra Costa	446,000	310	1.9	310
Victory Toyota	684,000	475	1.6	775
Broadway	171,000	120	2.5	300
Love Chevrolet	392,000	270	2.2	600
Cypress Ford	Unable to be determined			

**Table 4-2. SCSD Average Annual Flow Summary from MRWPCA**

Year	Actual Minimum Day Flow <sup>1</sup> (gpd)	Actual Maximum Day Flow <sup>1</sup> (gpd)	Modified Minimum Day Flow <sup>2</sup> (gpd)	Modified Maximum Day Flow <sup>2</sup> (gpd)	Average <sup>3</sup> (gpd)
2002	0.61	2.20	1.01	1.90	1.61
2003	0.82	2.06	0.99	2.06	1.46
2004	-1.61	2.30	0.96	1.61	1.24
2005	-0.91	2.48	0.74	2.09	1.47
2006	1.23	3.38	1.23	2.31	1.79
2007	0.33	3.46	0.94	1.64	1.34
2008	-0.57	2.72	1.13	2.72	2.15
2009	1.32	2.93	1.32	2.93	1.90

<sup>1</sup> Actual flows calculated.

<sup>2</sup> Modified Minimum and Maximum flows based on reasonable flow meter results.

Arbitrarily low or high flow readings were removed from the data selection.

<sup>3</sup> Average based on daily flows from modified flow summary. Does not include flows that appeared to be arbitrarily low or high.

**Table 4-3. Existing Average Annual Flows By Land Use**

Source of Flow	Quantity	Unit	Flow Factor (gal/day/unit)	Total Average Annual Flow (gal/day)
Residential	21,020	persons	65	1,366,300
Hotel Rooms	698	rooms	100	69,800
Commercial	2,974,898	sf	0.10	297,490
School	3,215	students	20	64,300
<b>Existing Average Daily Flows</b>				<b>1,797,890</b>

Table 4-4. Existing Average Daily Flows By Tributary Area

Description of Tributary Area	Estimated Residential Population (Including Mix-Use)	gpd	# of Hotel Rooms	gpd	Estimated # of Students	gpd	Commercial/ Public Facility (minus schools & hotels) (sq. ft.)	gpd	Total gpd	Flow Monitoring (gpd)
<b>Amador Tributary Area</b>										
Rosita	848	55,088	0	0	0	0	248,065	24,806	79,894	
Amador	1,555	101,075	41	4,100	0	0	302,069	30,207	135,382	
									<b>215,276</b>	<b>259,000</b>
<b>Contra Costa Tributary Area</b>										
Contra Costa	5,211	338,715	19	1,900	729	14,580	255,830	25,583	380,778	
									<b>380,778</b>	<b>446,000</b>
<b>Victory Toyota Tributary Area</b>										
Toyota	6,580	427,705	0	0	1,039	20,780	407,224	40,722	489,208	
Broadway	2,948	191,646	0	0	1,147	22,940	58,407	5,841	220,427	
									<b>709,634</b>	<b>684,000</b>
<b>Love Chevrolet Tributary Area</b>										
Love Chevy	3,475	225,882	81	8,100	300	6,000	354,998	35,500	275,481	
Military	118	7,638	0	0	0	0	0	0	7,638	
									<b>283,119</b>	<b>392,000</b>
<b>Cypress Ford Tributary Area</b>										
Cypress Ford	0	0	189	18,900	0	0	790,124	79,012	97,912	
									<b>97,912</b>	<b>Not Measured</b>
<b>27" Tributary Area</b>										
27"	285	18,525	368	36,800	0	0	558,181	55,818	111,143	
									<b>111,143</b>	<b>Not Measured</b>
<b>Total</b>	<b>21,020</b>	<b>1,366,273</b>	<b>698</b>	<b>69,800</b>	<b>3,215</b>	<b>64,300</b>	<b>2,974,898</b>	<b>297,490</b>	<b>1,797,862</b>	<b>1,781,000</b>

**Table 4-5. Summary of Peaking Factor Analysis**

Flow Condition	Flow (mgd)	Peaking Factor	Notes
Average Daily Flow (ADF)	1.80	--	Record daily flows from MRWPCA from January 2006 through May 2009.
Maximum Day Dry Weather Flow (MDDWF)	2.72	1.5	From October 25, 2008
Peak Hour Dry Weather Flow (PHDWF)	5.4	3.0 – Residential	Based on flow monitoring conducted between February 10, 2009 and March 26, 2009.
		3.1 - Commercial	
Peak Hour Wet Weather Flow (PHWWF)	Varies for Each Tributary Area		See Chapter 5

**Table 4-6. Region “A” Future Average Daily Flows By Land Use**

Source of Flow	Quantity	Unit	Flow Factor (gal/day/unit)	Total Average Annual Flow (gal/day)
Residential	27,839	persons	65	1,809,535
Hotel Rooms	1,284	rooms	100	128,400
Commercial	3,481,698	sf	0.10	348,170
School	3,697	students	20	73,945
<b>Future Average Daily Flows</b>				<b>2,360,050</b>

**Table 4-7. Region “B” Future Average Daily Flows By Land Use**

Source of Flow	Quantity	Unit	Flow Factor (gal/day/unit)	Total Average Annual Flow (gal/day)
Residential	0	persons	65	0
Hotel Rooms <sup>1</sup>	150	rooms	100	15,000
Commercial <sup>2</sup>	762,300	sf	0.10	76,230
School	0	students	20	0
<b>Future Average Daily Flows</b>				<b>91,230</b>

<sup>1</sup> Assumes hotel constructed on general commercial parcel. Number of hotel rooms assumed.

<sup>2</sup> Assumes 70 acres developed for commercial use with a 25% floor to area developed ratio.

**Table 4-8. Region “C” Future Average Daily Flows By Land Use**

Source of Flow	Quantity	Unit	Flow Factor (gal/day/unit)	Total Average Annual Flow (gal/day)
Residential	8,554	persons	65	556,010
Hotel Rooms	0	rooms	100	0
Commercial	0	sf	0.10	0
School	0	students	20	0
<b>Future Average Daily Flows</b>				<b>556,010</b>

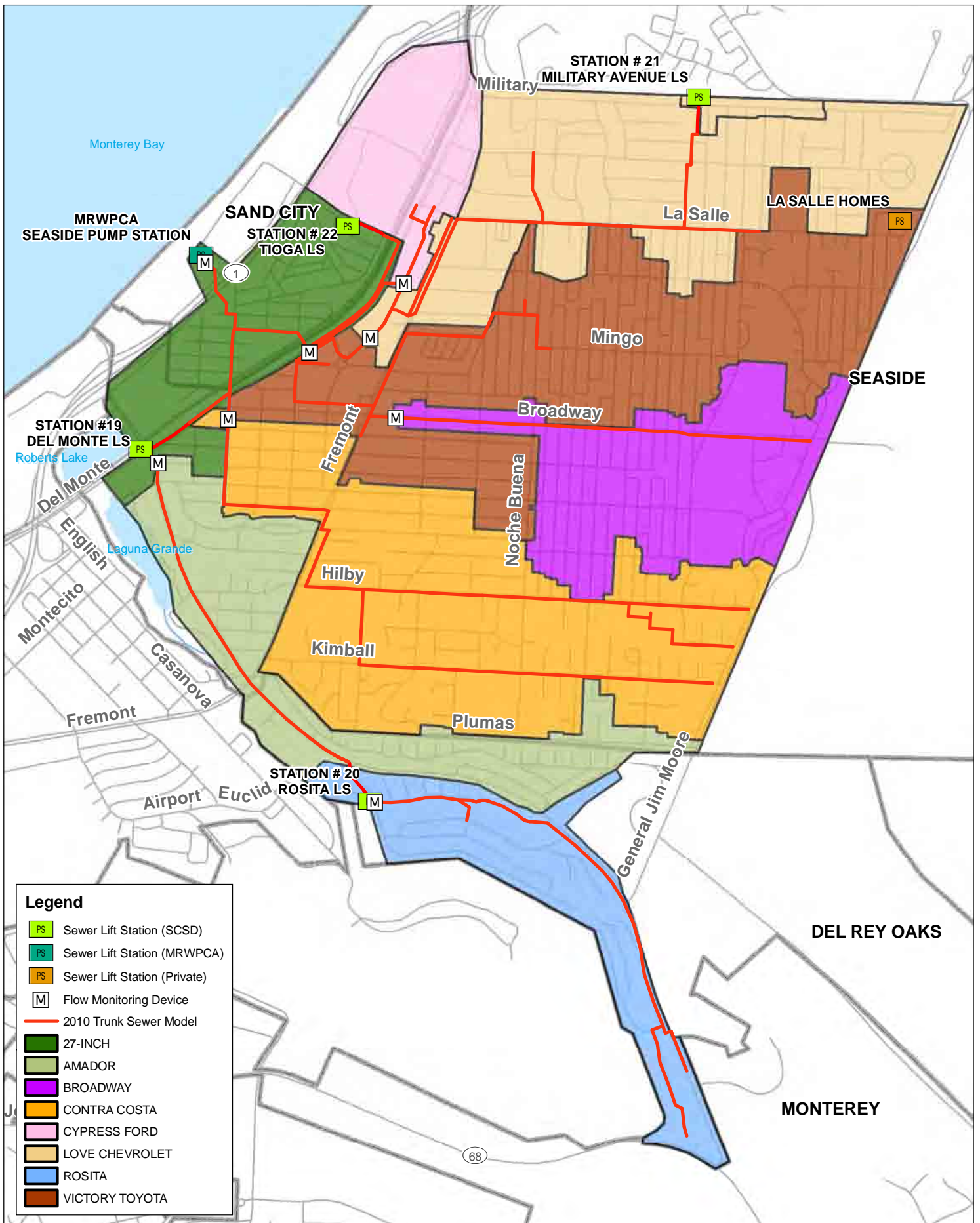
**Table 4-9. Region “D2” Future Average Daily Flows By Land Use**

Source of Flow	Quantity	Unit	Flow Factor (gal/day/unit)	Total Average Annual Flow (gal/day)
Residential	1,123	persons	65	72,995
Hotel Rooms	0	rooms	100	0
Commercial <sup>1</sup>	370,260	sf	0.10	37,026
School	0	students	20	0
<b>Future Average Daily Flows</b>				<b>110,021</b>

<sup>1</sup> Assumes 34 acres developed for commercial use with a 25% floor to area developed ratio.

**Table 4-10. Summary of Future Average Daily Flows**

Region	Future WW Flow (gpd)
Region "A"	2,360,050
Region "B"	91,230
Region "C"	556,010
Region "D2"	110,021
<b>Total</b>	<b>3,117,311</b>
<b>Total (mgd)</b>	<b>3.12</b>



**Legend**

- Sewer Lift Station (SCSD)
- Sewer Lift Station (MRWPCA)
- Sewer Lift Station (Private)
- Flow Monitoring Device
- 2010 Trunk Sewer Model
- 27-INCH
- AMADOR
- BROADWAY
- CONTRA COSTA
- CYPRESS FORD
- LOVE CHEVROLET
- ROSITA
- VICTORY TOYOTA

**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN**

**FIGURE 4-1: FLOW MONITORING BASIN MAP**

NOTES:  
BASEMAP PROVIDED BY SCSD.  
WALLACE GROUP DID NOT  
PERFORM BOUNDARY SURVEY  
SERVICES FOR THIS MAP. NOT  
A LEGAL DOCUMENT. MAP  
PRODUCED MAY 2011.



Figure 4-2. Amador Average Daily Flow Readings

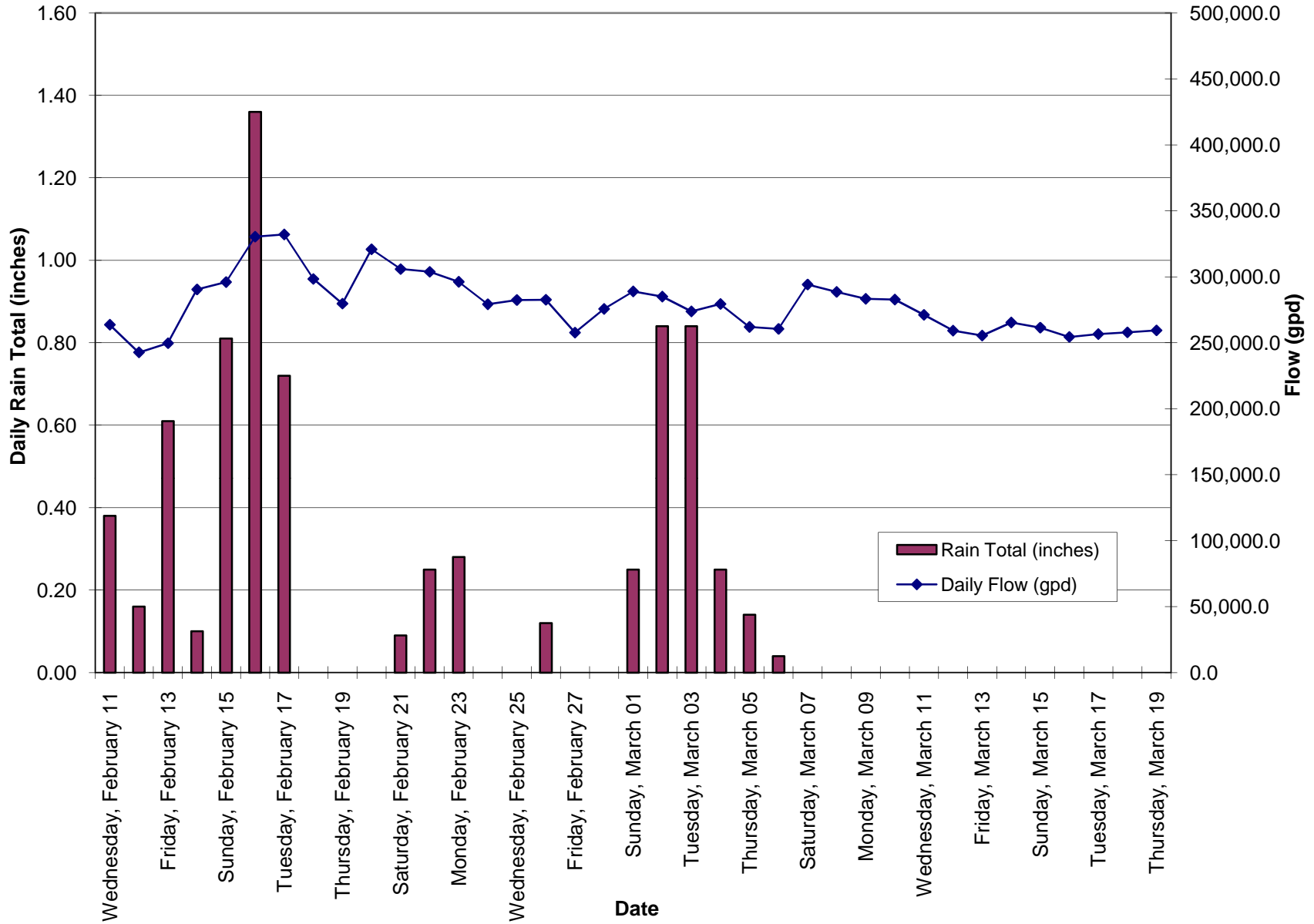


Figure 4-3. Contra Costa Average Daily Flow Readings

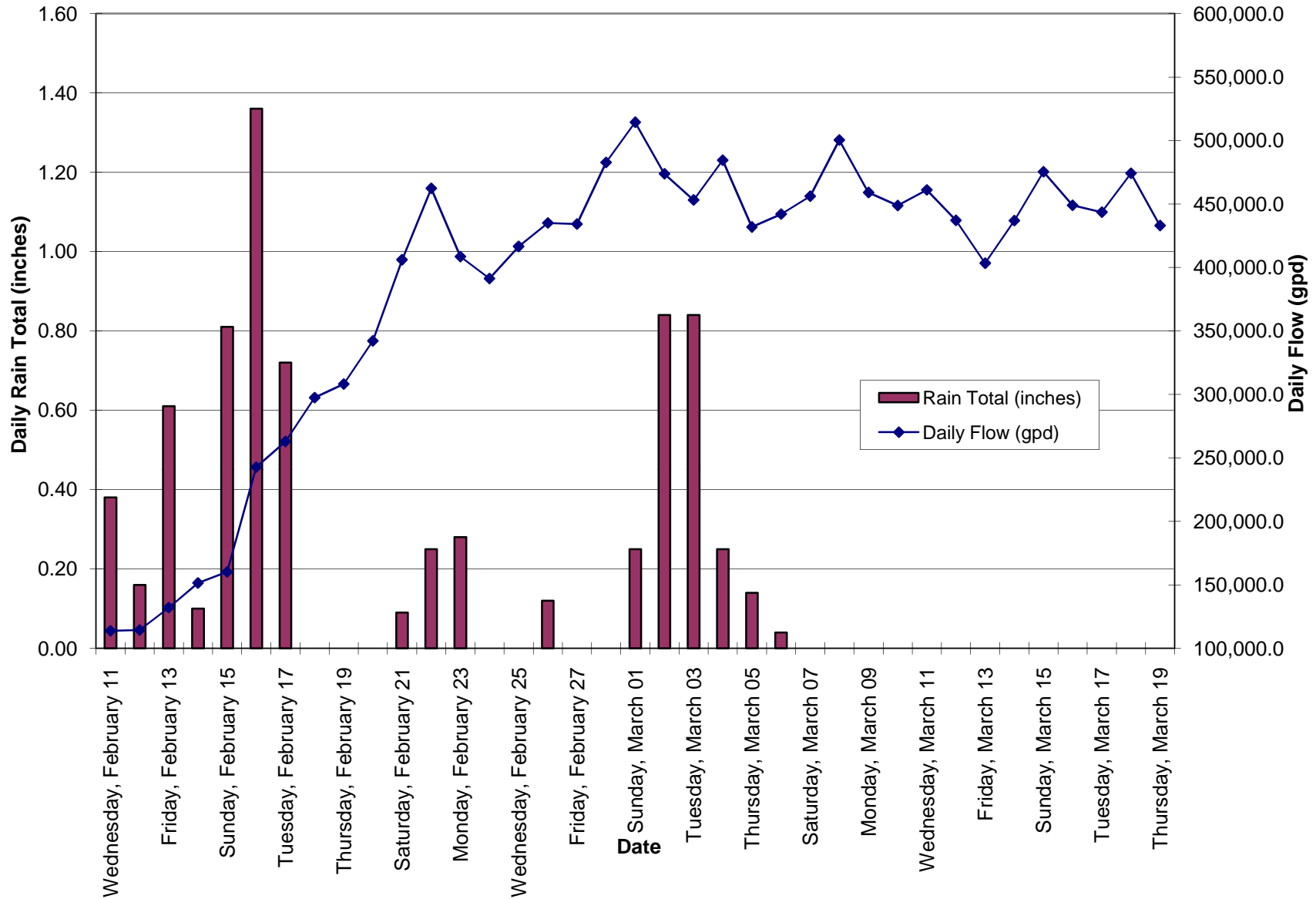


Figure 4-4. Victory Toyota Average Daily Flow Readings

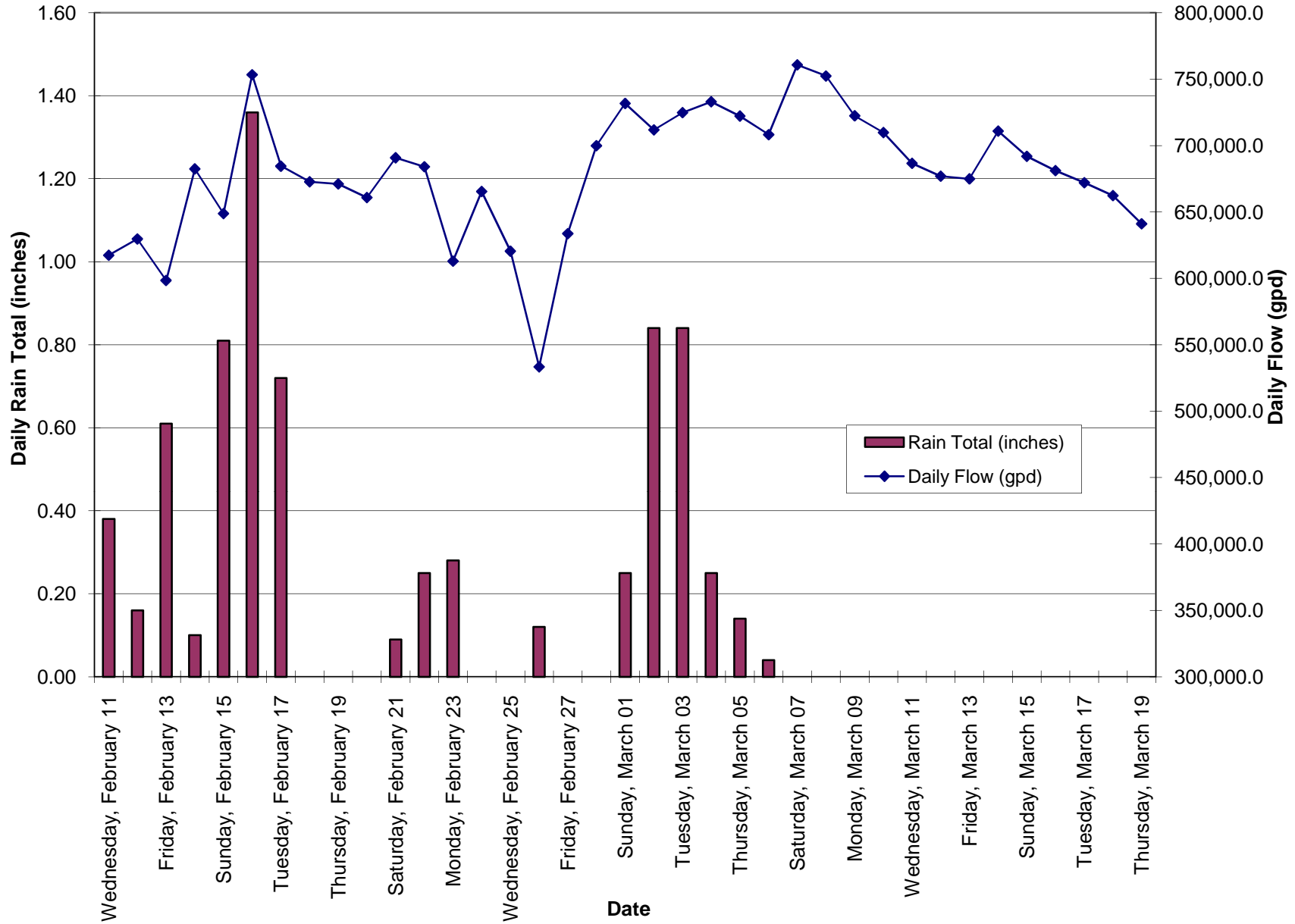


Figure 4-5. Broadway Average Daily Flow Readings

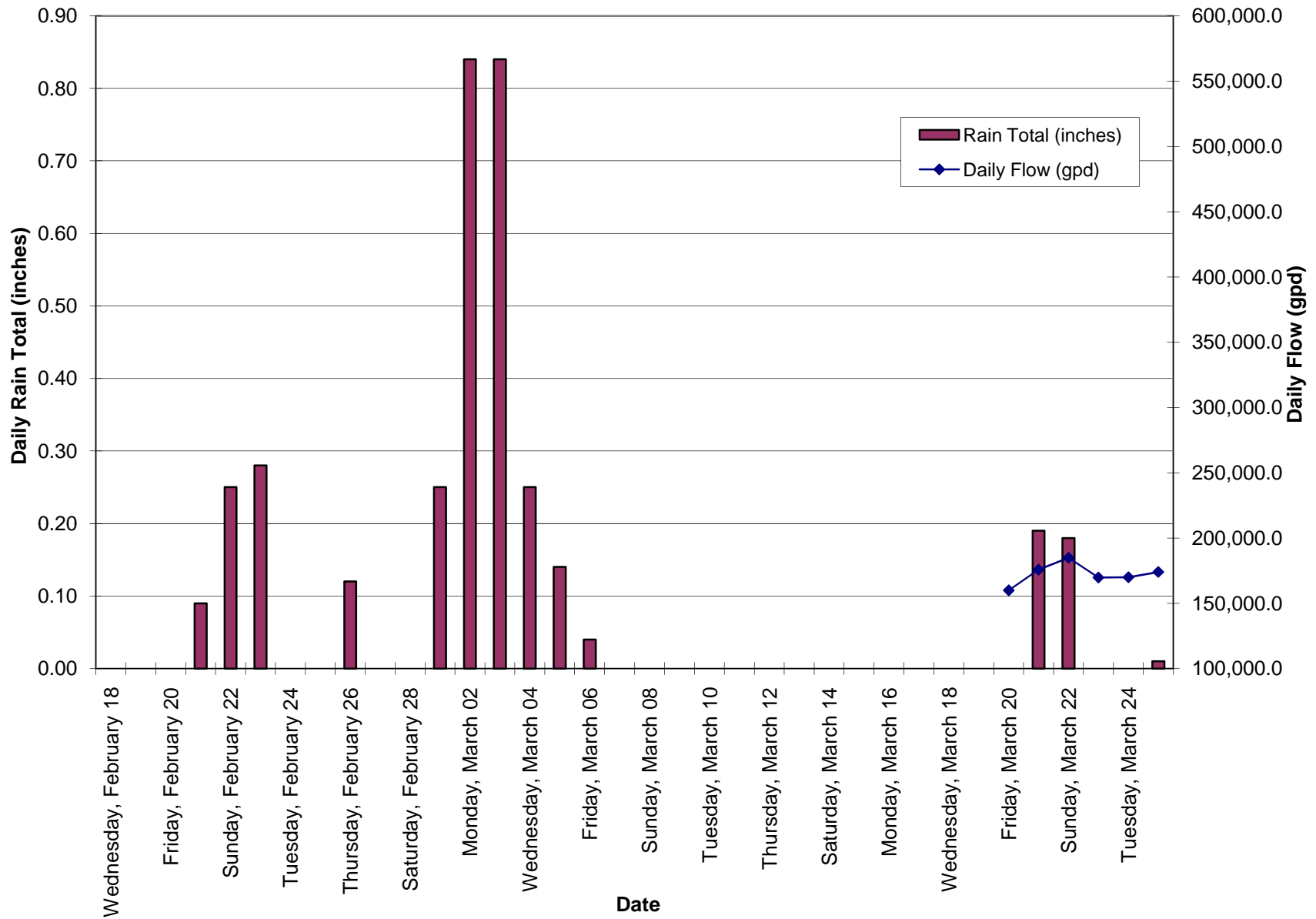


Figure 4-6. Love Chevrolet Average Daily Flow Readings

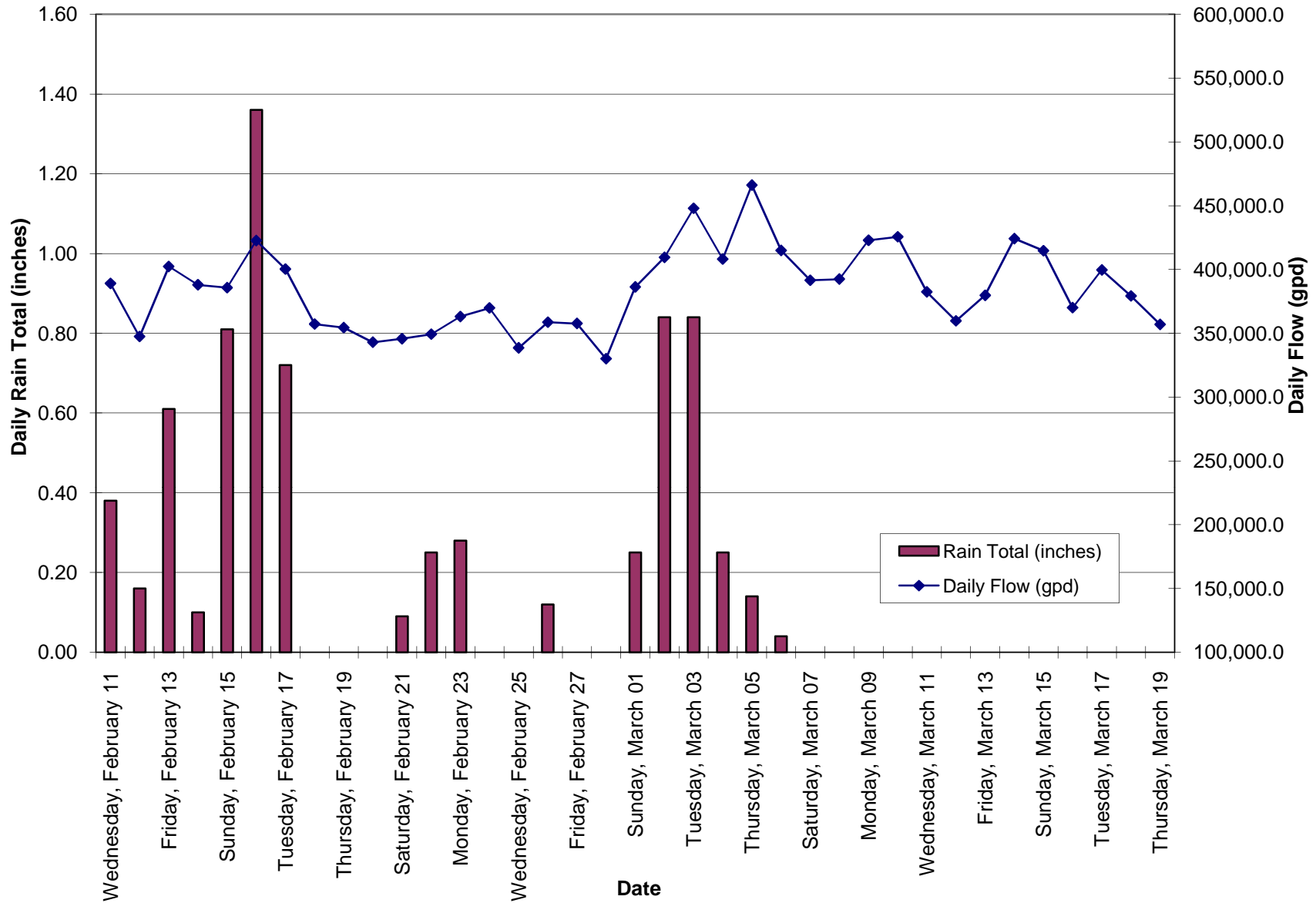
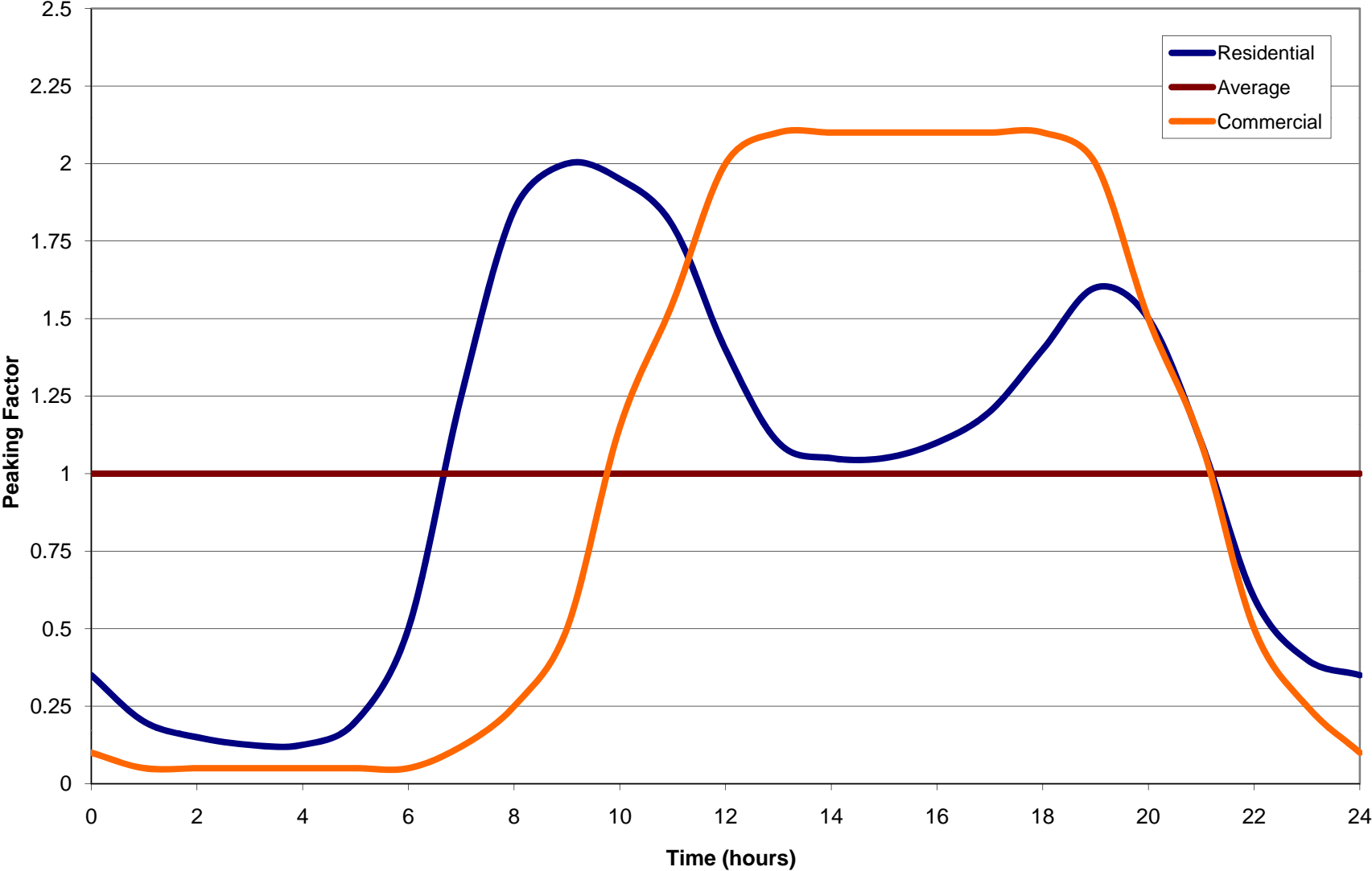


Figure 4-7. Diurnal Curve



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## CHAPTER 5

### INFLOW AND INFILTRATION

Chapter 5 presents the data collected during the sewer flow monitoring regarding inflow and infiltration and an evaluation of the impact inflow and infiltration has on Seaside County Sanitation District's (SCSD) collection system. All tables and figures for Chapter 5 are located at the end of this chapter.

#### INFLOW AND INFILTRATION

Inflow and infiltration (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 far exceed dry weather flow conditions. For the purposes of this report, 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, cellar, 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 runoff, or drainage. Inflow does not include infiltration. Inflow occurs and varies rapidly with rainfall conditions, with flows rising and falling within minutes or hours of a severe storm event.

#### SEWER FLOW MONITORING RESULTS

As noted in Chapter 4, sewer flow monitors were installed at eight locations throughout the collection system. These locations are depicted on Figure 4-1, located in Chapter 4. The flow monitoring was conducted between February 10, 2009 and March 26, 2009. The following provides a discussion of the rain data and the results of the sewer flow monitoring for each tributary area as it relates to I/I.

##### Rain Data

The most accurate rain data available is through weather stations that are monitored by the California Irrigation Management Information System (CIMIS). Three CIMIS stations were identified in the region of Seaside: Station 19 in Castroville, Station 116 in Salinas North, and Station 210 in Carmel. Figure 5-1 graphs the rain levels for each station over the entire duration of the flow monitoring. Station 19, Castroville had a total of 5.84 inches. Station 116, Salinas North had a total of 4.80 inches and Station 210, Carmel had a total of 7.62 inches. The exact total rainfall in Seaside is not known; however, these three stations provide a good estimate for the days that Seaside potentially saw

rainfall. Although weather patterns of storms in Carmel are not necessarily representative of rainfall duration or intensity in Seaside, for the purposes of this report, the rainfall from Carmel will be graphed against the total flows from the flow meters to determine if SCSD has any I/I problem areas.

## **Flow Monitoring Results**

The following provides a summary of I/I results for each of the flow monitoring stations:

### 27-inch

As noted in Chapter 4, the 27-inch tributary did not provide valid flow results throughout the entire duration of the flow monitoring. This tributary area is expected to be more prone to I/I due to the relative flatness of this region and the age of the infrastructure. For the purposes of this report, the collection system model will be evaluated with a 2.0 wet weather peaking factor for an 8-hour duration for I/I. These peaking factors are similar to what was experienced in the Amador tributary area.

### Amador

The Amador tributary area was anticipated to have one of the highest I/I factors in SCSD due to the age and condition of a large portion of the infrastructure. Figure 5-2 depicts the flow on February 16, 2009, which received 1.36 inches of rain, and March 17, 2009, which was used for dry weather flow calibration. Table 5-1 provides the hourly readings of rain on February 16. The rain was light in the morning and then stopped from 10:00 am to 3:00 pm and then increased in intensity in the late afternoon with its largest intensity, 0.25 inches in one hour, at 8:00 pm. This rain pattern correlates identically to increased flows during the entire duration of the rain event, increasing and decreasing as the storm increases and decreases throughout the day. The largest peaking factor with the 0.25 inches of rain was 1.6. This storm was less than a 10 year storm. Therefore, there is a high probability that a larger storm could produce a significantly higher peaking factor. A 25 year storm is estimated to produce 0.8 inches in one hour. Even though the rain intensity is 3 times greater for a 25 year storm, it is not estimated that the I/I will increase by a magnitude of 3. It is estimated that a 25 year storm could produce a 2.0 peaking factor. Therefore, for the purposes of this report, the collection system model will be evaluated with a 2.0 peaking factor for an 8-hour duration for I/I.

### Rosita

As noted in Chapter 4, flows were not read for the Rosita flow meter. Therefore, since Rosita flows into the Amador tributary area, it is anticipated that similar peaking factors could occur in the Rosita tributary area. Therefore, the collection system model will be evaluated with a 2.0 peaking factor for an 8-hour duration for I/I.

### Contra Costa

The Contra Costa tributary area was also anticipated to have influence from I/I due to its age and pipe condition. Unfortunately, the large rain event on February 16<sup>th</sup> occurred while the flow meter appeared to not be providing accurate data. Figure 5-3 compares March 3, 2009, a rain day that received 0.84 inches versus March 9, 2009, a dry day. Table 5-2 provides the hourly flow data for March 3, 2009.

March 3, 2009 received 0.25 inches in one hour at 9:00 pm, which resulted in a 1.3 peaking factor. As discussed for the Amador tributary area, 0.25 inches in one hour is

less than a 10 year storm. Although the true maximum peaking factor is undetermined, it is anticipated that the Contra Costa tributary area could see up to a 1.8 peaking factor. Therefore, for the purposes of this report, the collection system model will be evaluated with a 1.8 peaking factor for an 8-hour duration for I/I.

#### Victory Toyota

The majority of the Victory Toyota tributary is located on the hillside. Therefore, it is not anticipated that there would be a large I/I factor in this tributary. Figure 5-4 compares February 16, 2009, a rain day, versus March 16, 2009, a dry day used to calibrate the sewer model. Based on the comparison of the two days, there was a slight increase in flows throughout the day, resulting from that day's rainfall. Although the true maximum peaking factor is undetermined, it is anticipated that the Victory Toyota tributary area could see up to a 1.6 peaking factor. For the purposes of this report, the collection system model will be evaluated with a 1.6 peaking factor for an 8-hour duration for I/I.

#### Broadway

Since the flow meter was washed away, there was not sufficient data for the Broadway flow meter to evaluate the impacts of I/I. Since Broadway is upstream of Victory Toyota, the same peaking factor will be used. Therefore, for the purposes of this report, the collection system model will be evaluated with a 1.6 peaking factor for an 8-hour duration for I/I.

#### Love Chevrolet

As noted in Chapter 4, the diurnal pattern for Love Chevrolet tributary area was fairly flat with 300 gpm spikes throughout the day. Figure 5-5 compares February 16, 2009, a rain day, versus March 19, 2009, a dry day used to calibrate the sewer model. Based on the comparison of the two days, there are two factors that appear. The first is the average flow on the rain day increases by 60 to 70 gpm consistently throughout the day while the rain is occurring. This implies that there is inflow consistently coming into this tributary area upstream of the flow meter. Although the true maximum peaking factor is undetermined, it is anticipated that the Love Chevrolet tributary area could see up to a 1.4 peaking factor. For the purposes of this report, the collection system model will be evaluated with a 1.4 peaking factor for an 8-hour duration for I/I.

#### Cypress Ford

Since flows were not obtained for Cypress Ford tributary area, I/I can not be determined. This tributary area is very small, with fairly recent construction. It is not anticipated that I/I is a large factor. Therefore, for the purposes of this report, a peaking factor will not be applied to the Cypress Ford tributary area.

### **I/I Summary**

Although flow data was not able to be obtained for all of the flow meters and several days throughout the flow monitoring were not valid, the figures provided in this chapter reflect how well some of the days correlated with rain days.

Based on flow summaries, I/I does not appear to be a large concern for the SCSD area. Table 5-3 provides a summary of the peaking factors for each of the tributary areas. These peaking factors are applied in addition to the typical diurnal curve.

**Table 5-1. February 16, 2009 Rain Data**

<b>Time</b>	<b>Rain (inches)</b>	<b>Time</b>	<b>Rain (inches)</b>
0100	0.04	1300	0.01
0200	0.01	1400	0.00
0300	0.07	1500	0.00
0400	0.03	1600	0.11
0500	0.01	1700	0.00
0600	0.06	1800	0.06
0700	0.19	1900	0.02
0800	0.19	2000	0.25
0900	0.07	2100	0.01
1000	0.00	2200	0.19
1100	0.00	2300	0.00
1200	0.00	2400	0.04
<b>Total</b>			<b>1.36</b>

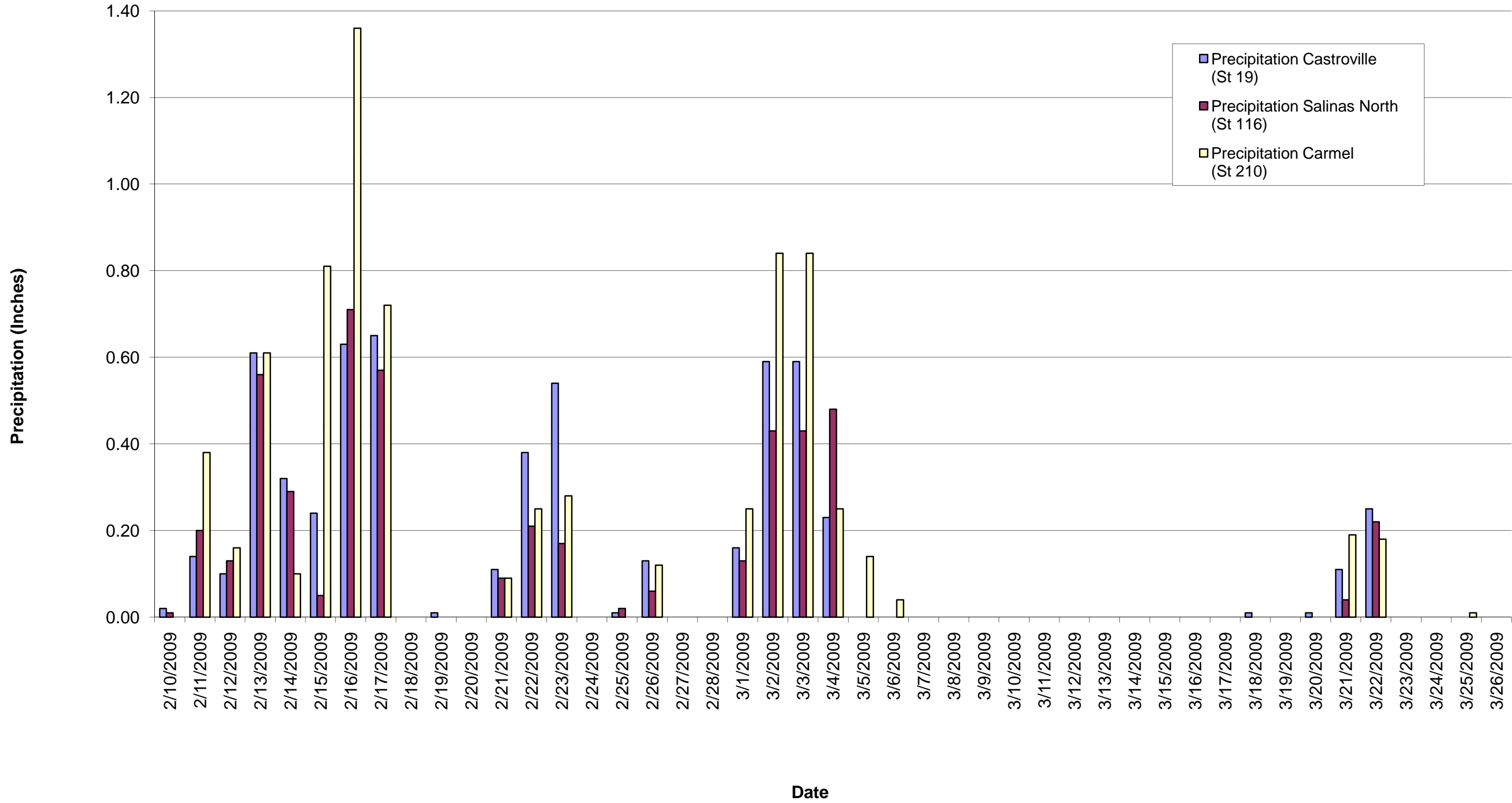
**Table 5-2. March 3, 2009 Rain Data**

<b>Time</b>	<b>Rain (inches)</b>	<b>Time</b>	<b>Rain (inches)</b>
0100	0.00	1300	0.12
0200	0.00	1400	0.00
0300	0.00	1500	0.02
0400	0.02	1600	0.05
0500	0.00	1700	0.02
0600	0.00	1800	0.00
0700	0.00	1900	0.00
0800	0.00	2000	0.02
0900	0.00	2100	0.25
1000	0.00	2200	0.06
1100	0.06	2300	0.02
1200	0.08	2400	0.12
<b>Total</b>			<b>0.84</b>

**Table 5-3. I/I Peaking Factor Summary**

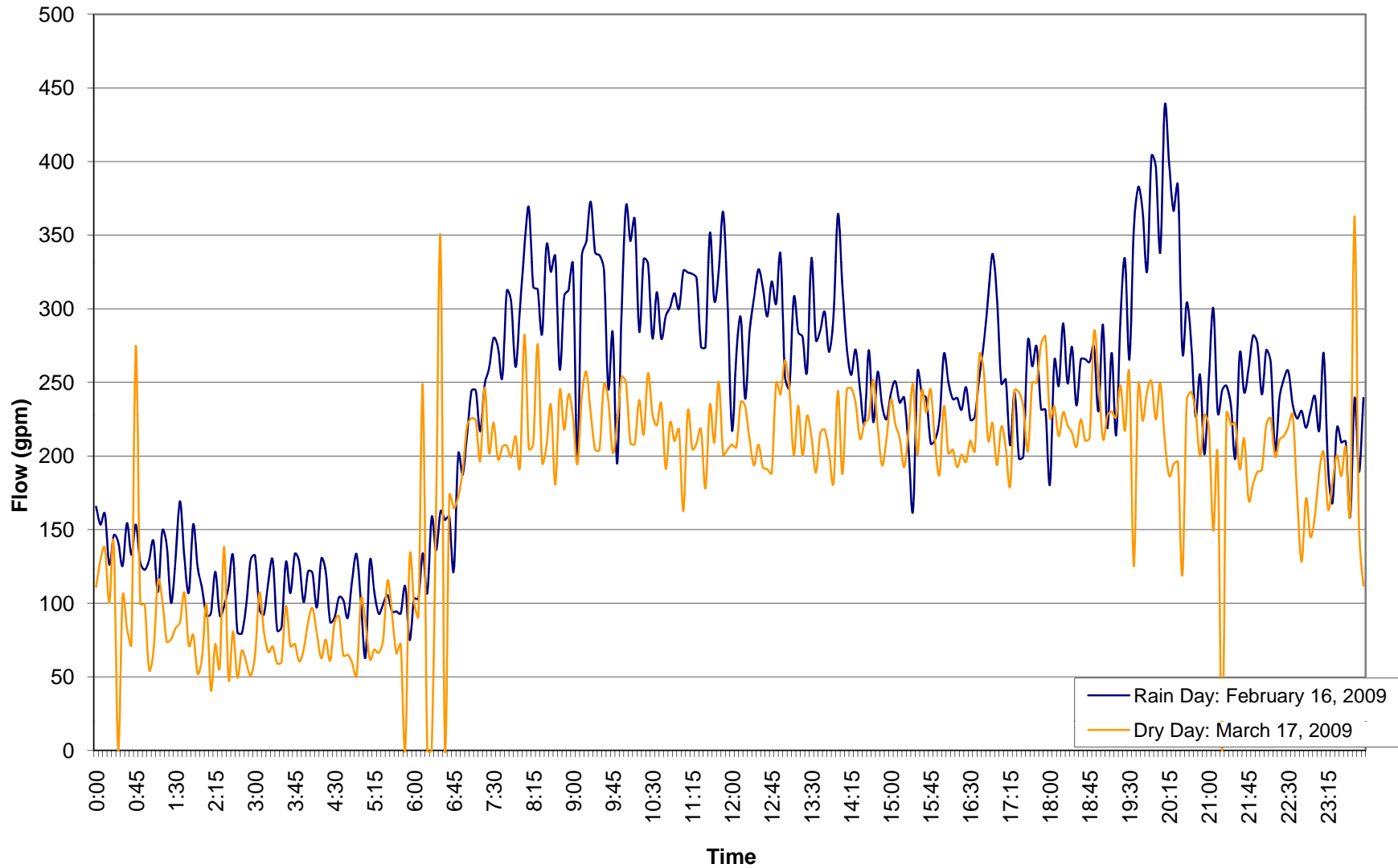
<b>Tributary Area</b>	<b>I/I Peaking Factor</b>
27-inch	2.0
Amador	2.0
Rosita	2.0
Contra Costa	1.8
Victory Toyota	1.6
Broadway	1.6
Love Chevrolet	1.4
Cypress Ford	1.0

Figure 5-1. CIMIS Rain Data

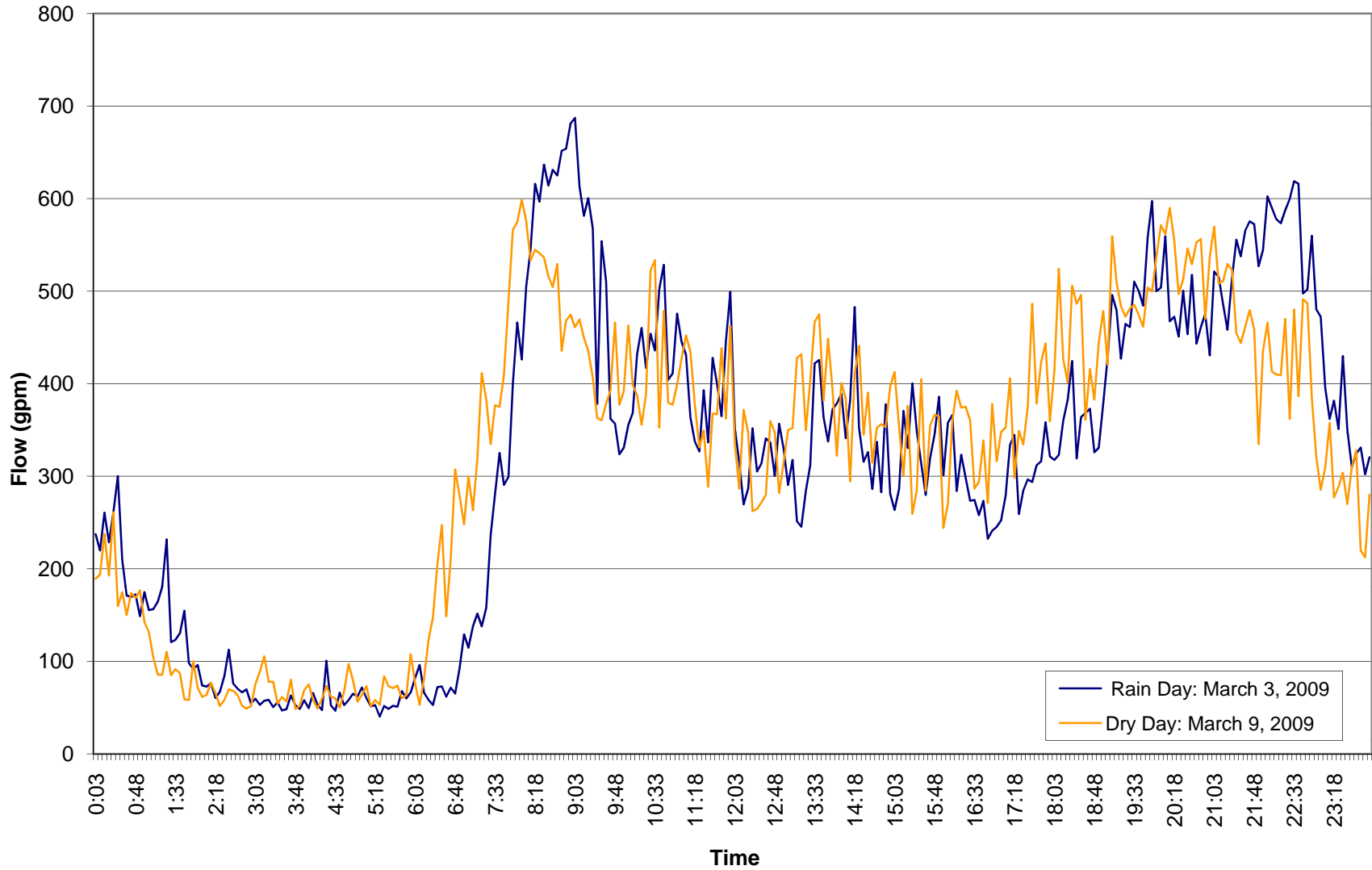


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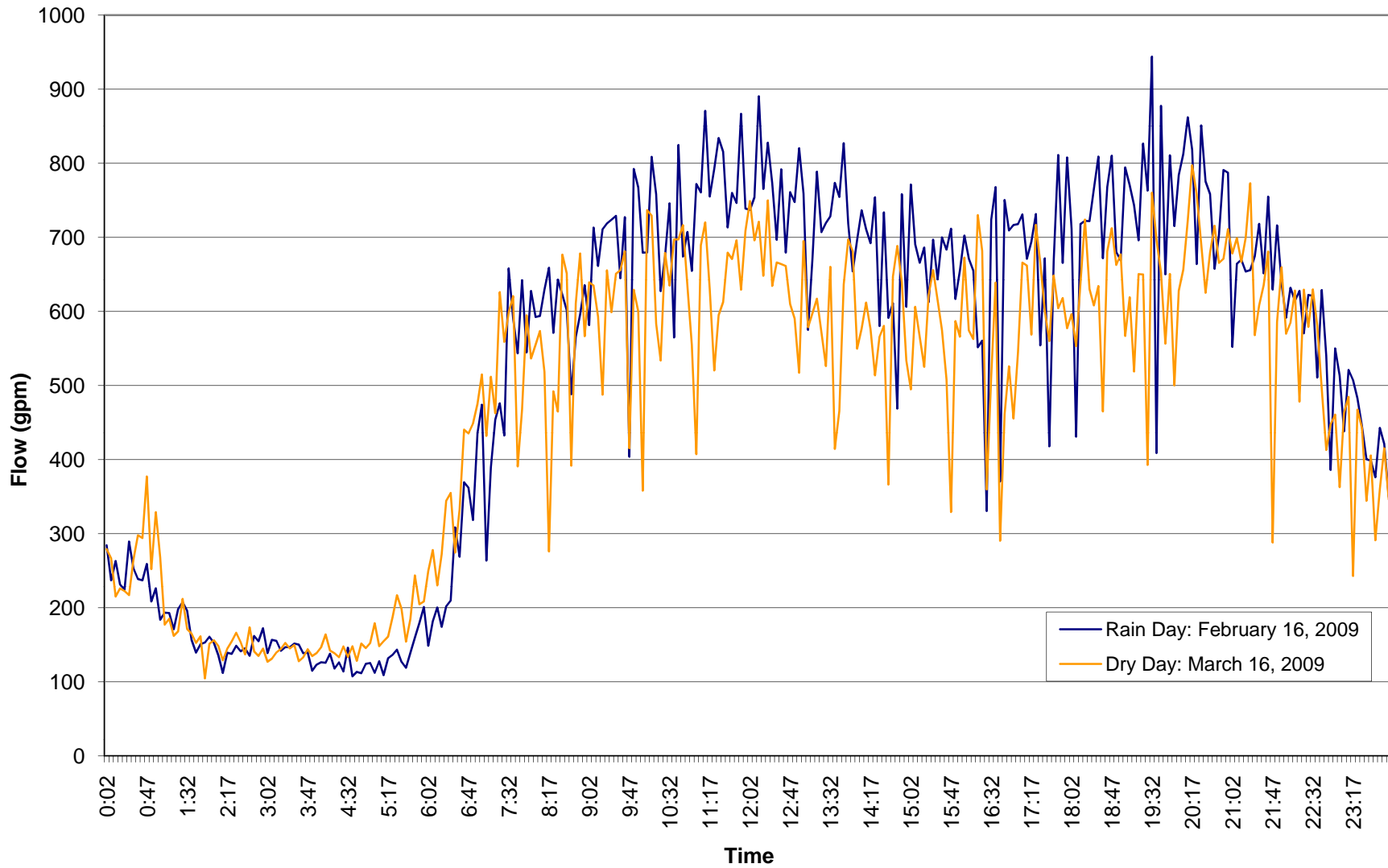
**Figure 5-2. Amador  
Dry Weather vs. Wet Weather Flow**



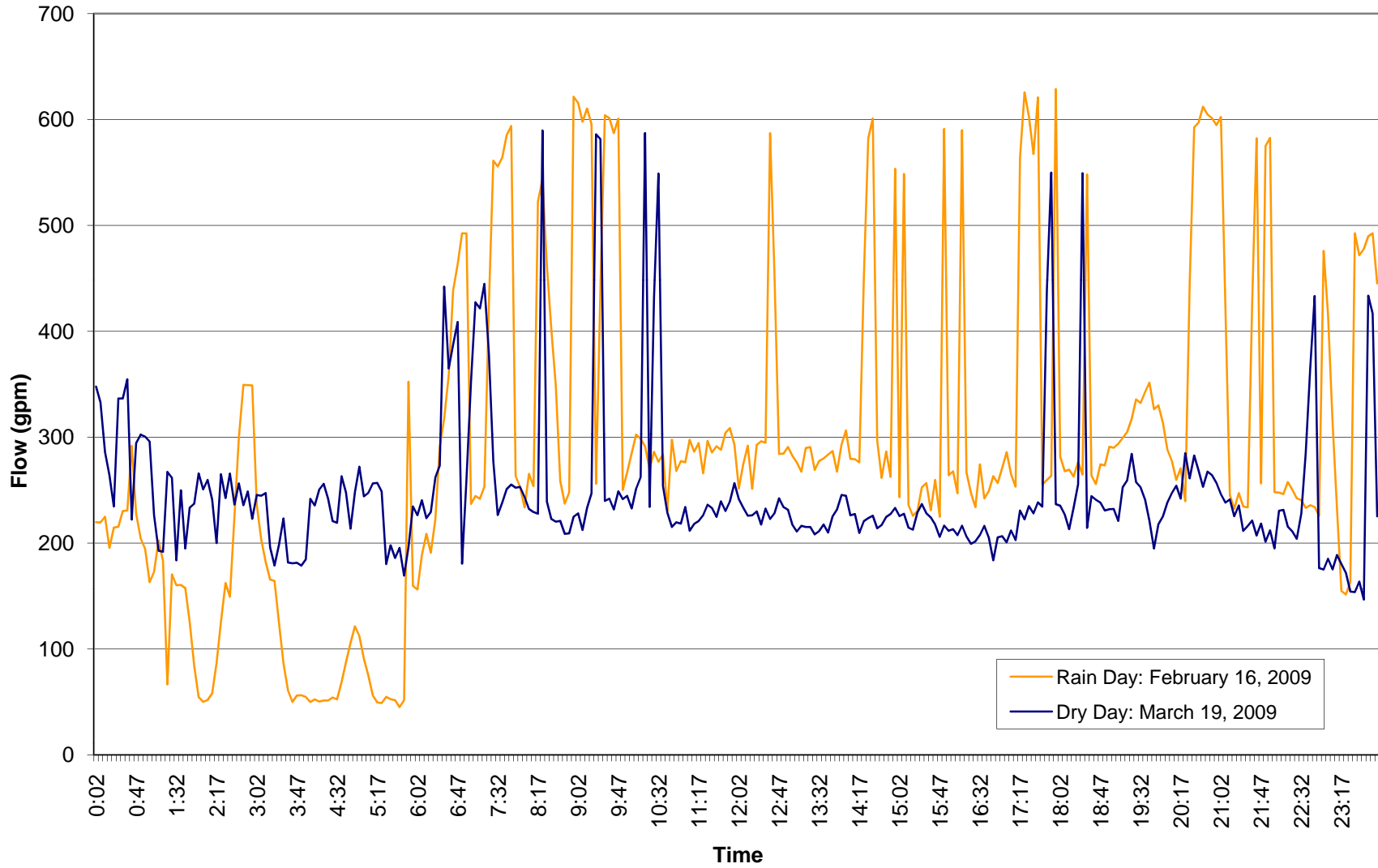
**Figure 5-3. Contra Costa  
Dry Weather vs. Wet Weather Flow**



**Figure 5-4. Victory Toyota  
Dry Weather vs. Wet Weather Flow**



**Figure 5-5. Love Chevrolet  
Dry Weather vs. Wet Weather Flow**



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## CHAPTER 6

### LIFT STATION EVALUATION

This Chapter will evaluate Seaside County Sanitation District's (SCSD) four lift stations for their physical condition and ability to meet existing and future wastewater flows. All tables and figures for Chapter 6 are located at the end of this chapter.

#### LIFT STATION BACKGROUND

SCSD owns four lift stations located throughout the collection system; however, they contract with Monterey Regional Water Pollution Control Agency (MRWPCA) to operate and maintain the lift stations. The service areas and locations of the lift stations are depicted on Figure 6-1 and their features are summarized in Table 6-1. The four lift stations are listed as follows:

- Station #19 – Del Monte Lift Station
- Station #20 – Rosita Lift Station
- Station #21 – Military Lift Station
- Station #22 – Tioga Lift Station

#### Station #19 – Del Monte Lift Station

The Del Monte Lift Station is the largest lift station for SCSD. It is a wet pit/dry pit Smith & Loveless triplex lift station. The lift station is located on the northwest corner of Del Monte Blvd. and Canyon Del Rey Blvd. The lift station pumps a short distance to a gravity main in Del Monte Blvd. It collects all of the flow from Canyon Del Rey Blvd., including flow from Rosita Lift Station.

#### Station #20 – Rosita Lift Station

Rosita is SCSD's second largest lift station. It is a duplex submersible lift station with Flygt pumps. The Rosita Lift Station is located on the northwest corner of Rosita Road and Angelus Way at the edge of a parking lot along a creek. The lift station collects flow from Del Rey Oaks and pumps to the gravity main in Canyon Del Rey Blvd.

#### Station #21 – Military Lift Station

The Military Lift Station is a small duplex submersible lift station with Flygt pumps. It is located on north side of Military Avenue just west of Highland Street. Military Lift Station collects wastewater from a small residential zone.

#### Station #22 – Tioga Lift Station

The Tioga Lift Station is a small duplex submersible lift station with Flygt pumps. It is located on the south side of Tioga Avenue, west of Highway 1. This lift station collects a small amount of flow from a couple of commercial businesses immediately adjacent to the lift station. It is estimated only a total of just over 16,000 sq. ft. of commercial property and maybe one or two houses flow to the Tioga lift station.

## PHYSICAL EVALUATION

A thorough physical investigation of the four sewer lift stations owned by SCSD was completed. A description of the facilities and findings of the condition of the four lift stations are outlined below. **The capital improvement project recommendations for lift station upgrades are determined following the completion of both the physical and the hydraulic evaluations and the projects are described at the end of this chapter.** A full report, including pictures of the lift stations, is included as Appendix A.

On February 11, 2009, the lift station evaluations were conducted to determine their overall physical condition. As part of the investigation, flow and megaohm tests were conducted on each of the pumps. The flow tests were to confirm the production of each pump. The megaohm tests were conducted to assess the condition of each pump motor. As the motor windings deteriorate, the megaohm readings drop. The readings should be around 150 m $\Omega$ . The lower the value, the higher the likelihood that the pump will spark or burn out.

A visual check of the wet well, piping, valves, and control panels was also conducted at each lift station. A structural investigation of each wet well was beyond the scope of this study; however, signs of corrosion from sulfuric acid buildup were noted in the full report located in Appendix A. Each pump was disassembled and seals and impellers were inspected. Based on this investigation the following information was determined for each lift station.

### Station #19 – Del Monte Lift Station

See Table 6-2 for comments and recommendations from the physical evaluation for Del Monte Lift Station.

The Del Monte Lift Station was refurbished in 1988, which included a new dry pit. Physically, the Del Monte Lift Station is in good condition. Additional recommendations pertaining to the hydraulic performance of this lift station are provided later in this chapter.

### Station #20 – Rosita Lift Station

See Table 6-3 for comments and recommendations from the physical evaluation for Rosita Lift Station.

The Rosita Lift Station was originally constructed in 1956 and refurbished in 1988. Physically, the Rosita Lift Station is in fair to poor condition and is nearing its useful life. There is severe corrosion and deterioration throughout. Additional recommendations pertaining to the hydraulic performance of this lift station are provided later in this chapter.

### Station #21 – Military Lift Station

See Table 6-4 for comments and recommendations from the physical evaluation for Military Lift Station.

Military Lift Station was originally constructed in 1960 and refurbished in 1979. Physically, Military Lift Station is in poor condition and is nearing its useful life. There is

severe corrosion and deterioration throughout, which may make it more cost effective to replace the facilities entirely instead of refurbishment. Additional recommendations pertaining to the hydraulic performance of this lift station are provided later in this chapter.

#### Station #22 – Tioga Lift Station

See Table 6-5 for comments and recommendations from the physical evaluation for Tioga Lift Station.

Tioga Lift Station was refurbished in 1979. The lift station currently only has one pump. SCSD has not replaced the second pump, which was pulled due to pump failure. Physically, the lift station is in fair condition. Refurbishment of the piping and wet well is needed. Additional recommendations pertaining to the hydraulic performance of this lift station are provided later in this chapter.

### **HYDRAULIC PERFORMANCE EVALUATION – EXISTING CONDITIONS**

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

- Force main velocities should be greater than 2.0 feet per second to maintain self cleaning properties but less than 5.0 feet per second to minimize head loss and water hammer.
- Lift Stations should be able 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 in duplex conditions and with only two pumps in triplex conditions.
- Lift Station wet wells should be sized 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.
- Lift stations should have a means of conveying peak flow during a power outage. Lift stations serving a small number of customers could use wet well storage to meet this requirement.

#### **Existing Lift Station Flows**

Table 6-6 provides a summary of the existing flows for each lift station based on the unit factors for the various land uses noted in Chapter 4. The flows for each lift station are based on gravity flow to the lift station from its tributary area. The Del Monte Lift Station also receives flow from the Rosita Lift Station, which is approximately 480 gpm under simplex conditions and approximately 700 gpm under duplex conditions.

## **Force Main Evaluation**

The force mains were evaluated for two factors: physical capacity and physical condition.

### Physical Capacity

The force main velocities were calculated using the tested single pump capacity and the force main size for Stations 20, 21, and 22 and the assumed duplex capacity was used for Station #19. The calculated velocities are provided in Table 6-7. As noted above, force main velocities should be greater than 2.0 feet per second to maintain self cleansing properties but less than 5.0 feet per second to minimize head loss and water hammer.

Based on the velocities identified in Table 6-7, the velocities within the force mains for each lift station are within acceptable ranges. The Del Monte LS under duplex conditions is at 6.2 ft/sec; however, the lift station does not run under these conditions normally. In addition, the force main velocity for the Rosita LS is just slightly over 5 ft/sec at its design point. However, based on the latest pump test, the pump is not operating at its design point and the velocities are now under 5 ft. sec.

### Physical Condition

All four of the lift stations were constructed in the 1950's and 1960's, with rehabilitations in the 1970's and 1980's. However, the force mains were not replaced when the rehabilitations were completed. The force mains for each lift station were constructed of ductile iron piping with no lining. These force mains are over 50 years old and are anticipated to have severe corrosion in the interior of the force mains even though there are self cleaning velocities. It is recommended that the force mains for each lift station be replaced during the next lift station replacement or rehabilitation.

## **Wet Well Capacity Evaluation**

To determine the sufficiency of the wet well capacity under existing conditions, each lift station was evaluated under three different operating conditions. They included:

- Worst Case Scenario – This is when the volume of flow coming into the lift station is exactly half of the flow rate of the pump.
- Average Daily Flows
- Peak Hour Dry Weather Flows

Pump run times were calculated based on the lift station volumes and tested and/or design pump flows (see Table 6-1). Table 6-8 summarizes the wet well cycle time calculations.

Lift station pumps should typically cycle not more than 5 or 6 times per hour to limit pump starts. This recommendation, however, should be based on the actual pump manufacturer's information. Often times, the smaller horsepower motors are capable of starting more often.

The following is a summary of the conclusions about the existing wet well capacity for each lift station:

#### Station #19 – Del Monte Lift Station

The Del Monte Lift Station, the largest lift station in SCSD's service area receives 104 gpm under average daily flows plus 480 gpm from Rosita LS. Based on Table 6-8, under worse case scenario for a simplex condition, Station #19 could run up to almost 14 times in one hour if flows were equal to 600 gpm or half of the simplex pump operation. This scenario would likely not trigger the second pump to turn on.

Since average day flow conditions are similar to the worst case scenario, it is anticipated that this lift station does cycle between 11 and 15 times per hour or whenever the Rosita Lift Station cycles. Under peak hour dry weather flows, it is anticipated that the duplex pump is required to be turned on. It is estimated that under this condition, the lift station could be cycling up to 25 times per hour.

Based on Table 6-8, the run time for the pumps is extremely short. This means that the operating volume of the wet well is not adequate for the amount of flow that is going to this lift station. It is unknown at this time if the wall between the existing wet well and the old wet well can be removed to increase capacity. Removing this wall would increase capacity at this lift station. If it can't be removed, there are three options to increase capacity and reduce the number of starts in an hour. One, construct a new wet well with a greater depth. Two, construct a new wet well with a greater diameter. Three, install variable frequency drive (VFD) pumps.

In addition to lack of volume in the wet well, this lift station is a wet pit/dry pit configuration, which is typically an operations and maintenance problem due to the confined space entry and inability to pull the pumps easily.

Therefore, it is recommended that the Del Monte Lift Station be converted from a wet pit/dry pit lift station to a submersible lift station with VFD pumps and to replace the force main with a new PVC force main (force main size to be verified). Options to utilize the existing facilities (force main and wet well) for back-up redundant facilities should be investigated during the preliminary design.

There are two options for constructing a new lift station. The first is to construct a lift station adjacent to the existing dry pit away from the street. It is unknown if there is sufficient room for an 10-foot diameter wet well in this location. The second is to insert a new concrete wet well inside the existing dry pit. It is estimated that this would result in a wet well with an 8-foot diameter. There are two concerns with this construction. First, the cost to bypass pump the existing flow may be too high to make this project feasible. The second is that an 8-foot diameter wet well may not be adequate for future flows. It is recommended that a feasibility analysis be completed prior to the design of the new lift station.

#### Station #20 – Rosita Lift Station

The Rosita Lift Station receives approximately 36 gpm under average daily flows. Under a worse case scenario, Station #20 could run up to 21 times per hour if the flow was 240 gpm. Under existing flows, this is unlikely to occur. Under normal operating conditions,

the lift station is running almost 6 times per hour and over 11 times per hour under Peak Hour Dry Weather Flow.

Based on Table 6-8, the pump run times are adequate for existing flows and therefore, this lift station is not required to be upgraded due to hydraulic constraints.

#### Station #21 – Military Lift Station

Military Lift Station receives only a small amount of residential flow. Under average day conditions, this lift station sees only 9 gpm. Under worse case scenario, the lift station could run up to 7.5 times per hour if the flow were at 75 gpm. Under normal operating conditions, the lift station runs 1.7 times per hour and only 3.2 times per hour under Peak Hour Dry Weather Flow. This lift station does have some odor problems in the downstream manhole to the force main. This manhole is located in the backyard of a private residence. It is recommended to seal this manhole with a locking manhole lid to reduce the odors venting through this lift station force main.

Based on Table 6-8, the pump run times are adequate for existing flows and therefore, this lift station is not required to be upgraded due to hydraulic constraints.

#### Station #22 – Tioga Lift Station

Tioga Lift Station has an extremely small tributary area with an average daily flow of only 1 gpm. Based on Table 6-8, the pump run times are adequate for existing flows and therefore, this lift station is not required to be upgraded due to hydraulic constraints.

With the construction of the Del Monte Sewer Main Upgrade (See Chapter 7 and 9), the Tioga Lift Station may be able to be eliminated. Prior to the construction of the South of Tioga Development Project, this alternative should be analyzed.

### **Emergency Response Time Evaluation**

Another critical factor for lift station design is to evaluate the emergency response time that an operator has if total pump failure due to power outage or other anomaly were to occur. Table 6-9 estimates the amount of time between high water alarm and overflow. The results for each lift station are provided below.

#### Station #19 – Del Monte Lift Station

The Del Monte Lift Station receives the largest amount of flow out of the four lift stations. However, the volume of the wet well is not substantial. There is a little over 1,600 gal of volume before the lift station overflows into Del Monte Boulevard and into the storm drain system. If the Rosita Lift Station is on when the Del Monte Lift Station has a power failure, under average daily flows, the emergency response time is approximately 3 minutes; sixteen minutes if the Rosita Lift Station is not on. Under peak hour dry weather flow, the response time drops to 1 minute if both pumps at Rosita Lift Station are on.

The response time for the Del Monte Lift Station is not adequate for this lift station. It is recommended that an emergency generator be installed or additional storage be provided for this lift station.

#### Station #20 – Rosita Lift Station

The Rosita Lift Station is the only lift station that has a permanent standby generator. Therefore, if a power outage were to occur, the generator should turn on providing SCSD with additional time to respond to a power failure. If the failure were to occur due to another anomaly, under average daily flows, SCSD would have 21 minutes before the lift station would overflow to a bypass line that is directed to the adjacent creek. Under peak hour dry weather flow, SCSD has 7 minutes to respond before overflowing to the creek.

If the bypass line were removed, the Rosita Lift Station would then back up the collection system, and fill the two upstream manholes before overflowing. This would provide SCSD with an additional hour before the system would overflow. In addition, if the system were to overflow, the wastewater may not overflow directly to the creek and could possibly be contained in the street or in the parking lot.

The overflow pipe should be plugged or removed to safeguard against a potential accidental spill to the creek. If an overflow were to occur, SCSD is responsible to report to the Regional Water Quality Control Board, California Emergency Management Agency, Monterey County Environmental Health, and California Department of Fish & Game regardless of the amount of wastewater spilled. It is recommended that this bypass line be eliminated. Once this line is eliminated, this facility has back up power and substantial capacity for a pump failure.

#### Station #21 – Military Lift Station

Military Lift Station has a very low flow, but the wet well capacity is also very small. There is just over 550 gal of storage available before overflowing, which provides approximately one hour for response under average daily flows and 20 minutes under peak dry weather flows.

If this lift station overflows, the wastewater would flow to the north to the natural drainage swale located along the backside of the parcels. If the old wet well adjacent to the existing wet well has not been abandoned, it is recommended to install an overflow line to this wet well to provide additional storage for the Military Lift Station.

#### Station #22 – Tioga Lift Station

Tioga Lift Station has extremely low flow. The response time for this lift station is over 19 hours under average daily flows and over 6 hours under peak hour dry weather flow. Additional storage needs are not required for Tioga Lift Station.

### **HYDRAULIC PERFORMANCE EVALUATION – FUTURE CONDITIONS**

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

#### **Future Wastewater Flows**

As noted in Chapter 2, future development may occur in several regions with minor infill throughout Region “A”. The minor infill will not have a tremendous impact on the overall

collection system; however, the projects identified in Chapter 2 and Regions “B”, “C”, “D1” and “D2” will have significant impacts to the collection system and potentially some of the lift stations. The impacts from the various regions, excluding Region “D1” are provided in the following evaluation:

Station #19 – Del Monte Lift Station

Del Monte Lift Station will be impacted from the following development:

- Del Monte Hotel: 9,500 gpd
- A portion of West Broadway Specific Plan: 60,000 gpd
- Possible upgrades to the Rosita Lift Station

Station #20 –Rosita Lift Station

Rosita Lift Station will be impacted from the following development:

- Region B: 134,585 gpd
- Region D2: 110,020 gpd

Station #21 – Military Lift Station

Military Lift Station is not expected to receive any additional flow in the future and will therefore not be evaluated.

Station #22 – Tioga Lift Station

Tioga Lift Station could be impacted by the South of Tioga Project. It is recommended that the developer and SCSD evaluate the proposed sewer alignments to determine if this lift station can be eliminated. If it is required, SCSD and/or the developer should determine if the existing Tioga Lift Station is properly located to facilitate the needs of the project without the need for any additional lift stations.

Table 6-10 provides a summary of the future flows for Del Monte and Rosita Lift Stations.

**Lift Station Evaluation – Future Flow Conditions**

The following is an analysis of the Del Monte and Rosita Lift Stations:

Station #19 – Del Monte Lift Station

Under existing conditions, the wet well capacity of the Del Monte Lift Station was not adequate and a VFD submersible lift station was recommended. The upgrades to this lift station should account for the anticipated future flows. The following are the benefits or constraints that should be evaluated during the design of a new submersible lift station with VFD pumps:

- Installing the VFD pumps will decrease the plug flow conditions downstream of the lift station, reducing the impacts from future development to the downstream collection system.
- Installing a new wet well will increase the storage volume, increasing the amount of time for emergency response during a power failure, and reducing pump cycle times.

- The force main will need to be analyzed with the new VFD operating conditions to determine if cleansing velocities are still maintained with the lower flows. A smaller diameter force main may be required.
- Due to the amount of flow going to this lift station in the future, it is recommended to utilize the existing wet pit as an overflow to provide additional storage during emergency conditions.
- Even with the additional storage, it is estimated that the emergency response time will still not be adequate. It is recommended that a permanent standby generator be installed at this location.

#### Station #20 –Rosita Lift Station

Under existing conditions, the operating level in the Rosita Lift Station is only 10 inches or 300 gal; however, there is substantially more capacity in this wet well. To meet the future demands at the Rosita Lift Station, the existing wet well could be fully utilized by raising the pump on level so that the operating volume of the wet well is 36 inches or over 1,100 gal. In addition, two new submersible pumps between 900 and 1,000 gpm each would be recommended to be installed, which would also require an upgrade to the force main from a 6-inch to a 10-inch PVC. This configuration would limit the number of starts to approximately 12 starts per hour under worse case scenario; however, it will decrease the emergency response time to approximately 15 minutes under future average daily flows and less than 10 minutes under future peak hour dry weather flow.

A second option is to install a new lift station adjacent to the existing lift station with a larger diameter to increase storage capacity. It would still be recommended to install two new 900 to 1,000 gpm pumps and new 10-inch force main. It is recommended that Del Monte Lift Station be upgraded prior to upgrading Rosita Lift Station with larger capacity pumps to ensure that the Del Monte Lift Station does not reach capacity.

A third option is to install a new lift station with variable frequency drive (VFD) pumps adjacent to the existing lift station and abandon the existing lift station in place. This would reduce the impact from the 1,000 gpm pumped flow peaks to the downstream Del Monte Lift Station and could also reduce the size of a new force main. The existing wet well may be able to be utilized depending on the size of the new pumps; however, the cost to by pass the lift station during construction may be more expensive than constructing a new wet well.

### **SUMMARY OF RECOMMENDATIONS**

Based on the discussion provided, the following is a summary of the recommendations from both the physical and hydraulic evaluations:

#### **Station #19 – Del Monte Lift Station**

Physically, the Del Monte Lift Station is in good condition and requires only minimal upgrades. Hydraulically, the lift station does not have sufficient wet well capacity to meet the existing or future needs. The insufficient capacity results in excess pump cycling and low emergency response time. It is recommended to replace this lift station with a new submersible lift station with variable frequency drive, which will be capable of

matching the inflow. Due to the location of this project and its complexity, this upgrade will require substantial planning, design, and permitting. Therefore, it is recommended that a few upgrades be completed in the near term that will provide a better operating facility. These upgrades include:

- Clear pump #2 suction valve obstruction and re-test pumping capacity. Also fully inspect pump impeller and seals once valve is operating properly.
- Install a by-pass to allow for alternative pumping if necessary.
- Investigate storage capacity options

The long term recommendation for the Del Monte Lift Station is to replace the entire lift station with a submersible lift station with variable frequency drives and abandon in place the existing 14-foot diameter wet well that is located in the street. The following is a list of the various attributes that should be included in this project:

- New wet well adjacent to the existing dry pit (size to be determined)
- Three new submersible VFD pumps
- New valve vault
- By-pass piping for alternative pumping facilities
- Convert existing dry pit into an overflow
- New force main (size to be determined)
- Permanent back up generator
- Utilize existing wet well and force main for redundant facilities or fill with backfill and abandon in place the existing wet pit located in the street.

### **Station #20 –Rosita Lift Station**

Physically, the Rosita Lift Station is in fair to poor condition. There is corrosion throughout the lift station, exposed electrical conduit, and poor drainage within the vault. Hydraulically, the lift station cycles between 6 and 11 times per hour, which is acceptable, but on the higher end of recommended industry practice. In addition, the current set points for the wet well appear to be too close. The lift station is capable of meeting existing demands and some nominal future demands; however, the lift station is not capable of meeting the future build-out demands for Regions “B” and “D2”. Based on these observations, the following are recommendations for the near term operation of the Rosita Lift Station:

- Re-route generator conduit to opposite side of parking lot
- Plug by-pass line to creek
- Increase operating volume of the wet well to decrease start/stops for the pump
- Re-align bases to the pumps and anchor to the floor of the lift station
- Replace slide rail connection to pump to eliminate pump recirculation. May require complete slide rail replacement.
- Fix or install a new vault lid
- Install drain to prevent standing water in vault
- Replace chain with rated stainless steel chain/clevis

To meet the future flows from Regions “B” and “D2”, it is recommended to replace the existing lift station with a new VFD lift station and new force main. It is recommended that the new lift station be constructed adjacent to the existing lift station. The existing wet well could be used for a future over flow basin.

#### **Station #21 – Military Lift Station**

Physically, the Military Lift Station is in poor condition. There is extreme corrosion throughout the entire lift station piping and miscellaneous facilities. In addition, the pumps are worn and the motors have extremely low impedance. Hydraulically, the lift station is adequately sized to meet existing and future demands. It is recommended to construct a new lift station, with the same capacity, adjacent to the existing lift station. Thus, the recommendations in Table 6-4 should not be implemented. The existing wet well could be used for a future over flow basin.

#### **Station #22 – Tioga Lift Station**

It is recommended to complete a feasibility analysis to determine if the Tioga Lift Station can be abandoned and sewer connections be re-located to a gravity sewer main.

**Table 6-1. Lift Station Summary**

	Lift Station			
	Station #19 Del Monte	Station # 20 Rosita	Station #21 Military	Station #22 Tioga
Date Constructed	Unknown	1956	1960	Unknown
Date Refurbished	Apr-88	Jun-88	Aug-79	Aug-79
Type	Wet Pit/Dry Pit	Submersible	Submersible	Submersible
Pump Manufacturer	Smith & Loveless	Flygt	Flygt	Flygt
Number of Pumps	3	2	2	2
Horsepower (HP), each	15	20	5	3
Pump Serial #	870827	NA	NA	NA
Motor Model #	875082c	NA	NA	6085-092-0830033
Motor Serial #	0150E-1HAN-001	NA	NA	NA
Voltage	230/460	240	240	460/230
Motor Type	Constant Speed	Constant Speed	Constant Speed	Constant Speed
Tested Single Pump Capacity (gpm) <sup>1</sup>	Pump 1	959	273 <sup>9</sup>	NA <sup>3</sup>
	Pump 2	722 <sup>2</sup>	416	NA <sup>3</sup>
	Pump 3	984		
Pump Design Point <sup>10</sup>	gpm	1,200	480	150
	ft (static)	27.5	58	40
Impedance Test (Megohm) <sup>1</sup>	Motor 1	150, 150, 150	150, 150, 150	0.15, 0.15, 0.15
	Motor 2	150, 150, 150	150, 150, 150	0.4, 0.4, 0.4
	Motor 3	150, 150, 150		
Total Hours of Operation <sup>1</sup>	Pump 1	9,012	6,780	8,043
	Pump 2	9,784	6,549	8,244
	Pump 3	9,243		
Permanent Standby Generator	No	Yes	No	No
Bypass Capabilities	No	Yes	No	Yes
Wet Pit Coating	None	None	Coal Tar Epoxy	None
Wet Well Diameter (ft)	14 <sup>5</sup>	8	6	6
Wet Well Set Points (inches) <sup>6</sup>	Low Alarm	2	9.6	30
	Off	18	18	38
	Lead On	45	28.8	55
	Lag On	49	32.4	60
	Last On	55		
	High Alarm	72	54	112
	Overflow	NA	78	144
Wet Well Operating Volume (gal) <sup>7</sup>	1,295	338	300	211
Wet Well Maximum Volume (gal) <sup>8</sup>	360,258	1,391	1,445	529
Force Main Diameter (inches)	12	6	4	4
Force Main Length (feet)	790	660	528	605
Force Main Start Elevation (feet)	3.89	43.30	128.02	24.50
Force Main End Elevation (feet)	23.82	91.97	159.95	38.07
Force Main Total Static Head (feet)	19.9	48.7	31.9	13.6

NA - Not Available

<sup>1</sup> Information provided from inspection completed by FRM on February 11, 2009.

<sup>2</sup> An obstruction in line was confirmed based on the inability to close the suction valve of Pump #2. This is most likely the cause of the lower flow reading. Obstruction should be removed and pump re-tested to determine true pumping capacity.

<sup>3</sup> The exposed pipes for Military Lift Station were too corroded to take flow readings.

<sup>4</sup> Pump 1 was removed and has not been re-installed.

<sup>5</sup> Wet well for Del Monte Lift Station is only comprised of one half of the total 14 ft diameter. There is a dividing wall that splits the wet well into two chambers. The other half is not used.

<sup>6</sup> Information provided by MRWPCA staff.

<sup>7</sup> Wet well operating capacity based on operating range (Pump Off to Lead On).

<sup>8</sup> Wet well maximum capacity based on maximum desired operating range (Low Alarm to High Alarm).

<sup>9</sup> The mate between the slide rail and the pump is worn. Recirculation of flow was occurring in the wet well.

<sup>10</sup> Pump design point estimated from pump curve provided by manufacturer and estimated system curve. Curves provided in Appendix B.

**Table 6-2. Summary of Physical Evaluation and Recommendations for Station #19 – Del Monte Lift Station**

<b>Lift Station Component</b>	<b>Comment</b>	<b>Recommendation</b>
Wet Pit	The wet pit has light aggregate showing, which means minor corrosion attack from sulfides/sulfuric acid.	Coat the interior of the wet pit
Dry Pit	The interior of the dry pit is in excellent condition. The exterior hatch of the dry pit has corrosion.	Coat the exterior of the hatch on the dry pit
Bypass	None	Install bypass
Piping (inside wet well)	The piping that is visible is in good condition.	
Slide Rails	N/A	
Check Valves	Check valves are in satisfactory condition.	
Suction and Discharge Valves	Discharge valves are in satisfactory condition. Suction valves on pumps 1 and 3 are in satisfactory condition. The Suction valve on pump 2 has an obstruction and could not be closed.	Clear the obstruction in suction valve of pump 2 and re-test the pump
Electrical Panel	Panel is in good working condition. Alarms were tested and functioned satisfactorily.	
Pump #1	Motor on pump #1 is in good working condition. Impeller and wear surfaces are in satisfactory condition.	
Pump #2	Motor on pump #2 is in good working condition. Due to obstruction in suction valve, pump #2 could not be inspected.	Clear the valve and re-test the pump. It is also recommended to inspect the impeller and seals on the pump once the suction valve is cleared.
Pump #3	Motor on pump #3 is in good working condition. Impeller and wear surfaces are in satisfactory condition.	
<b>Overall Physical Condition</b>	<b>Lift Station is in good physical condition with minor upgrades required.</b>	

N/A – Not Applicable

**Table 6-3. Summary of Physical Evaluation and Recommendations for Station #20 – Rosita Lift Station**

<b>Lift Station Component</b>	<b>Comment</b>	<b>Recommendation</b>
Wet Well	Light aggregate showing at lid, which means minor corrosion attack from sulfides/sulfuric acid. Riser rings appear to be in satisfactory condition.	Coat interior wet well to prevent further deterioration
Bypass	None	Install bypass
Overflow Line	An overflow line discharges to the creek adjacent to the lift station. This is not recommended. If spill were to occur in the creek, this could result in a greater fine than if contained on the street.	Re-locate overflow line to a new overflow well or plug the overflow line. An evaluation should be completed to determine where the overflow would daylight.
Piping (inside wet well)	Piping is made of ductile iron and bolts are plated with zinc. Condition is satisfactory.	Coat piping and replace bolts with stainless steel
Slide Rails	Rails are galvanized pipe and top rail bracket is made of steel. Top rail bracket is corroding.	Replace slide rails and top rail bracket with stainless steel
Lifting Chains	Chains are made of zinc/galvanized plated steel. Appears to be in okay working condition. If chain degrades, the chain could break while removing the pump.	Replace chain with rated stainless steel chain/clevis
Discharge Bases	Bases are cast iron and appear to not be attached to the floor of the lift station. This can cause shifting of pump and pipe work, eventually causing discharge piping to break.	Re-align bases and anchor to the floor of the lift station
Valve Vault	Piping is ductile iron with minor surface corrosion. Isolation and check valves are functional. The vault has standing water, no drain was installed. Vault lid has been damaged. Integral supports for the lid have been removed and could pose safety issue.	<ul style="list-style-type: none"> <li>• Fix or install a new vault lid</li> <li>• Install drain and seal lid to prevent standing water in vault</li> <li>• Coat valves and piping</li> </ul>
Generator	Buried conduit from generator to lift station is exposed at the creek, from creek bank erosion.	Relocate conduit to opposite side of parking lot
Electrical Panel	Panel is in good working condition. Alarms were tested and functioned satisfactorily.	
Pump #1	Motor is in good working condition. Slide rail connections appear to be worn out, causing recirculation in wet well and loss of ~140 gpm. Impeller is worn.	Replace impeller, volute, discharge base, and pump discharge bracket
Pump #2	Motor is in good working condition. Wear ring missing from volute and impeller is showing signs of wear. Pump discharge bracket is missing right side. This was most likely removed due to close tolerances of the concrete platform. Impeller is worn.	<ul style="list-style-type: none"> <li>• Replace impeller and volute</li> <li>• Replace discharge bracket and notch concrete for installation and removal of pump</li> </ul>
<b>Overall Physical Condition</b>	<b>This lift station is in fair to poor physical condition. Piping is corroded, pumps need overhaul, slide rails and brackets are corroded.</b>	

**Table 6-4. Summary of Physical Evaluation and Recommendations for Station #21 – Military Lift Station**

<b>Lift Station Component</b>	<b>Comment</b>	<b>Recommendation</b>
Wet Well	Appears to be coated with coal tar epoxy. Coating is in satisfactory condition.	
Bypass	None	Install bypass
Piping (inside wet well)	Piping made of ductile iron, bolts are stainless steel. Piping is severely corroded.	Coat piping, although replace piping is recommended
Slide Rails	Rails are stainless pipe and top rail bracket is made of stainless steel and are in okay condition.	
Lifting Chains	Chains made of stainless steel and are in okay condition.	
Valve Vault	Piping is of ductile iron construction with severe surface corrosion. Isolation and check valves are functional.	Coat valves and piping in valve vault, although replace piping is recommended
Electrical Panel	Electrical panel is in good working condition. Alarms were tested and functioned satisfactorily. Exterior of the panel is corroding.	Re-coat exterior of panel
Pump #1	Motor has low megaohm readings. Impeller has wear on wear ring mating surface, wear ring missing. Pump discharge bracket is showing signs of wear.	Replace pump, motor, and discharge bracket
Pump #2	Motor has low megaohm readings. Impeller has wear on wear ring mating surface. Wear ring is missing. Pump discharge bracket is showing signs of wear.	Replace pump, motor, and discharge bracket
<b>Overall Condition</b>	<b>This lift station is in poor physical condition.</b>	

**Table 6-5. Summary of Physical Comments and Recommendations for Station #22 – Tioga Lift Station**

<b>Lift Station Component</b>	<b>Comment</b>	<b>Recommendation</b>
Wet Well	The wet well is coated; however, coating is peeling off. Light aggregate is showing at the lid. Riser rings appear to be satisfactory condition. Lid is missing bolts from the hinge.	<ul style="list-style-type: none"> <li>• Re-coat wet well to prevent further damage</li> <li>• Replace missing bolts on lid hinge</li> </ul>
Bypass	None	Install bypass
Piping (inside wet well)	Piping is made of ductile iron, bolts are stainless steel. Piping is showing signs of corrosion.	Coat piping inside wet well
Slide Rails	Rails and bracket are stainless steel and in good condition.	
Lifting Chains	Lifting chain is made of stainless steel and in good condition.	
Valve Vault	Piping in vault is ductile iron and has minor corrosion. Isolation and check valves are functional.	Coat piping and valves inside valve vault
Electrical Panel	Panel is in good working condition. Alarms were tested and functioned satisfactorily.	
Pump #1	Pump 1 was removed from service by SCSD due to pump failure	Fix or buy new pump and re-install
Pump #2	Pump #2's motor is in good working condition. Pump is in satisfactory condition.	
<b>Overall Condition</b>	<b>This lift station is fair condition.</b>	

**Table 6-6. Summary of Existing Lift Station Wastewater Flows**

			Lift Station			
			Station #19 Del Monte	Station # 20 Rosita	Station #21 Military	Station #22 Tioga
Land Use Components						
	Residential	Persons	1,111	419	204	6
	Commercial	Sq. Ft.	370,165	248,965	0	16,352
	Hotels	Rooms	409	0	0	0
	Schools	Students	0	0	0	0
	Upstream Lift Station		Rosita	NA	NA	NA
Flow Rate (gpd)						
	Residential		72,215	27,235	13,268	390
	Commercial		37,016	24,897	0	1,635
	Hotel Rooms		40,900	0	0	0
	Schools		0	0	0	0
Total Average Daily Flow		gpd	150,131	52,132	13,268	2,025
		gpm	104	36	9	1
		w/ Simplex LS	584	NA	NA	NA
Maximum Day Dry Weather Flow		Peaking Factor	1.5	1.5	1.5	1.5
		gpd	225,197	78,197	19,902	3,038
		gpm	156	54	14	2
Peak Hour Dry Weather Flow		w/ Simplex LS	636	NA	NA	NA
	Residential	Peaking Factor	2.0	2.0	2.0	2.0
		Commercial	Peaking Factor	2.1	2.1	2.1
		gpd	462,082	160,129	39,803	6,321
		gpm	321	111	28	4
	w/ Duplex LS	1,121	NA	NA	NA	
Wet Weather Flow		Peaking Factor	2.0	2.0	1.8	1.0
		gpd	300,263	104,263	23,882	2,025
		gpm	209	72	17	1
		w/ Duplex LS	1,009	NA	NA	NA

**Table 6-7. Force Main Velocity Evaluation**

		Lift Station			
		Station #19 Del Monte	Station # 20 Rosita	Station #21 Military	Station #22 Tioga
Pump Test					
Force Main Diameter	inches	12	6	4	4
Simplex Flow	gpm	984	416	N/A	19
Velocity	ft/sec	2.8	4.7	--	0.5
Duplex Flow <sup>1</sup>	gpm	1,700	--		
Velocity	ft/sec	4.8			
Design Flows					
Force Main Diameter	inches	12	6	4	4
Simplex Flow	gpm	1,200	480	150	125
Velocity	ft/sec	3.4	5.4	3.8	3.2
Duplex Flow <sup>1</sup>	gpm	2,200	NA		
Velocity	ft/sec	6.2			

<sup>1</sup> Force Main evaluation is for standard operating conditions. Del Monte Lift Station is a triplex lift station with normal operating conditions running two pumps at one time with the third pump as a backup. Rosita, Military, and Tioga Lift Stations are duplex stations with normal operating conditions only running one pump at any one time with the second pump as a back up. The flow under duplex conditions is assumed.

**Table 6-8. Lift Station Cycle Times**

		Lift Station			
		Station #19 Del Monte	Station # 20 Rosita	Station #21 Military	Station #22 Tioga
Wetwell Operating Volume	gallons	1,295	338	300	211
Tested Simplex Pump Operation	gpm	984	416	NA	19
Assumed Duplex Pump Operation	gpm	1,700	NA	NA	NA
Design Simplex Pump Operation	gpm	1,200	480	150	125
Assumed Duplex Pump Operation	gpm	2,200	NA	NA	NA
<b>Worst Case Number of Pump Cycles per Hour (Flow In = One-half Pump Rate)</b>					
Tested Simplex Pump Operation	minutes	5.3	3.3	NA	44.5
	Cycles per Hour	11.4	18.4	NA	1.3
Design Simplex Pump Operation	minutes	4.3	2.8	8.0	6.8
	Cycles per Hour	13.9	21.3	7.5	8.9
<b>Existing Average Daily Flow</b>					
Tested Simplex Pump Operation	minutes	5.5	10.2	NA	162.4
	Cycles per Hour	11.0	5.9	NA	0.4
Design Simplex Pump Operation	minutes	4.3	10.1	34.6	152.1
	Cycles per Hour	13.9	5.9	1.7	0.4
<b>Peak Hour Dry Weather Flow</b>					
Tested Simplex Pump Operation	minutes	3.4	4.2	NA	62.7
	Cycles per Hour	17.7	14.4	NA	1.0
Design Simplex Pump Operation	minutes	2.4	4.0	13.3	49.9
	Cycles per Hour	25.5	15.1	4.5	1.2

**Table 6-9. Lift Station Emergency Response Time**

	Lift Station			
	Station #19 Del Monte <sup>1</sup>	Station # 20 Rosita	Station #21 Military	Station #22 Tioga
High Water Alarm (inches)	72	54	112	40
Overflow (inches)	210	78	144	132
Volume (gal)	1,676	752	564	1,621
ADF Inflow (gpm) w/o Upstream LS	104	36	9	1
<b>ADF Response Time (min)</b>	<b>16</b>	<b>21</b>	<b>61</b>	<b>1,153</b>
ADF Inflow (gpm) w/ Upstream LS	584			
<b>ADF Response Time (min)</b>	<b>3</b>			
PHDWF Inflow (gpm) w/o Upstream LS	321	111	28	4
<b>PHDWG Response Time (min)</b>	<b>5</b>	<b>7</b>	<b>20</b>	<b>369</b>
PHDWF Inflow (gpm) w/ Upstream LS (duplex)	1,121			
<b>PHDWG Response Time (min)</b>	<b>1</b>			

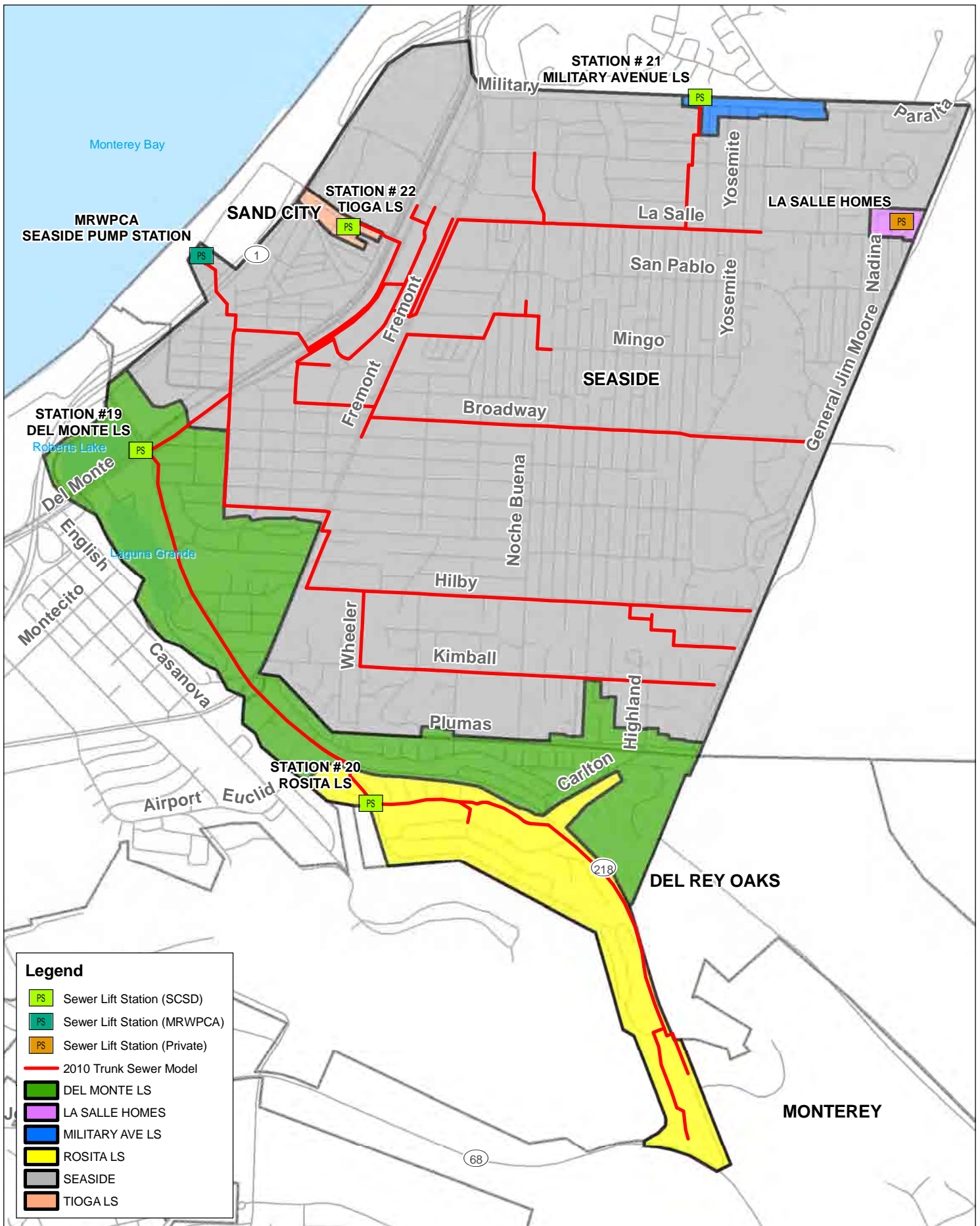
<sup>1</sup> The volume of the Del Monte Lift Station is based on half of a 14 foot diameter wet well with a 3.5 foot diameter ring on the upper 8.5 feet.

**Table 6-10. Summary of Future Lift Station Wastewater Flows**

	Lift Station	
	Station #19 Del Monte	Station # 20 Rosita
Existing Average Daily Flows (gpd)	150,131	52,132
Future Average Daily Flows (gpd)	69,500	244,605
Total Average Daily Flow	gpd	219,631
	gpm	153
	w/ Simplex LS <sup>1</sup>	1,153
Maximum Day Dry Weather Flow	Peaking Factor	1.5
	gpd	329,447
	gpm	229
	w/ Simplex LS <sup>1</sup>	1,229
Peak Hour Dry Weather Flow	Peaking Factor	2.0
	gpd	658,894
	gpm	458
	w/ Duplex LS <sup>1</sup>	2,308
Wet Weather Flow <sup>2</sup>	Peaking Factor	2.0
	gpd	369,763
	gpm	257
	w/ Duplex LS <sup>1</sup>	2,107

<sup>1</sup> Assumes Rosita LS will be upgraded to a 1,000 gpm pump under simplex conditions, and 1,850 gpm under duplex conditions.

<sup>2</sup> The Peaking factor for I/I is applied to existing flows only. It is assumed that future development will not have an I/I problem.



**Legend**

- Sewer Lift Station (SCSD)
- Sewer Lift Station (MRWPCA)
- Sewer Lift Station (Private)
- 2010 Trunk Sewer Model
- DEL MONTE LS
- LA SALLE HOMES
- MILITARY AVE LS
- ROSITA LS
- SEASIDE
- TIOGA LS

**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN  
FIGURE 6-1: LIFT STATION LOCATIONS  
AND SERVICE AREA MAP**

NOTES:  
BASEMAP PROVIDED BY SCSD.  
WALLACE GROUP DID NOT  
PERFORM BOUNDARY SURVEY  
SERVICES FOR THIS MAP. NOT  
A LEGAL DOCUMENT. MAP  
PRODUCED MAY 2011.



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## CHAPTER 7

### COLLECTION SYSTEM ANALYSIS

This Chapter presents the analysis of the gravity wastewater collection system for the Seaside County Sanitation District (SCSD). Refer to Chapter 6 for a detailed evaluation of SCSD's four (4) lift stations and force mains. Refer to Chapter 9 for the proposed capital improvements based on the analysis presented in this Chapter.

#### INTRODUCTION

The SCSD collection system consists of a network of 6-inch to 27-inch gravity sewer pipes, and four (4) lift stations, providing service to the Cities of Seaside, Sand City, and Del Rey Oaks. The main trunk sewer system was analyzed using a computer based hydraulic model as part of this Master Plan project, to evaluate performance of the wastewater collection system under both existing and future conditions. Figure 7-1 provides an overview of the sewer pipes, lift stations, and force mains that were included in the hydraulic model. All gravity sewer pipes 8-inch and larger in diameter were modeled and are considered to be the trunk sewer system. In addition, several segments of 6-inch diameter sewer pipes were included in the sewer model under the direction of SCSD staff. These 6-inch segments consist of known "problem areas" throughout the system and/or may receive additional flows from potential future development. SCSD's lift stations and corresponding force mains were included in the sewer model; However a more detailed investigation and analysis of the lift stations was performed outside of the sewer modeling program, presented in Chapter 6.

The analysis of the wastewater collection system is based on a sewer Geographic Information System (GIS) developed for the entire SCSD collection system in support of this Master Plan project. The sewer GIS was compiled using the following data:

- Survey-grade coordinates and rim elevations for the sewer manholes on the trunk sewer system
- Manhole and rodhole locations from the 2004 AMBAG topographic mapping project
- Sewer record plans and atlas maps

Horizontal measurements are based the North American Datum (NAD) of 1983 California State Plane Zone 4 Coordinate System. Vertical measurements are based on North American Vertical Datum (NAVD) of 1988.

#### COLLECTION SYSTEM ANALYSIS CRITERIA

Design criteria as described in the SCSD's *Draft Sanitary Sewer Management Plan, Element 5: Design and Performance Standards*, were applied in analysis of the trunk sewer collection system. These design criteria provide capacity buffer for surcharge conditions, for fluctuations in flows due to diurnal variations, and anticipated peak wet

weather flows. Gravity pipe performance was analyzed based on maximum percent full (d/D ratio), defined as the depth of flow in a pipe divided by the diameter of the pipe. Criteria utilized are as follows:

- Minimum Velocity: 2.0 feet per second (fps) under average flow conditions
- Percent full (d/D) criteria as included in Table 7-1. Maximum d/D varies from 0.67 to 0.90 dependent on pipe diameter.
- Maximum Velocity: 8.0 fps
- Manning coefficient of friction “n” = 0.013 for VCP and RCP; n = 0.011 for PVC

Within the sewer model all system upgrades were designated as PVC, with the exception of existing ductile iron sewer pipe utilized at street crossings; existing ductile iron pipes were assumed to be replaced with ductile iron if upgrades are required.

## COLLECTION SYSTEM FLOWS

Existing and future flows were analyzed in the sewer model for both dry weather and wet weather conditions. Flow rates were derived as described in Chapter 4 of this report. Flow parameters as utilized in this analysis are defined as follows.

- **ADF:** Average daily dry weather system flow
- **MDDWF:** Maximum daily dry weather system flow
- **PHDWF:** Peak hour dry weather system flow
- **I/I:** Flow due to wet weather infiltration and inflow
- **WWF:** Wet weather system flow, equal to ADF plus the added flow contribution from I/I

## COLLECTION SYSTEM MODEL DEVELOPMENT

A hydraulic model of the sewer collection system was developed with the MWHSoft® InfoSWMM sewer modeling program, Suite 7.0 Service Pack1 Update 9. 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 or surcharged pipes). Model results were evaluated for pipeline capacity, flow velocity, and maximum d/D ratio under various flow conditions.

### Flow Allocation

Wastewater flows were assigned to the sewer model utilizing estimated flows as described in Chapter 4. Flows were allocated to individual sewer manholes based on actual location of SCSD customers. Tributary areas for each modeled manhole were developed and shown on Figure C-1, included in Appendix C. Each tributary area represents the total residential, commercial, and institutional customers contained within the tributary boundary.

Future wastewater flows were allocated to the sewer model based on the most probable connection location; refer to Figure C-2 included in Appendix C for the future flow locations. **The impact to the collection system from future flows will need to be re-evaluated if proposed development infrastructure connects to the existing SCSD collection system in a different location.**

Diurnal curves were then applied to the allocated wastewater flows, to represent both dry weather and wet weather conditions. A separate diurnal curve was applied to residential and commercial connections, with hotels and schools included in the residential curve. A detailed discussion of the diurnal curves for the SCSD system is included in Chapter 4.

### **Model Calibration**

Approximately six weeks of sewer flow data was collected in support of the hydraulic model development, as described in Chapters 4 and 5 of this report. Representative data for each flow monitoring location was compared to model results for both wet and dry weather days. Through this process the diurnal curves applied to the model were adjusted to accurately represent the system flows as recorded through the flow monitoring. Model results for existing conditions were also compared to the SCSD maintenance records to confirm locations where the model exhibited existing collection system deficiencies. Graphs comparing model results and flow monitoring data are included in Appendix C.

### **System Conditions Analyzed**

The hydraulic model was utilized to analyze dry and wet weather system flow 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 as specified, and to identify areas recommended for high priority maintenance operations. Scenarios developed consist of the following:

- *Existing MDDWF Scenario:* This scenario represents the trunk sewer system under existing maximum dry weather flow conditions.
- *Existing WWF Scenario:* This scenario represents the trunk sewer system under existing ADF with contributions from I/I. In some tributary areas, anticipated peaking factors for contributions from I/I are higher than diurnal curve peaking factors for dry weather.
- *Future MDDWF Scenario:* This scenario represents the trunk sewer system under future maximum dry weather flow conditions, with all potential development as described in Chapter 2 flowing to the existing collection system.
- *Future WWF Scenario:* This scenario represents the trunk sewer system under future ADF conditions with contributions from I/I, and all potential future

connections to the collection system in place. Within the model it was assumed that future connections to the existing system *would not* receive inflow from I/I.

## COLLECTION SYSTEM MODEL RESULTS – EXISTING FLOW CONDITIONS

### Deficient System Capacity

The following locations were identified through the analysis as having insufficient capacity to meet SCSD performance standards while conveying existing system flows. Pipe upgrades identified for existing conditions may increase in diameter for future conditions, as described later in this chapter. Refer to Figures 7-2 and 7-3 for a system-wide map of maximum d/D under existing flow conditions. Refer to Figure 7-4 for an overall map of recommended system upgrades for existing conditions.

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 SCSD standards, if the downstream recommended improvements were not constructed. Through the digital sewer model, maximum d/D was analyzed for the system as a whole, ensuring that recommended upgrades did not trigger additional downstream improvements.

#### Luzern Street

- Reference: Figure 7-8
- Location Extents: Manhole D7-5 to Manhole C8-108

Luzern Street is currently a 6-inch VCP sewer main that receives flow from the Military Lift Station. When the Military Lift Station is running, the sewer main immediately downstream of the force main runs full. In addition, pipe segments downstream, flow with a d/D up to 0.85 under MDDWF, and 0.92 under WWF with peak flow up to 345 gpm. Upgrade to 8-inch PVC reduces maximum d/D to 0.60, occurring just downstream from the Lift Station. This upgrade requires 1,430 lineal feet of 8-inch PVC and bolted manhole covers at the connection manhole for the force main, and the manhole immediately downstream. These two manholes are both shallow, with total depth less than 4 feet, and have a relatively high chance of surcharging due to the surge in flow from the force main. The sewer model indicates overflowing at these manholes when the military lift station is running.

#### La Salle Avenue

- Reference: Figure 7-9
- Location Extents: Manhole C8-108 to Manhole C8-33

La Salle Avenue, from Luzern Street to Noche Buena Street, is currently 6-inch VCP. Under WWF conditions with peak flow up to 486 gpm, the sewer main gravity flows with a d/D up to 0.90, with multiple pipe segments surcharging (d/D 1.0). In addition, the model indicates the potential for overflow from the two manholes downstream from Luzern Street during WWF conditions. Dry weather flow conditions result in maximum

d/D up to 0.84, with surcharging in a single pipe segment. Upgrade to 8-inch PVC results in two pipe segments with a d/D that exceeds the SCSD criterion of 0.67 due to low slope (Manhole C8-101 to C8-88, length of approximately 360 linear feet). Increasing slope to 1.3% through the two pipe segments results in acceptable d/D levels; this requires an increase of approximately one foot of depth to the downstream manhole, decreasing downstream pipe slope from 3.8% to approximately 3.5%. Also, under wet weather conditions the pipe segment just upstream from Noche Buena street flows with a d/D up to 0.73 with the 8-inch upgrade due to backwater effect from downstream piping. The downstream pipe is discussed further within the “Marginal System Capacity” section in this Chapter. Total length of the 8-inch upgrade is 1,970 feet.

#### Del Monte Boulevard

- Reference: Figure 7-10
- Location Extents: Manhole B8-81 to Manhole B9-28

The sewer main that traverses on Fremont Boulevard from La Salle Avenue to The Mall, on The Mall from Fremont Boulevard to Del Monte Boulevard and on Del Monte Boulevard from The Mall to the easement that heads towards Ortiz Avenue is all 10-inch VCP. This stretch of sewer main gravity flows with a d/D up to 0.88, with multiple pipe segments surcharging (d/D 1.0) under WWF conditions, with peak flow up to 729 gpm. The model indicates the potential for overflow from the manhole located at the La Salle and Fremont Boulevard intersection during WWF. Under MDDWF, gravity flow d/D reaches 0.85 with a single pipe segment surcharging. Upgrade to 12-inch PVC results in maximum d/D ranging from 0.73 to 0.42.

However, the recommended alignment for this upgrade reroutes the sewer main from La Salle to Del Monte Boulevard, then south on Del Monte Boulevard to Ortiz Avenue. This new alignment reduces total project length from 3,470 feet to approximately 3,200 feet. In addition, this new sewer main in Del Monte would allow for the two existing sewer mains in Del Monte (6-inch and 10-inch) to be abandoned. The new 12-inch sewer main in Del Monte would vary between approximately 16 and 20 feet deep, from Tioga Avenue downstream approximately 1,000 feet, to overcome the adverse slope of Del Monte and catch grade at the existing 10-inch sewer main (MH B8-51) which is currently 20 feet deep.

Figure 7-10 illustrates the proposed alignment on Del Monte Boulevard. **The pipes and manholes modeled for the Del Monte alignment alternative are schematic only and do not represent final gravity sewer design.** A minimum pipe slope of 0.5% was utilized to model the new pipeline from the connection at Fremont (MH B8-81) to the connection to the existing 10-inch sewer main in Del Monte (MH B8-51). Existing slope of the 10-inch pipe was utilized to model the new pipeline from the existing manhole connection (MH B8-51) to Ortiz Avenue.

#### Birch Avenue

- Reference: Figure 7-11
- Location Extents: Manhole C9-6 to Manhole B9-86 and Manhole C8-19 to Manhole C9-6

The sewer main that traverses on Baker Street from Phoenix Avenue to Birch Avenue and on Birch Avenue from Baker Street going west 600 feet toward Fremont Boulevard is 10-inch VCP and has a d/D greater than 0.92 under WWF conditions, with peak flow up to 830 gpm. The sewer main upstream from Baker Street on Phoenix Avenue east to Noche Buena is 8-inch VCP, and has a d/D up to 0.80 under WWF conditions. Upgrade of this entire stretch of sewer main from 8-inch VCP to 10-inch PVC, and the 10-inch VCP to 12-inch PVC, results in a maximum d/D of 0.58. Total upgrade length is 1,600 feet.

#### Fremont Boulevard

- Reference: Figure 7-12
- Location Extents: Manhole B9-75 to Manhole B9-21, Manhole B9-21 to Manhole B9-28, and Manhole B9-58 to Manhole B9-60

The sewer main that traverses Fremont Boulevard from Birch Avenue to the Easement just north of Broadway, along the Easement north of Broadway Avenue from Fremont Boulevard to Alhambra Street, and along Alhambra Street from the Easement north of Broadway Avenue to Del Monte Boulevard is all 12-inch VCP. Each of these segments, for a total of 2,800 feet of sewer main, has a d/D between 0.73 and 1.0 (surcharging) for WWF conditions with peak flow up to 1,429 gpm, and d/D between 0.66 and 1.0 for MDDWF conditions. Upgrade to 15-inch PVC results in a maximum d/D of 0.71.

The sewer main on Del Monte Boulevard from Alhambra Street to the Easement over to Ortiz Avenue is a 15-inch sewer main and has a d/D up to 0.88 under WWF conditions with peak flow up to 1,473 gpm, and 0.82 for MDDWF conditions. In addition, upstream upgrades identified for Fremont Boulevard would increase peak flow and maximum d/D for this pipe segment. Upgrade of this 250 foot stretch of sewer main to 18-inch results in a maximum d/D of 0.65.

The sewer main on Fremont Boulevard, from Broadway Avenue to the Easement north of Broadway Avenue is 10-inch VCP and has a d/D up to 0.88 under WWF conditions, with peak flow up to 596 gpm. Upgrade of this 160-foot pipe segment to 12-inch PVC results in a maximum d/D of 0.62.

#### **Marginal System Capacity**

Locations where pipes flow close to design standards as included in Table 7-1 were identified within the hydraulic model, as follows. The d/D values provided represent system performance with all improvements recommended for existing conditions in place. It is recommended that these locations be flushed on a regular basis to maintain optimum pipe capacity. Marginal pipe locations are depicted on Figure 7-4 and again on Figure C-3 located in Appendix C.

#### Ortiz Avenue

- Reference Figure 7-4
- Location Extents: Manhole B9-23 to Manhole A9-51

The sewer main on Ortiz Avenue from Holly Street to Contra Costa Street is two pipe segments of existing 21-inch VCP, with WWF maximum d/D of 0.80 and 0.86. Under

MDDWF conditions these pipes flow with a maximum d/D of 0.72 and 0.78. Although a d/D of 0.86 is high, it occurs in a single pipe segment during wet weather flows only, and therefore does not warrant upgrade at this time.

#### Sierra Avenue to Hilby Avenue

- Reference Figure 7-4
- Location Extents: Manhole C11-98 to Manhole C11-87

Two segments of 6-inch VCP sewer main that traverse from Sierra Avenue to Hilby Avenue flow with a d/D up to 0.72 under WWF conditions, and up to 0.70 for MDDWF conditions.

#### Broadway Avenue

- Reference Figure 7-4
- Location Extents: Manhole C9-51 to Manhole C9-32

The 6-inch VCP sewer main that traverses from Judson Street to Kenneth Street flows with a d/D up to 0.70 under WWF conditions, and d/D up to 0.67 under MDDWF conditions.

#### La Salle Avenue

- Reference Figure 7-4
- Location Extents: Manhole C8-33 to Manhole C8-24 and Manhole C8-3 to Manhole B8-81

Existing 8-inch VCP just downstream from Noche Buena flows with a maximum d/D of 0.74 for WWF conditions and 0.61 for MDDWF conditions.

Existing 8-inch VCP pipe just upstream from Fremont Boulevard flows with a d/D up to 0.76 for WWF and 0.74 for MDDWF conditions. SCSD staff believes this pipe segment may actually be 6-inch VCP. If this pipe segment is 6-inch, it would flow with a maximum d/D of 1.0 (surcharged) during WWF conditions and 0.94 for MDDWF conditions, assuming all upstream and downstream recommended pipe upgrades are in place. The model does not demonstrate any overflow in this location under these conditions.

### **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. SCSD specifies a minimum pipe velocity of 2.0 feet per second (fps) to maintain solids in suspension. A total of 66 modeled pipes were identified with a velocity below 2.0 fps under existing average day conditions, and a total of 53 pipes did not meet velocity criteria under maximum day conditions. It is recommended that pipes identified with a maximum velocity of less than 2.0 fps be flushed and/or vacuumed on a regular basis. Total length of pipe is 3.4 miles. These pipes are depicted in Figure C-3 and listed in Table C-1, included in Appendix C.

## Pipe Travel Time

Excessive pipe travel time is a result of low velocity and/or long pipe runs, and can lead to problems with hydrogen sulfide attack and odor at downstream manholes. Typically wastewater is oxygenated as it flows through a manhole, decreasing likelihood of hydrogen sulfide generation. Travel time exceeding thirty minutes through a single pipe (manhole to manhole) is undesirable. All pipes included in the hydraulic model have an existing average day travel time of 18 minutes or less; pipe travel time is not anticipated to cause maintenance issues for the SCSD system.

## COLLECTION SYSTEM MODEL RESULTS – FUTURE FLOW CONDITIONS

Refer to Figures 7-5 and 7-6 for a system-wide map of maximum d/D under future flow conditions. Refer to Figure 7-7 for an overall map of recommended system upgrades for future conditions.

### Future Sewer System Infrastructure

Recommendations for future upgrades to the SCSD sewer collection system are based on the following assumptions:

- Both Del Monte and Rosita Lift Station are equipped with VFD pumps at the time of pump station upgrade
- New development will contribute minimal I/I to the collection system
- The Del Monte upgrade will reroute flow from La Salle to Del Monte Boulevard
- The Tioga Lift Station is abandoned with future Area A development
- Gravity flow of future wastewater contribution from Regions “B” and “C”

### Regions “B” and “D2” Impacts

It is anticipated that the wastewater from Regions “B” and “D2” will flow to Highway 218. At General Jim Moore Boulevard and Highway 218 there is a shallow culvert that would be required to be crossed if the flow comes west on General Jim Moore Boulevard. This may require an inverted siphon or potentially a lift station. It is highly recommended to not install a lift station at this location due to the downstream impacts it would have on the collection system capacity between General Jim Moore Boulevard and Rosita Lift Station. If the wastewater flow is able to gravity feed towards Ryan Ranch Road, then the wastewater could be routed around the culvert and gravity flow on Highway 218, through the park, down Angelus Way to the Rosita Lift Station. Based on this assumption, the following upgrades are recommended:

#### Angelus Way

- Reference: Figure 7-14
- Location Extents: Manhole C12-3 to Rosita Lift Station

The sewer main on Angelus Way from Del Rey Park to Rosita Lift Station is 8-inch VCP. Due to the impacts from Regions “B” and “D2”, this pipe would gravity flow with a d/D up to 0.88 and several segments within this stretch of sewer main would surcharge (d/D of

1.0) under future MDDWF conditions. Future peak flows through this 1,490-foot stretch range from 589 to 676 gpm. Upgrade to 12-inch PVC results in d/D from 0.53 to 0.32. It is noted that existing pipe upstream from this upgrade is 12-inch diameter.

#### Canyon Del Rey (1)

- Reference: Figure 7-15
- Location Extents: Manhole B12-2 to Manhole A10-14

The sewer main on Canyon Del Rey from Rosita Lift Station to Hilby Avenue is 8-inch VCP. Due to the impacts from Regions "B" and "D2" and increased flow from the recommended Rosita Lift Station Upgrade, several segments within this stretch of sewer main would surcharge (d/D of 1.0) and gravity flow d/D would reach 0.92 under future MDDWF conditions. Upgrade to 12-inch PVC results in maximum d/D ranging from 0.44 to 0.30, with a peak MDDWF of 748 to 802 gpm. Total affected pipe length is 3,280 feet.

#### Canyon Del Rey (2)

- Reference: Figure 7-16
- Location Extents: Manhole A10-9 to Manhole A10-4

The sewer main on Canyon Del Rey from Harcourt Avenue to Sonoma Avenue is 12-inch VCP and CMP. Due to the impacts from Regions "B" and "D2", redevelopment of Broadway Specific Plan, and increased flow from the recommended Rosita Lift Station Upgrade, several segments within this stretch of sewer main would gravity flow with a d/D up to 0.96. Upgrade to 15-inch PVC results in maximum d/D up to 0.54 for MDDWF and 0.53 for WWF, with peak MDDWF ranging from 859 to 920 gpm. Total affected pipe length is 1,070 feet.

### **Region "C" Impacts**

Region "C" is located on the east side of General Jim Moore Boulevard. Based on the topography of this development, future estimated wastewater flow was divided into three zones that would gravity flow down La Salle Avenue, Broadway Avenue, and Hilby Avenue. This results in large impacts to several major tributaries within the collection system. Most of these tributary areas are currently 6-inch VCP that do not meet the minimum sewer main diameter pipe standards as set forth by SCSD. There are other alternatives to these projects; however, they would require lift stations which ultimately result in higher operation and maintenance costs to SCSD. Therefore, the following proposed upgrades were analyzed:

#### La Salle Avenue

- Reference: Figure 7-17
- Location Extents: Manhole D8-41 to Manhole C8-108, Manhole C8-108 to Manhole C8-33, and Manhole C8-33 to Manhole B8-81

The sewer main on La Salle Avenue that flows to Fremont Boulevard currently does not extend up to General Jim Moore Boulevard. This existing sewer main terminates at Mariposa Street. The homes to the east of Mariposa Street gravity flow from La Salle Avenue to Yosemite Street, then through backyard easements south towards San Pablo

Avenue. The two existing mains run parallel for a short distance on La Salle between Mariposa Street and Yosemite Street. The main that flows to San Pablo Avenue is 6-inch and would require to be upgraded to accept future flows. It is not recommended to upgrade this existing pipe that traverses backyard easements; rather, it is recommended to construct a new 8-inch PVC sewer main from General Jim Moore Boulevard to Mariposa Street for a total length of 2,200 feet. La Salle Avenue currently does not connect to General Jim Moore Boulevard. Therefore, an easement between the end of La Salle Avenue and General Jim Moore Boulevard would be required. Alternatively, a new sewer could be routed from General Jim Moore through an easement to the cul-de-sac at the end of Lysett Court, then north to La Salle. This option would minimize the length of easement required for construction but would require a deeper sewer line.

The sewer main on La Salle Avenue from Mariposa Street to Luzern Street is currently 6-inch VCP. Due to impacts from Region "C", it has a MDDWF peak d/D up to 0.85 with a pipe segment surcharging (d/D of 1.0). Upgrade to 8-inch PVC results in a maximum d/D of 0.48 under MDDWF conditions, with peak flows ranging from 876 to 930 gpm. Total length is 1,050 feet.

The sewer main on La Salle Avenue from Luzern Street to Noche Buena Street is recommended to be upgraded from a 6-inch to 8-inch sewer main to meet existing needs. Future peak MDDWF flows for this segment reach 979 gpm, which would result in multiple pipes surcharging (d/D of 1.0) for both the existing 6-inch main and the 8-inch upgrade for existing conditions. Upgrade to a 10-inch PVC results in maximum d/D ranging from 0.43 to 0.71. In addition, two pipes would require increase in slope to 1.3%, as described for existing conditions. Total length is 1,970 feet.

The sewer main on La Salle Avenue from Noche Buena Street to Fremont Boulevard is currently 8-inch VCP. Due to impacts from Region "C", segments of this reach flow with a MDDWF peak d/D up to 0.76. In addition, maximum d/D would increase with the construction of recommended upstream upgrades. Upgrade to 10-inch PVC for a total length of 1,200 feet results in maximum d/D ranging from 0.54 to 0.70, with peak MDDWF up to 1,088 gpm.

#### Del Monte Boulevard

- Reference: Figure 7-18
- Location Extents: Manhole B8-81 to Manhole B9-28

The sewer main that traverses on Fremont Boulevard from La Salle Avenue to The Mall, on The Mall from Fremont Boulevard to Del Monte Boulevard and on Del Monte Boulevard from The Mall to the easement that heads towards Ortiz Avenue is all 10-inch VCP. Future peak flows for this stretch range from 1,093 to 1,140 gpm. This stretch of sewer main has pipe segments that would surcharge (d/D of 1.0) with future flow. This reach of sewer is recommended to be upgraded under existing conditions; however, the impacts from Region "C" require the sewer main to be upsized to a 15-inch PVC sewer main in lieu of the 12-inch recommended for existing conditions. Upgrade to 15-inch PVC results in a maximum d/D of 0.75. Recommended alignment for this upgrade reroutes the sewer main from La Salle to Del Monte Boulevard, then south on Del Monte Boulevard to Ortiz Avenue, as described in more detail under the existing conditions section. Total pipe length for the Del Monte alignment is approximately 3,200 feet.

### Hilby Avenue

- Reference: Figure 7-19
- Location Extents: Manhole D11-24 to Manhole B10-70 and Manhole B10-70 to Manhole B10-52

The sewer main on Hilby Avenue from General Jim Moore Boulevard to Shafer Street is 6-inch VCP. Future peak flows, including Region “C”, range from 303 to 452 gpm. This stretch of sewer main has segments that would surcharge (d/D of 1.0), with gravity flow d/D up to 0.81. Upgrade to 10-inch PVC reduces maximum d/D to 0.51. Total pipe length is 4,420 feet.

The sewer main on Hilby Avenue from Shafer Street to Wheeler Street is 8-inch VCP. Future peak flows, including Region “C” range from 452 to 496 gpm. Upgrade to 10-inch PVC results in maximum d/D of 0.64. Total length is 930 feet.

### Broadway Avenue

- Reference: Figure 7-20
- Location Extents: Manhole D9-74 to Manhole C9-32 and Manhole C9-32 to Manhole B9-58

The sewer main on Broadway Avenue from General Jim Moore Boulevard to Kenneth Street is 6-inch VCP. Future peak flows including Region “C” range from 303 to 698 gpm for this stretch of sewer main. With the projected increase in flow, multiple pipe segments in this stretch would surcharge (d/D of 1.0), with gravity flow d/D up to 0.95. Upgrade to 10-inch PVC results in maximum d/D of 0.40. Total length is 3,690 feet. It is noted that the three most upstream pipe segments in Broadway (Manhole D9-74 to Manhole D9-48) exhibit existing capacity to accept future flow from Region C. However, this portion of pipe is recommended to be upsized due to velocity concerns, and because the 6-inch diameter does not meet SCSD’s minimum pipe size criteria. Peak velocity with the modeled 10-inch upgrade reaches 8.5 fps, which exceeds SCSD design criteria. The slopes in this upstream portion may be decreased for final engineering design for future Region C connection, which would decrease velocity, but also increase modeled d/D values. Installing a smaller pipe (8-inch diameter) could further increase velocity, and may not provide adequate capacity with reduced pipe slopes.

The sewer main on Broadway Avenue from Kenneth Street to Fremont Boulevard is 8-inch VCP, with future peak flow up to 736 gpm including Region “C”. This stretch of sewer main would flow with a d/D up to 1.0 (surcharging) with future flows. Upgrade to 10-inch PVC reduces maximum d/D to 0.52. Total length is 2,460 feet.

### **Region “A” Impacts**

Future development and redevelopment in Region A would increase sewer flow to the Tioga Lift Station. The recommended Del Monte Boulevard 15-inch gravity main would be deep enough that the sewer line in Tioga Avenue could gravity flow to Del Monte, allowing for the Tioga Lift Station to be abandoned. It is recommended that the Tioga Lift Station be abandoned at the time of construction of any future development that would increase flow to this lift station. Conditions and operation of this lift station is discussed in detail in Chapter 6.

## Regions “A” and “C” Impacts

Portions of the Region A and Region C future development would contribute flow to the following identified pipe deficiency.

### Ortiz Avenue

- Reference: Figure 7-13
- Location Extents: Manhole B9-28 to Manhole A9-51

The sewer main on Ortiz Avenue from Del Monte Boulevard to Contra Costa Street receives all of the flow from the Victory Toyota, Love Chevrolet, Cypress Ford, and a portion of the 27-inch tributary area. This 21-inch VCP sewer main has a d/D greater than 0.92 under MDDWF with all of the future development. Under existing conditions, this sewer main is right at capacity with a d/D of 0.8 during MDDWF, and was identified as marginal for WWF with a d/D of 0.87. Upgrade to 24-inch PVC from Del Monte to Holly Street and to 27-inch PVC from Holly Street to Contra Costa Street results in a MDDWF maximum d/D of 0.83, and d/D of 0.80 under WWF conditions. Total impacted length is 1,200 feet. Due to the existing marginal capacity of this section of the collection system, it is recommended that this upgrade take place at or before time of construction of the first development project that impacts this sewer main. This project would require construction under the Southern Pacific Railroad Right-of-Way.

## Region “D2” Impacts

Region D2 has the potential to connect to the existing collection system in Highway 218 at Ryan Ranch Road. In this case, the following deficiency has been identified.

### Highway 218

- Reference Figure 7-21
- Location Extents: Manhole D14-1 to Manhole C13-38

The sewer main in Highway 218 from Ryan Ranch Road to Del Rey Gardens Drive is 6-inch VCP. With future flow from Region D2 routed to this existing main, d/D would reach 0.88 under MDDWF. Upgrade to 8-inch PVC would result in a MDDWF d/D up to 0.58, and maximum d/D of 0.47 under WWF conditions.

**Table 7-1. SCSD Design and Performance Standards**

<b>Gravity Pipe Percent Full Criteria</b>	
<b>Pipe Diameter</b>	<b>Maximum Allowed d/D</b>
10 inches and smaller	0.67
12-inch to 24-inch	0.80
27 inches and larger	0.90
<b>Other Design Criteria</b>	
Minimum Velocity	2.0 fps
Maximum Velocity	8.0 fps
Manning's Coefficient, n	0.013 for VCP & PCP, 0.011 for PVC



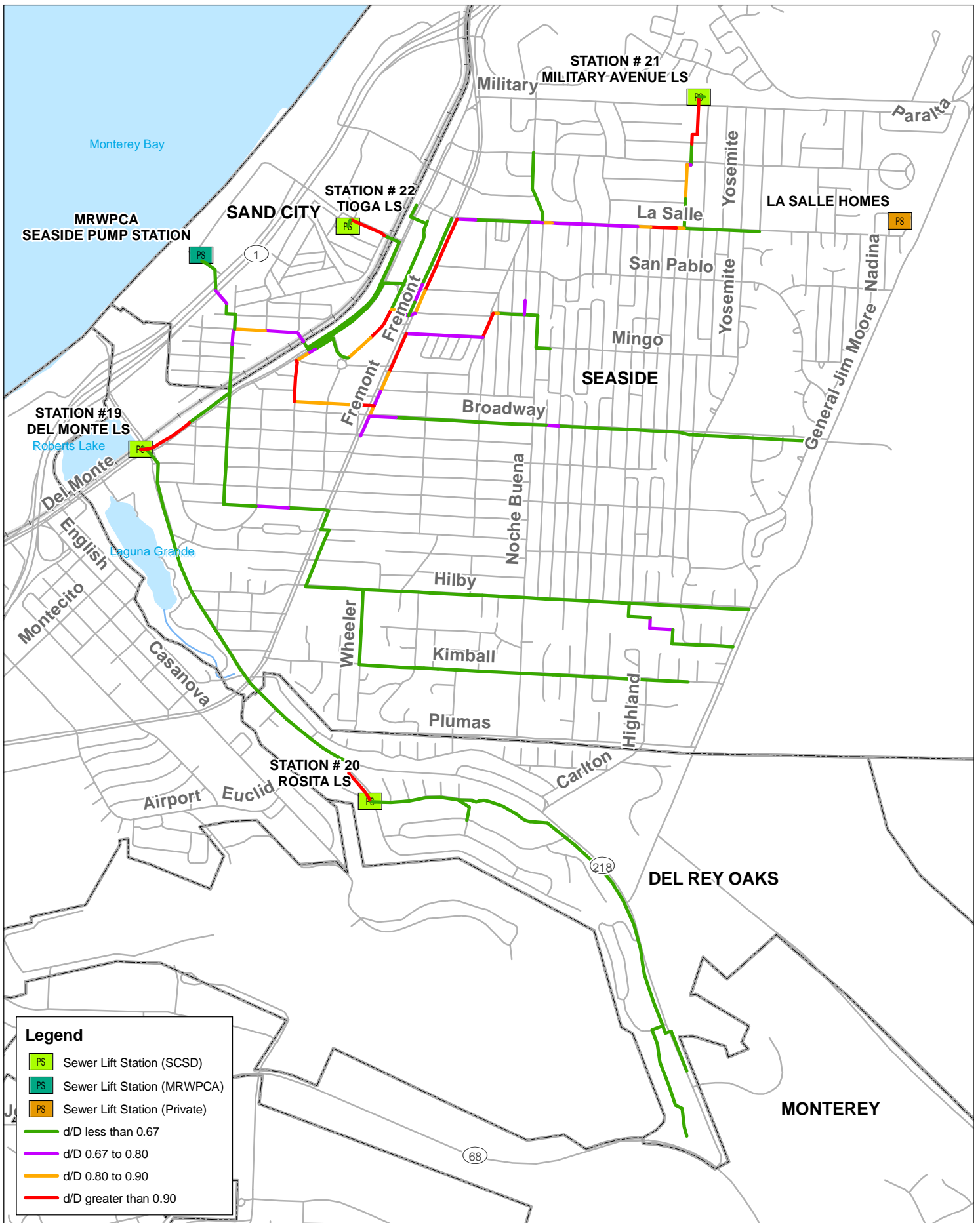
- Legend**
- Sewer Lift Station (SCSD)
  - Sewer Lift Station (MRWPCA)
  - Sewer Lift Station (Private)
  - 2010 Trunk Sewer Model
  - Sewer Force Main

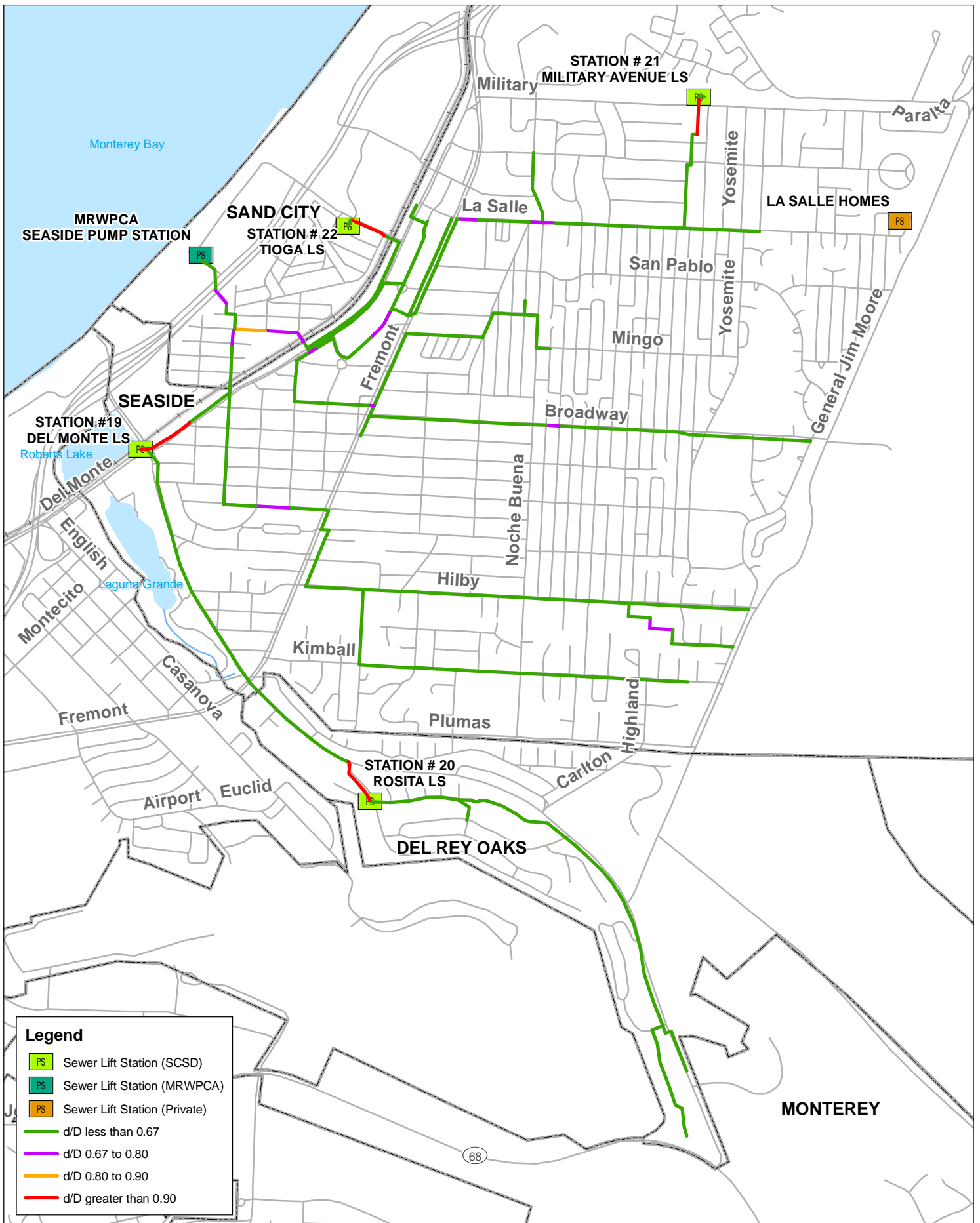
NOTE: The MRWPCA Lift Station location is shown for reference only, and is not included as a part of the sewer system model

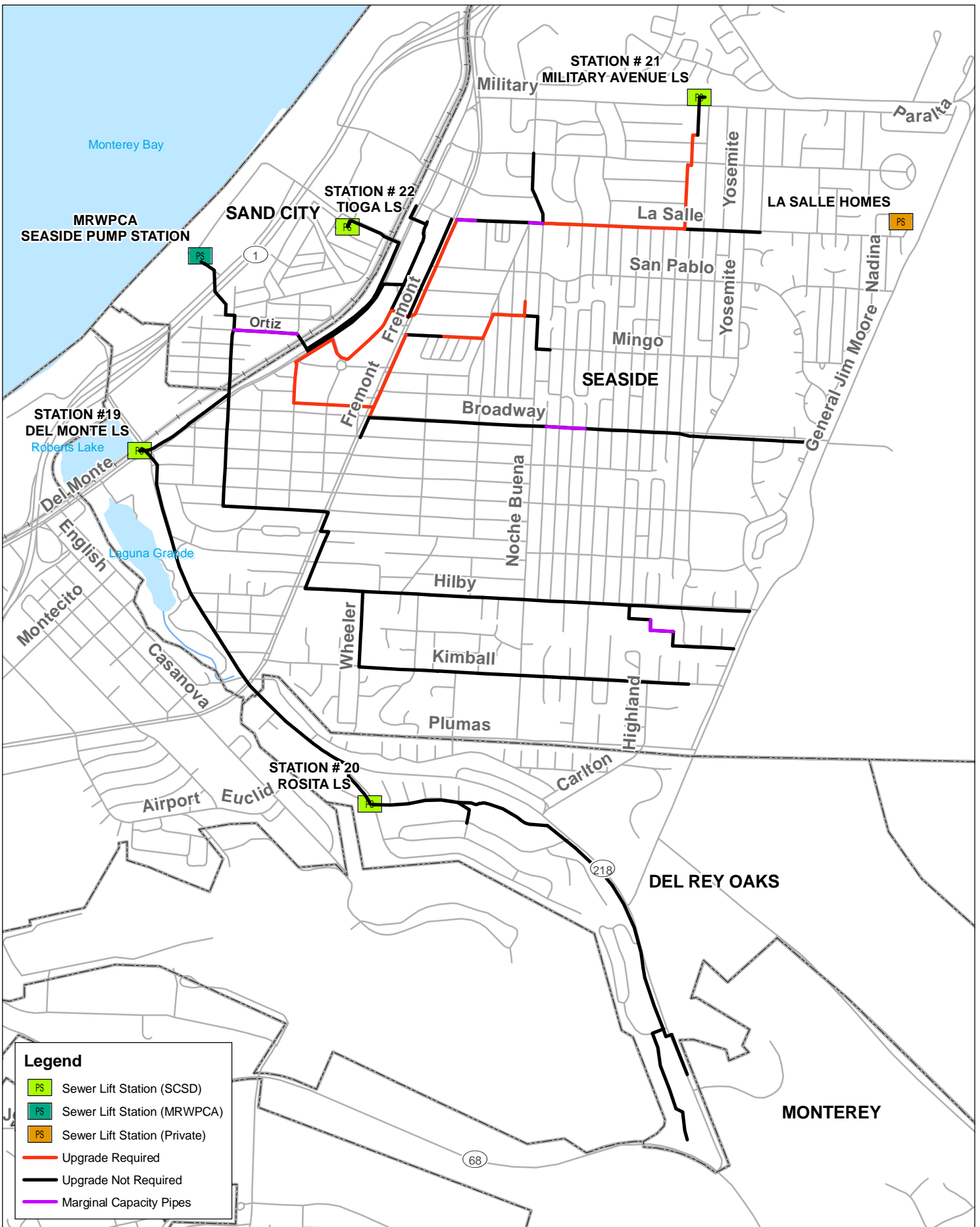
**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN  
FIGURE 7-1: 2010 TRUNK SEWER MODEL  
OVERVIEW MAP**

NOTES:  
BASEMAP PROVIDED BY SCSD.  
WALLACE GROUP DID NOT  
PERFORM BOUNDARY SURVEY  
SERVICES FOR THIS MAP. NOT  
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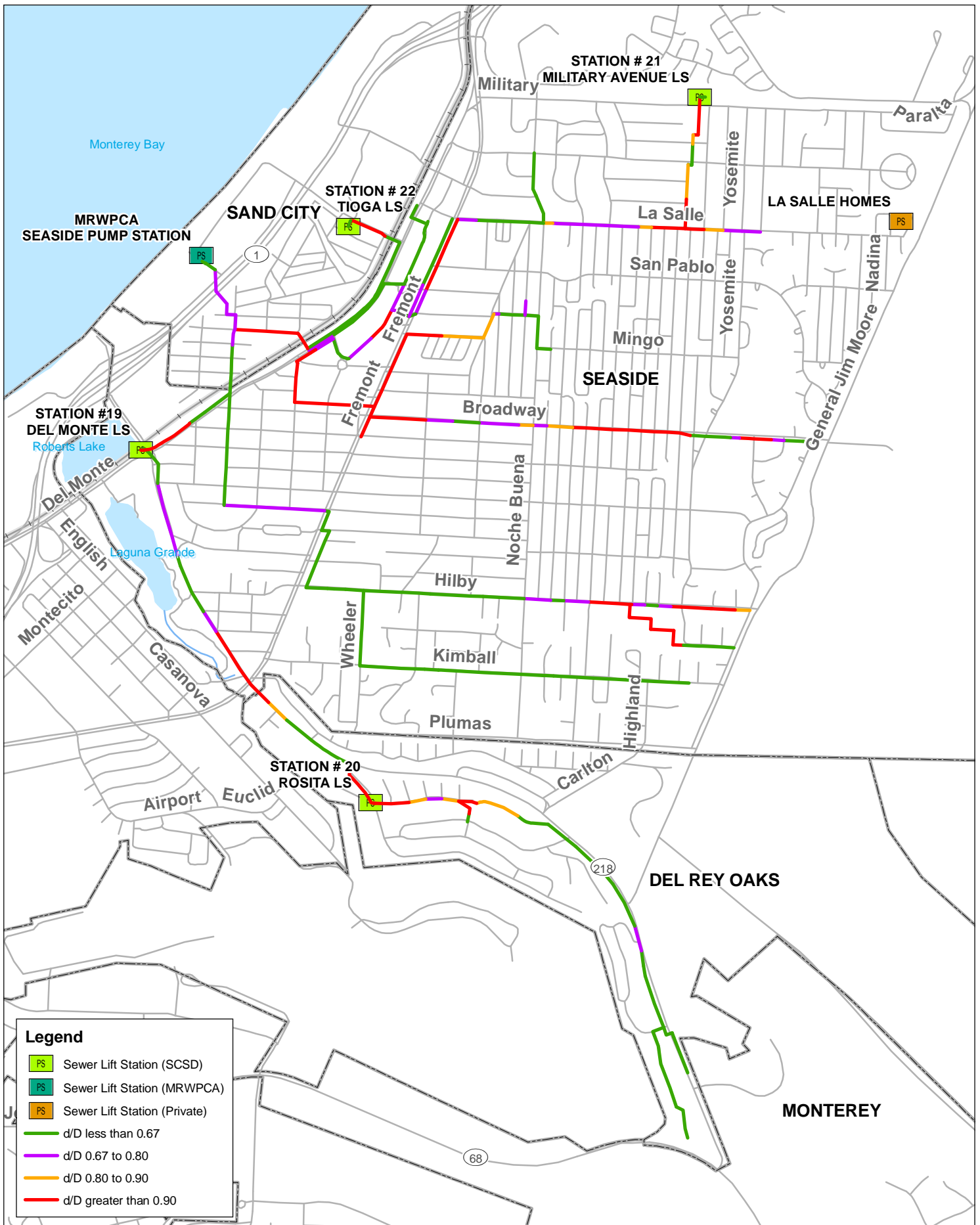
- Legend**
- Sewer Lift Station (SCSD)
  - Sewer Lift Station (MRWPCA)
  - Sewer Lift Station (Private)
  - Upgrade Required
  - Upgrade Not Required
  - Marginal Capacity Pipes

**SEASIDE COUNTY SANITATION DISTRICT  
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**FIGURE 7-4: TRUNK SEWER EXISTING FLOWS  
PIPE UPGRADE & MARGINAL CAPACITY LOCATION MAP**

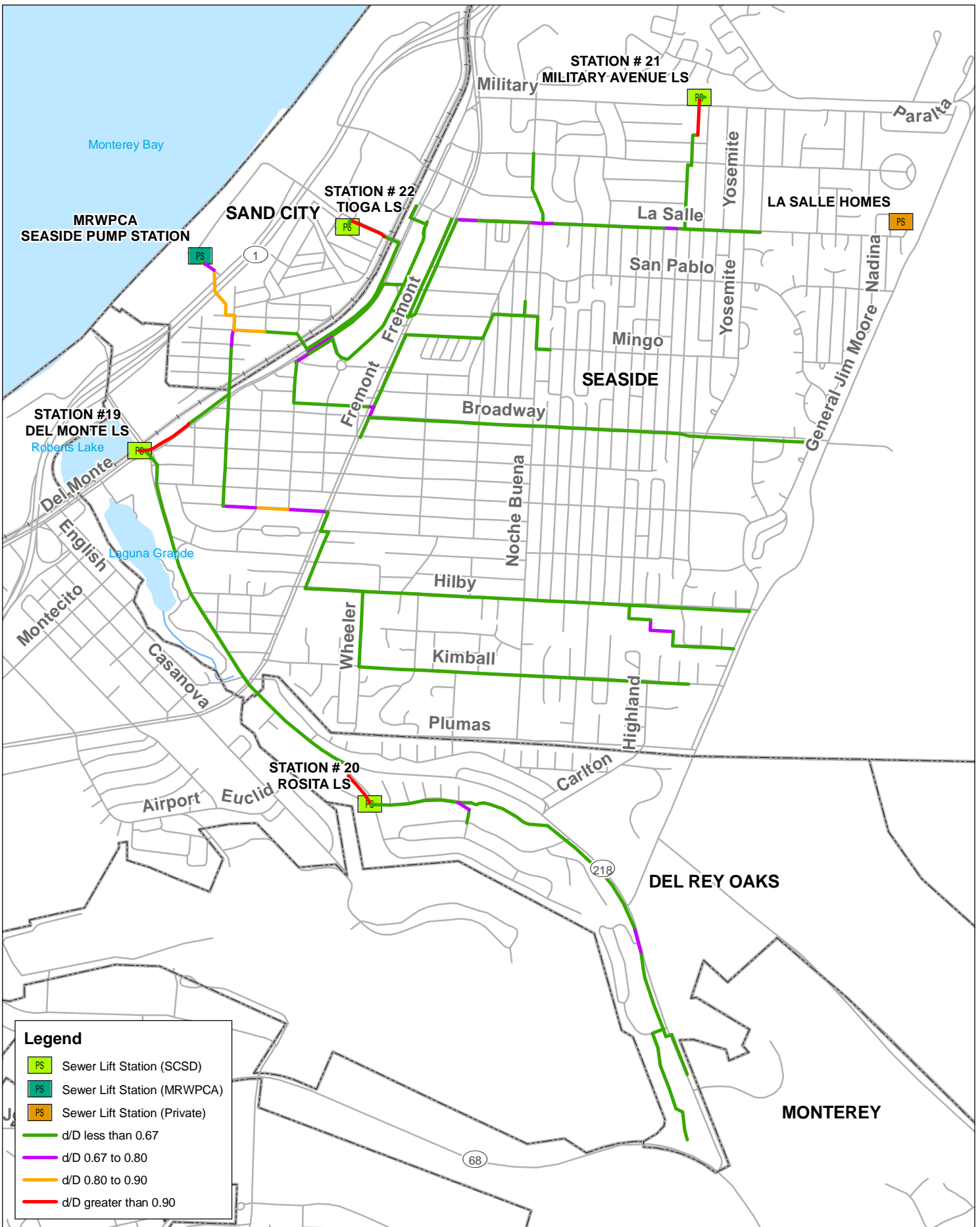
NOTES:  
BASEMAP PROVIDED BY SCSD.  
WALLACE GROUP DID NOT  
PERFORM BOUNDARY SURVEY  
SERVICES FOR THIS MAP. NOT  
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**FIGURE 7-5: TRUNK SEWER d/D DURING  
FUTURE WORST-CASE FLOW CONDITIONS**

NOTES:  
BASEMAP PROVIDED BY SCSD.  
WALLACE GROUP DID NOT  
PERFORM BOUNDARY SURVEY  
SERVICES FOR THIS MAP. NOT  
A LEGAL DOCUMENT. MAP  
PRODUCED MAY 2011.



**Legend**

- Sewer Lift Station (SCSD)
- Sewer Lift Station (MRWPCA)
- Sewer Lift Station (Private)
- d/D less than 0.67
- d/D 0.67 to 0.80
- d/D 0.80 to 0.90
- d/D greater than 0.90



**SEASIDE COUNTY SANITATION DISTRICT**  
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**FIGURE 7-6: TRUNK SEWER d/D WITH UPGRADES**  
**DURING FUTURE WORST-CASE FLOW CONDITIONS**

NOTES:  
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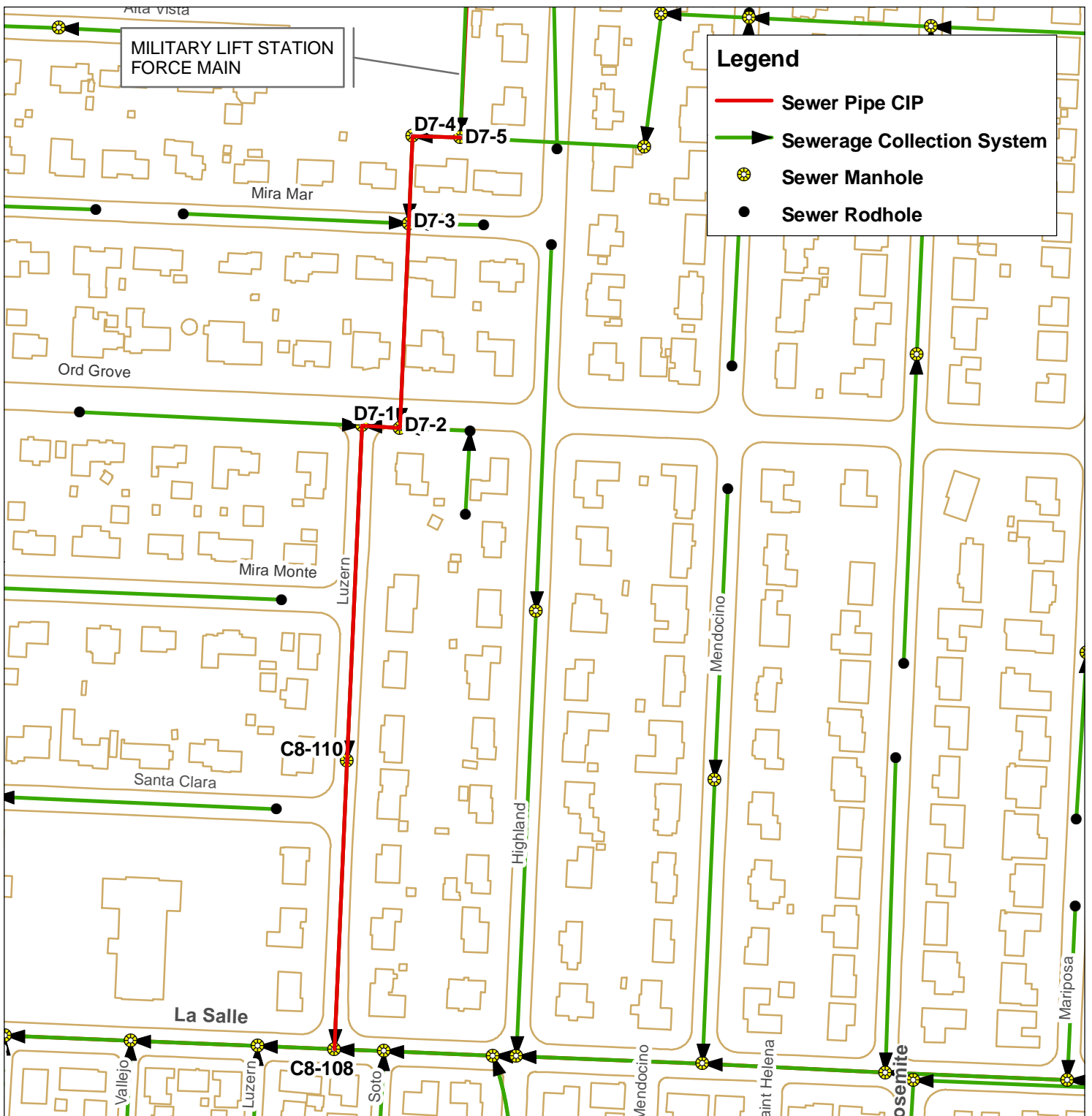




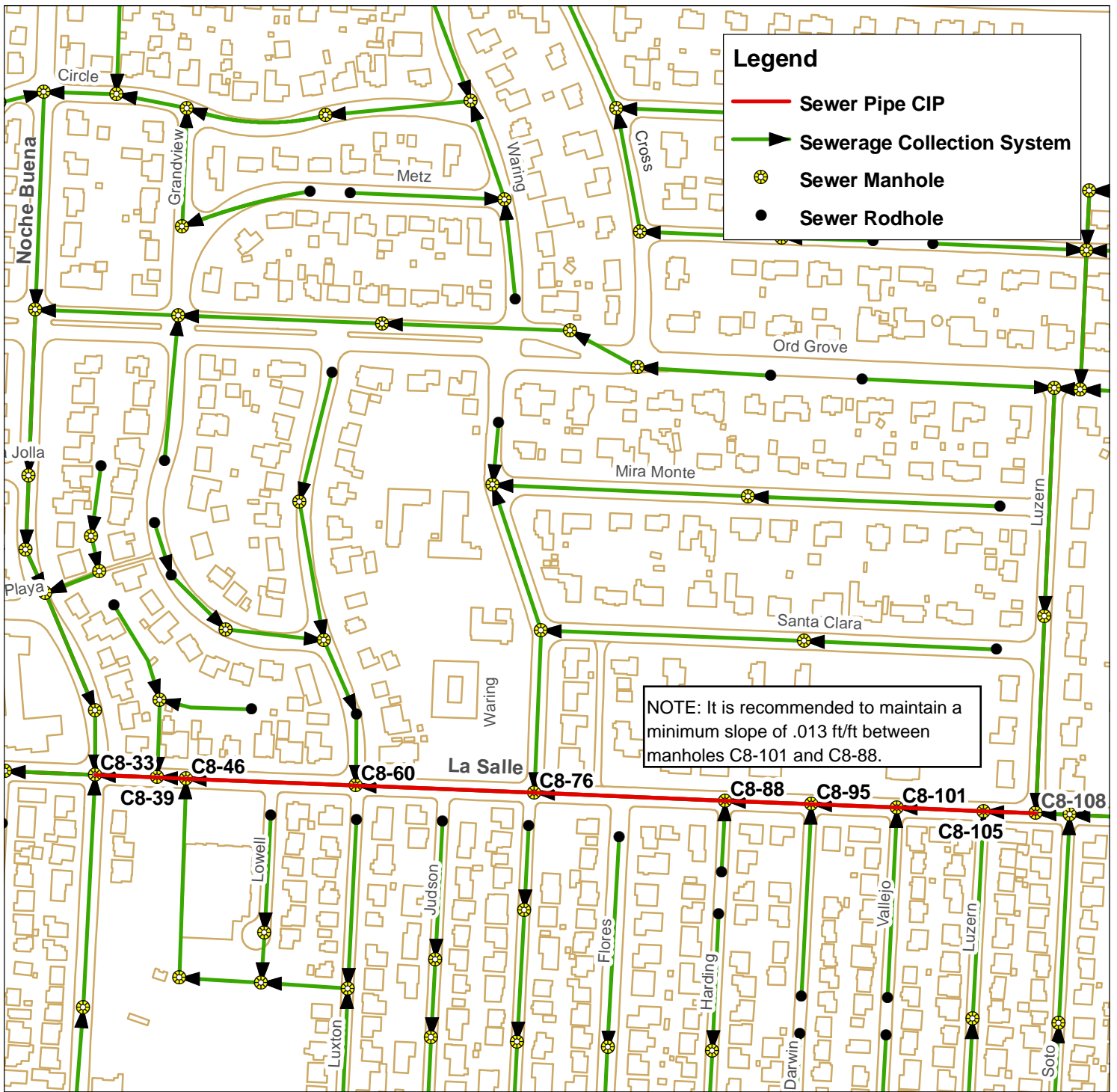
**SEASIDE COUNTY SANITATION DISTRICT**  
**2011 SEWER MASTER PLAN**  
**FIGURE 7-7: TRUNK SEWER FUTURE FLOWS**  
**PIPE UPGRADE LOCATION MAP**

NOTES:  
 BASEMAP PROVIDED BY SCSD.  
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 PERFORM BOUNDARY SURVEY  
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 A LEGAL DOCUMENT. MAP  
 PRODUCED MAY 2011.

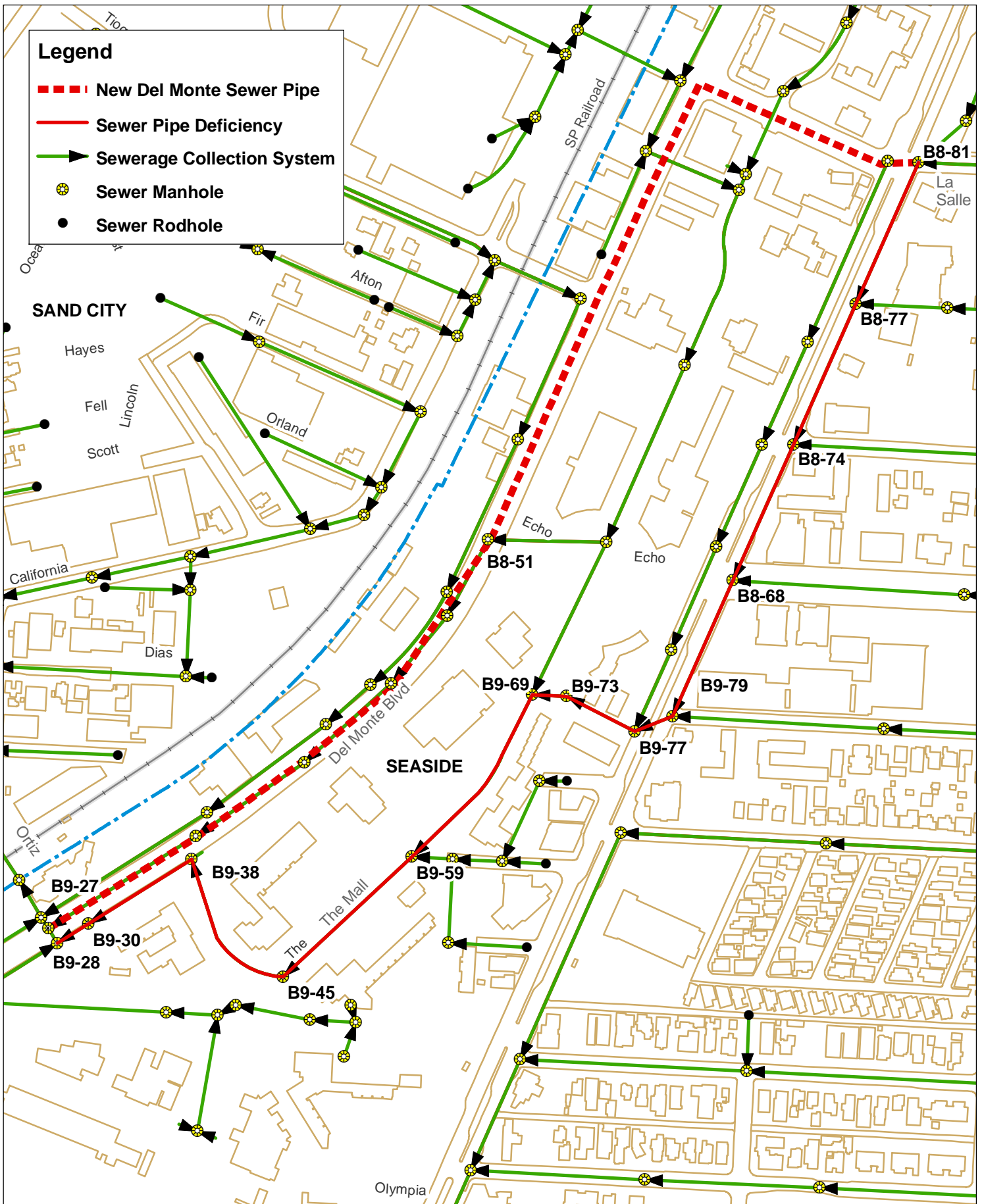




Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Existing MDF d/D (exist pipe dia)	Existing MDF d/D (proposed pipe dia)	Existing WWF d/D (exist pipe dia)	Existing WWF d/D (proposed pipe dia)
D7-5 : D7-4	68	6	8	1.00	0.56	1.00	0.60
D7-4 : D7-3	125	6	8	0.86	0.54	0.92	0.58
D7-3 : D7-2	291	6	8	0.58	0.36	0.66	0.39
D7-2 : D7-1	54	6	8	0.61	0.38	0.74	0.41
D7-1 : C8-110	478	6	8	0.70	0.43	0.85	0.48
C8-110 : C8-108	412	6	8	0.58	0.36	0.66	0.41



Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Existing MDF d/D (exist pipe dia)	Existing MDF d/D (proposed pipe dia)	Existing WWF d/D (exist pipe dia)	Existing WWF d/D (proposed pipe dia)
C8-108 : C8-105	109	6	8	0.56	0.36	0.81	0.40
C8-105 : C8-101	181	6	8	0.80	0.43	1.00	0.49
C8-101 : C8-95	180	6	8	1.00	0.51	1.00	0.58
C8-95 : C8-88	180	6	8	0.79	0.45	0.82	0.51
C8-88 : C8-76	399	6	8	0.62	0.38	0.70	0.43
C8-76 : C8-60	374	6	8	0.65	0.39	0.74	0.44
C8-60 : C8-46	355	6	8	0.64	0.38	0.74	0.44
C8-46 : C8-39	61	6	8	0.68	0.40	0.80	0.46
C8-39 : C8-33	130	6	8	0.84	0.60	0.90	0.73



**Legend**

- ▬▬▬ New Del Monte Sewer Pipe
- ▬ Sewer Pipe Deficiency
- ▬▶ Sewerage Collection System
- Sewer Manhole
- Sewer Rodhole



**EXISTING FREMONT BOULEVARD SEWER MAIN**

Pipe ID	Length [feet]	Existing Diameter [inches]	Existing MDF d/D (exist pipe dia)	Existing WWF d/D (exist pipe dia)
B8-81 : B8-77	368	10	0.85	1.00
B8-77 : B8-74	365	10	0.82	1.00
B8-74 : B8-68	354	10	0.85	1.00
B8-68 : B9-79	352	10	0.75	0.88
B9-79 : B9-77	97	10	0.60	0.71
B9-77 : B9-73	181	10	0.54	0.69
B9-73 : B9-69	81	10	0.53	0.87
B9-69 : B9-59	486	10	1.00	1.00
B9-59 : B9-45	418	10	0.77	0.81
B9-45 : B9-38	385	10	0.60	0.67
B9-38 : B9-30	288	10	0.57	0.64
B9-30 : B9-28	88	10	0.75	0.78

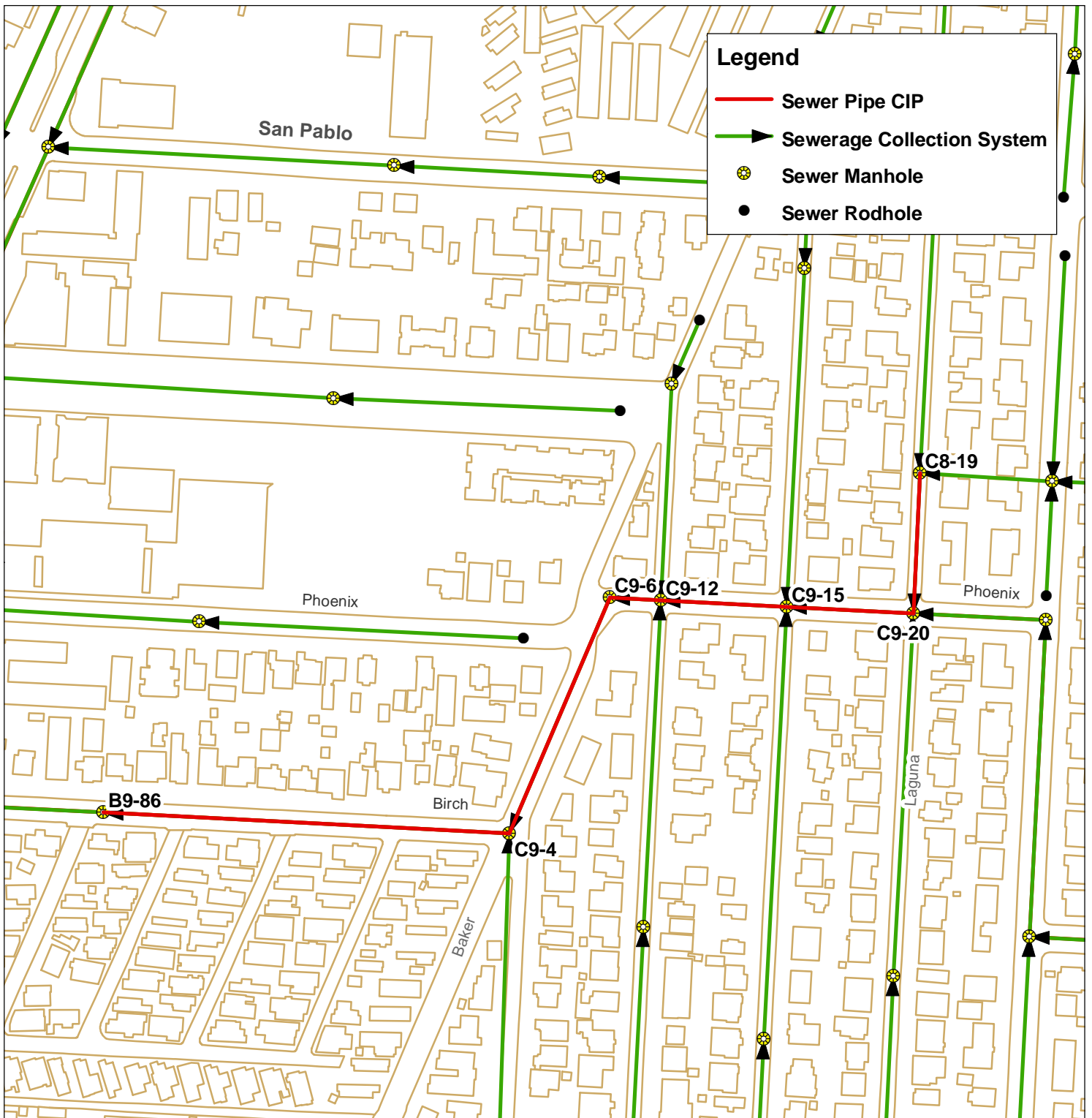
**PROPOSED DEL MONTE BOULEVARD SEWER MAIN**

Pipe ID	Length [feet]	Proposed Diameter [inches]	Existing MDF d/D (proposed pipe dia)	Existing WWF d/D (proposed pipe dia)
B8-81 : DM-1	92	12	0.42	0.49
DM-1 : DM-2	470	12	0.64	0.72
DM-2 : DM-3	562	12	0.55	0.61
DM-3 : DM-4	617	12	0.42	0.46
DM-4 : DM-5	327	12	0.60	0.65
DM-5 : DM-6	338	12	0.62	0.68
DM-6 : DM-7	385	12	0.48	0.52
DM-7 : B9-27	382	12	0.59	0.62

**NOTES:**

New pipe for the Del Monte Alternative is schematic and included in the sewer model for the purposes of determining feasibility and required pipe size only. Pipe lengths and alignment are subject to change for final engineering design.



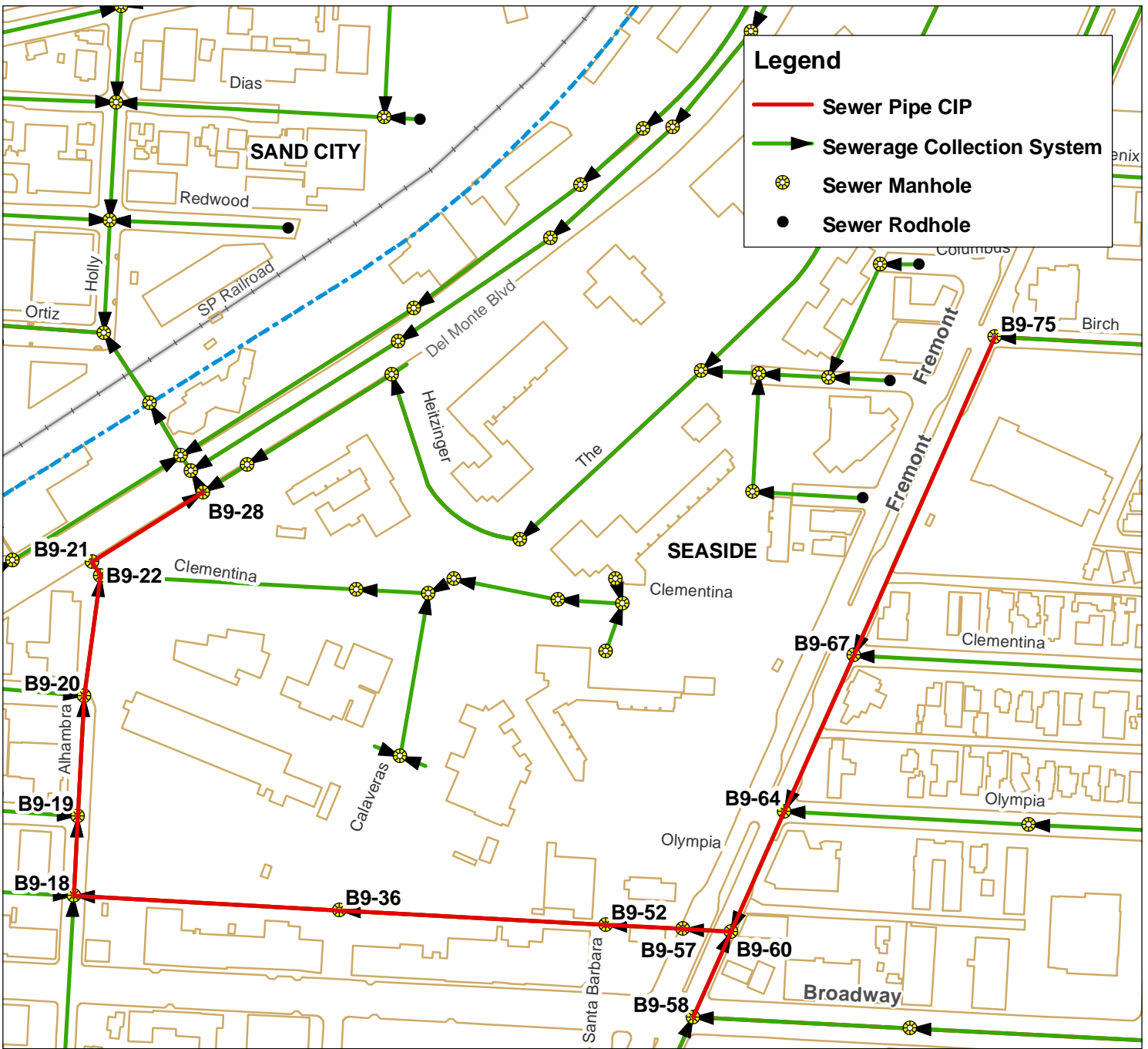


**Legend**

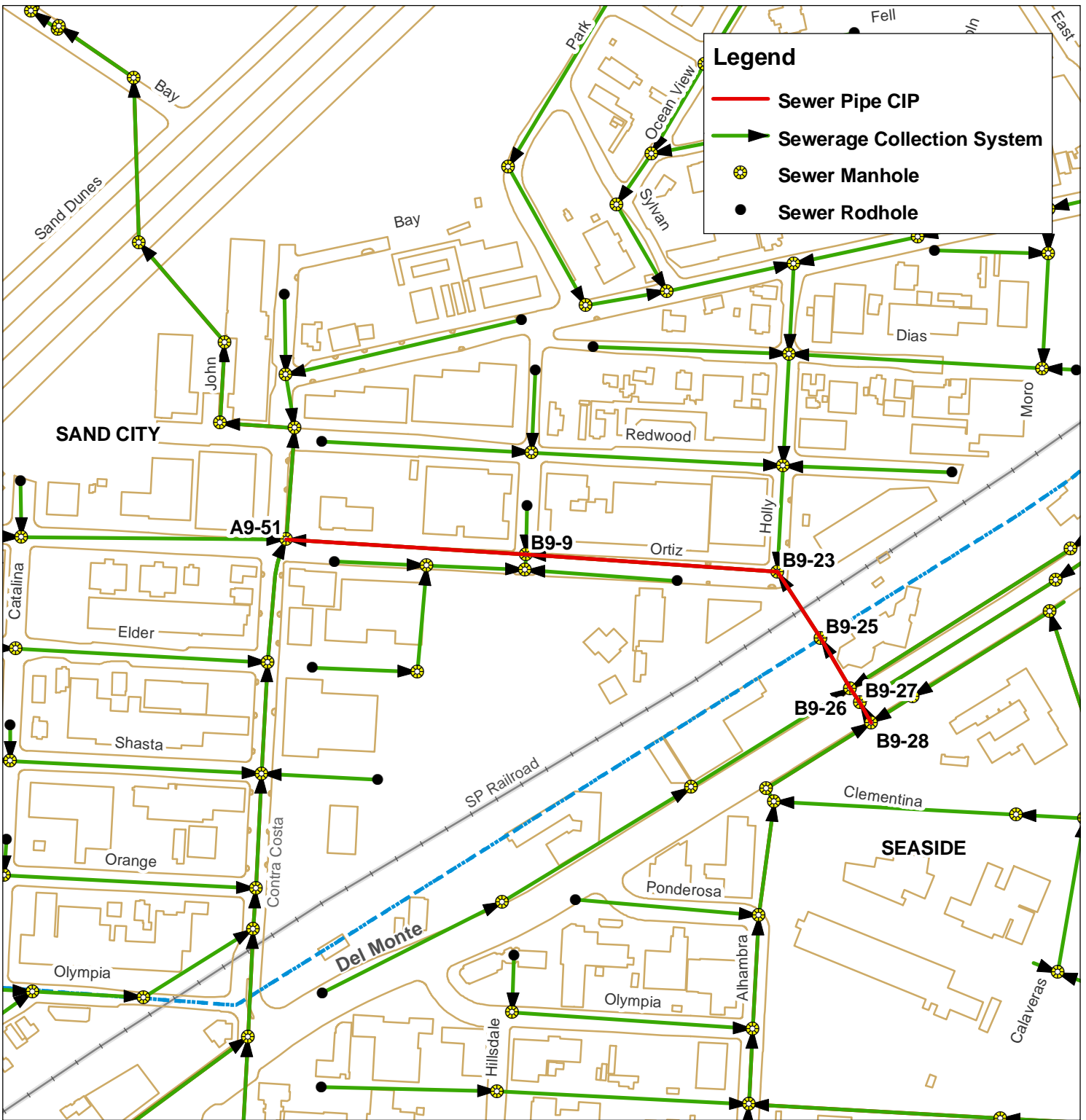
- Sewer Pipe CIP
- ▶ Sewerage Collection System
- ⊙ Sewer Manhole
- Sewer Rodhole

Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Existing MDF d/D (exist pipe dia)	Existing MDF d/D (proposed pipe dia)	Existing WWF d/D (exist pipe dia)	Existing WWF d/D (proposed pipe dia)
C8-19 : C9-20	200	8	10	0.76	0.52	0.77	0.53
C9-20 : C9-15	181	8	10	0.59	0.38	0.62	0.39
C9-15 : C9-12	180	8	10	0.63	0.40	0.66	0.41
C9-12 : C9-6	73	8	10	0.80	0.56	0.81	0.58
C9-6 : C9-4	365	10	12	0.89	0.55	0.92	0.57
C9-4 : B9-86	579	10	12	0.72	0.52	0.76	0.54





Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Existing MDF d/D (exist pipe dia)	Existing MDF d/D (proposed pipe dia)	Existing WWF d/D (exist pipe dia)	Existing WWF d/D (proposed pipe dia)
B9-75 : B9-67	589	12	15	0.90	0.51	0.96	0.53
B9-67 : B9-64	288	12	15	0.80	0.48	0.86	0.50
B9-64 : B9-60	223	12	15	0.66	0.44	0.73	0.45
B9-58 : B9-60	158	10	12	0.76	0.59	0.88	0.62
B9-60 : B9-57	82	12	15	1.00	0.68	1.00	0.71
B9-57 : B9-52	130	12	15	0.93	0.60	0.98	0.62
B9-52 : B9-36	450	12	15	0.77	0.46	0.84	0.48
B9-36 : B9-18	451	12	15	0.73	0.44	0.86	0.45
B9-18 : B9-19	135	12	15	0.89	0.50	1.00	0.52
B9-19 : B9-20	203	12	15	0.88	0.51	1.00	0.53
B9-20 : B9-22	205	12	15	0.88	0.48	1.00	0.52
B9-22 : B9-21	28	12	18	1.00	0.47	1.00	0.51
B9-21 : B9-28	221	15	18	0.82	0.54	0.88	0.65



**Legend**

- Sewer Pipe CIP
- ▶ Sewerage Collection System
- Sewer Manhole
- Sewer Rodhole

Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Future MDF d/D (exist pipe dia)	Future MDF d/D (proposed pipe dia)	Future WWF d/D (exist pipe dia)	Future WWF d/D (proposed pipe dia)
B9-28 : B9-27	41	21	24	0.88	0.59	0.89	0.58
B9-27 : B9-26	31	21	24	0.89	0.54	0.89	0.53
B9-26 : B9-25	103	21	24	0.93	0.51	0.94	0.50
B9-25 : B9-23	142	21	24	0.99	0.58	1.00	0.55
B9-23 : B9-9	450	21	27	1.00	0.66	1.00	0.63
B9-9 : A9-51	429	21	27	1.00	0.83	1.00	0.79

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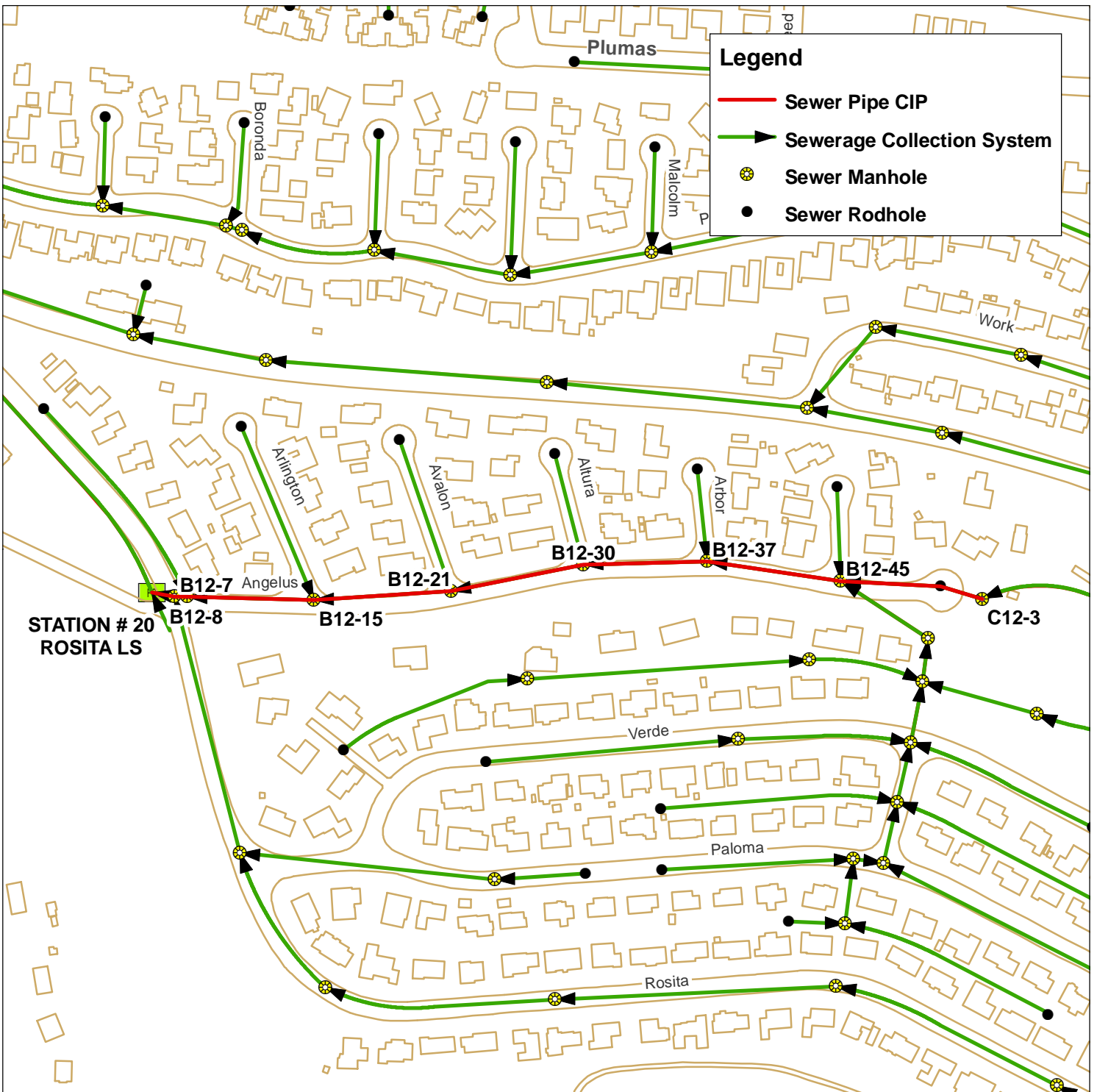
1 INCH = 250 FEET

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2011 SEWER MASTER PLAN**

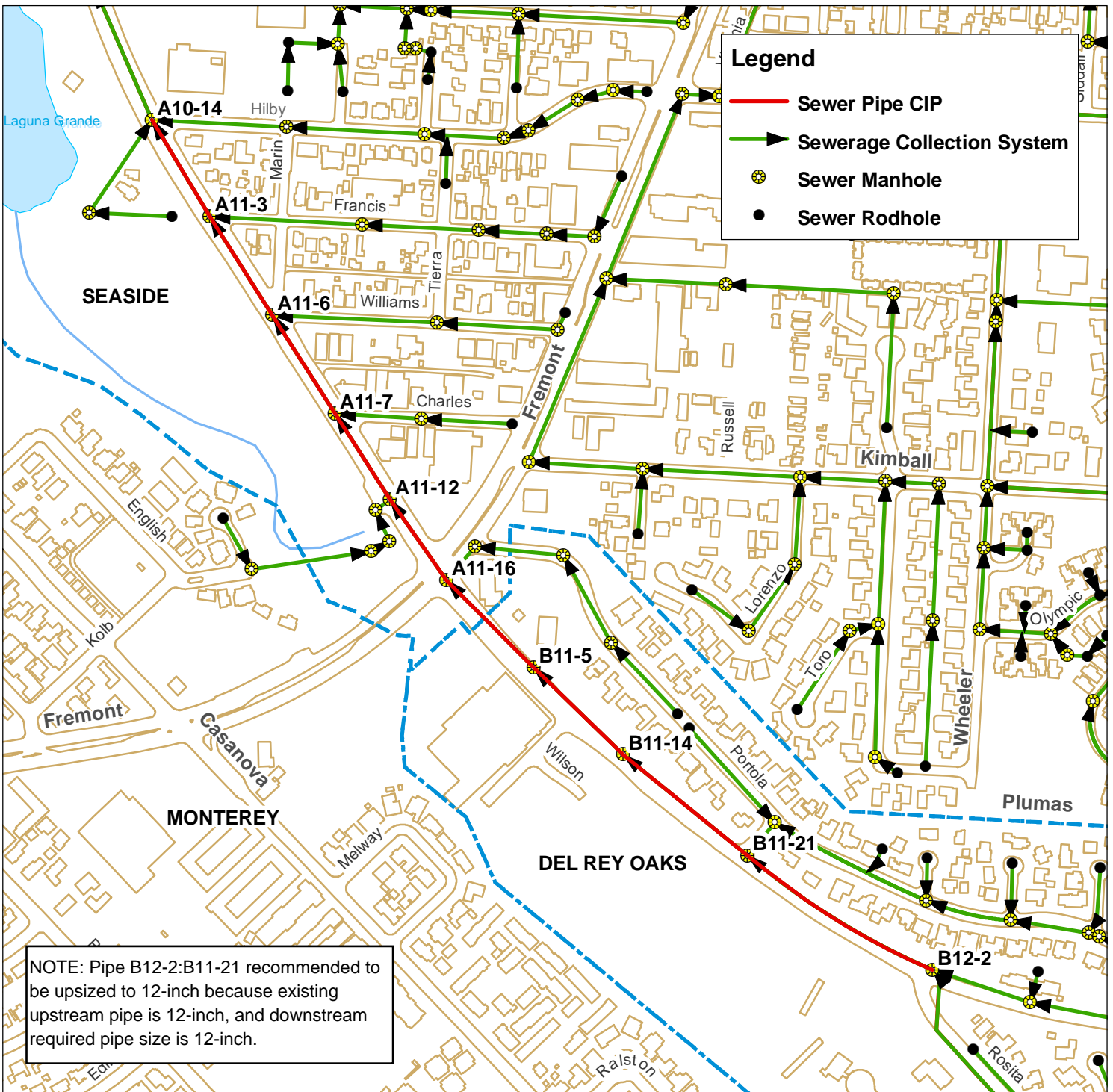
**FIGURE 7-13: ORTIZ SEWER LINE UPGRADE**

NOTES:  
BASEMAP PROVIDED BY SCSD.  
WALLACE GROUP DID NOT  
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SERVICES FOR THIS MAP. NOT  
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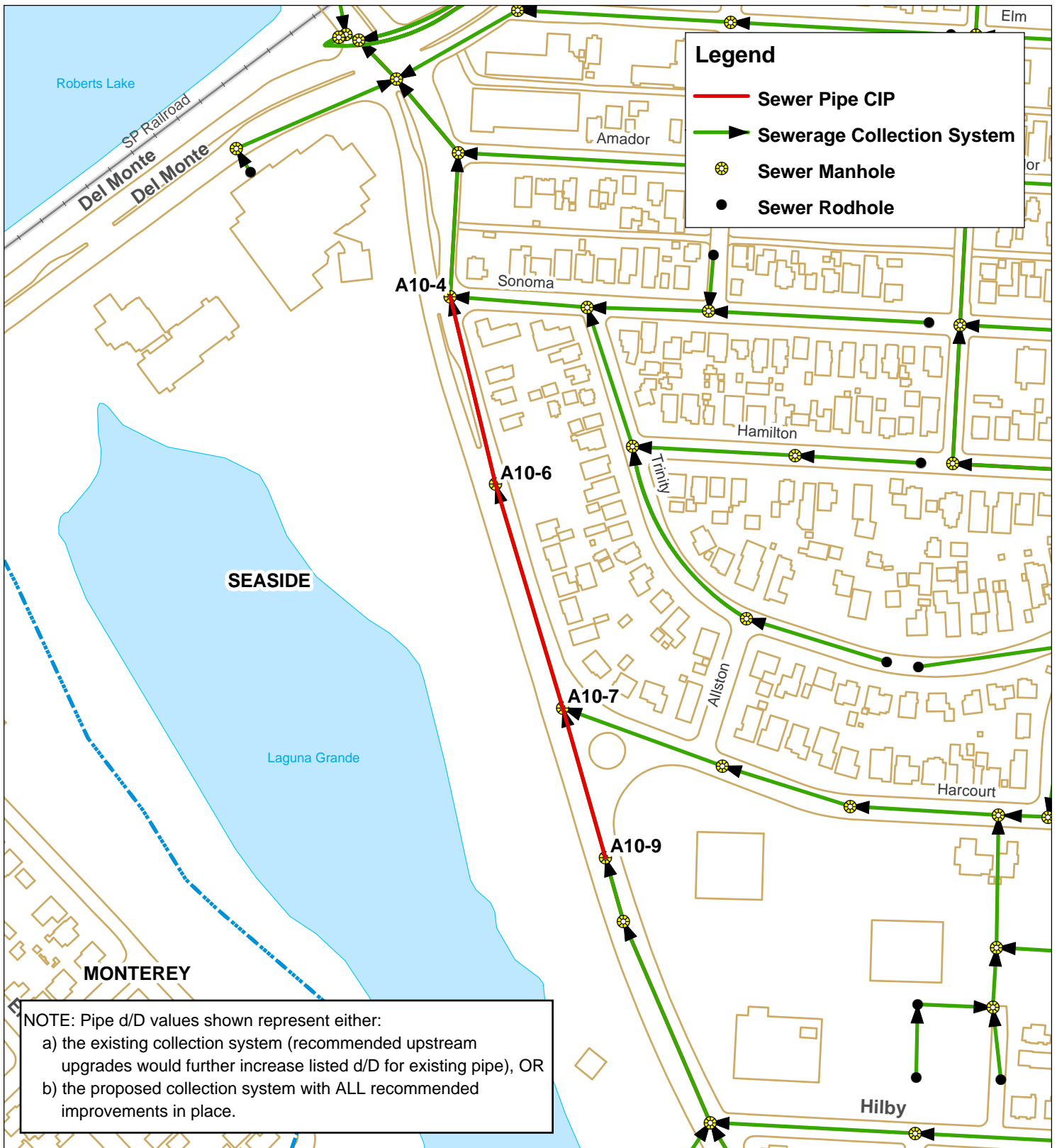


Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Future MDF d/D (exist pipe dia)	Future MDF d/D (proposed pipe dia)	Future WWF d/D (exist pipe dia)	Future WWF d/D (proposed pipe dia)
C12-3 : B12-45	254	8	12	1.00	0.45	0.92	0.39
B12-45 : B12-37	240	8	12	0.88	0.43	0.82	0.37
B12-37 : B12-30	219	8	12	0.69	0.33	0.59	0.30
B12-30 : B12-21	239	8	12	0.82	0.32	0.57	0.28
B12-21 : B12-15	244	8	12	1.00	0.39	0.79	0.35
B12-15 : B12-8	224	8	12	1.00	0.38	1.00	0.34
B12-8 : B12-7	22	6	12	1.00	0.42	1.00	0.38
B12-7 : RLS	41	8	12	1.00	0.53	1.00	0.48

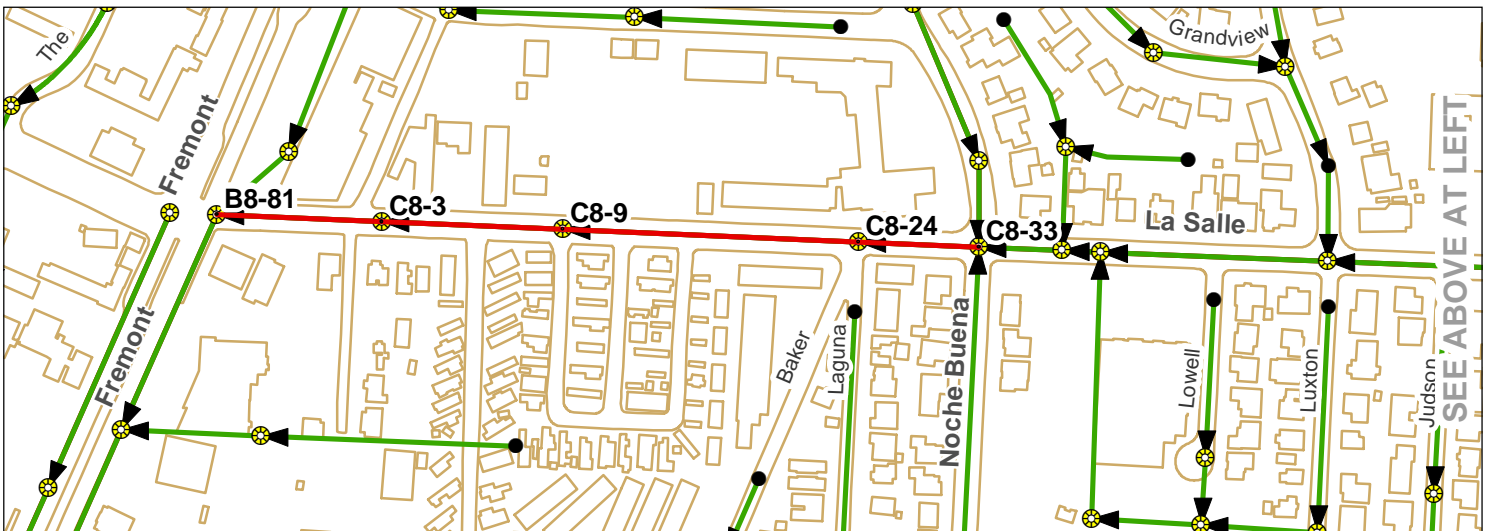
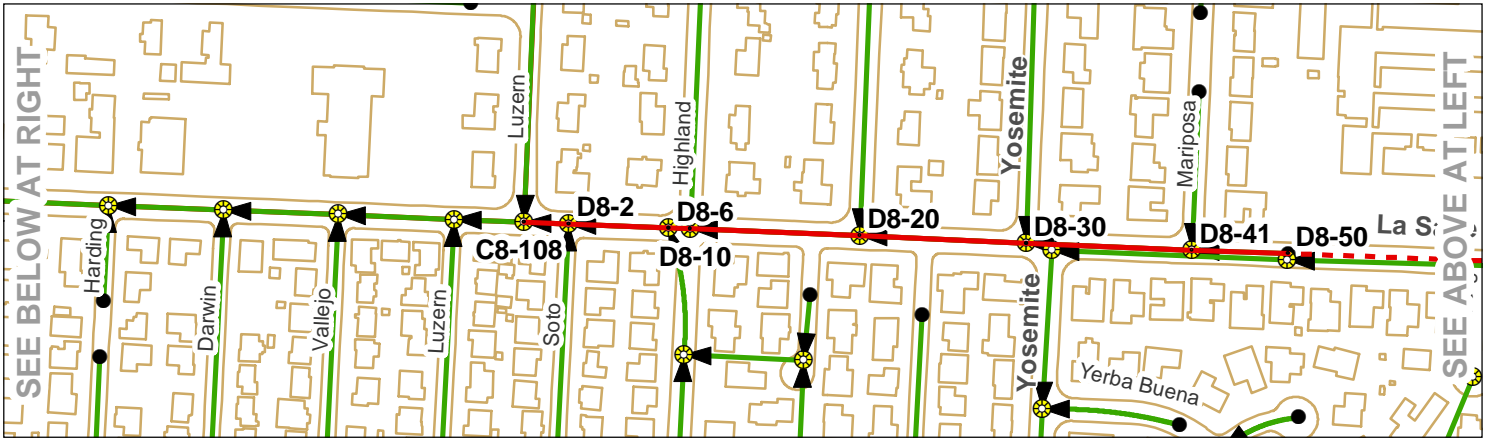
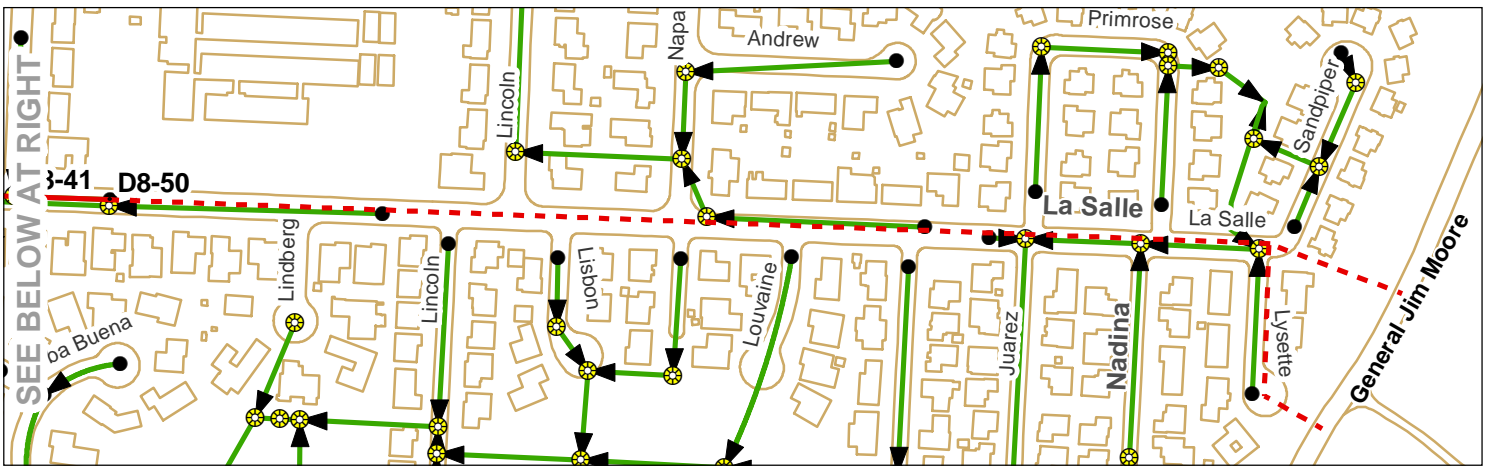


NOTE: Pipe B12-2:B11-21 recommended to be upsized to 12-inch because existing upstream pipe is 12-inch, and downstream required pipe size is 12-inch.

Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Future MDF d/D (exist pipe dia)	Future MDF d/D (proposed pipe dia)	Future WWF d/D (exist pipe dia)	Future WWF d/D (proposed pipe dia)
B12-2 : B11-21	608	8	12	0.53	0.31	0.55	0.30
B11-21 : B11-14	446	8	12	0.63	0.35	0.78	0.33
B11-14 : B11-5	348	8	12	0.86	0.42	1.00	0.40
B11-5 : A11-16	345	8	12	1.00	0.46	1.00	0.44
A11-16 : A11-12	275	8	12	1.00	0.46	1.00	0.44
A11-12 : A11-7	284	8	12	0.92	0.44	1.00	0.42
A11-7 : A11-6	325	8	12	0.92	0.44	1.00	0.42
A11-6 : A11-3	326	8	12	0.77	0.39	0.79	0.37
A11-3 : A10-14	314	8	12	0.65	0.45	0.68	0.44



Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Future MDF d/D (exist pipe dia)	Future MDF d/D (proposed pipe dia)	Future WWF d/D (exist pipe dia)	Future WWF d/D (proposed pipe dia)
A10-9 : A10-7	285	12	15	0.72	0.51	0.77	0.50
A10-7 : A10-6	428	12	15	0.78	0.53	0.85	0.52
A10-6 : A10-4	354	12	15	0.72	0.54	0.77	0.53



**Legend**

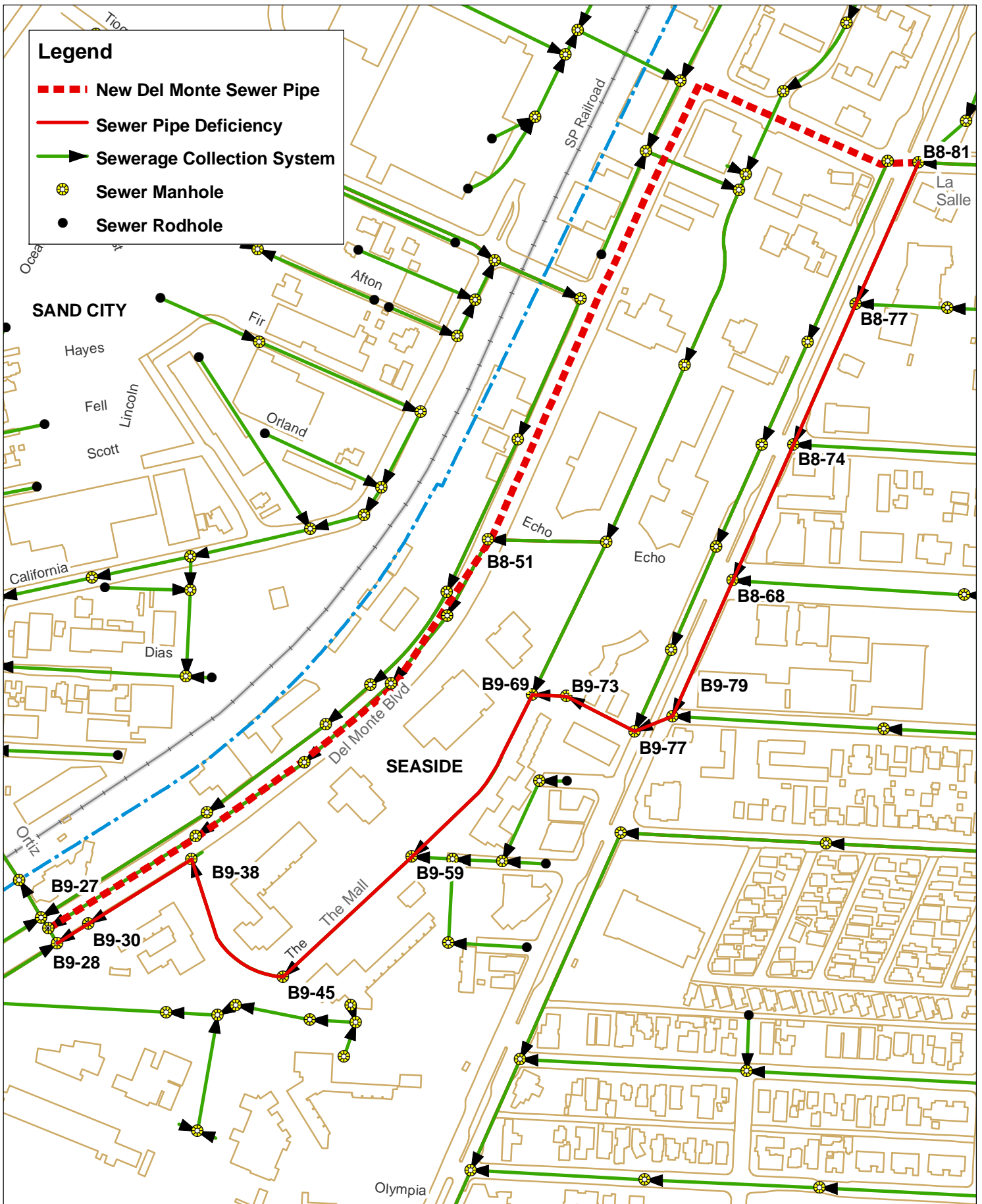
- - - Potential New Sewer Pipe Alignments
- Sewer Pipe CIP
- ▶ Sewerage Collection System
- Sewer Manhole
- Sewer Rodhole

Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Future MDF d/D (exist pipe dia)	Future MDF d/D (proposed pipe dia)	Future WWF d/D (exist pipe dia)	Future WWF d/D (proposed pipe dia)
D8-41 : D8-30	260	6	8	0.68	0.39	0.53	0.31
D8-30 : D8-20	261	6	8	0.68	0.39	0.53	0.32
D8-20 : D8-10	266	6	8	0.84	0.40	0.56	0.33
D8-10 : D8-6	33	6	8	1.00	0.42	0.59	0.35
D8-6 : D8-2	156	6	8	1.00	0.43	0.80	0.36
D8-2 : C8-108	71	6	8	1.00	0.48	1.00	0.43
C8-108 : C8-105	109	6	10	1.00	0.43	1.00	0.42
C8-105 : C8-101	181	6	10	1.00	0.72	1.00	0.51
C8-101 : C8-95	180	6	10	1.00	0.67	1.00	0.61
C8-95 : C8-88	180	6	10	0.82	0.58	0.82	0.54
C8-88 : C8-76	399	6	10	0.69	0.47	0.70	0.44
C8-76 : C8-60	374	6	10	0.73	0.48	0.74	0.45
C8-60 : C8-46	355	6	10	0.73	0.47	0.74	0.45
C8-46 : C8-39	61	6	10	0.77	0.49	0.85	0.46
C8-39 : C8-33	130	6	10	0.89	0.71	0.95	0.66
C8-33 : C8-24	188	8	10	0.67	0.68	0.74	0.64
C8-24 : C8-9	463	8	10	0.56	0.54	0.60	0.52
C8-9 : C8-3	283	8	10	0.60	0.58	0.65	0.56
C8-3 : B8-81	258	8	10	0.76	0.72	0.80	0.70

**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN**

**FIGURE 7-17: LA SALLE (REGION C) SEWER  
LINE UPGRADE & EXTENSION, PAGE 2 OF 2**





**Legend**

- - - New Del Monte Sewer Pipe
- Sewer Pipe Deficiency
- ▶ Sewerage Collection System
- Sewer Manhole
- Sewer Rodhole



**EXISTING FREMONT BOULEVARD SEWER MAIN**

Pipe ID	Length [feet]	Existing Diameter [inches]	Future MDF d/D (exist pipe dia)	Future WWF d/D (exist pipe dia)
B8-81 : B8-77	368	10	1.00	1.00
B8-77 : B8-74	365	10	1.00	1.00
B8-74 : B8-68	354	10	1.00	1.00
B8-68 : B9-79	352	10	0.72	0.74
B9-79 : B9-77	97	10	0.56	0.61
B9-77 : B9-73	181	10	0.57	0.63
B9-73 : B9-69	81	10	0.73	0.75
B9-69 : B9-59	486	10	1.00	1.00
B9-59 : B9-45	418	10	0.78	0.79
B9-45 : B9-38	385	10	0.62	0.63
B9-38 : B9-30	288	10	0.73	0.76
B9-30 : B9-28	88	10	0.92	0.94

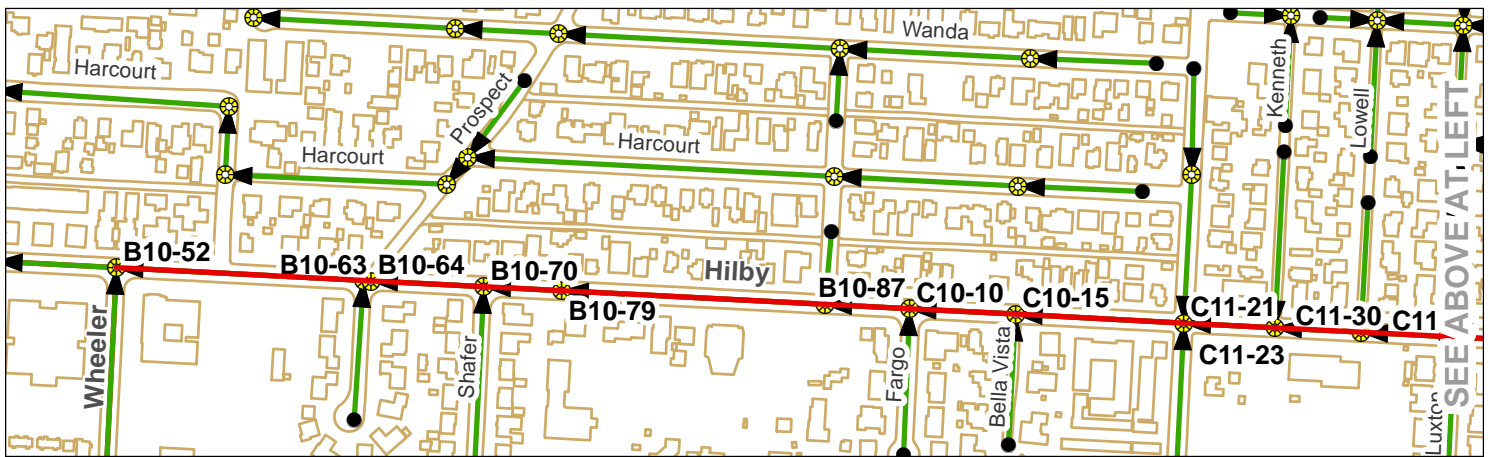
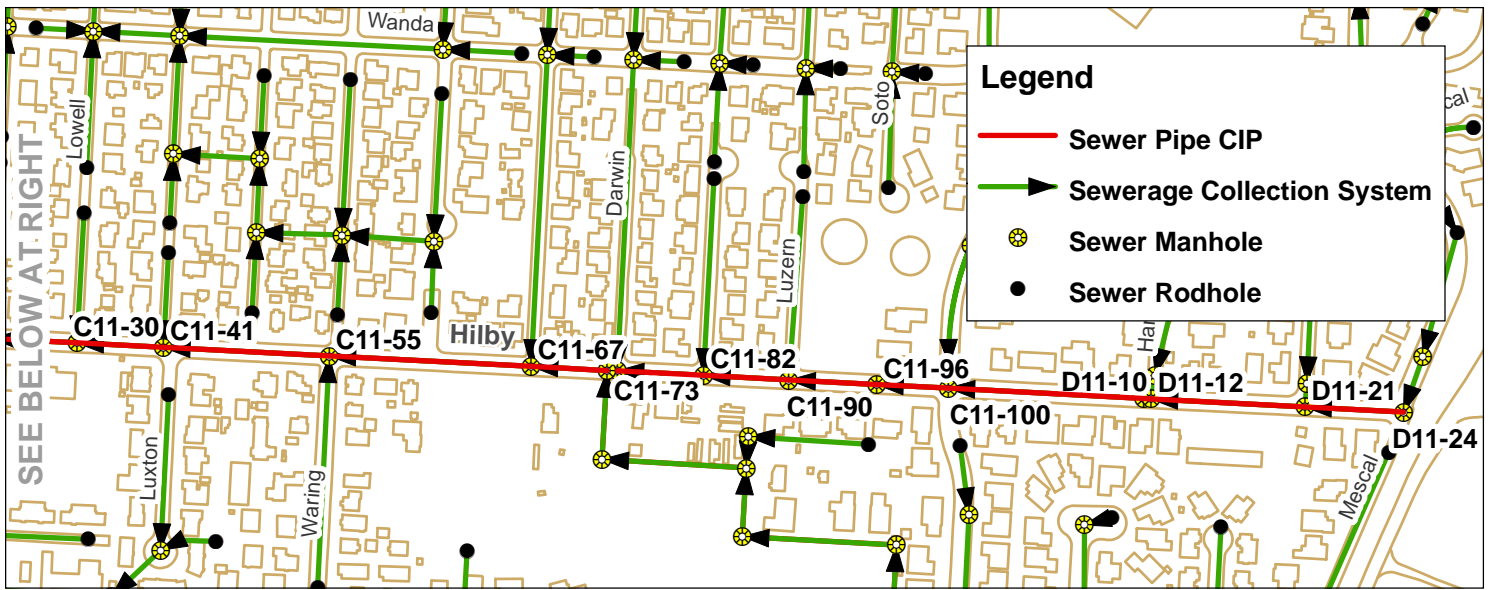
**PROPOSED DEL MONTE BOULEVARD SEWER MAIN**

Pipe ID	Length [feet]	Proposed Diameter [inches]	Future MDF d/D (proposed pipe dia)	Future WWF d/D (proposed pipe dia)
B8-81 : DM-1	92	15	0.47	0.46
DM-1 : DM-2	470	15	0.70	0.67
DM-2 : DM-3	562	15	0.61	0.57
DM-3 : DM-4	617	15	0.49	0.45
DM-4 : DM-5	327	15	0.68	0.62
DM-5 : DM-6	338	15	0.74	0.68
DM-6 : DM-7	385	15	0.63	0.58
DM-7 : B9-27	382	15	0.75	0.71

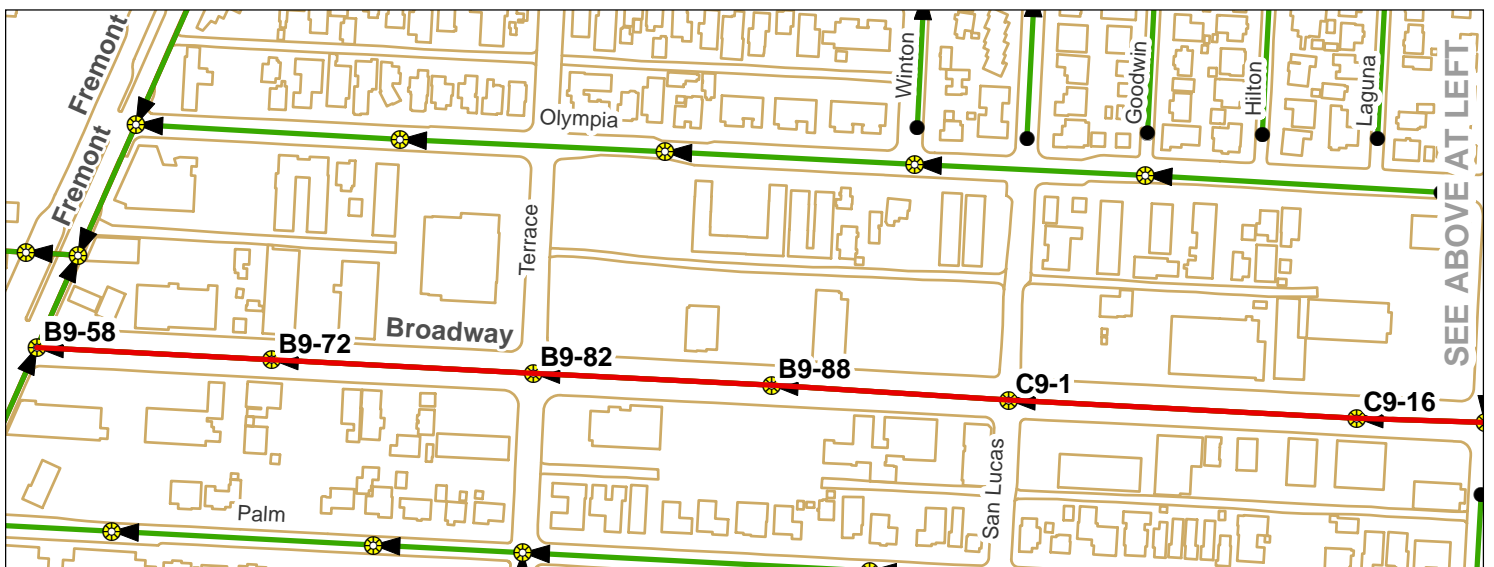
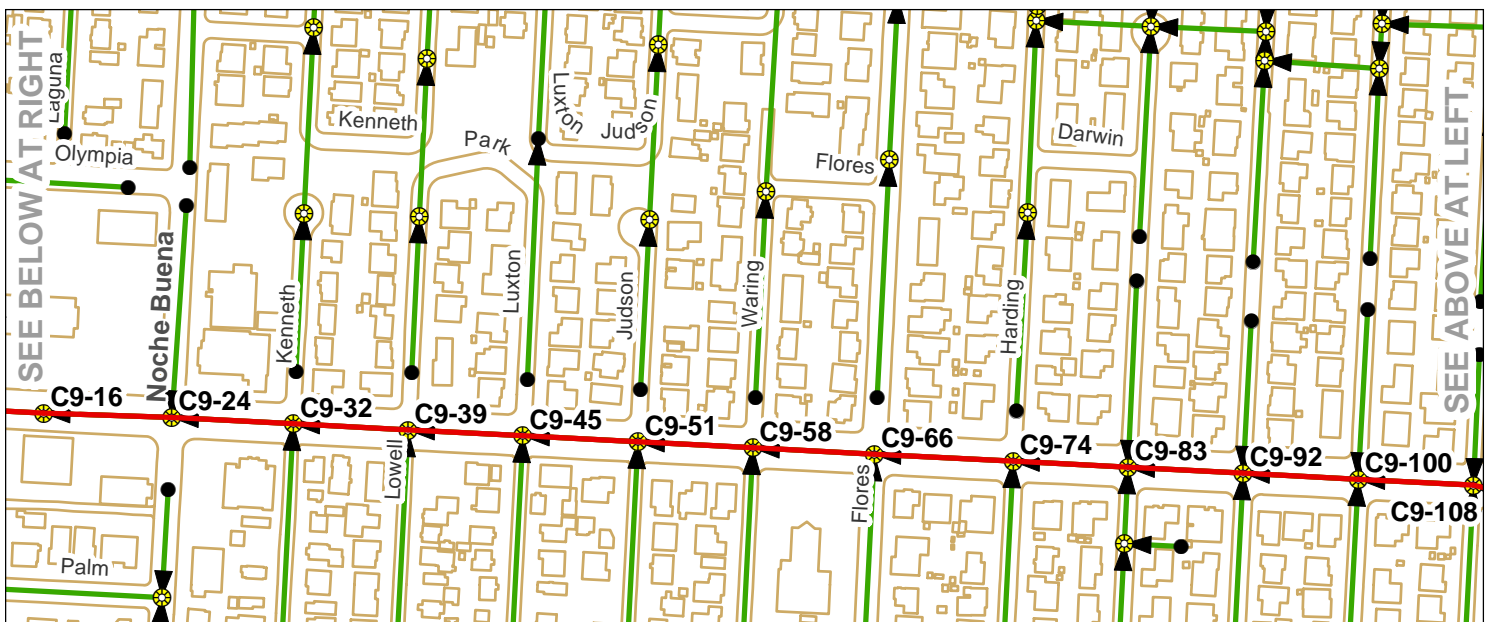
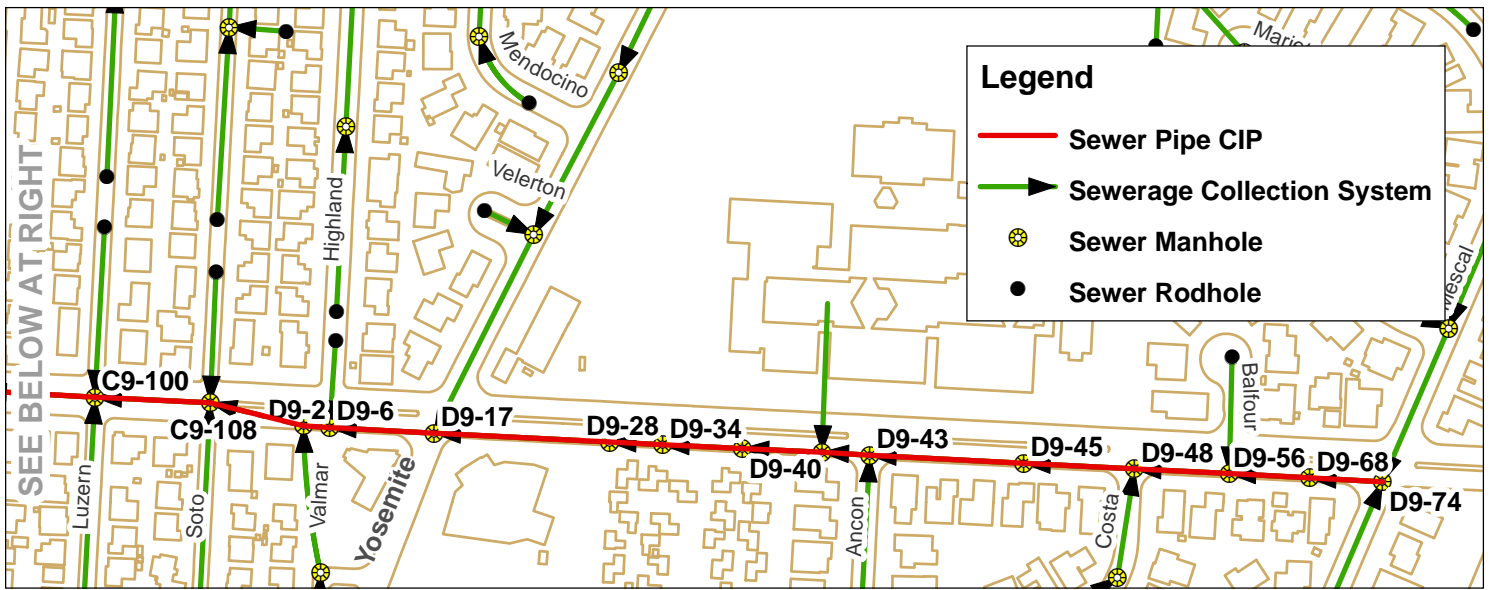
**NOTES:**

New pipe for the Del Monte Alternative is schematic and included in the sewer model for the purposes of determining feasibility and required pipe size only. Pipe lengths and alignment are subject to change for final engineering design.





Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Future MDF d/D (exist pipe dia)	Future MDF d/D (proposed pipe dia)	Future WWF d/D (exist pipe dia)	Future WWF d/D (proposed pipe dia)
D11-24 : D11-21	206	6	10	0.81	0.26	0.49	0.22
D11-21 : D11-12	321	6	10	1.00	0.27	0.51	0.23
D11-12 : D11-10	16	6	10	1.00	0.31	0.63	0.26
D11-10 : C11-100	408	6	10	1.00	0.38	0.87	0.31
C11-100 : C11-96	149	6	10	1.00	0.46	1.00	0.38
C11-96 : C11-90	183	6	10	0.74	0.36	0.70	0.30
C11-90 : C11-82	178	6	10	0.51	0.23	0.42	0.19
C11-82 : C11-75	180	6	10	0.77	0.24	0.72	0.20
C11-73 : C11-67	158	6	10	1.00	0.42	1.00	0.37
C11-67 : C11-55	422	6	10	1.00	0.51	1.00	0.45
C11-55 : C11-41	346	6	10	0.78	0.42	0.78	0.37
C11-41 : C11-30	180	6	10	0.53	0.27	0.52	0.25
C11-30 : C11-23	179	6	10	0.71	0.33	0.69	0.30
C11-23 : C11-21	190	6	10	0.76	0.35	0.74	0.31
C11-21 : C10-15	351	6	10	0.53	0.28	0.53	0.25
C10-15 : C10-10	221	6	10	0.50	0.26	0.50	0.24
C10-10 : B10-87	177	6	10	0.52	0.27	0.52	0.25
B10-87 : B10-79	549	6	10	0.61	0.34	0.62	0.31
B10-79 : B10-70	163	8	10	0.54	0.41	0.54	0.38
B10-70 : B10-64	236	8	10	0.54	0.51	0.55	0.47
B10-64 : B10-63	15	8	10	0.53	0.64	0.54	0.59
B10-63 : B10-52	516	8	10	0.56	0.46	0.58	0.44

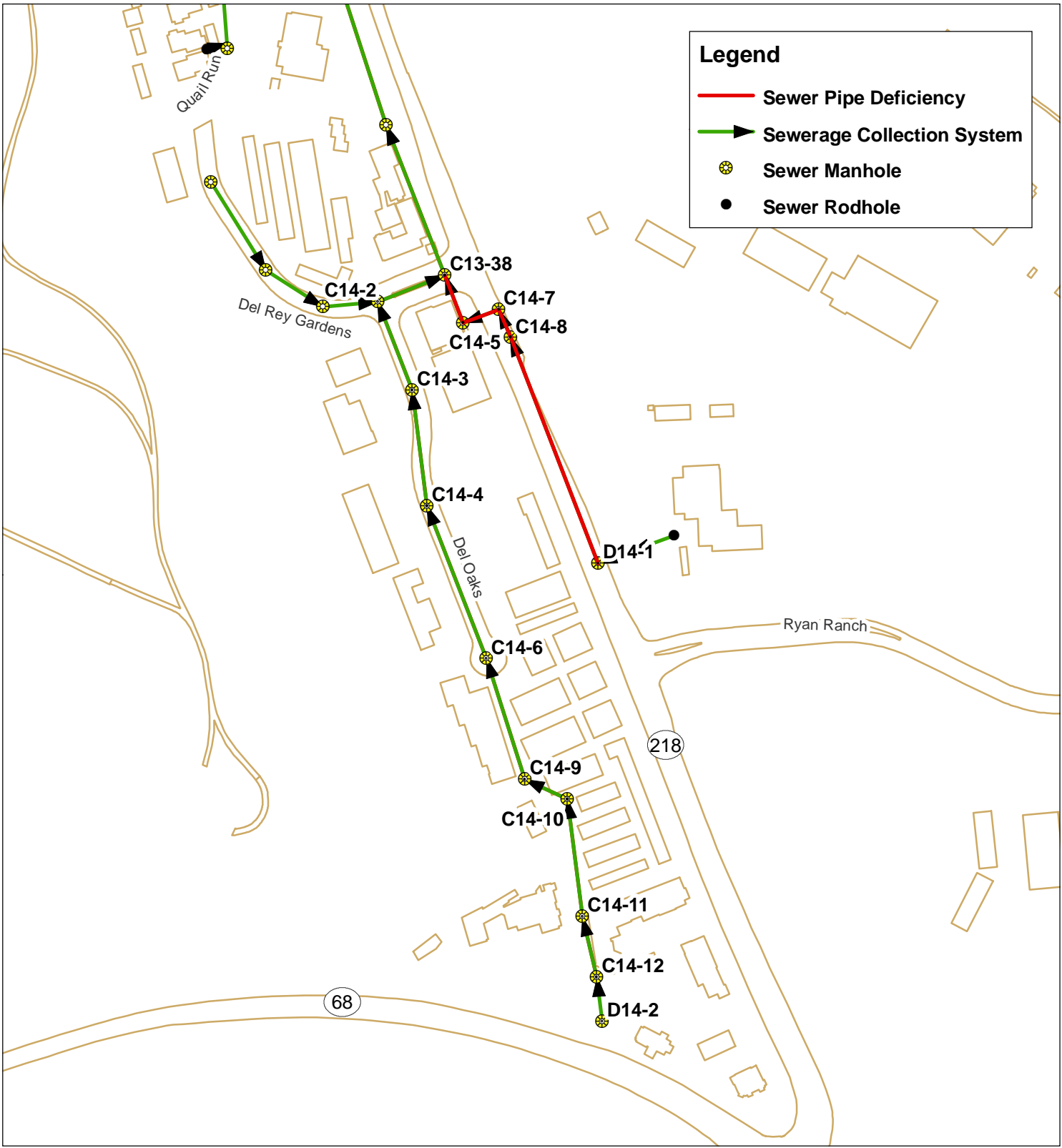


Pipe ID	Length [feet]	Existing Diameter [inches]	Proposed Diameter [inches]	Future MDF d/D (exist pipe dia)	Future MDF d/D (proposed pipe dia)	Future WWF d/D (exist pipe dia)	Future WWF d/D (proposed pipe dia)
D9-74 : D9-68	114	6	10	0.46	0.21	0.38	0.17
D9-68 : D9-56	126	6	10	0.51	0.23	0.42	0.19
D9-56 : D9-48	148	6	10	0.58	0.25	0.48	0.21
D9-48 : D9-45	173	6	10	0.77	0.29	0.55	0.24
D9-45 : D9-43	241	6	10	0.95	0.32	0.63	0.27
D9-43 : D9-42	75	6	10	1.00	0.35	0.75	0.30
D9-42 : D9-40	125	6	10	0.95	0.35	0.76	0.30
D9-40 : D9-34	125	6	10	0.78	0.30	0.62	0.26
D9-34 : D9-28	83	6	10	0.61	0.26	0.52	0.23
D9-28 : D9-17	275	6	10	0.57	0.25	0.49	0.22
D9-17 : D9-6	163	6	10	0.57	0.25	0.50	0.22
D9-6 : D9-2	41	6	10	0.60	0.26	0.52	0.23
D9-2 : C9-108	150	6	10	1.00	0.30	0.64	0.27
C9-108 : C9-100	180	6	10	1.00	0.31	0.69	0.28
C9-100 : C9-92	180	6	10	1.00	0.33	0.86	0.30
C9-92 : C9-83	180	6	10	1.00	0.38	1.00	0.34
C9-83 : C9-74	180	6	10	1.00	0.37	0.90	0.34
C9-74 : C9-66	217	6	10	1.00	0.32	0.75	0.30
C9-66 : C9-58	190	6	10	1.00	0.32	0.85	0.30
C9-58 : C9-51	180	6	10	1.00	0.35	1.00	0.33
C9-51 : C9-45	180	6	10	1.00	0.36	1.00	0.34
C9-45 : C9-39	180	6	10	0.90	0.34	0.90	0.32
C9-39 : C9-32	180	6	10	0.89	0.40	0.89	0.38
C9-32 : C9-24	190	8	10	0.69	0.44	0.69	0.42
C9-24 : C9-16	201	8	10	0.83	0.49	0.83	0.46
C9-16 : C9-1	545	8	10	0.78	0.48	0.78	0.45
C9-1 : B9-88	371	8	10	0.57	0.39	0.57	0.37
B9-88 : B9-82	373	8	10	0.79	0.47	0.79	0.45
B9-82 : B9-72	409	8	10	1.00	0.52	1.00	0.49
B9-72 : B9-58	368	8	10	1.00	0.50	1.00	0.48

NOTE: Pipe d/D values shown represent either:  
a) the existing collection system (recommended upstream upgrades would further increase listed d/D for existing pipe), OR  
b) the proposed collection system with ALL recommended improvements in place.

NOTE: The stretch of pipe from Manhole D9-74 to Manhole D9-48 is recommended to be upsized due to velocity constraints.





Pipe ID	Length [ft]	Existing Diameter [inches]	Proposed Diameter [inches]	Future MDF d/D (existing pipe dia)	Future MDF d/D (proposed pipe dia)	Future WWF d/D (exist pipe dia)	Future WWF d/D (proposed pipe dia)
D14-1 : C14-8	531	6	8	0.77	0.39	0.53	0.32
C14-8 : C14-7	65	6	8	0.51	0.31	0.40	0.25
C14-7 : C14-5	83	6	8	0.64	0.36	0.48	0.29
C14-5 : C13-38	111	6	8	0.88	0.58	0.70	0.47



**SEASIDE COUNTY SANITATION DISTRICT  
2011 SEWER MASTER PLAN  
FIGURE 7-21: HIGHWAY 218 (REGION D2)  
SEWER LINE UPGRADE**

NOTES:  
BASEMAP PROVIDED BY SCSD.  
WALLACE GROUP DID NOT  
PERFORM BOUNDARY SURVEY  
SERVICES FOR THIS MAP. NOT  
A LEGAL DOCUMENT. MAP  
PRODUCED MAY 2011.



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## CHAPTER 8

### REGION D1 ANALYSIS

The City of Monterey is working with Seaside County Sanitation District (SCSD) to determine if it is feasible and cost effective for SCSD to provide sewer service to Region D1. Chapter 8 provides an analysis of the SCSD collection system that is impacted by the wastewater flows from Monterey's Region D1. All tables and figures for Chapter 8 are located at the end of this Chapter.

#### BACKGROUND

The City of Monterey owns and operates 112 miles of sewer mains and owns 7 lift stations. Similar to SCSD, the City of Monterey contracts with Monterey Regional Water Pollution Control Agency (MRWPCA) to operate and maintain the lift stations. Region D1 is located at the southeast corner of the City of Monterey, near the airport (See Figure 8-1). This portion of the collection system flows east towards Highway 68/218 intersection to Lift Station No. 6, where it then gets pumped back up Highway 68 to the City of Monterey's Lift Station. It is not physically possible to gravity flow this Region to the City.

Through past investigations, it was determined that physically, the collection system could be re-routed from Region D1 to flow to SCSD's collection system instead of flowing to Lift Station No. 6. This would then eliminate the need to "double-pump" the flow through the Monterey Lift Station. However, a capacity analysis had not been completed on SCSD's collection system to determine if upgrades to the collection system would be required due to the increase in wastewater flows.

#### BASIS OF ANALYSIS

##### Region D1 Sewer Flow Rates

The City of Monterey provided flow data for both existing and future (build-out) conditions for Region D1 (*City of Monterey Lift Station Assessment, H68/H218 Sewer Area Study*). Flow rates per individual developments within Region D1 are summarized in Table 8-1. The City also provided existing dry and wet weather flow rates for Lift Station No. 6, as reported by MRWPCA. The lift station flow rates were utilized to calculate the wet weather peaking factor for the City's Region D1 collection system.

##### Peaking Factors and Diurnal Curves

The maximum day peaking factor of 1.5 as calculated for the SCSD system was applied to sewer loading from Region D1. A wet weather peaking factor of 1.67 was calculated from the Lift Station No. 6 average day and wet weather flow records. Total flows from Region D1 based on these peaking factors are summarized in Table 8-2. The wet weather factor was applied over the entire 24-hr analysis period; the wet weather contribution as described by the City is due mainly to groundwater infiltration rather than

inflow. The residential and commercial flow diurnal curves developed for the SCSD system were applied to the Region D1 flows as well.

#### Worst-Case Flow Conditions

Under existing Region D1 conditions, wet weather flow is greater than maximum daily flow, which is expected because the wet weather peaking factor is greater than the maximum day peaking factor. However, under future conditions, the maximum day flow is anticipated to exceed wet weather flow; a wet weather peaking factor was not applied to future development, assuming the new sewer system was designed and installed to prevent I/I. This is in accordance with analysis of the SCSD system. In summary, worst case flow conditions for Region D1 are as follows:

- Existing Conditions: Wet Weather Flow (WWF)
- Future Conditions: Maximum Day Dry Weather Flow (MDDWF)

#### **Performance Criteria**

Collection system performance and design criteria are in accordance with the SCSD's Draft Sanitary Sewer Management Plan, Element 5, as summarized within Chapter 7 of this Report. Gravity pipe performance was analyzed based on percent full (d/D ratio), defined as the depth of flow in a pipe divided by the diameter of the pipe. Percent full criteria per SCSD are summarized in Table 8-3.

### **COLLECTION SYSTEM MODEL DEVELOPMENT**

#### **System Conditions Analyzed**

Existing and future potential flow contributions from Region D1 were analyzed for impacts to the SCSD collection system under the following worst case scenarios:

##### Maximum Day Dry Weather Flow (MDDWF)

1. Existing SCSD conditions, future Region D1 conditions
2. Future SCSD conditions, future Region D1 conditions

##### Average Day Flow plus Infiltration and Inflow (Wet Weather Flow, WWF)

3. Existing SCSD conditions, existing Region D1 conditions
4. Existing SCSD conditions, future Region D1 conditions

### **COLLECTION SYSTEM MODEL RESULTS**

Impacts to the SCSD sewer collection system due to the contribution of sewer flow from the City of Monterey Region D1 are detailed below.

#### **Gravity Collection System – Existing Region D1 Conditions**

To determine the impact of Region D1 on the SCSD collection system, the flows from the existing Region D1 were introduced into the SCSD sewer model. There were no

recommended collection system upgrades (Near Term) for the existing SCSD collection system due to existing deficiencies. Existing flow from Region D1, for both MDDWF and WWF, has minimal impact on the SCSD collection system and do not require any upgrades. Existing WWF from Region D1 causes the following existing SCSD pipes to exceed the maximum d/D criteria. These upgrades would be required to be completed prior to Region D1 coming on-line.

#### Monterey Project #1

- Reference Figure 8-2
- Location Extents: Angelus Way, MH B12-7 to Rosita Lift Station

A single 6-inch clay pipe just upstream from Rosita lift station reaches a d/D of 0.71. The maximum d/D is 0.62 without flow contribution from D1. It is recommended to upgrade this 25 ft stretch of pipe to 8-inch.

*\* It should be noted that this stretch of sewer main is recommended to be upgraded as part of Angelus, 1,490 ft of new 12-inch PVC (See Long Term Project #5).*

#### Monterey Project #2

- Reference Figure 8-2
- Location Extents: Canyon Del Rey Blvd., Manhole B11-5 to Manhole A11-12

Two 8-inch clay pipes in Canyon Del Rey Boulevard flow with a d/D up to 0.70 with existing Region D1 flows. Both pipes flow with a maximum d/D of 0.65 without flow contribution from D1. It is recommended to upgrade this 620 ft stretch of pipe to 10-inch.

*\* It should be noted that this stretch of sewer main is recommended to be upgraded as part of Canyon Del Rey (1), 3,280 ft of new 12-inch PVC (See Long Term Project #1).*

#### Monterey Project #3

- Reference Figure 8-3
- Location Extents: Highway 218., SCSD Manhole D14-1 to City of Monterey Manhole H12-013

The City of Monterey will be required to re-route their existing sewer main on Highway 218 from SCSD's manhole D14-1 to approximately 2,250 feet south (Manhole H12-013). It is recommended to install an 8-inch main to convey flow from Region D1 to SCSD's collection system.

#### Monterey Project #4

- Reference: Figure 8-3
- Location Extents: Highway 218., Manhole D14-1 to Manhole C13-38

Existing sewer pipe in Highway 218 between the Region D1 connection location at Ryan Ranch Road and Del Rey Gardens Drive is all 6-inch VCP. This entire segment of sewer main has capacity under existing Region D1 flows. However, 6-inch sewer main does not meet SCSD's minimum pipe diameter requirements. The 6-inch sewer mains are recommended to be upgraded to 8-inch under the following scenarios:

- If the new connection increases flow to the 6-inch main more than 10 percent; or
- If more than 10 homes are connected to the sewer main; or
- If new sewer main is required to be installed upstream of the existing 6-inch sewer main.

Therefore, it is recommended to upgrade 800 feet of 6-inch VCP to 8-inch PVC prior to connecting Region D1.

### **Gravity Collection System – Future Region D1 Conditions**

The future build-out flow conditions were modeled with SCSD's existing collection system. Projected future flow from Region D1 causes gravity pipe flow to exceed SCSD percent full standards in multiple locations. However, the sewer model analysis does not indicate flooding (overflowing) or surcharging in the existing SCSD system with future MDDWF from Region D1. Future MDDWF from Region D1 causes the following existing SCSD pipes to exceed the maximum d/D criteria. *These upgrades would be required to be completed prior to any additional development to occur in Region D1.*

#### Monterey Project #5

- Reference Figure 8-2
- Location Extents: Angelus Way, Manhole B12-8 to Rosita LS

In addition to Monterey Project #1 recommended under existing conditions, the 8-inch main just upstream of the 6-inch main on Angelus Way has a maximum d/D of 0.68 with future flow conditions. It is recommended to upsize the 6- and 8-inch VCP sewer main to 10-inch PVC based on future conditions for SCSD, which results in a maximum d/D of 0.52 with all future flow. Total affected pipe length is 65 feet.

*\* It should be noted that this stretch of sewer main is recommended to be upgraded as part of Angelus, 1,490 ft of new 12-inch PVC (See Long Term Project #5).*

#### Monterey Project #6

- Reference Figure 8-2
- Location Extents: Canyon Del Rey Blvd., Manhole B11-14 to Manhole A11-6

The stretch of existing 8-inch VCP sewer main from 700 feet south of Fremont Boulevard to Williams Avenue flows with a maximum d/D of 0.76. This pipe is recommended to be upsized to 12-inch PVC based on future flow conditions for SCSD, which results in a maximum d/D of 0.51 with all future flow. Total affected pipe length is 1,590 feet.

*\* It should be noted that this stretch of sewer main is recommended to be upgraded as part of Canyon Del Rey (1), 3,280 ft of new 12-inch PVC (See Long Term Project #6).*

### Monterey Project #7

- Reference Figure 8-3
- Location Extents: Tarp's Road House Parking Lot, Manhole D14-2 to Manhole C13-38

In addition to the 8-inch upgrade recommended for Canyon Del Rey, a single 6-inch pipe segment in Del Rey Gardens Drive flows with a d/D up to 0.75, based on future flow contribution from Highway 68 with connection via the 6-inch sewer line that flows from Tarp's. If future development in Region D1 proposes to connect to this line, it is recommended that the entire stretch of 6-inch pipe from Del Rey Gardens Drive to Highway 68 is upgraded to 8-inch PVC. Upgrade to 8-inch results in a maximum d/D of 0.54. Total pipe length is 1,860 feet. Alternatively, the City may be able to route future D1 flow from Highway 68 to the new sewer line in Canyon Del Rey (Highway 218). With all future flow routed to Highway 218, the new 8-inch PVC has a maximum d/D of 0.57. It is recommended that all Region D1 flow is routed to Highway 218, if physically possible, eliminating the need to upgrade the existing pipe from Tarp's.

### **Rosita Lift Station**

Existing and future flows to Rosita Lift Station are summarized in Table 8-4.

#### Existing Region D1 Conditions

Existing WWF from Region D1 would increase wet weather flow volume to Rosita Lift Station by 65%. Per the sewer model analysis, peak inflow to Rosita would increase from 222 gpm to 310 gpm. The existing pumps at Rosita Lift Station have a design point of 480 gpm and tested capacity of 416 gpm. Therefore, the existing pumps at Rosita have the flow capacity to accept existing Region D1 flows. The sewer model indicates no increase in lift station peak cycles per hour, rather an increase in total pump run time. The Rosita lift station requires physical improvements due to corrosion and wear to continue to provide dependable service, and the added flow contribution from Region D1 would increase likelihood of lift station failure due to increase in total pumping hours. Therefore, it is recommended that all the near-term improvements recommended for Rosita lift station be completed prior to Region D1 connection.

#### Future Region D1 Conditions

Future MDDWF from Region D1 would increase existing dry weather flow volume to Rosita Lift Station by 166%, and increase total future dry weather flow volume by 29%. Therefore, under future flow conditions, nearly 25% of flow pumped through Rosita would be generated by Area D1. With existing SCSD flow, Future Region D1 contributions would increase peak flow to Rosita from 166 gpm to 342 gpm. This peak of 342 gpm is still less than the tested pump capacity of 416 gpm at Rosita. However, increase in total pumping time at this station would be proportional to the increase in flow volume, which means pumping time would more than double. This increase in pumping time shortens the expected life of the lift station. Due to the current age and physical condition of the lift station, it is recommended that the long-term improvements recommended for the Rosita lift station be completed prior to allowing any future development in Region D1 to connect to the SCSD system. Flow contribution from Region D1 would increase design pumping capacity for the Rosita lift station upgrade.

## **Del Monte Lift Station**

Existing and future flows to Del Monte Lift Station are summarized in Table 8-5.

### Existing Region D1 Conditions

Existing WWF from Region D1 would increase existing wet weather flow volume to Del Monte Lift Station by 23%. Peak wet weather inflow to Del Monte would increase from 736 gpm to 764 gpm. Increase in peak inflow to the lift station is minor because all the flow is routed through Rosita Lift Station. Therefore, the existing Del Monte station is capable of conveying existing flows from Region D1. Per the investigation conducted for this Master Plan the Del Monte Lift Station is in good physical condition with minor upgrades required. However, this Lift Station has existing deficiencies for emergency storage that are recommended to be corrected prior to D1 connection. The additional pump run time from Rosita Lift Station due to D1 contributions greatly increases the likelihood of overflow at Del Monte if the Del Monte pumps failed.

### Future Region D1 Conditions

Future MDDWF from Region D1 would increase existing dry weather flow volume to Del Monte Lift Station by 58%, and future flow volume by 17%. Existing peak inflow to the lift station would increase 15%, from 552 gpm to 635 gpm. Peak inflow with all future development contributing to the lift station would increase 7%, from 1,189 gpm to 1,277 gpm. At a minimum, all near-term improvements to Del Monte Lift Station should be complete prior to allowing any future development in Region D1 to connect to the SCSD system. If at the time of future D1 development, the long-term improvements to the lift station have not been completed, it is recommended that a flow monitoring study for flow into the lift station be conducted and the physical condition of the pumps be evaluated prior to allowing future development in Region D1 to connect. Depending on lift station condition at time of development, future development in Region D1 may trigger the need to upgrade this station. In addition, the Rosita lift station upgrade, recommended to be complete prior to future D1 connection, may trigger the need to upgrade the Del Monte station as well.

## **SUMMARY**

A complete list of projects recommended for Region D1 is provided in Table 8-6. In addition, Table 8-6 provides an overview of each project, its associated cost to construct the project, and the City of Monterey's share. Table 9-7 provides a summary of all SCSD existing and future capital improvement projects and their proportional cost share by Region, including Region D1 and D2.

**Table 8-1. Region D1 Sewer Flows**

Development	Status	Average Flow [cfs]	Average Flow [gpd]	Flow Type
<b>Highway 68 (Manhole C14-12)</b>				
Highway 68 Phoenix	Future	0.0155	10,018	Commercial
Tarpy Flats	Future	0.0198	12,797	Commercial
MPUSD Site at Tarpy Flats	Future	0.0150	9,695	Residential
	<b>Total Existing</b>	<b>0.0000</b>	<b>0</b>	
	<b>Total Future</b>	<b>0.0503</b>	<b>32,510</b>	
<b>Highway 218 (Manhole D14-01)</b>				
Monterey Research Park	3/4 Existing, 1/4 Future	0.0511	33,027	Commercial
Ryan Ranch	1/2 Existing, 1/2 Future	0.0156	10,083	Commercial
City Corporation Yard	Existing	0.0015	969	Commercial
MST Maintenance Facility	Existing	0.0155	10,018	Commercial
	<b>Total Existing</b>	<b>0.0631</b>	<b>40,799</b>	
	<b>Total Future</b>	<b>0.0837</b>	<b>54,097</b>	

**Table 8-2. Region D1 Sewer Flow Summary**

Flow Condition	Existing Flow [gpd]	Future Flow [gpd]
Average Day Flow	40,799	86,606
Wet Weather Flow	68,002	113,810
Maximum Day Dry Weather Flow	61,198	129,910

**Table 8-3. SCSD Design and Performance Standards  
Gravity Pipe Percent Full Criteria**

Pipe Diameter	Maximum Allowed d/D
10 inches and smaller	0.67
12-inch to 24-inch	0.80
27 inches and larger	0.90

**Table 8-4. Rosita Lift Station Flow Summary**

			24-HR FLOW VOLUME [GALLONS]			PEAK INFLOW RATE PER SEWER MODEL [GPM]		
Scenario	SCSD Flow Condition	D1 Flow Condition	SCSD	SCSD + D1	Percent Increase	SCSD	SCSD + D1	Percent Increase
1. MDDWF	Existing	Future	78,197	208,107	166%	166	342	106%
2. MDDWF	Future	Future	445,105	575,015	29%	676	775	15%
3. ADF + I/I	Existing	Existing	104,263	172,265	65%	222	310	40%
4. ADF + I/I	Existing	Future	104,263	218,073	109%	222	324	46%

**Table 8-5. Del Monte Lift Station Flow Summary**

			24-HR FLOW VOLUME [GALLONS]			PEAK INFLOW RATE PER SEWER MODEL [GPM]		
Scenario	SCSD Flow Condition	D1 Flow Condition	SCSD	SCSD + D1	Percent Increase	SCSD	SCSD + D1	Percent Increase
1. MDDWF	Existing	Future	225,197	355,107	58%	552	635	15%
2. MDDWF	Future	Future	774,552	904,462	17%	1189	1277	7%
3. ADF + I/I	Existing	Existing	300,263	368,265	23%	736	764	4%
4. ADF + I/I	Existing	Future	300,263	414,073	38%	736	801	9%

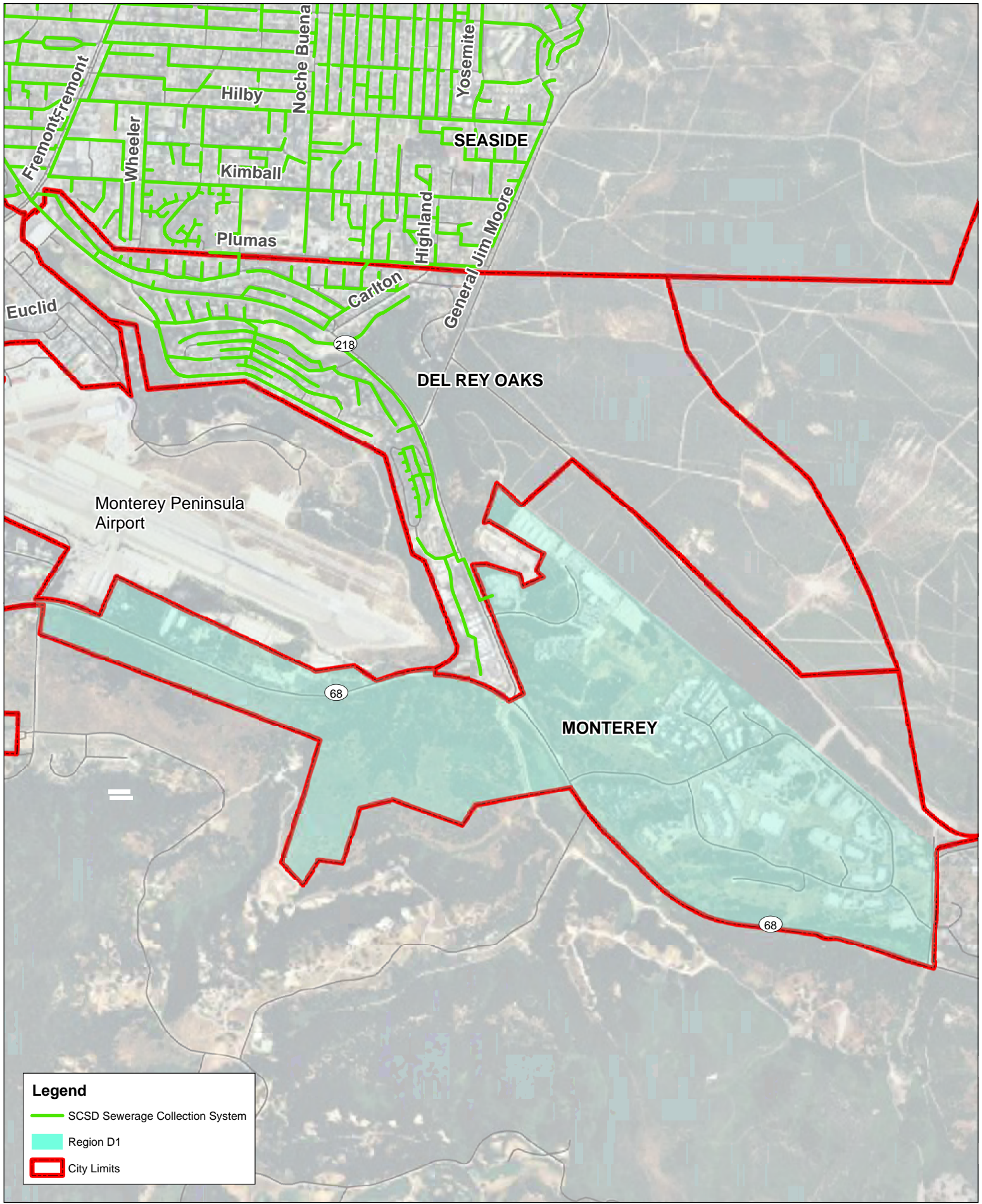
**Table 8-6. City of Monterey Capital Improvement Projects**

Title	Description	Tributary Area	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)*	City of Monterey's Share (\$)	Notes
<b>Monterey Project #3</b>	New Sewer Main	City of Monterey	--	2,250	--	8	Canyon Del Rey Blvd	From Monterey MH H12-013 to SCSD MH D 14-1	Monterey H12-013	SCSD D14-1	\$240	LF	\$540,000	<b>\$756,000</b>	<b>\$756,000</b>	100% Monterey
<b>Monterey Project #4</b>	Upgrade Sewer Main <i>Part of Long Term Project #1</i>	Rosita	--	800	6	8	Canyon Del Rey Blvd	From SCSD's last manhole on Hwy 218 to Del Rey Gardens	D14-1	C13-38	\$240	LF	\$192,000	<b>\$268,800</b>	<b>\$268,800</b>	100% Monterey
<b>Angelus</b>	Upgrade Sewer Main <i>Long Term Project #5</i>	Rosita	--	1,490	6&8	12	Angelus	Just upstream of Rosita Lift Station	C12-3	Rosita LS	\$205	LF	\$305,450	<b>\$427,630</b>	<b>\$252,302</b>	Per Table 9-7, 26% + 33% = 59% Monterey Share
<b>Canyon Del Rey (1)</b>	Upgrade Sewer Main <i>Long Term Project #6</i>	Amador	--	3,280	6	12	Canyon Del Rey Blvd	From Rosita LS to Hilby Ave	B12-2	A10-14	\$265	LF	\$869,200	<b>\$1,216,880</b>	<b>\$717,959</b>	Per Table 9-7, 26% + 33% = 59% Monterey Share
<b>Canyon Del Rey (2)</b>	Upgrade Sewer Main <i>Long Term Project #7</i>	Amador	--	800	12	15	Canyon Del Rey Blvd	From Harcourt Ave. to Sonoma Ave.	A10-9	A10-4	\$280	LF	\$224,000	<b>\$313,600</b>	<b>\$185,024</b>	Per Table 9-7, 26% + 33% = 59% Monterey Share
<b>Rosita LS Upgrade Near Term</b>	Lift Station Upgrades <i>Short Term Project #2</i>	Rosita	1	--	--	--	Rosita	At Rosita Road and Angelus Way	--	--	\$44,000	LS	\$44,000	<b>\$61,600</b>	<b>\$0</b>	Per Table 9-7, Existing SCSD deficiency, Project must be done before Region D1 or D2 can flow to LS
<b>Del Monte Lift Station Upgrade Near Term</b>	Lift Station Upgrades <i>Near Term Project #1</i>	Amador	1	--	--	--	Del Monte	At Del Monte Blvd and Canyon Del Rey Blvd.	--	--	\$12,500	LS	\$12,500	<b>\$17,500</b>	<b>\$0</b>	Per Table 9-7, Existing SCSD deficiency, Project must be done before Region D1 or D2 can flow to LS
<b>Rosita LS VFD Upgrade Long Term</b>	Lift Station Upgrades <i>Long Term Project #4</i>	Rosita	1	--	--	--	Rosita	At Rosita Road and Angelus Way	--	--	\$575,000	LS	\$575,000	<b>\$805,000</b>	<b>\$394,450</b>	Per Table 9-7, 21% + 27% = 49% Monterey Share
<b>Del Monte Lift Station Upgrade Long Term</b>	New Lift Station <i>Long Term Project #3</i>	Amador	1	--	--	--	Del Monte	At Del Monte Blvd. and Canyon Del Rey Intersection	--	--	\$1,250,000	LS	\$1,250,000	<b>\$1,875,000</b>	<b>\$562,500</b>	Per Table 9-7, 13% + 17% = 30% Monterey Share
														<b>\$5,742,010</b>	<b>\$3,137,035</b>	

\* Total includes construction cost plus preliminary engineering, design engineering, administration construction management and inspection costs. Construction costs were developed based on engineering judgment, confirmed bid prices for similar work in the Central Coast area, consultation with vendors and contractors, established budgetary unit prices for the work, and other reliable sources.

All CIP costs are expressed in November 2009 dollars, using McGraw-Hill ENR Construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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**Legend**

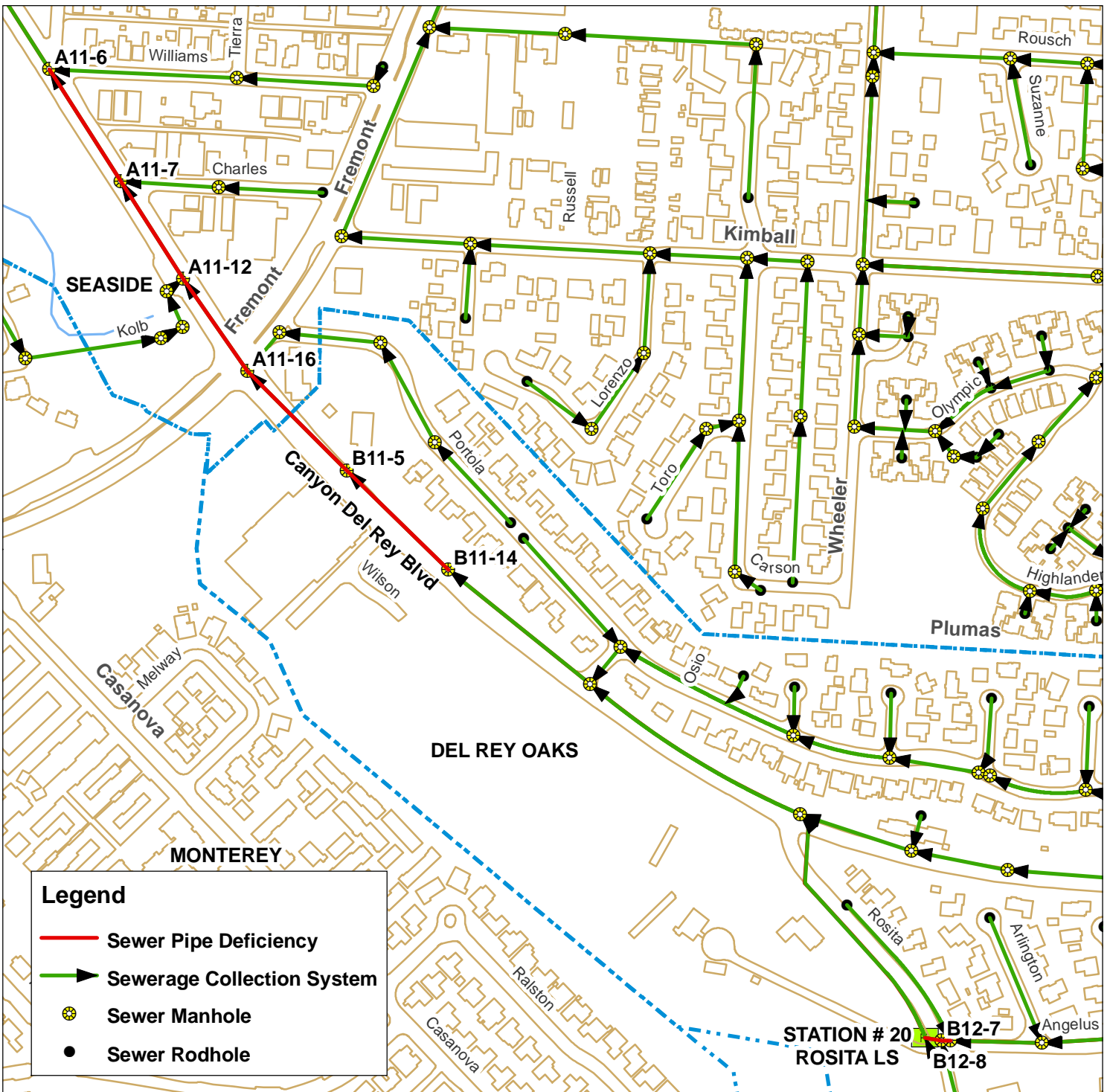
- SCSD Sewerage Collection System
- Region D1
- City Limits



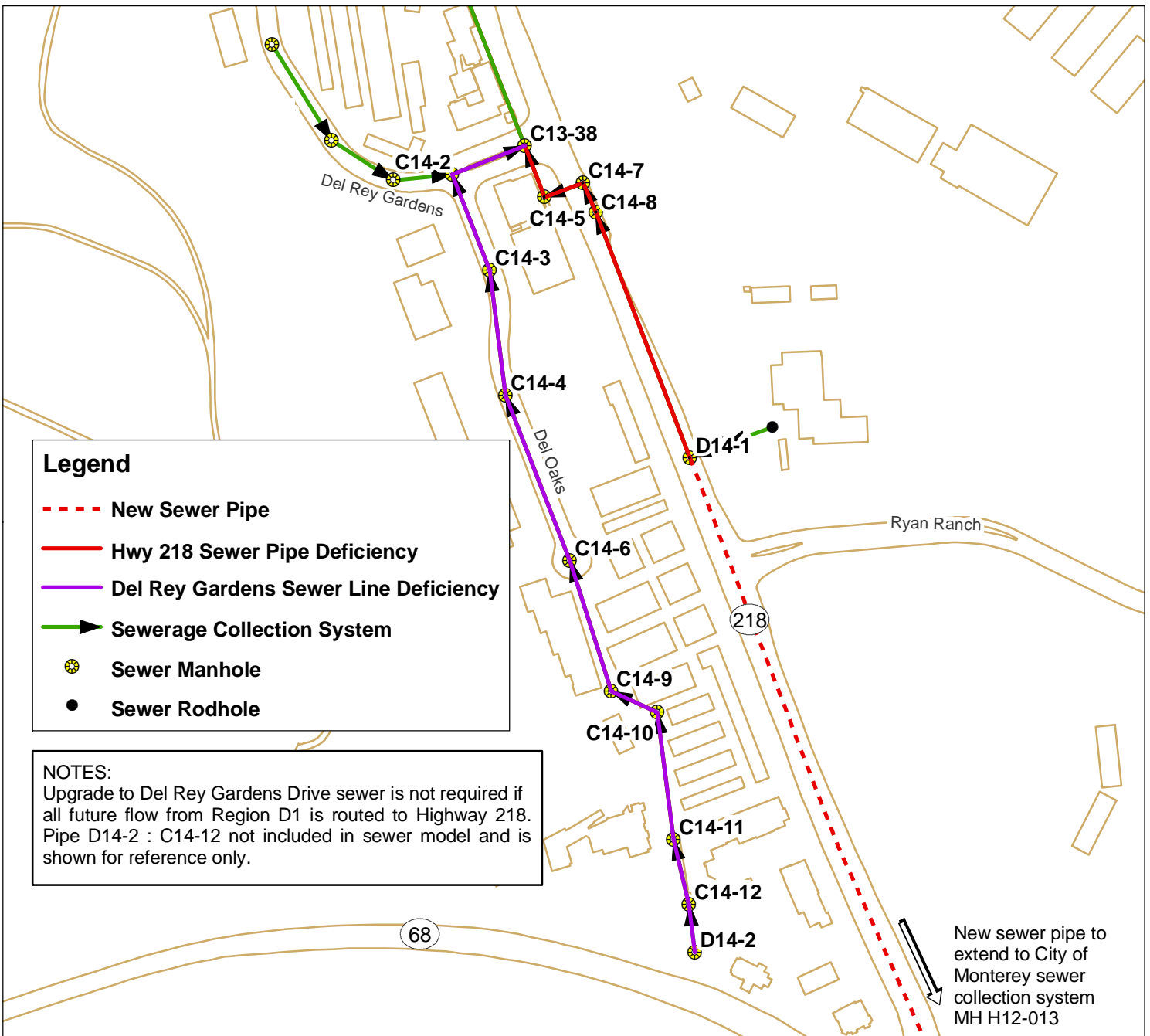
**SEASIDE COUNTY SANITATION DISTRICT  
 2011 SEWER MASTER PLAN  
 FIGURE 8-1: REGION D1 LOCATION MAP**

NOTES:  
 BASEMAP PROVIDED BY SCSD.  
 WALLACE GROUP DID NOT  
 PERFORM BOUNDARY SURVEY  
 SERVICES FOR THIS MAP. NOT  
 A LEGAL DOCUMENT. MAP  
 PRODUCED MAY 2011.





Pipe ID	Length [ft]	Existing Diameter [inches]	Existing SCSD + Existing D1, WWF d/D (existing pipe dia)	Existing SCSD + Future D1, WWF d/D (existing pipe dia)	Proposed Diameter [inches]	Future SCSD + Future D1, MDF d/D (proposed pipe dia)
<b>ANGELUS WAY</b>						
B12-8 : B12-7	22	6	0.71	0.79	12	0.41
B12-7 : RLS	41	8	0.62	0.68	12	0.52
<b>CANYON DEL REY BOULEVARD</b>						
B11-14 : B11-5	348	8	0.64	0.69	12	0.47
B11-5 : A11-16	345	8	0.70	0.76	12	0.51
A11-16 : A11-12	275	8	0.70	0.75	12	0.49
A11-12 : A11-7	284	8	0.66	0.71	12	0.47
A11-7 : A11-6	325	8	0.66	0.70	12	0.46



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## CHAPTER 9

### CAPITAL IMPROVEMENT PROJECTS

This Chapter presents the proposed Capital Improvement Projects (CIP), with a brief description of the proposed projects and a preliminary cost estimate for each proposed improvement for Seaside County Sanitation District (SCSD). Also included in the CIP recommendations are general timelines and scheduling for the needed improvements, and general guidelines for cost allocations relative to existing and future developments.

#### BASIS OF CAPITAL IMPROVEMENT PROGRAM COSTS

The CIP costs were developed based on engineering judgment, confirmed bid prices for similar work in the Central Coast area, 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. Some projects may have factors other than 1.4 depending on project type. All CIP costs are expressed in November 2009 dollars, using McGraw-Hill ENR Construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work. The unit cost for new gravity sewers includes the proposed pipelines, manholes, lateral re-connections, sewer bypassing, traffic control, etc., and all other aspects of sewer system construction.

#### TIMING OF RECOMMENDED IMPROVEMENTS

There are some projects triggered by existing deficiencies and some projects triggered by future development. The projects that address existing deficiencies are ranked in order of importance, which is discussed in greater detail within this Chapter. These existing deficiencies are considered near-term projects. The first eleven (11) Near-Term projects are considered to be health and safety related projects. This means if an overflow occurred, there could be damage to property or the environment. These first eleven projects are recommended to be completed within the next 1 to 6 years (See Table 9-2). Projects 12 through 18 are efficiency related projects. These projects will assist the operations staff during routine maintenance and inspection of the collection system, but are not likely to cause overflows or sewage spills. These projects are recommended to be completed within the next 15 years (See Table 9-2).

There are also projects that are triggered by potential future development, for which the timing is always difficult to ascertain. These long-term projects are grouped by Development Region to address potential impacts and future upgrades (See Table 9-3).

#### CIP RANKING

The near term capital improvement projects were ranked to determine what priority the existing recommended projects should be constructed. Table 9-1 evaluates each of the projects in five categories: overflow to a water body of the state, hydraulic capacity (d/D),

community impact, maintenance hot spots, and cost. Each category was provided a weighted importance factor based on what factors are more important than others. The importance factor is multiplied by the score the project received and then summed together to determine its final score.

*Although the projects are ranked as described above, it should be noted that **all** projects identified in the Near-Term CIPs are a result of deficiencies in the existing collection system due to existing needs and are therefore all important to be constructed within the next 1 to 6 years for the first 11 projects and within the next 15 years for projects 12 through 18. It is also recommended that SCSD review these projects periodically to determine if any substantial changes have occurred that may re-prioritize a project to a higher ranking.*

Table 9-2 provides a summary of all the existing recommended CIPs, or Near Term Projects, in order of ranking from Table 9-1. Table 9-2 also provides an estimate of the construction and “soft” costs for each project. The costs are based on engineering judgment, confirmed bid prices for similar work in the Central Coast area, consultation with vendors and contractors, established budgetary unit prices for the work, and other reliable sources. The cost estimates are approximate and should be used for planning purposes only. Actual project costs will vary depending upon economic conditions at the time of construction. As noted previously, these costs are based on Year 2009 dollars (McGraw-Hill ENR Construction Cost Index of **8592**) and need to be escalated to the year or years scheduled for the work.

Table 9-3 provides a summary of the future recommended CIPs, or Long Term Projects, and their estimated costs. These projects are not ranked. The costs are based on engineering judgment, confirmed bid prices for similar work in the Central Coast area, consultation with vendors and contractors, established budgetary unit prices for the work, and other reliable sources. The cost estimates are approximate and should be used for planning purposes only. Actual project costs will vary depending upon economic conditions at the time of construction. As noted previously, these costs are based on Year 2009 dollars (McGraw-Hill ENR Construction Cost Index of **8592**) and need to be escalated to the year or years scheduled for the work.

Following the tables, project description sheets are provided for each project noted. The project description sheets provide the following information:

- Project name
- Project trigger
- Project benefit
- Project need
- Project cost
- Project schedule
- Project description
- Project map

These description sheets can be used by SCSD in the planning for each project, and for inclusion in fiscal year budget requests.

## **UNIT COSTS**

Table 9-2 and 9-3 provide costs for the recommended capital improvement projects. The unit costs are based on recent construction costs and engineering judgment. The unit costs for the various pipe diameters are as follows in Table 9-4:

## **OPERATION AND MAINTENANCE PROGRAM**

In addition to the projects required to meet the hydraulic needs of the collection system, SCSD has additional projects or programs that are related to the day-to-day operations and maintenance of the collection system. Table 9-5 provides a summary of the costs for the proposed operation and maintenance budget. Table 9-6 provides a summary of the capital outlay (equipment purchases) anticipated over the next six years. This information will be used to assist in the preparation of the sewer rate study.

## **PROPORTIONAL SHARE BY REGION**

Table 9-7 provides a summary of the each of the Region's proportional share and costs based on need and flow contribution.

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Table 9-1. SCSD CIP Ranking Matrix

Importance Factor	5	4	3	2	1			
	Overflow to Water Body of the State	Design Standard	Community Impact	Maintenance Hot Spot	Cost	Impacted By Future Development		
Project Name	Yes - 10 No - 0	Meets Design Standard - 0 Doesn't Meet Design Standards - 2 Surcharging - 5 Overflowing - 10	< 1,000 - 0 1,001 to 5,000 - 5 >5,000 - 10	Not Critical - 0 Yearly Check - 5 Weekly or Monthly Checks - 10	<\$25,000 - 10 \$25,001 to \$100,000 - 5 >\$100,000 - 2	Yes/No	Score	Ranking
							= Importance Factor X Points	
Del Monte Lift Station Upgrade Near Term	10	0	10	10	5	Yes	105	1
Rosita Lift Station Upgrade Near Term	10	0	5	10	5	Yes	90	2
942 Angelus Way Sewer Main Upgrade	10	0	0	10	5	No	75	3
Del Rey Park Sewer Main Upgrade	10	0	0	10	5	No	75	4
Del Monte Blvd. Sewer Main Upgrade	0	5	10	10	2	Yes	72	5
Military Lift Station Replacement	10	0	0	10	2	No	72	6
Fremont Blvd. Sewer Main Upgrade	0	5	10	5	2	Yes	62	7
Luzern St. Sewer Main Upgrade	0	5	0	10	2	No	42	8
La Salle Ave. Sewer Main Upgrade	0	5	5	0	2	Yes	37	9
Tioga Lift Station Feasibility Analysis	0	0	0	10	10	Yes	30	10
Birch Ave. Sewer Main Upgrade	0	2	5	0	2	No	25	11
Root Intrusion Sewer Main Replacement	0	0	0	10	2	Partially	22	12
Brick Manhole Inspection	0	2	0	0	10	No	18	13
Drop Manhole Inspection	0	2	0	0	10	No	18	14
Manhole Lids	0	0	0	0	10	No	10	15
Rod Hole Replacement	0	2	0	0	2	Partially	10	16
New Manhole Installations	0	2	0	0	2	Partially	10	17
Canyon Del Rey CMP Sewer Line Replacement	0	0	0	5	2	Yes	12	18

CAPITAL IMPROVEMENT PROJECTS

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Table 9-2. SCSD Near-Term Capital Improvement Projects

Project #	Title	Description	Tributary Area	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Add'l Projects Req'd to Meet Future Needs*	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)**
1	Del Monte Lift Station Upgrade Near Term	Lift Station upgrades	Amador	1	--	--	--	Del Monte	At Del Monte Blvd and Canyon Del Rey Blvd.	--	--	Yes	\$12,500	LS	\$12,500	\$17,500
2	Rosita Lift Station Upgrades Near Term	Lift Station upgrades	Rosita	1	--	--	--	Rosita	At Rosita Road and Angelus Way	--	--	Yes	\$44,000	LS	\$44,000	\$61,600
3	942 Angelus Way Sewer Main Upgrade	Replace ductile iron sewer main	Rosita	--	80	6	8	West side of Del Rey Park	From Via Verde to Angelus Way	B12-52	B12-53	No	\$450	LF	\$36,000	\$50,400
4	Del Rey Park Sewer Main Upgrade	New sewer main	Rosita	--	425	--	8	Del Rey Park	From Via Verde at Los Encinos Drive to north side of Del Rey Park	C12-29	Between C12-23 and C12-39	No	\$450	LF	\$191,250	\$267,750
5	Del Monte Blvd. Sewer Main Upgrade	Upsize sewer main	Love Chevrolet/ Cypress Ford	--	3,200	10	15	Auto Center Parkway	From La Salle and Fremont to Del Monte Blvd.	--	--	Yes	\$220	LF	\$704,000	\$985,600
								Del Monte Blvd.	From Auto Center Parkway to Ortiz Ave.	B8-81	B9-28					
		Abandon Existing Sewer Main			2,020	6	--	Del Monte Blvd.	From Tioga to Ortiz	B8-58	B9-26		\$10	LF	\$20,200	\$28,280
					1,420	10	--	Del Monte Blvd.	From Auto Center Parkway to Ortiz Ave.	B8-51	B9-27		\$10	LF	\$14,200	\$19,880
<b>Total</b>																<b>\$1,033,760</b>
6	Military Lift Station Replacement	Lift Station replacements	Love Chevrolet	1	--	--	--	Military Avenue	On Military Avenue west of Highland Street	--	--	No	\$395,000	LS	\$395,000	\$553,000
7	Fremont Blvd. Sewer Main Upgrade	Upsize sewer main	Victory Toyota	--	1,100	12	15	Fremont	From Birch Ave. to Easement north of Broadway Ave	B9-75	B9-60	No	\$315	LF	\$346,500	\$485,100
					1,700	12	15	Easement north of Broadway Ave.	From Fremont Blvd to Alhambra Street	B9-60	B9-18		\$220	LF	\$374,000	\$523,600
								Alhambra Street	From Easement to Del Monte Blvd	B9-18	B9-22					
					250	15	18	Del Monte Blvd.	From Alhambra to Easement over to Ortiz Ave	B9-22	B9-28		\$235	LF	\$58,750	\$82,250
					160	10	12	Fremont	From Broadway Ave to Easement north of Broadway Ave	B9-58	B9-60		\$300	LF	\$48,000	\$67,200
<b>Total</b>																<b>\$1,158,150</b>
8	Luzern St. Sewer Main Upgrade	Upsize sewer main	Love Chevrolet	--	1,430	6	8	Luzern	From Military Lift Station to La Salle	D7-5	C8-108	No	\$180	LF	\$257,400	\$360,360
9	La Salle Ave. Sewer Main Upgrade	Upsize sewer main	Love Chevrolet	--	1,970	6	10	La Salle	From Luzern Street to Noche Buena Street	C8-108	C8-33	Yes	\$180	LF	\$354,600	\$496,440

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**Table 9-2. SCSD Near-Term Capital Improvement Projects**

Project #	Title	Description	Tributary Area	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Add'l Projects Req'd to Meet Future Needs*	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)**
10	<b>Tioga Lift Station Feasibility Analysis</b>	Feasibility Analysis	27-inch	1	--	--	--	Tioga	On Tioga Avenue at Metz Road	--	--	No	\$10,000	LS	\$10,000	<b>\$11,500</b>
11	<b>Birch Ave. Sewer Main Upgrade</b>	Upsize sewer main	Victory Toyota	--	200	8	10	Laguna	From easement to Phoenix	C8-19	C9-20	No	\$195	LF	\$39,000	\$54,600
					450	8	10	Phoenix	From Laguna Street to Baker Street	C9-20	C9-6		\$195	LF	\$87,750	\$122,850
					950	10	12	Baker	From Phoenix Ave. (East) to Birch Ave.	C9-6	C9-4		\$205	LF	\$194,750	\$272,650
								Birch	From Baker Street towards 600 ft. towards Fremont Blvd	C9-4	B9-86					
<b>Total</b>																<b>\$450,100</b>
12	<b>Root Intrusion Sewer Main Replacement</b>	Replace sewer main	All	--	5,800	Varies	Varies	--	--	--	--	No	\$195	LF	\$1,131,000	<b>\$1,300,650</b>
13	<b>Brick Manhole Inspection</b>	Inspect brick manholes	All	295	--	--	--	--	--	--	--	No	\$250	each	\$73,750	<b>\$84,813</b>
14	<b>Drop Manhole Inspection</b>	Inspect drop manholes	All	92	--	--	--	--	--	--	--	No	\$750	each	\$69,000	<b>\$79,350</b>
	<b>Drop Manhole Replacement</b>	Inspect drop manholes	All	30	--	--	--	--	--	--	--	No	\$8,000	each	\$240,000	<b>\$336,000</b>
<b>Total</b>																<b>\$415,350</b>
15	<b>Manhole Lids</b>	Install manhole lids	All	76	--	--	--	--	--	--	--	No	\$700	each	\$53,200	<b>\$74,480</b>
16	<b>Rod Hole Replacement</b>	Replace rodhole with new manhole	All	557	--	--	--	--	--	--	--	No	\$1,200	each	\$668,400	<b>\$935,760</b>
17	<b>New Manhole Installations</b>	Install new manhole	All	207	--	--	--	--	--	--	--	No	\$8,000	each	\$1,656,000	<b>\$2,318,400</b>
18	<b>Canyon Del Rey CMP Sewer Line Replacement</b>	Replace sewer main	Rosita	--	525	12	12	Canyon Del Rey	Hilby Avenue	A10-14	A10-9	No	\$265	LF	\$139,125	\$194,775
					285	12	15	Canyon Del Rey	Harcourt Avenue	A10-9	A10-7	Yes	\$280	LF	\$79,800	\$111,720
<b>Total</b>																<b>\$306,495</b>
<b>TOTAL NEAR-TERM PROJECT COSTS</b>																<b>\$9,896,508</b>

\* If noted "Yes", then the proposed project has existing deficiencies. In addition, upgrades are necessary for future development. The proposed pipe diameter noted in this Table is to meet the capacity needs of future development.  
 \*\* Total includes construction cost plus preliminary engineering, design engineering, administration construction management and inspection costs. Construction costs were developed based on engineering judgment, confirmed bid prices for similar work in the Central Coast area, consultation with vendors and contractors, established budgetary unit prices for the work, and other reliable sources.  
 \*\*\* See Table 9-3 for additional upgrades to meet future needs.  
 All CIP costs are expressed in November 2009 dollars, using McGraw-Hill ENR Construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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Table 9-3. SCSD Long-Term Capital Improvement Projects

Project #	Title	Description	Tributary Area	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)*
<b>Region D1 Required Upgrades</b>															
1	Highway 218 Upgrade	Upgrade Sewer Main	Rosita	--	800	6	8	Highway 218	From SCSD's last manhole on Hwy 218 to Del Rey Gardens	D14-1	C13-38	\$240	LF	\$192,000	\$268,800
		Upgrade Sewer Main	City of Monterey	--	2,250	6	8	Highway 218	From east of Hwy 68/218 intersection to SCSD's last manhole on Hwy 218	--	D14-1	\$240	LF	\$540,000	\$756,000
<b>Total</b>															<b>\$1,024,800</b>
<b>Regions A and C Required Upgrades</b>															
2	Ortiz	Upgrade sewer main	27-inch	--	320	21	24	Ortiz	From Del Monte Blvd. to Holly Street	B9-28	B9-23	\$280	LF	\$89,600	\$125,440
				--	880	21	27	Ortiz	From Holly Street to Contra Costa Street	B9-23	A9-51	\$355	LF	\$312,400	\$437,360
<b>Total</b>															<b>\$562,800</b>
<b>Regions B and D2 Required Upgrades</b>															
3	Del Monte Lift Station VFD Upgrade	New Lift Station	Amador	1	--	--	--	Del Monte	At Del Monte Blvd. and Canyon Del Rey Intersection	--	--	\$1,250,000	LS	\$1,250,000	<b>\$1,875,000</b>
4	Rosita Lift Station VFD Upgrade	New Lift Station	Rosita	1	--	--	--	Rosita	At Rosita Road and Angelus Way	--	--	\$575,000	LS	\$575,000	<b>\$805,000</b>
5	Angelus	Upgrade sewer main	Rosita	--	1,490	8	12	Angelus	From Del Rey Park to Rosita Lift Station	C12-3	B12-7	\$205	LF	\$305,450	<b>\$427,630</b>
6	Canyon Del Rey (1)	Upgrade sewer main	Amador	--	3,280	8	12	Canyon Del Rey	From Rosita Lift Station to Hilby Avenue	B12-2	A10-14	\$265	LF	\$869,200	<b>\$1,216,880</b>
7	Canyon Del Rey (2)	Upgrade sewer main	Amador	--	800	12	15	Canyon Del Rey	From Harcourt Avenue to Sonoma Avenue	A10-9	A10-4	\$280	LF	\$224,000	<b>\$313,600</b>

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Table 9-3. SCS D Long-Term Capital Improvement Projects

Project #	Title	Description	Tributary Area	Quantity	Length (Ft)	Old Diameter (in)	New Diameter (in)	Street	Location	Upstream Manhole Number	Downstream Manhole Number	Construction Cost (\$)		Subtotal (\$)	Total Project Cost (\$)*
<b>Region C Required Upgrades</b>															
8	La Salle	New sewer main	Love Chevrolet	--	2,200	--	8	La Salle	From General Jim Moore Blvd. to Mariposa Street	--	D8-41	\$160	LF	\$352,000	\$492,800
		Upgrade sewer main			1,050	6	8	La Salle	From Mariposa Street to Luzern Street	D8-41	C8-108	\$180	LF	\$189,000	\$264,600
					1,200	8	10	La Salle	From Noche Buena Street to Fremont Blvd.	C8-33	B8-81	\$195	LF	\$234,000	\$327,600
<b>Total</b>														<b>\$1,085,000</b>	
9	Broadway	Upgrade sewer main	Broadway/ Victory Toyota	--	3,690	6	10	Broadway	From General Jim Blvd to Kenneth Street	D9-74	C9-32	\$195	LF	\$719,550	\$1,007,370
					2,460	8	10		From Kenneth Street to Fremont Blvd.	C9-32	B9-58	\$195	LF	\$479,700	\$671,580
<b>Total</b>														<b>\$1,678,950</b>	
10	Hilby	Upgrade sewer main	Contra Costa	--	4,420	6	10	Hilby	From General Jim Blvd to Shafer Street	D11-24	B10-79	\$195	LF	\$861,900	\$1,206,660
					930	8	10		From Shafer Street to Wheeler Street	B10-79	B10-52	\$195	LF	\$181,350	\$253,890
<b>Total</b>														<b>\$1,460,550</b>	
<b>TOTAL LONG-TERM PROJECT COSTS</b>														<b>\$10,450,210</b>	
<p>* Total includes construction cost plus preliminary engineering, design engineering, administration construction management and inspection costs. Construction costs were developed based on engineering judgment, confirmed bid prices for similar work in the Central Coast area, consultation with vendors and contractors, established budgetary unit prices for the work, and other reliable sources.</p> <p>All CIP costs are expressed in November 2009 dollars, using McGraw-Hill ENR Construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.</p>															

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**Table 9-4. Unit Cost for Construction of Sewer Mains**

<b>Pipe Diameter (inches)</b>	<b>Unit Cost (\$/LF)</b>	<b>Notes</b>
8	180	Special unit prices for 942 Angelus Way and Del Rey Park Sewer Main Upgrades were developed
10	195	Typical construction
10	255	For projects with heavy traffic control requirements
12	205	Typical construction
12	265	For projects with heavy traffic control requirements
12	300	For projects located in trenches with concrete backfill
15	220	Typical construction
15	280	For projects with heavy traffic controls requirements
15	315	For projects located in trenches with concrete backfill
18	235	Typical construction
27	355	Typical construction

**Table 9-5. SCSD Operation & Maintenance Annual Costs**

Title	Description	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17
<b>Video Inspection</b>	Conduct video inspection of critical sewer mains	\$ 30,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000
<b>Sewer System Management Plan</b>	Update to the Sewer System Management Plan	\$ 15,000	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
<b>Sewer Operation &amp; Maintenance</b>	Annual cleaning of all sewer lines, weekly hot spots, root intrusion, broken main repairs, reporting, etc	\$ 745,000	\$ 745,000	\$ 745,000	\$ 745,000	\$ 745,000	\$ 745,000
<b>FOG Program</b>	Develop and implement FOG program, including inspections	\$ 27,000	\$ 27,000	\$ 27,000	\$ 27,000	\$ 27,000	\$ 27,000
<b>GIS Maintenance/Mapping</b>	Update GIS database and maps on a semi-annual basis	\$ 25,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
<b>LS Maintenance</b>	Contract with MRWPCA for weekly lift station maintenance	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
<b>PG&amp;E</b>	Electricity bill for operating lift stations	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000
		<b>\$ 871,000</b>	<b>\$ 886,000</b>	<b>\$ 901,000</b>	<b>\$ 886,000</b>	<b>\$ 901,000</b>	<b>\$ 886,000</b>

\* Budgets provided by SCSD staff

**Table 9-6. SCSD Capital Outlay Annual Costs**

Purchase	Description	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17
<b>Video Inspection</b>	Purchase GIS software & hardware, including new video camera	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Vehicle</b>	Purchase new jetter truck for operation's staff	\$ 210,000	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Vehicle</b>	Purchase new pickup truck for operation's staff	\$ -	\$ 25,000	\$ -	\$ -	\$ -	\$ -
<b>Vector Truck</b>	Purchase new vector truck for operation's staff	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 450,000
		<b>\$ 225,000</b>	<b>\$ 25,000</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 450,000</b>

\* Budgets provided by SCSD staff

Table 9-7. Proportional Cost Share By Region

Project #	Project Name	Region A Existing Proportional Share	Region A Existing Proportional Costs	Region A Future Proportional Share	Region A Future Proportional Costs	Region B Proportional Share	Region B Proportional Costs	Region C Proportional Share	Region C Proportional Costs	Region D1 Proportional Share	Region D1 Proportional Costs	Region D2 Proportional Share	Region D2 Proportional Costs
<b>Near Term</b>													
1	Del Monte Lift Station Upgrade Near Term	100%	\$17,500	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
2	Rosita Lift Station Upgrades Near Term	100%	\$61,600	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
3	942 Angelus Way Sewer Main Upgrade	100%	\$50,400	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
4	Del Rey Park Sewer Main Upgrade	100%	\$267,750	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
5	Del Monte Blvd. Sewer Main Upgrade	44%	\$454,854	18%	\$186,077	0%	\$0	38%	\$392,829	0%	\$0	0%	\$0
6	Military Lift Station Replacement	100%	\$553,000	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
7	Fremont Blvd. Sewer Main Upgrade	72%	\$833,868	9%	\$104,234	0%	\$0	19%	\$220,049	0%	\$0	0%	\$0
8	Luzern St. Sewer Main Upgrade	100%	\$360,360	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
9	La Salle Ave. Sewer Main Upgrade	75%	\$372,330	0%	\$0	0%	\$0	25%	\$124,110	0%	\$0	0%	\$0
10	Tioga Lift Station Feasibility Analysis	3%	\$345	97%	\$11,155	0%	\$0	0%	\$0	0%	\$0	0%	\$0
11	Birch Ave. Sewer Main Upgrade	100%	\$450,100	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
12	Root Intrusion Sewer Main Replacement	100%	\$1,300,650	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
13	Brick Manhole Inspection	100%	\$84,813	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
14	Drop Manhole Inspection/Replacement	100%	\$415,350	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
15	Manhole Lids	100%	\$74,480	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
16	Rod Hole Replacement	100%	\$935,760	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
17	New Manhole Installations	100%	\$2,318,400	0%	\$0	0%	\$0	0%	\$0	0%	\$0	0%	\$0
18	Canyon Del Rey CMP Sewer Line Replacement	90%	\$275,846	0%	\$0	5%	\$15,325	0%	\$0	2%	\$6,130	3%	\$9,195
<b>Total</b>			<b>\$8,827,405</b>		<b>\$301,465</b>		<b>\$15,325</b>		<b>\$736,987</b>		<b>\$6,130</b>		<b>\$9,195</b>
<b>Long Term</b>													
1	Highway 218 Upgrade (Within SCSD Collection System & Monterey Project #3)	0%	\$0	0%	\$0	0%	\$0	0%	\$0	100%	\$1,024,800	0%	\$0
2	Ortiz	0%	\$0	32%	\$180,096	0%	\$0	68%	\$382,704	0%	\$0	0%	\$0
3	Del Monte Lift Station VFD Upgrade	40%	\$750,000	10%	\$187,500	20%	\$375,000	0%	\$0	13%	\$243,750	17%	\$318,750
4	Rosita Lift Station VFD Upgrade	19%	\$152,950	0%	\$0	33%	\$265,650	0%	\$0	21%	\$169,050	27%	\$217,350
5	Angelus	0%	\$0	0%	\$0	41%	\$175,328	0%	\$0	26%	\$111,184	33%	\$141,118
6	Canyon Del Rey (1)	0%	\$0	0%	\$0	41%	\$498,921	0%	\$0	26%	\$316,389	33%	\$401,570
7	Canyon Del Rey (2)	0%	\$0	0%	\$0	41%	\$128,576	0%	\$0	26%	\$81,536	33%	\$103,488
8	La Salle	0%	\$0	0%	\$0	0%	\$0	100%	\$1,085,000	0%	\$0	0%	\$0
9	Broadway	0%	\$0	0%	\$0	0%	\$0	100%	\$1,678,950	0%	\$0	0%	\$0
10	Hilby	0%	\$0	0%	\$0	0%	\$0	100%	\$1,460,550	0%	\$0	0%	\$0
<b>Total</b>			<b>\$902,950</b>		<b>\$367,596</b>		<b>\$1,443,475</b>		<b>\$4,607,204</b>		<b>\$1,946,709</b>		<b>\$1,182,276</b>

CAPITAL IMPROVEMENT PROJECTS

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# Near Term Project No. 1: Del Monte Lift Station Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 2 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$12,500
Planning, Engineering, CM, Legal/Admin (40%)		\$5,000
<b>Total Project Cost</b>		<b>\$17,500</b>

## Project Description

The current Del Monte Lift Station wetwell operating volume is inadequate for existing inflow, causing excessive pump cycling and low emergency response time. This upgrade proposes to install a bypass to the wetwell, allowing for emergency pumping in the case of pump failure. In addition, a field investigation and corresponding analysis is required to determine if operating volume can be increased within the existing wetwell, or by utilizing the portion of the wetwell that was abandoned under a previous project.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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San Luis Obispo, CA

## NEAR TERM PROJECT NO. 1 DEL MONTE LIFT STATION UPGRADE

NOTES:  
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# Near Term Project No. 2: Rosita Lift Station Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 3 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$44,000
	Planning, Engineering, CM, Legal/Admin (40%)	\$17,600
	<b>Total Project Cost</b>	<b>\$61,600</b>

## Project Description

The Rosita Lift Station is in fair to poor condition and has insufficient operating volume causing excessive pump cycles per hour. This upgrade project proposes to: plug the existing by-pass line to the creek, increase operating volume by changing pump set points, re-align pump bases, replace slide rail connections and lift chains, reroute emergency generator conduit, fix or install a new vault lid, and install a drain to prevent standing water in the vault.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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## NEAR TERM PROJECT NO. 2 ROSITA LIFT STATION UPGRADE

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# Near Term Project No. 3: 942 Angelus Way Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 3 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Environmental threat/potential spill

## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$36,000
	Planning, Engineering, CM, Legal/Admin (40%)	\$14,400
	<b>Total Project Cost</b>	<b>\$50,400</b>

## Project Description

The 942 Angelus Way project proposes to replace the existing steel sewer line that crosses the creek just south of Del Rey Park, with ductile iron pipe that is less susceptible to damage. The existing steel line is exposed to the atmosphere and has developed a pinhole leak that has been patched with a pipe sleeve. This project requires approximately 80 feet of new sewer main.



1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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## NEAR TERM PROJECT NO. 3 942 ANGELUS WAY SEWER LINE UPGRADE

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# Near Term Project No. 4: Del Rey Park Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

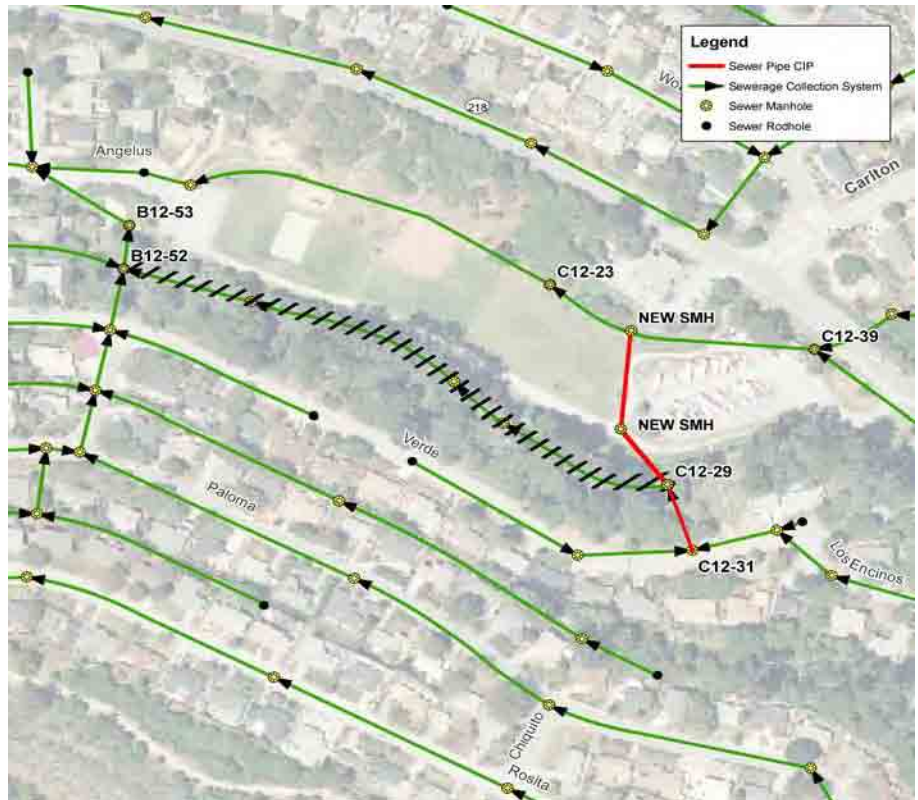
Est. Construction Duration: 5 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$191,250
	Planning, Engineering, CM, Legal/Admin (40%)	\$76,500
	<b>Total Project Cost</b>	<b>\$267,750</b>



## Project Description

The Del Rey Park project proposed to reroute existing sewer main to the main in Del Rey Park, to allow for access for operations and maintenance and reduce future problems with root intrusion. The existing sewer main is inaccessible for maintenance due to proximity to the creek, and the trees and shrubs growing over the sewer main cause pipe offsets and root intrusion. A 125 foot segment of existing 6-inch VCP is proposed to be upgraded to 8-inch pipe, with 300 feet of new 8-inch pipe, for a total project length of 425 feet.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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## NEAR TERM PROJECT NO. 4 DEL REY PARK SEWER LINE UPGRADE

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# Near Term Project No. 5: Del Monte Blvd Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	44%
New Development	56%
Region A	18%
Region B	0%
Region C	38%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 12 weeks



## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

Construction Cost <sup>1</sup>	\$738,400
Planning, Engineering, CM, Legal/Admin (40%)	\$295,360
<b>Total Project Cost</b>	<b>\$1,033,760</b>

## Project Description

The Del Monte Boulevard project proposes to replace and reroute existing sewer main in Fremont Boulevard. The existing main has potential for overflow due to insufficient capacity. Relocating the new sewer in Del Monte Boulevard allows for multiple existing mains to be abandoned and consolidated, and limits construction in Fremont Boulevard which is costly due to the thickness of existing asphalt and concrete in the roadway. Total length of new 15-inch sewer main is approximately 3,200 feet. The new line is sized to accept future flow.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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## NEAR TERM PROJECT NO. 5 DEL MONTE BLVD SEWER LINE UPGRADE

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# Near Term Project No. 6: Military Lift Station Replacement

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 16 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$395,000
	Planning, Engineering, CM, Legal/Admin (40%)	\$158,000
	<b>Total Project Cost</b>	<b>\$553,000</b>



## Project Description

The existing Military Lift Station is in poor physical condition and experiences high levels of inflow and infiltration during storm events. The Lift Station project proposes to replace the station in its entirety, with a new station that matches existing pump and wet well capacity. In addition, the installation of a sealed lid at the station may prevent some inflow at the wet well.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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## NEAR TERM PROJECT NO. 6 MILITARY LIFT STATION REPLACEMENT

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# Near Term Project No. 7: Fremont Blvd Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	72%
New Development	28%
Region A	9%
Region B	0%
Region D1	0%
Region C	19%
Region D2	0%

## Project Components

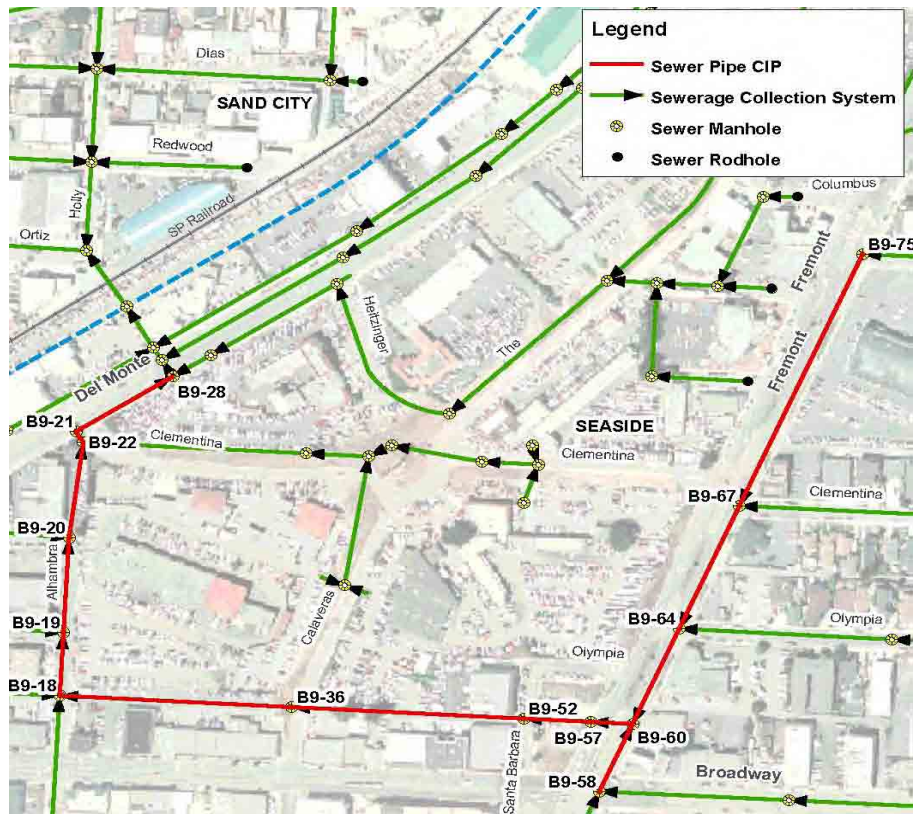
- Upgrade Gravity Pipeline
- New Gravity Pipeline
- Upgrade Lift Station
- Upgrade Force Main
- Rehabilitation/Repair
- Inspection and/or analysis
- Replace Manhole or Rodhole

## Project Scheduling

Est. Construction Duration: 14 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$827,250
	Planning, Engineering, CM, Legal/Admin (40%)	\$330,900
	<b>Total Project Cost</b>	<b>\$1,158,150</b>

## Project Description

The Fremont Boulevard upgrade project proposes to replace approximately 3,200 feet of sewer main to provide capacity for existing flow conditions. Existing flow causes segments of pipes and manholes to surcharge during peak flow conditions. The existing 10, 12, and 15-inch pipe will be upsized one standard pipe diameter to 12, 15, and 18-inch, respectively. Although future development will contribute additional flow to this pipe segment, the pipe does not need to be upsized further to accept future flow conditions.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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## NEAR TERM PROJECT NO. 7 FREMONT BLVD SEWER LINE UPGRADE

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# Near Term Project No. 8: Luzern Street Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 6 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$257,400
Planning, Engineering, CM, Legal/Admin (40%)		\$102,960
<b>Total Project Cost</b>		<b>\$360,360</b>

## Project Description

The Luzern project proposes to replace approximately 1,430 feet of 6-inch sewer main with 8-inch, from the Military Lift Station discharge location to La Salle Avenue. In addition, three existing manholes will be upgraded with bolted manhole covers, due to their shallow depth and likelihood of overflow due to the pressure flow from the lift station. This location has overflowed in the past, and both the increased pipe capacity and bolted manhole covers will help to alleviate this problem.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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## NEAR TERM PROJECT NO. 8 LUZERN STREET SEWER LINE UPGRADE

## NOTES:

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# Near Term Project No. 9: La Salle Avenue Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	75%
New Development	25%
Region A	0%
Region B	0%
Region C	25%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 6 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$384,150
	Planning, Engineering, CM, Legal/Admin (40%)	\$153,660
	<b>Total Project Cost</b>	<b>\$537,810</b>

## Project Description

The La Salle Avenue project proposes to upgrade approximately 1,430 feet of 6-inch sewer to 10-inch, from Luzern Street to Noche Buena Street. This location has insufficient capacity for existing conditions, and exhibits potential for overflow near to the La Salle and Luzern intersection during peak flow conditions. The new pipe is sized to meet future needs due to potential flow contribution from Region C.



1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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## NEAR TERM PROJECT NO. 9 LA SALLE AVENUE SEWER LINE UPGRADE

## NOTES:

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# Near Term Project No. 10: Tioga Lift Station Feasibility Analysis

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	3%
New Development	97%
Region A	97%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

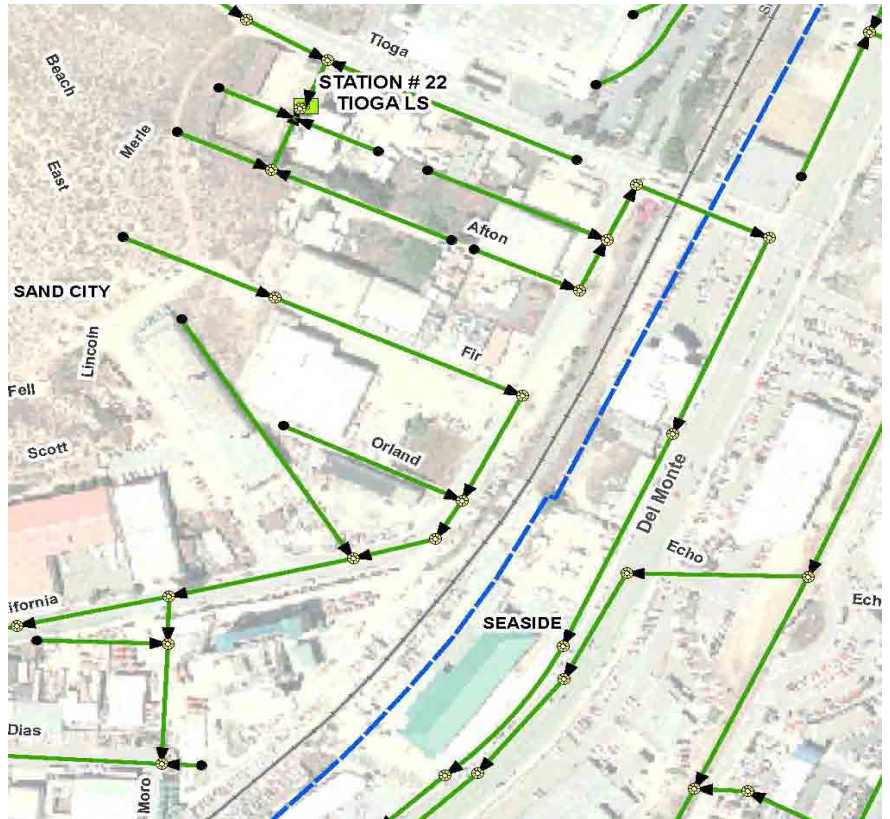
- Upgrade Gravity Pipeline
- New Gravity Pipeline
- Upgrade Lift Station
- Upgrade Force Main
- Rehabilitation/Repair
- Inspection and/or analysis
- Replace Manhole or Rodhole

## Project Scheduling

Est. Construction Duration: 0 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Analysis Cost <sup>1</sup>	\$10,000
	Planning, Legal/Admin (15%)	\$1,500
	<b>Total Project Cost</b>	<b>\$11,500</b>

## Project Description

The Tioga Lift Station receives a very small volume of flow from existing development on and near to Tioga Avenue. Low inflow to a lift station may result in formation of hydrogen sulfide gas, causing safety and odor issues. The Tioga project proposes to complete a feasibility study to determine if the lift station can be abandoned, and existing sewer connections re-located to a gravity sewer main. The abandonment would result in cost savings to the District due to the elimination of operations and maintenance costs.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## NEAR TERM PROJECT NO. 10 TIOGA LIFT STATION FEASIBILITY ANALYSIS

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Near Term Project No. 11: Birch Avenue Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 7 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$321,500
	Planning, Engineering, CM, Legal/Admin (40%)	\$128,600
	<b>Total Project Cost</b>	<b>\$450,100</b>

## Project Description

The Birch Avenue project proposes to replace approximately 1,600 feet of 8-inch and 10-inch sewer main with 10-inch and 12-inch pipe, respectively. This sewer main flows near to maximum capacity under peak flow conditions. This project includes replacing existing pipe on Laguna Street, Phoenix Avenue, Baker Street, and Birch Avenue.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## NEAR TERM PROJECT NO. 11 BIRCH AVENUE SEWER LINE UPGRADE

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Near Term Project No. 12: Root Intrusion Sewer Line Replacement

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

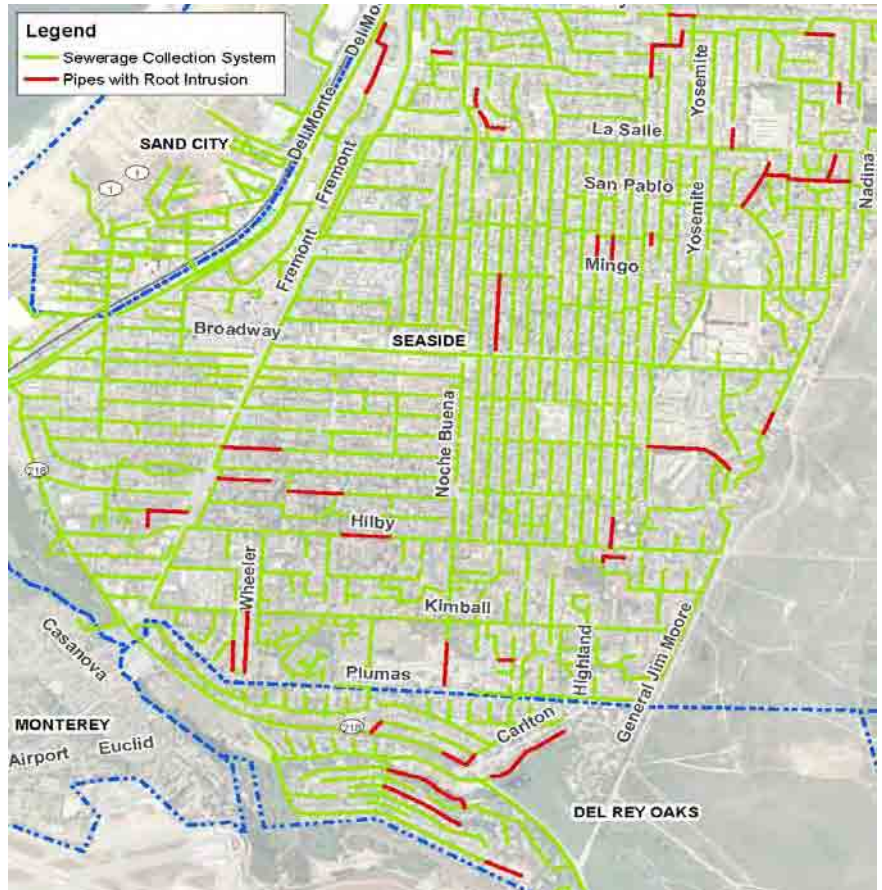
- Upgrade Gravity Pipeline
- New Gravity Pipeline
- Upgrade Lift Station
- Upgrade Force Main
- Rehabilitation/Repair
- Inspection and/or analysis
- Replace Manhole or Rodhole

## Project Scheduling

N/A

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

Video Inspection Cost <sup>1</sup>	\$1,131,000
Planning, Legal/Admin (15%)	\$169,650
<b>Total Project Cost</b>	<b>\$1,300,650</b>

## Project Description

SCSD has over 3.5 miles of sewer main that are treated yearly for continual root intrusion. This effort is both time consuming and costly, and requires the use of chemicals and cleaning equipment. The Root Intrusion Replacement project proposes to video inspect all sewer mains with known root intrusion and identify pipes for replacement that appear to be in poor condition. At this time it is estimated that approximately 30% of the existing sewer mains with root intrusion will need to be replaced.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

PREPARED BY:  
Wallace Group  
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San Luis Obispo, CA

## NEAR TERM PROJECT NO. 12 ROOT INTRUSION SEWER LINE REPLACEMENT

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Near Term Project No. 13: Brick Manhole Inspection

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

N/A

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Description

The Brick Manhole Inspection project proposes to inspect all existing brick manholes, to identify locations with water and/or sand infiltration or evidence of deterioration. Once identified, problem manholes will be slated for upgrad with epoxy lining to protect against corrosion or replacement, as required. There are approximately 295 brick manholes in the SCSD system.



## Project Cost Breakdown

Inspection Cost <sup>1</sup>	\$73,750
Planning, Legal/Admin (15%)	\$11,063
<b>Total Project Cost</b>	<b>\$84,813</b>

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

## PREPARED BY:

Wallace Group  
www.wallacegroup.us  
San Luis Obispo, CA

## NEAR TERM PROJECT NO. 13 BRICK MANHOLE INSPECTION

## NOTES:

Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Near Term Project No. 14: Drop Manhole Inspection

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

N/A

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

Inspection Cost <sup>1</sup>	\$69,000
Planning, Legal/Admin (15%)	\$10,350
Construction Cost <sup>1</sup>	\$240,000
Planning, Engineering, CM, Legal/Admin (40%)	\$96,000
<b>Total Project Cost</b>	<b>\$415,350</b>

## Project Description

The Drop Manhole Inspection project proposes to inspect all existing drop manholes to determine where drop manholes were improperly constructed. Once identified, drop manholes would be reconstructed to SCSD standards to limit turbulence and odor issues. There are approximately 92 drop manholes in the SCSD system, including brick manholes that are also drop manholes. It is anticipated that approximately 30 of the existing drop manholes in the system will need to be replaced.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## NEAR TERM PROJECT NO. 14 DROP MANHOLE INSPECTION

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Near Term Project No. 15: Manhole Lid Replacement

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

N/A

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$53,200
	Planning, Engineering, CM, Legal/Admin (40%)	\$21,280
	<b>Total Project Cost</b>	<b>\$74,480</b>

## Project Description

The Manhole Lid Replacement project proposes to install either solid gasketed manhole lids or manhole inserts in locations where water and sand infiltration and inflow is an ongoing maintenance problem. The solid lids would prevent sand and water from entering the manhole, and inserts in the manholes would capture sand and water before it enters the collection system. Approximately 76 manholes have been identified for this project.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## NEAR TERM PROJECT NO. 15 MANHOLE LID REPLACEMENT

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Near Term Project No. 16: Rod Hole Replacement

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

N/A

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$668,400
	Planning, Engineering, CM, Legal/Admin (40%)	\$267,360
	<b>Total Project Cost</b>	<b>\$935,760</b>

## Project Description

The Rod Hole Replacement project proposes to upgrade all existing rod holes with an 8-inch riser to allow for operations and maintenance access. Rod holes were installed throughout the SCSD system at the end of sewer mains, similar to cleanouts, and are not accessible for inspection and cleaning of the sewer mains. The most critical maintenance locations would be replaced first, with the remainder of the rod holes replaced over an extended period of time. There are approximately 557 rodholes throughout the SCSD system. In addition, a new video camera that fits within the 8-inch risers would be purchased for video inspection of the sewer mains.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

## PREPARED BY:

Wallace Group  
www.wallacegroup.us  
San Luis Obispo, CA

## NEAR TERM PROJECT NO. 16 ROD HOLE REPLACEMENT

## NOTES:

Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Near Term Project No. 17: New Manhole Installation

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	100%
New Development	0%
Region A	0%
Region B	0%
Region C	0%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

N/A

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$1,656,000
Planning, Engineering, CM, Legal/Admin (40%)		\$662,400
<b>Total Project Cost</b>		<b>\$2,318,400</b>

## Project Description

The New Manhole Installation project proposes to install a new manhole on existing sewer mains with an existing length greater than 400 feet (manhole to manhole). Current SCSD standards require a maximum pipe length of 400 feet, which allows for adequate access for operation and maintenance crews to clean the sewer mains properly. Approximately 207 pipes in the SCSD system have a length greater than 400 feet.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## NEAR TERM PROJECT NO. 17 NEW MANHOLE INSTALLATION

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Near Term Project No. 18: Canyon Del Rey CMP Sewer Line Replacement

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	90%
New Development	10%
Region A	0%
Region B	5%
Region C	0%
Region D1	2%
Region D2	3%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 6 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$218,925
Planning, Engineering, CM, Legal/Admin (40%)		\$87,570
<b>Total Project Cost</b>		<b>\$306,495</b>

## Project Description

The Canyon Del Rey CMP project proposes to replace three existing sewer pipe segments due to potentially poor physical condition. Through routine maintenance operations, the District has determined this sewer main may not be structurally sound, and a nearby stretch of sewer main originally constructed at the same time has already failed and been replaced. The project includes approximately 810 feet of existing 12-inch pipe on Canyon Del Rey from Hilby Avenue to Harcourt Avenue. The pipe segment at Harcourt Avenue, approximately 285 feet, will be upsized to 15-inch to provide capacity for future flow conditions.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

## PREPARED BY:

Wallace Group  
www.wallacegroup.us  
San Luis Obispo, CA

## NEAR TERM PROJECT NO. 18 CANYON DEL REY CMP SEWER LINE REPLACEMENT

## NOTES:

Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 1: Highway 218 Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	0%
New Development	100%
Region A	0%
Region B	0%
Region C	0%
Region D1	100%
Region D2	0%

## Project Components

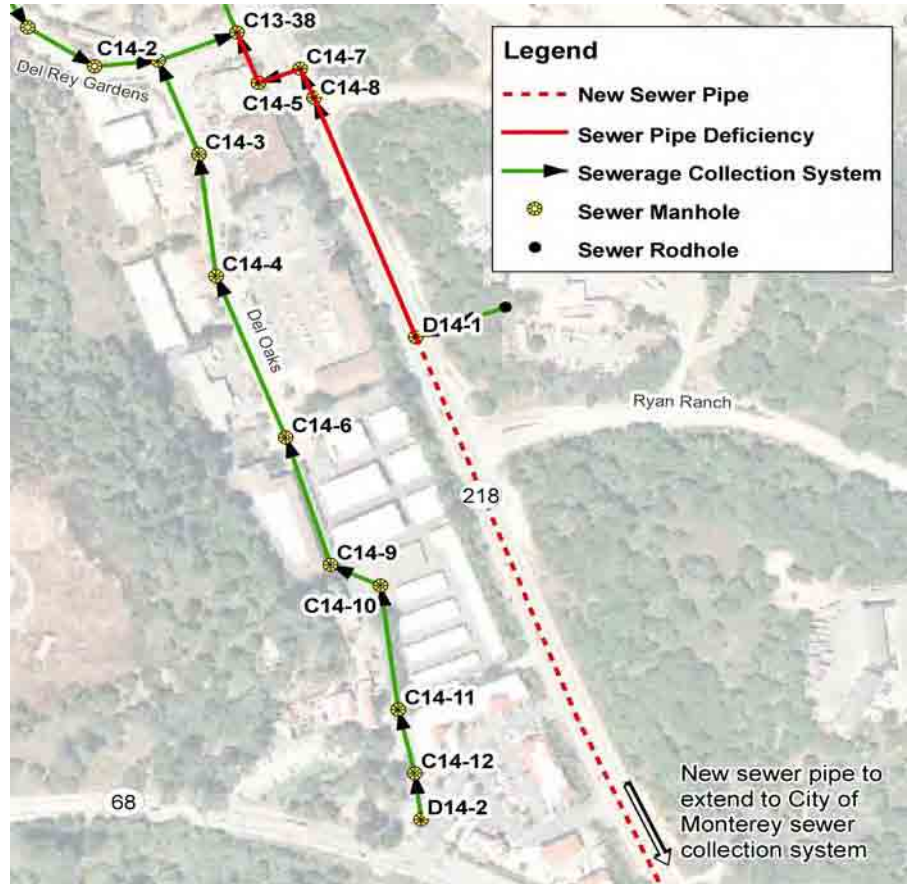
- Upgrade Gravity Pipeline
- New Gravity Pipeline
- Upgrade Lift Station
- Upgrade Force Main
- Rehabilitation/Repair
- Inspection and/or analysis
- Replace Manhole or Rodhole

## Project Scheduling

Est. Construction Duration: 14 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$732,000
Planning, Engineering, CM, Legal/Admin (40%)		\$292,800
<b>Total Project Cost</b>		<b>\$1,024,800</b>

## Project Description

The Highway 218 project proposes to reroute existing City of Monterey (Region D1) sewer to the SCSD system. Region D1 currently flows to a lift station with known maintenance problems, and poor pipe condition results in a high level of inflow and infiltration during storm events. Rerouting the D1 piping to SCSD would allow for the City's lift station to be abandoned, and the new piping could reduce infiltration and inflow. Approximately 800 feet of existing SCSD sewer in Highway 218 would be upsized from 6-inch to 8-inch to accommodate the Region D1 flow. Approximately 2,250 feet of new main is required to route D1 to SCSD.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

## PREPARED BY:

Wallace Group  
www.wallacegroup.us  
San Luis Obispo, CA

## LONG TERM PROJECT NO. 1 HIGHWAY 218 SEWER LINE UPGRADE

## NOTES:

Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 2: Ortiz Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	0%
New Development	100%
Region A	32%
Region B	0%
Region C	68%
Region D1	0%
Region D2	0%

## Project Components

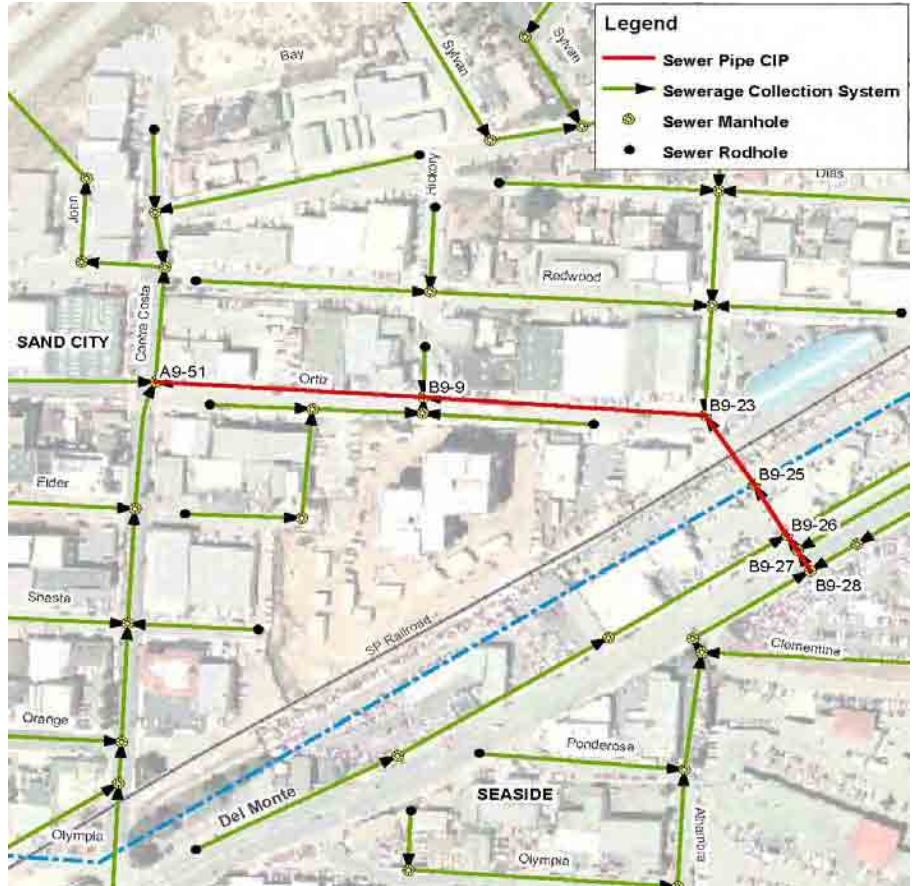
- Upgrade Gravity Pipeline
- New Gravity Pipeline
- Upgrade Lift Station
- Upgrade Force Main
- Rehabilitation/Repair
- Inspection and/or analysis
- Replace Manhole or Rodhole

## Project Scheduling

Est. Construction Duration: 11 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$402,000
Planning, Engineering, CM, Legal/Admin (40%)		\$160,800
<b>Total Project Cost</b>		<b>\$562,800</b>

## Project Description

The Ortiz upgrade project proposes to replace approximately 1,200 feet of existing 21-inch sewer main, on Ortiz Avenue from Del Monte Boulevard to Contra Costa Street. This project includes approximately 320 feet of new 24-inch sewer main and approximately 880 feet of new 27-inch sewer main, and is recommended to be complete prior to any future service connection to the existing collection system. This project requires construction within the Southern Pacific Railroad right-of-way.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

## PREPARED BY:

Wallace Group  
www.wallacegroup.us  
San Luis Obispo, CA

## LONG TERM PROJECT NO. 2 ORTIZ SEWER LINE UPGRADE

## NOTES:

Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 3: Del Monte Lift Station VFD Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	40%
New Development	60%
Region A	10%
Region B	20%
Region D1	13%
Region C	0%
Region D2	17%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 30 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$1,250,000
Planning, Engineering, CM, Legal/Admin (50%)		\$625,000
<b>Total Project Cost</b>		<b>\$1,875,000</b>

## Project Description

The Del Monte Lift Station VFD project proposes to replace the existing lift station with a new wetwell and three new VFD operated submersible pumps. Additional required infrastructure includes a permanent stand-by generator, upgraded force main, and new valve vault. The existing lift station is not capable of pumping potential future flows, and the wetwell has insufficient capacity for existing inflow. The installation of VFDs will minimize downstream collection system impacts due to potential increased flows to the Del Monte lift station.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

### LONG TERM PROJECT NO. 3 DEL MONTE LIFT STATION VFD UPGRADE

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 4: Rosita Lift Station VFD Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	19%
New Development	81%
Region A	0%
Region B	33%
Region C	0%
Region D1	21%
Region D2	27%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 24 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration



## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$575,000
	Planning, Engineering, CM, Legal/Admin (40%)	\$230,000
	<b>Total Project Cost</b>	<b>\$805,000</b>

## Project Description

The Rosita Lift Station VFD project proposes to replace the existing lift station with a new wet well and VFD operated pumps to provide capacity for potential future inflow. The existing force main is required to be replaced to accommodate the increase lift station flow. The installation of VFDs will minimize downstream collection system impacts due to potential increased flows to the Rosita lift station. In addition, the existing wet well could be used for an overflow basin for emergency storage in the case of pump failure.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## LONG TERM PROJECT NO. 4 ROSITA LIFT STATION VFD UPGRADE

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 5: Angelus Way Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	0%
New Development	100%
Region A	0%
Region B	41%
Region D1	26%
Region C	0%
Region D2	33%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 9 weeks

## Project Need

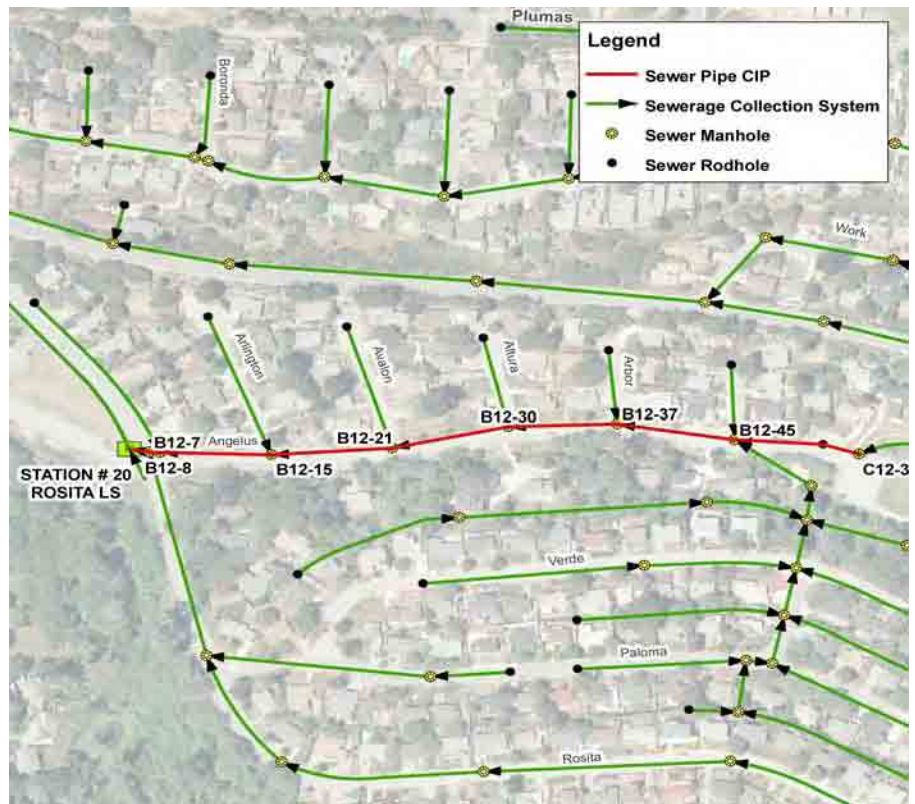
- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$305,450
	Planning, Engineering, CM, Legal/Admin (40%)	\$122,180
	<b>Total Project Cost</b>	<b>\$427,630</b>

## Project Description

The Angelus Way project proposes to upgrade approximately 1,490 feet of 8-inch pipe to 12-inch, from Del Rey Park to the Rosita Lift Station. This project increases collection system capacity to provide potential sanitary sewer service to Regions B, D1, and D2. Existing sewer piping upstream from this recommended upgrade is 12-inch.



1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## LONG TERM PROJECT NO. 5 ANGELUS WAY SEWER LINE UPGRADE

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 6: Canyon Del Rey Sewer Line Upgrade (1)

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	0%
New Development	100%
Region A	0%
Region B	41%
Region C	0%
Region D1	26%
Region D2	33%

## Project Components

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

## Project Scheduling

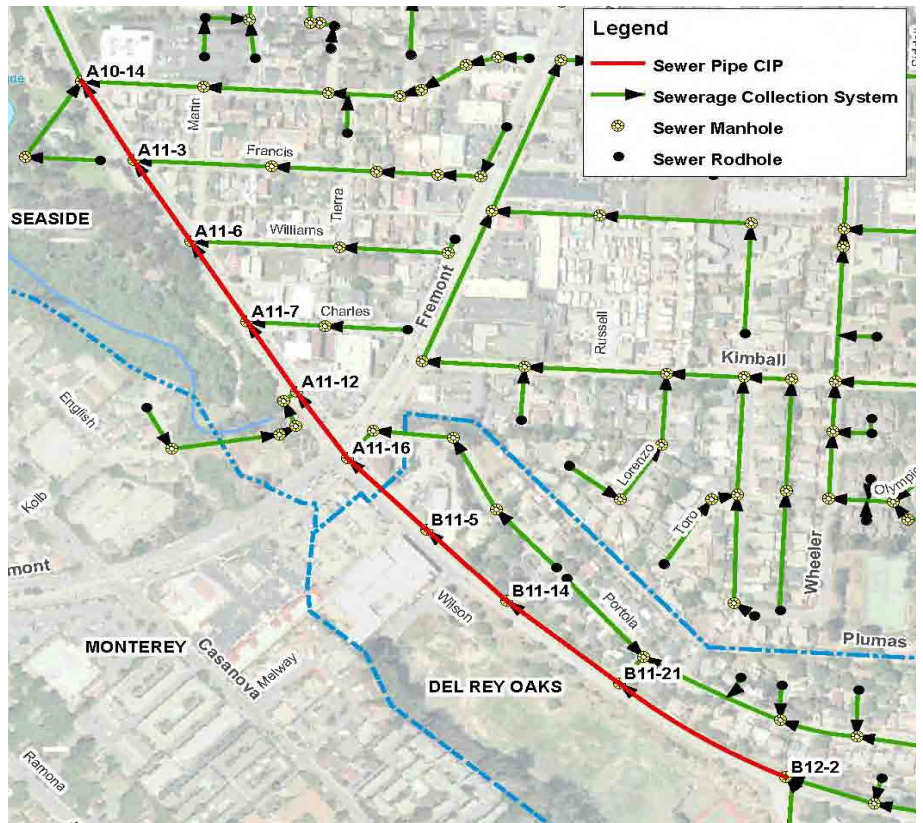
Est. Construction Duration: 15 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$869,200
Planning, Engineering, CM, Legal/Admin (40%)		\$347,680
<b>Total Project Cost</b>		<b>\$1,216,880</b>



## Project Description

The Canyon Del Rey (1) project proposes to upgrade approximately 3,280 feet of 8-inch sewer main to 12-inch, from the Rosita Lift Station to Hilby Avenue. This project increases collection system capacity to provide potential sanitary sewer service to Regions B, D1, and D2, and accommodate the potential increased flow from the proposed Rosita Lift Station upgrade.

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## LONG TERM PROJECT NO. 6 CANYON DEL REY SEWER LINE UPGRADE (1)

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 7: Canyon Del Rey Sewer Line Upgrade (2)

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	0%
New Development	100%
Region A	0%
Region B	41%
Region D1	26%
Region C	0%
Region D2	33%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 7 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$224,000
Planning, Engineering, CM, Legal/Admin (40%)		\$89,600
<b>Total Project Cost</b>		<b>\$313,600</b>

## Project Description

The Canyon Del Rey (2) project proposes to upgrade approximately 800 feet of 12-inch sewer main to 15-inch, from Harcourt Avenue to Sonoma Avenue. This project increases collection system capacity to provide potential sanitary sewer service to Regions B, D1, and D2, and accommodate potential increased flow from the proposed Rosita Lift Station upgrade.



1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## LONG TERM PROJECT NO. 7 CANYON DEL REY SEWER LINE UPGRADE (2)

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 8: La Salle Avenue Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	0%
New Development	100%
Region A	0%
Region B	0%
Region C	100%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 15 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

	Construction Cost <sup>1</sup>	\$775,000
	Planning, Engineering, CM, Legal/Admin (40%)	\$310,000
	<b>Total Project Cost</b>	<b>\$1,085,000</b>

## Project Description

The La Salle Avenue project proposes to upgrade existing sewer main and construct new sewer main to provide potential sanitary sewer service to the Region C development. Approximately 1,050 feet of existing 6-inch main and 1,200 feet of 8-inch main would be upsized to 8-inch and 10-inch respectively. Approximately 2,200 feet of new 8-inch pipe is required on La Salle from Mariposa Avenue to General Jim Moore Boulevard.



1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## LONG TERM PROJECT NO. 8 LA SALLE AVENUE SEWER LINE UPGRADE

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 9: Broadway Avenue Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	0%
New Development	100%
Region A	0%
Region B	0%
Region C	100%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 18 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Description

The Broadway Avenue project proposes to upgrade approximately 3,690 feet of 6-inch sewer main and 2,460 feet of 8-inch sewer main to 10-inch, from General Jim Moore Boulevard to Fremont Avenue. This project would increase collection system capacity to provide sanitary sewer service to potential development in Region C.



## Project Cost Breakdown

Construction Cost <sup>1</sup>	\$1,199,250
Planning, Engineering, CM, Legal/Admin (40%)	\$479,700
<b>Total Project Cost</b>	<b>\$1,678,950</b>

1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

## LONG TERM PROJECT NO. 9 BROADWAY AVENUE SEWER LINE UPGRADE

NOTES:  
Wallace Group did not perform boundary survey services for this map. Not a legal document.



# Long Term Project No. 10: Hilby Avenue Sewer Line Upgrade

Seaside County Sanitation District Capital Improvement Project Information Sheet  
2010 Sewer Collection System Master Plan

## Project Trigger

- Existing Condition
- Future Condition

## Jurisdiction

- City of Seaside
- City of Del Rey Oaks
- Sand City

## Project Benefit

Existing Customers	0%
New Development	100%
Region A	0%
Region B	0%
Region C	100%
Region D1	0%
Region D2	0%

## Project Components

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

## Project Scheduling

Est. Construction Duration: 17 weeks

## Project Need

- Insufficient capacity for existing flow
- Insufficient capacity for future flow
- Existing condition limits O&M
- Reduction of I/I & sand infiltration

## Project Cost Breakdown

Construction Cost <sup>1</sup>	\$1,043,250
Planning, Engineering, CM, Legal/Admin (40%)	\$417,300
<b>Total Project Cost</b>	<b>\$1,460,550</b>

## Project Description

The Hilby Avenue project proposes to upgrade approximately 4,420 feet of 6-inch sewer main and 930 feet of 8-inch sewer main to 10-inch, from General Jim Moore Boulevard to Wheeler Street. This project would increase collection system capacity to provide sanitary sewer service to potential development in Region C.



1. Construction costs are expressed in Year 2009 dollars, using an ENR construction Cost Index of 8592, and will need to be escalated to the year or years scheduled for the work.

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

### LONG TERM PROJECT NO. 10 HILBY AVENUE SEWER LINE UPGRADE

NOTES:  
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## CHAPTER 10

### SEWER RATE STUDY

This Chapter presents the sewer rate study prepared by David Taussig & Associates with support from District staff, District Board and Wallace Group.

#### INTRODUCTION

Seaside County Sanitation District (“SCSD” or the “District”) is a special district responsible for the maintenance and operation of the sanitary sewer collection system serving the Cities of Del Rey Oaks, Sand City and Seaside. The District’s sanitary sewer collection system serves an area of approximately 2,400 acres with a population of about 37,000. The sewer system consists of approximately 73 miles of pipeline with 740 manholes, 560 rod holes, and 4 lift stations. The wastewater is ultimately pumped to the Monterey Regional Water Pollution Control Agency (“MRWPCA”) regional wastewater treatment plant.

SCSD has engaged David Taussig & Associates, Inc. (“DTA”) to review and update the District’s current sewer rate structure. This study provides the background, legal justification and cost of service analysis to support the recommended rate structure provided herein. The recommended rate structure accomplishes the following objectives:

- Generate revenues to fund annual operating costs, capital costs and reserve requirements;
- Determine sewer rates that are equitable to all users; and
- Create sewer rates that are Proposition 218 compliant.

The scope of services necessary to accomplish the objectives above is outlined below:

- Review current rate structure and recommend any changes to the rate structure;
- Document the legal justification for imposing the recommended rate structure;
- Define an Equivalent Dwelling Unit (“EDU”) Methodology;
- Perform a Revenue Requirement and Cost of Service Analysis using rate modeling techniques. The model will provide a 15 year horizon, however the rate structure will cover the first five years of the model;
- Calculate sewer rates needed to fund all costs on a pay-as-you-go basis; and
- Design a recommended rate structure for the various user classes and describe a path for implementation.

#### LEGAL JUSTIFICATION

Ongoing fees for sewer service are commonly called rates. These sewer rates must be supported by a cost of service study showing the revenue requirement will be met

through the collection of sewer rates as well as a method of reasonably apportioning the costs of service to the various customer classes. Sewer rates for ongoing sewer service have a direct relationship to land ownership, hence are considered property-related fees subject to the limitations of Article XIII D, Section 6 of the California Constitution (“Proposition 218”).

Proposition 218 was adopted in 1996, adding Article XIII C and D to the California Constitution dealing with the initiative process and procedures involving real property-related fees and charges. While some real property-related fees and charges require voter approval, it is clear that sewer rates are exempt from such requirement. However, sewer agencies that provide sewer services to landowners are still subject to certain limitations of Proposition 218, including:

1. Revenues derived from the fee or charge shall not exceed the funds required to provide the property-related service;
2. Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed;
3. The amount of fee or charge imposed on any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to that parcel;
4. No fee or charge may be imposed for a service unless that service is actually used by, or immediately available to, the owner of the property in question; and
5. The fee or charge is subject to a majority protest and individual notices regarding such fee or charge must be mailed to all affected utility customers/property owners.

The rate structure recommended in this study will meet all of the limitations of Proposition 218 in both revenue requirements and proportionality.

## **CURRENT RATE STRUCTURE AND RECOMMENDED CHANGES**

SCSD currently funds the majority of its operational and capital improvement costs through sewer rate revenue. SCSD’s current sewer rates are charged as a percentage add-on to the rates charged by MRWPCA and are included as a separate line item on MRWPCA’s bi-monthly bills. The current SCSD sewer rate is equal to 66.4% of the MRWPCA rate as shown in Table 1 of Exhibit A. For residential users, this equates to \$7.97 per month (66.4% of MRWPCA rate of \$12.00 per month).

MRWPCA cost of service includes operations, maintenance and capital improvement costs required to provide sewage collection and treatment to its customers. MRWPCA’s rates are based on three cost factors: i) contributing sewage flow, measured in gallons per day; ii) sewage strength measured in milligrams per liter (“mg/l”) of biochemical oxygen demand; and iii) suspended solids, measured in parts per million (“ppm”). This makes sense for MRWPCA because they are a sewer treatment agency and their costs are related to these three factors. However, since SCSD is a sewer “collection” agency, it was determined that in order to meet the benefit requirements of Proposition 218, the sewer rate should be based solely on sewage flow.

In the past it has been generally accepted that a percentage add-on (66.4% for example) was an acceptable and easy to implement rate structure to cover SCSD cost of service. However, as discussed in Introduction above, the limitations of Proposition 218 include the requirement that “revenues derived from the fee or charge shall not exceed the funds required to provide the property-related service.” In order to, as best as possible, ensure that SCSD revenues match their costs of service, an equivalent dwelling unit (“EDU”) methodology will be used, as explained in more detail in the EDU Analysis Section in this Chapter.

## **EDU ANALYSIS**

An equivalent dwelling unit (“EDU”) is the means by which we relate benefits of service for a particular customer to a base customer, which in this case would be a customer residing in a residential unit. The EDU represents the relative magnitude of average sewage flow, consequently the average impact to the collection system and therefore average cost recovery responsibility within the service area as compared to those same variables for a residential dwelling unit. The EDU factor for a specific land use is expressed as a ratio of the magnitude of the demand variable for that land use to the magnitude of the demand variable for a base customer or land use, in this case a residential dwelling unit. The demand variable in this EDU analysis is the average sewer generation rate in gallons per day (“GPD”) as shown in Table 2 of Exhibit A. Data on average flow by land use category was provided by MRWPCA. For instance, a residential unit is expressed as 1.00 EDU for our analysis and a motel/hotel room is expressed as 0.43 (82 GPD for “Motel/Hotel” divided by 189 GPD for “Residential”) EDUs. Therefore, the sewer rate charged per motel/hotel room would be 0.43 times the amount charged for a residential unit. The EDUs for all other land use categories are based on the average flow for each land use as compared to the flow for a residential unit. Please note that certain customers considered “special users” as identified in Table 2 of Exhibit A, are charged annually based on water usage, which is considered a proxy for sewer flow rate.

The various land uses that are used in this analysis are consistent with the land use categories used by MRWPCA as shown in Tables 1, 2, and 3 of Exhibit A. MRWPCA provided data regarding existing customers along with the appropriate usage factors by various land use categories within the SCSD service area. These customer counts were then multiplied by their corresponding EDU factors, calculating an aggregate EDU count of 10,754, as shown in Table 2 of Exhibit A.

## **REVENUE REQUIREMENTS AND COST OF SERVICE**

The sewer revenue requirement analysis determines the level of revenues necessary to cover the cost of providing sewer collection services to its customers. Because Proposition 218 restricts the total revenue requirement to only that which is necessary to fund the cost of service, annual budgets need to be developed to identify and quantify operation and maintenance costs, to include a capital improvement and capital replacement program and to fund a reserve program for rate stabilization. A Financial Model was developed (see Exhibit B) that forecasts revenues and operational and maintenance costs over a 15 year period. The net revenue (revenue less operational

expenses) will then fund a rate stabilization reserve program and also a capital replacement program. A 15 year projected time period (fiscal years 2011-12 through 2025–26) was chosen in order to match the timing of operational expenses and capital replacement projects as described in further detail below.

Expenditures include (i) operations and maintenance and other outside services, (ii) capital replacement, and (iii) reserve stabilization. The District's principal sources of revenue to recover these costs include the sewer rates, the District's share of property taxes, and use of money and property charges. The new sewer rates are calculated to fund all costs on a pay-as-you-go basis.

A description of the revenues, operating and maintenance expenses, capital replacement costs, reserve requirements, and capital facilities replacement fund are shown below.

### **Revenues**

Annual operating revenues for the District consist of rate revenue, ad valorem property taxes, revenue from use of money and property, and estimated capacity fee revenues.

For purposes of the Financial Model, the ad valorem property tax revenue was assumed to decrease from the current level of \$255,778 by 3% in year one, hold constant in year two and increase at 2% per year for every year thereafter. Revenue from use of money and property is based on the District's budget and is assumed to remain level each year at \$51,157. Capacity fee calculations and fair share allocations to new development were not a part of the current scope of work. However, for purposes of the Financial Model, capacity fee revenues are estimated at \$136,327 annually starting in year six. The estimated capacity fee revenues were calculated based on the amount of escalated costs allocated to new development of approximately \$2.7 million (based on unescalated cost of \$2.2 million in Table 10-1, located at the end of the Chapter) and assumed to be collected in equal amounts each year for 20 years.

### **Operating and Maintenance Expenses**

Annual operating expenses are grouped into two categories: District employee labor and materials allocated to sewer operations and outside services. The sewer operations budget for year one is \$745,000 as shown in Table 9-5. For purposes of the Financial Model, the sewer operating expenses are assumed to increase each year by 3%. Outside services consist of video inspections, sewer system management plan, GIS mapping, LS maintenance and PG&E costs. These costs are estimated to be approximately \$84,000 in year one. For purposes of the Financial Model, the video inspection costs increase from \$30,000 in year one to \$82,400 in year two and then increase by 3% each year thereafter. Sewer system management plan costs are assumed to be incurred every other year beginning in year one. All other costs are assumed to increase by 3% each year beginning in year two. Operating expenses do not include the Fats, Oils and Grease ("FOG") program costs as shown in Table 9-5, which are expected to be funded through a separate fee on food service establishments.

## **Capital Improvement Program**

The District intends to use sewer rates to fund the following projects from the Sewer Master Plan: (i) all 18 Near Term Capital Projects from Table 9-2 (Health and Safety Projects and Efficiency Projects), (ii) all Capital Outlay Expenses from Table 9-6, and (iii) Long Term Capital Projects two through four from Table 9-3. The total amount to be funded through the sewer rates is equal to \$13,684,308 (unescalated) as shown in Table 10-1. For purposes of the Financial Model, capital costs are assumed to increase by 3% each year to the year constructed.

While certain costs have been allocated to new development outside the District's current service boundary (see Exhibit C), the proposed rate structure assumes that existing development will have to carry the full cost of the three (3) Long Term Projects until sufficient capacity fee revenues become available. This is because the facilities are needed to serve future development within the existing service boundary and the District may not be able to wait to accumulate sufficient funds from new development to construct the facilities. As discussed above, the estimated capacity fee revenues will partially offset the costs of facilities needed to serve both existing and future development over the 15 year term as shown in Exhibit B.

For purposes of the rate analysis, the Near Term Capital Projects have been divided into two groups based on funding priority. As noted in Chapter 9 of this report, the first 11 Near Term Capital Projects are a high priority due to health and safety concerns and need to be constructed within the first six years. Near Term Capital Projects 12 through 18 can be delayed beyond year six without impacting the health and safety of the residents of the District. Table 10-1 summarizes the costs to be funded through sewer rate revenues. A more detailed listing of the individual projects is included in Exhibit C.

## **Rate Stabilization Fund**

It is recommended that the District establish a rate stabilization reserve fund in order to provide a funding source from which the District can draw during years of revenue shortfall resulting from higher than expected operations and maintenance costs or lower than expected revenues.

For purposes of the Financial Model, contributions from net operating revenue to the rate stabilization fund are assumed to equal 15% of operational expenses on an annual basis until the fund reaches a maximum of \$200,000. A balance of \$200,000 represents an average of greater than 20% of annual operation and maintenance costs within the five year study rate period. Subsequent to reaching this maximum, all net operating revenue would be contributed to the capital replacement fund.

## **Capital Facilities Replacement Fund**

Facilities are funded as sufficient rate revenues are accumulated in the capital replacement fund. For purposes of the Financial Model, it was assumed that the capital replacement fund will have a starting balance of \$600,000 (before any contributions are made from rates).

As discussed in the Capital Improvement Program section, the year one sewer rate (along with the recommended annual escalator – see Proposed Rate Structure Section) has been calculated in order to fund the Near Term Capital Outlay Projects (projects one through eleven) and Capital Outlay Projects by year six and the remaining projects identified in Table 10-1 by year 15 on a pay-as-you-go basis.

## **PROPOSED RATE STRUCTURE**

In order to meet projected revenue requirements as projected over the next five years, it is recommended to include an annual increase in the sewer rate per EDU, as summarized in Table 10-2. The recommended rate structure by land use class for years one through five is shown in Table 3 of Exhibit A. Table 10-3 details the annual percentage change in the monthly sewer rate per EDU for each fiscal year for the first five years.

Table 10-1. Rate Study Costs to be Funded

<b>Master Plan Table</b>	<b>Projects</b>	<b>Costs allocated to Existing Development (unescalated)</b>	<b>Costs allocated to New Development (unescalated)</b>	<b>Total Costs (unescalated)</b>
Table 9-2	Near Term Capital Projects (Health and Safety Projects 1 - 11)	\$3,422,107	\$1,038,453	\$4,460,560
Table 9-2	Near Term Capital Projects (Health and Safety Projects 12 – 18)	\$5,405,299	\$30,650	\$5,435,948
Table 9-6	Capital Outlay Projects (Efficiency Projects)	\$545,000	\$0	\$545,000
Table 9-7	Region A Long Term Capital Projects (Projects 2 through 4)	\$2,039,350	\$1,203,450	\$3,242,800
NA	Total	\$11,411,756	\$2,272,553	\$13,684,308

Table 10-2. Monthly Sewer Rate Per EDU

	<b>Effective July 1, 2011</b>	<b>Effective July 1, 2012</b>	<b>Effective July 1, 2013</b>	<b>Effective July 1, 2014</b>	<b>Effective July 1, 2015</b>
Rate per month per EDU	\$11.88	\$12.13	\$12.39	\$12.66	\$12.93

Table 10-3. Annual Change of Sewer Rate

	<b>Effective July 1, 2011</b>	<b>Effective July 1, 2012</b>	<b>Effective July 1, 2013</b>	<b>Effective July 1, 2014</b>	<b>Effective July 1, 2015</b>
Rate per month per EDU	49.01%	2.15%	2.15%	2.15%	2.15%

**EXHIBIT A**  
**TABLES 1 THROUGH 3**

**TABLE 1. CURRENT SEWER RATES**

Description	Category Code [1]	Units	Monthly SCSD Sewer Rate
Business/Govt	001-099 [2]	Location/Each Business	\$5.51
Residential-Vacant	101	Each Living Unit	\$4.78
Residential/Apartments	102	Each Living Unit	\$7.97
Residential/Apartments	105	Each Living Unit	\$7.97
Residential-Vacant	106	Each Living Unit	\$4.78
Condo/Retirement	107	Each Living Unit	\$7.97
Condo/Retirement	109	Each Living Unit	\$7.97
Minimum/Vacancy	211	Location/Each Business	\$4.22
Motel/Hotel	221	Each Room	\$3.29
Bed & Breakfast Inn	222	Each Room	\$2.19
Supermarkets	231	Location	\$52.02
Medical Office	241	Each Licensed Physician	\$7.10
Dental Office	242	Each Licensed Dentist	\$9.59
Rest Home/Convalescent	243	Each Bed of Licensed Capacity	\$2.06
General Hospital	244	Each Bed of Licensed Capacity	\$12.18
Animal Hospital	245	Location/Each Licensed Business	\$14.28
Restaurant 1 meal/day	261	Each Restaurant Seat	\$0.50
Restaurant 2 meals/day	262	Each Restaurant Seat	\$0.76
Restaurant 3 meals/day	263	Each Restaurant Seat	\$1.43
Restaurant with Bar	264	Each Restaurant Seat	\$1.43
Bar	265	Location/Each Business	\$12.45
Nightclub	266	Location/Each Business	\$36.29
Takeout Food - Small	267	1 Cash Register or Checkout Line	\$17.60
Takeout Food - Medium	268	2 or 3 Cash Registers or Checkout Lines	\$42.56
Takeout Food - Large	269	4 or More Cash Registers or Checkout Lines	\$77.22
Bakery	270	Location/Each Business	\$19.99
Theater	281	Per Screen @ Each Location	\$16.83
Bowling Center	282	Location/Each Business	\$51.26
Gym	283-289 [3]	Per 500 members	\$5.51
Mortuary	290	Location/Each Business	\$25.50
School (Minimum)	291	Location/Each Business	\$5.51
School (Grades 0-6)	292	School Population	\$0.07
School (7-College)	293	School Population	\$0.13
Boarding School	294	School Population	\$1.59
Instructional Facility	295	Location/Each Business	\$5.51
Church	296-297 [4]	Per 100 members	\$5.51
Photo / Laboratory / Printer	301-326 [2]	Per 10 employees	\$5.51
Service Station/Garage	331	Location/Each Business	\$5.84
Paint and Body Shops	341-346 [2]	Per 10 employees	\$5.51
Commercial Laundry	352	Per 100 GPD of water usage	NA
Dry Cleaner	353	Location/Each Business	\$17.60
Laundromat	354	Each Washing Machine	\$4.45
Major Hotel	361	Per 100 GPD of water usage	NA
Car Wash	366	Per 100 GPD of water usage	NA
Special User	401	Per 100 GPD of water usage	NA
Rec Sports Facility	407	Per 100 GPD of water usage	NA
Ground Water	410	Per 100 GPD of water usage	\$4.22

[1] Category codes established by Monterey Regional Water Pollution Control Agency.  
 [2] Sewer rate increases by \$5.51 for every 10 employees.  
 [3] Sewer rate increases by \$5.51 for every 500 members.  
 [4] Sewer rate increases by \$5.51 for over 100 members.

TABLE 2. EDU FACTORS

Description	Category Code [1]	Units	Existing Units/Users [2]			GPD Avg. Flow [2]	EDU Factor	Total EDUs
			Del Rey Oaks	Seaside	Sand City			
Business/Govt	001-099	Location/Each Business	40	433	232	146	0.77	544
Residential-Vacant	101	Each Living Unit	1	19	21	0	0.00	0
Residential/Apartments	102	Each Living Unit	544	5,139	69	189	1.00	5,752
Residential/Apartments	105	Each Living Unit	17	2,759	51	189	1.00	2,827
Residential-Vacant	106	Each Living Unit	1	2		0	0.00	0
Condo/Retirement	107	Each Living Unit	148	175		189	1.00	323
Condo/Retirement	109	Each Living Unit				189	1.00	0
Minimum/Vacancy	211	Location/Each Business	1	61	15	0	0.00	0
Motel/Hotel	221	Each Room		478		82	0.43	207
Bed & Breakfast Inn	222	Each Room				54	0.29	0
Supermarkets	231	Location	1	5	1	797	4.22	30
Medical Office	241	Each Licensed Physician	3	15	2	195	1.03	21
Dental Office	242	Each Licensed Dentist	1	9	1	269	1.42	16
Rest Home/Convalescent	243	Each Bed of Licensed Capacity		111		54	0.29	32
General Hospital	244	Each Bed of Licensed Capacity				320	1.69	0
Animal Hospital	245	Location/Each Licensed Business				356	1.88	0
Restaurant 1 meal/day	261	Each Restaurant Seat	90	116		7	0.04	8
Restaurant 2 meals/day	262	Each Restaurant Seat		1,379	61	11	0.06	84
Restaurant 3 meals/day	263	Each Restaurant Seat		233	62	21	0.11	33
Restaurant with Bar	264	Each Restaurant Seat	174	370		21	0.11	60
Bar	265	Location/Each Business	1	6		317	1.68	12
Nightclub	266	Location/Each Business				950	5.03	0
Takeout Food - Small	267	1 Cash Register or Checkout Line	6	17	6	354	1.87	54
Takeout Food - Medium	268	2 or 3 Cash Registers or Checkout Lines	1	9	2	871	4.61	55
Takeout Food - Large	269	4 or More Cash Registers or Checkout Lines	1	3	2	1,588	8.40	50
Bakery	270	Location/Each Business	1	6	4	287	1.52	17
Theater	281	Per Screen @ Each Location				471	2.49	0
Bowling Center	282	Location/Each Business				1,433	7.58	0
Gym	283-289	Per 500 members		6	2	146	0.77	6
Mortuary	290	Location/Each Business		2		387	2.05	4
School (Minimum)	291	Location/Each Business		7		146	0.77	5
School (Grades 0-6)	292	School Population		4,014		2	0.01	44
School (7-College)	293	School Population		307		4	0.02	6
Boarding School	294	School Population				40	0.21	0
Instructional Facility	295	Location/Each Business		2	1	146	0.77	2
Church	296-297	Per 100 members	1	33		146	0.77	26
Photo / Laboratory / Printer	301-326	Per 10 employees	1	10	1	146	0.77	9
Service Station/Garage	331	Location/Each Business	2	46	13	140	0.74	45
Paint and Body Shops	341-346	Per 10 employees	2	14	6	146	0.77	17
Commercial Laundry	352 [3]	Per 100 GPD of water usage				100	0.53	NA
Dry Cleaner	353	Location/Each Business		2		483	2.56	5
Laundromat	354	Each Washing Machine		116		127	0.67	78
Major Hotel	361 [3]	Per 100 GPD of water usage		1		100	0.53	NA
Car Wash	366 [3]	Per 100 GPD of water usage		2	1	100	0.53	NA
Special User	401 [3]	Per 100 GPD of water usage		7	1	100	0.53	NA
Rec Sports Facility	407 [3]	Per 100 GPD of water usage		3		100	0.53	NA
Ground Water	410 [3]	Per 100 GPD of water usage		1		100	0.53	NA
Special User		Per 100 GPD of water usage				71,918	380.52	381

[1] Category codes established by Monterey Regional Water Pollution Control Agency. Total EDUs: 10,754  
 [2] Based on information provided by Monterey Regional Water Pollution Control Agency.  
 [3] The EDUs for categories 352, 361, 366, 401, 407, and 410 are included in the "Special User" category.

**TABLE 3. RECOMMENDED SEWER RATES FY 2011-2012 THROUGH FY 2015-2016**

Description	Category Code [1]	Units	Sewer Rate per Month [2]				
			FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16
Business/Govt	001-099 [3]	Location/Each Business	\$9.17	\$9.37	\$9.57	\$9.78	\$9.99
Residential-Vacant	101	Each Living Unit	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Residential/Apartments	102	Each Living Unit	\$11.88	\$12.14	\$12.40	\$12.67	\$12.94
Residential/Apartments	105	Each Living Unit	\$11.88	\$12.14	\$12.40	\$12.67	\$12.94
Residential-Vacant	106	Each Living Unit	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Condo/Retirement	107	Each Living Unit	\$11.88	\$12.14	\$12.40	\$12.67	\$12.94
Condo/Retirement	109	Each Living Unit	\$11.88	\$12.14	\$12.40	\$12.67	\$12.94
Minimum/Vacancy	211	Location/Each Business	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Motel/Hotel	221	Each Room	\$5.16	\$5.27	\$5.38	\$5.50	\$5.62
Bed & Breakfast Inn	222	Each Room	\$3.40	\$3.47	\$3.55	\$3.62	\$3.70
Supermarkets	231	Location	\$50.11	\$51.19	\$52.29	\$53.41	\$54.56
Medical Office	241	Each Licensed Physician	\$12.26	\$12.53	\$12.80	\$13.07	\$13.35
Dental Office	242	Each Licensed Dentist	\$16.91	\$17.27	\$17.64	\$18.02	\$18.41
Rest Home/Convalescent	243	Each Bed of Licensed Capacity	\$3.40	\$3.47	\$3.55	\$3.62	\$3.70
General Hospital	244	Each Bed of Licensed Capacity	\$20.12	\$20.55	\$20.99	\$21.44	\$21.90
Animal Hospital	245	Location/Each Licensed Business	\$22.39	\$22.87	\$23.36	\$23.86	\$24.38
Restaurant 1 meal/day	261	Each Restaurant Seat	\$0.44	\$0.45	\$0.46	\$0.47	\$0.48
Restaurant 2 meals/day	262	Each Restaurant Seat	\$0.69	\$0.70	\$0.72	\$0.73	\$0.75
Restaurant 3 meals/day	263	Each Restaurant Seat	\$1.32	\$1.35	\$1.38	\$1.41	\$1.44
Restaurant with Bar	264	Each Restaurant Seat	\$1.32	\$1.35	\$1.38	\$1.41	\$1.44
Bar	265	Location/Each Business	\$19.93	\$20.36	\$20.79	\$21.24	\$21.70
Nightclub	266	Location/Each Business	\$59.72	\$61.01	\$62.32	\$63.66	\$65.03
Takeout Food - Small	267	1 Cash Register or Checkout Line	\$22.26	\$22.74	\$23.22	\$23.72	\$24.23
Takeout Food - Medium	268	2 or 3 Cash Registers or Checkout Lines	\$54.76	\$55.93	\$57.14	\$58.37	\$59.62
Takeout Food - Large	269	4 or More Cash Registers or Checkout Lines	\$99.84	\$101.99	\$104.18	\$106.42	\$108.71
Bakery	270	Location/Each Business	\$18.05	\$18.44	\$18.83	\$19.24	\$19.65
Theater	281	Per Screen @ Each Location	\$29.61	\$30.25	\$30.90	\$31.56	\$32.24
Bowling Center	282	Location/Each Business	\$90.10	\$92.04	\$94.01	\$96.04	\$98.10
Gym	283-289 [4]	Per 500 members	\$9.17	\$9.37	\$9.57	\$9.78	\$9.99
Mortuary	290	Location/Each Business	\$24.34	\$24.86	\$25.39	\$25.94	\$26.50
School (Minimum)	291	Location/Each Business	\$9.17	\$9.37	\$9.57	\$9.78	\$9.99
School (Grades 0-6)	292	School Population	\$0.13	\$0.13	\$0.14	\$0.14	\$0.14
School (7-College)	293	School Population	\$0.25	\$0.25	\$0.26	\$0.27	\$0.27
Boarding School	294	School Population	\$2.52	\$2.57	\$2.63	\$2.69	\$2.74
Instructional Facility	295	Location/Each Business	\$9.17	\$9.37	\$9.57	\$9.78	\$9.99
Church	296-297 [5]	Per 100 members	\$9.17	\$9.37	\$9.57	\$9.78	\$9.99
Photo / Laboratory / Printer	301-326 [3]	Per 10 employees	\$9.17	\$9.37	\$9.57	\$9.78	\$9.99
Service Station/Garage	331	Location/Each Business	\$8.81	\$8.99	\$9.19	\$9.39	\$9.59
Paint and Body Shops	341-346 [3]	Per 10 employees	\$9.17	\$9.37	\$9.57	\$9.78	\$9.99
Commercial Laundry	352	Per 100 GPD of water usage	\$6.29	\$6.42	\$6.56	\$6.70	\$6.84
Dry Cleaner	353	Location/Each Business	\$30.37	\$31.03	\$31.69	\$32.37	\$33.07
Laundromat	354	Each Washing Machine	\$7.99	\$8.16	\$8.33	\$8.51	\$8.69
Major Hotel	361	Per 100 GPD of water usage	\$6.29	\$6.42	\$6.56	\$6.70	\$6.84
Car Wash	366	Per 100 GPD of water usage	\$6.29	\$6.42	\$6.56	\$6.70	\$6.84
Special User	401	Per 100 GPD of water usage	\$6.29	\$6.42	\$6.56	\$6.70	\$6.84
Rec Sports Facility	407	Per 100 GPD of water usage	\$6.29	\$6.42	\$6.56	\$6.70	\$6.84
Ground Water	410	Per 100 GPD of water usage	\$6.29	\$6.42	\$6.56	\$6.70	\$6.84
			Percentage Increase:	2.15%	2.15%	2.15%	2.15%

[1] Category codes established by Monterey Regional Water Pollution Control Agency.

[2] If approved, Sewer Rates shown would be effective as of July 1 of each fiscal year.

[3] Sewer Rate increases by \$9.17 for every 10 employees.

[4] Sewer Rate increases by \$9.17 for every 500 members.

[5] Sewer Rate increases by \$9.17 for over 100 members.

**EXHIBIT B**  
**FINANCIAL MODEL**

**Seaside County Sanitation District**  
**\$13.7 Million (unescalated) capital replacement program; fund first 11 projects and capital outlay projects by Year 6; fund remaining projects by Year 15**

Study Year Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Fiscal Year	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	
\$ Per EDU (Monthly)	\$11.88	\$12.13	\$12.39	\$12.66	\$12.93	\$13.12	\$13.41	\$13.70	\$13.99	\$14.29	\$14.60	\$14.91	\$15.23	\$15.56	\$15.89	
<b>OPERATING REVENUE</b>																
SCSD Rate Revenue	\$ 1,532,639	\$ 1,565,591	\$ 1,599,251	\$ 1,633,635	\$ 1,668,758	\$ 1,692,770	\$ 1,729,165	\$ 1,766,342	\$ 1,804,318	\$ 1,843,111	\$ 1,882,738	\$ 1,923,217	\$ 1,964,566	\$ 2,006,804	\$ 2,049,950	
Property Taxes	\$ 248,105	\$ 248,105	\$ 253,067	\$ 258,128	\$ 263,291	\$ 268,556	\$ 273,928	\$ 279,406	\$ 284,994	\$ 290,694	\$ 296,508	\$ 302,438	\$ 308,487	\$ 314,657	\$ 320,950	
Use of money and property	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	\$ 51,157	
Estimated Capacity Fee Revenue	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 136,327	\$ 136,327	\$ 136,327	\$ 136,327	\$ 136,327	\$ 136,327	\$ 136,327	\$ 136,327	\$ 136,327	\$ 136,327	
Total Revenue	\$ 1,831,901	\$ 1,864,852	\$ 1,903,475	\$ 1,942,920	\$ 1,983,205	\$ 2,148,810	\$ 2,190,576	\$ 2,233,231	\$ 2,276,796	\$ 2,321,289	\$ 2,366,729	\$ 2,413,138	\$ 2,460,536	\$ 2,508,944	\$ 2,558,384	
<b>OPERATIONAL EXPENSES:</b>																
Labor and Materials																
Sewer Operations and Maintenance	\$ 745,000	\$ 767,350	\$ 790,371	\$ 814,082	\$ 838,504	\$ 863,659	\$ 889,569	\$ 916,256	\$ 943,744	\$ 972,056	\$ 1,001,218	\$ 1,031,254	\$ 1,062,192	\$ 1,094,058	\$ 1,126,879	
Outside Services:																
Video Inspection	\$ 30,000	\$ 82,400	\$ 84,872	\$ 87,418	\$ 90,041	\$ 92,742	\$ 95,524	\$ 98,390	\$ 101,342	\$ 104,382	\$ 107,513	\$ 110,739	\$ 114,061	\$ 117,483	\$ 121,007	
Sewer System Management Plan	\$ -	\$ 15,450	\$ -	\$ 16,391	\$ -	\$ 17,389	\$ -	\$ 18,448	\$ -	\$ 19,572	\$ -	\$ -	\$ -	\$ -	\$ -	
GIS Maintenance/Mapping	\$ 25,000	\$ 25,750	\$ 26,523	\$ 27,318	\$ 28,138	\$ 28,982	\$ 29,851	\$ 30,747	\$ 31,669	\$ 32,619	\$ 33,598	\$ 34,606	\$ 35,644	\$ 36,713	\$ 37,815	
LS Maintenance	\$ 20,000	\$ 20,600	\$ 21,218	\$ 21,855	\$ 22,510	\$ 23,185	\$ 23,881	\$ 24,597	\$ 25,335	\$ 26,095	\$ 26,878	\$ 27,685	\$ 28,515	\$ 29,371	\$ 30,252	
PGE	\$ 9,000	\$ 9,270	\$ 9,548	\$ 9,835	\$ 10,130	\$ 10,433	\$ 10,746	\$ 11,069	\$ 11,401	\$ 11,743	\$ 12,095	\$ 12,458	\$ 12,832	\$ 13,217	\$ 13,613	
total operational expenses:	\$ 829,000	\$ 920,820	\$ 932,531	\$ 976,898	\$ 989,322	\$ 1,036,391	\$ 1,049,572	\$ 1,099,507	\$ 1,113,491	\$ 1,166,467	\$ 1,181,302	\$ 1,216,742	\$ 1,253,244	\$ 1,290,841	\$ 1,329,566	
NET OPERATING REVENUE	\$ 1,002,901	\$ 944,032	\$ 970,943	\$ 966,022	\$ 993,883	\$ 1,112,419	\$ 1,141,004	\$ 1,133,724	\$ 1,163,305	\$ 1,154,821	\$ 1,185,427	\$ 1,196,397	\$ 1,207,292	\$ 1,218,103	\$ 1,228,817	
Less:																
Rate Stabilization Reserves @ 15% of expenses	\$ 124,350	\$ 75,650	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Contribution to near term capital replacement reserves	\$ 878,551	\$ 868,382	\$ 970,943	\$ 966,022	\$ 993,883	\$ 1,112,419	\$ 1,141,004	\$ 1,133,724	\$ 1,163,305	\$ 1,154,821	\$ 1,185,427	\$ 1,196,397	\$ 1,207,292	\$ 1,218,103	\$ 1,228,817	
Budget Surplus (deficit)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Rate Stabilization Reserve Fund Balances:																
Beginning of Fiscal Year	\$ -	\$ 124,350	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	
Budget Surplus (Deficit)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Contribution to (Use of) Reserve Balance from Rates	\$ 124,350	\$ 75,650	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
End of Fiscal Year	\$ 124,350	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	
Capital Replacement Fund Balance:																
Beginning Fund Balance	\$ 600,000	\$ 558,361	\$ 674,545	\$ 552,145	\$ 1,029,091	\$ 330,684	\$ 5,520	\$ 185,339	\$ 627,817	\$ 146,636	\$ 81,236	\$ 1,267,069	\$ 2,469,802	\$ 383,959	\$ 1,603,982	
Contribution to capital replacement reserves	\$ 878,551	\$ 868,382	\$ 970,943	\$ 966,022	\$ 993,883	\$ 1,112,419	\$ 1,141,004	\$ 1,133,724	\$ 1,163,305	\$ 1,154,821	\$ 1,185,427	\$ 1,196,397	\$ 1,207,292	\$ 1,218,103	\$ 1,228,817	
Interest Earnings on Fund Balance	\$ -	\$ 2,792	\$ 3,373	\$ 2,761	\$ 5,145	\$ 1,653	\$ 28	\$ 927	\$ 3,139	\$ 733	\$ 406	\$ 6,335	\$ 12,349	\$ 1,920	\$ 8,020	
Less use of funds (based on 100% of costs)	\$ (920,190)	\$ (754,990)	\$ (1,096,716)	\$ (491,836)	\$ (1,697,436)	\$ (1,439,236)	\$ (961,212)	\$ (692,173)	\$ (1,647,625)	\$ (1,220,955)	\$ -	\$ -	\$ (3,305,484)	\$ -	\$ (2,836,106)	
Ending Fund Balance	\$ 558,361	\$ 674,545	\$ 552,145	\$ 1,029,091	\$ 330,684	\$ 5,520	\$ 185,339	\$ 627,817	\$ 146,636	\$ 81,236	\$ 1,267,069	\$ 2,469,802	\$ 383,959	\$ 1,603,982	\$ 4,713	
Near Term Capital Projects Funded	1,2,3,4,9,10	6	5	11	7	8,13,14,15,18	NA	NA	NA	12	16	NA	NA	NA	NA	
SCSD Capital Outlay Projects Funded	1	2,3	NA	NA	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Region A Long Term Capital Projects Funded	NA	NA	NA	NA	NA	NA	4	2	NA	NA	NA	NA	NA	NA	3	
Remaining Project Costs	\$ 13,147,042	\$ 12,763,813	\$ 12,017,110	\$ 11,871,032	\$ 10,478,804	\$ 9,310,754	\$ 8,600,028	\$ 8,145,091	\$ 6,692,390	\$ 5,635,579	\$ 5,804,646	\$ 5,978,786	\$ 2,753,501	\$ 2,836,106	\$ -	

Assumptions:																
Base Annual rate increase (%) (thru Year 5)	49.02%	2.15%	2.15%	2.15%	2.15%	1.49%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%	2.15%
O&M Inflation	3.00%	Total EDUs =		10,754												
rate stabilization threshold	\$200,000	Year 1 \$ per EDU (monthly) =		\$11.88												
Property Tax Increase starting in Year 3	2.00%	one time increase/(decrease) in year 6 =		1.49%												
Annual Capital Costs increase (%)	3.00%															
Annual Interest Earnings on Fund Balance (%)	0.50%															
															<b>Projects Not Funded by Year 15</b>	
															Near Term Capital Projects	NA
															SCSD Capital Outlay Projects	NA
															Region A Long Term Capital Projects	NA

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**EXHIBIT C**  
**CAPITAL IMPROVEMENT COSTS**

**Near Term Capital Projects 1 through 11 (Table 9-2, Sewer Master Plan)**

Project Number	Title	Description	2010 Construction Cost	Allocation to existing development	Near Term Costs Allocated to Existing Development	Accumulated
1	Del Monte Lift Station	Lift Station Upgrades including expanding wetwell capacity to meet current demand	\$17,500	100%	\$17,500	\$17,500
2	Rosita Lift Station	Lift station upgrades including pump control modifications and maintenance related repairs	\$61,600	100%	\$61,600	\$79,100
3	942 Angeles Way Sewer	Replace existing steel pipe with ductile iron pipe at creek crossing	\$50,400	100%	\$50,400	\$129,500
4	Del Rey Park Sewer Line	re-route existing main for maintenance purposes	\$267,750	100%	\$267,750	\$397,250
5	Del Monte Blvd. Sewer Line	replace and re-route existing sewer line. Consolidates capacity from older lines	\$1,033,760	44%	\$454,854	\$852,104
6	Military Lift Station Replacement	replace entire lift station	\$553,000	100%	\$553,000	\$1,405,104
7	Fremont Blvd. Sewer	replace existing pipeline. Additional capacity is needed to meet current demand	\$1,158,150	72%	\$833,868	\$2,238,972
8	Luzern Street Sewer Line	replace existing sewer line. Upgrade three existing manholes	\$360,360	100%	\$360,360	\$2,599,332
9	La Salle Avenue Sewer Line	replace existing pipeline. Additional capacity is needed to meet current demand	\$496,440	75%	\$372,330	\$2,971,662
10	Tioga Lift Station Feasibility Analysis	Investigate the possibility of abandonment	\$11,500	3%	\$345	\$2,972,007
11	Birch Avenue Sewer Line	replace existing sewer main	\$450,100	100%	\$450,100	\$3,422,107
<b>Subtotal Near Term Capital Projects (1 through 11)</b>			<b>\$4,460,560</b>		<b>\$3,422,107</b>	

**Near Term Capital Projects 12 through 18 (Table 9-2, Sewer Master Plan)**

Project Number	Title	Description	2010 Construction Cost	Allocation to existing development	Near Term Costs Allocated to Existing Development	Accumulated
12	Root Intrusion Replacements	inspect and replace pipes damaged by root intrusion	\$1,300,650	100%	\$1,300,650	\$4,722,757
13	Brick Manhole Inspection	inspect all brick manholes for infiltration and deterioration	\$84,813	100%	\$84,813	\$4,807,570
14	Drop Manhole Inspection	Inspect all drop manholes for improper construction and needed upgrades to meet current standards	\$415,350	100%	\$415,350	\$5,222,920
15	Manhole Lid Replacements	install upgraded manhole lids to prevent sand and water infiltration	\$74,480	100%	\$74,480	\$5,297,400
16	Rod Hole Replacement	Replace rod holes (cleanouts) with standard manholes	\$935,760	100%	\$935,760	\$6,233,160
17	New Manhole Installation	Install new manholes where existing sewer line pipe runs exceed 400 feet	\$2,318,400	100%	\$2,318,400	\$8,551,560
18	Canyon Del Rey Sewer line	replace existing sewer lines that have little or no structural integrity	\$306,495	90%	\$275,846	\$8,827,406
<b>Subtotal Near Term Capital Projects (12 through 18)</b>			<b>\$5,435,948</b>		<b>\$5,405,299</b>	

**SCSD Capital Outlay (Table 9-6, Sewer Master Plan)**

Project Number	Project	Description	2010 Construction Cost	Allocation to existing development	Capital Outlay Costs Allocated to Existing Development	Accumulated
1	Video Inspection	GIS Software/hardware, video camera	\$15,000	100%	\$15,000	\$8,842,406
2	Vehicle	one jetter truck	\$160,000	100%	\$160,000	\$9,002,406
3	Vehicle	one pickup	\$20,000	100%	\$20,000	\$9,022,406
4	Vactor Truck	one truck	\$350,000	100%	\$350,000	\$9,372,406
<b>Subtotal Capital Outlay Projects</b>			<b>\$545,000</b>		<b>\$545,000</b>	

**Region A Long Term Capital Cost (Table 9-3, Sewer Master Plan)**

Project Number	Project	Description	2010 Construction Cost	Allocation to existing development	Region A Long Term Capital Costs Allocated to Existing Development	Accumulated
2	Ortiz		\$562,800	0%	\$0	\$9,372,406
3	Del Monte Lift Station VFD Upgrade		\$1,875,000	80%	\$1,500,000	\$10,872,406
4	Rosita Lift Station VFD Upgrade		\$805,000	67%	\$539,350	\$11,411,756
<b>Subtotal Region A Long Term Capital Projects</b>			<b>\$3,242,800</b>		<b>\$2,039,350</b>	

**Total**

Project Number	Project	Description	2010 Construction Cost	Allocation to existing development	Total Capital Costs Allocated to Existing Development	Accumulated
<b>Total Capital Replacement Costs</b>			<b>\$13,684,308</b>		<b>\$11,411,756</b>	